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DRAFT CHAPTER 1 -- ECONOMICS OF IUU FISHING ACTIVITIES

This paper is work in progress by the OECD Secretariat and is submitted to the IUU Workshop as background documentation.

Comments and suggestions by Delegates are welcome.

Note that this is work in progress and is not for quotation.

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DRAFT CHAPTER 1 -- ECONOMICS OF IUU FISHING ACTIVITIES¹**Key Highlights of the Document**

IUU fishing is an economic activity. Incentives to engage in IUU fishing activities are thus economic by nature. The purpose of this paper is (1) to identify, analyse and model the economic, institutional (regulatory) and social factors creating these incentives and (2) to propose possible actions that can be taken to modify the incentive structure to engage in IUU fishing activities.

The first section defines the concepts and terms used in the document. IUU fishing activities can be conducted by vessels registered in flag States assumed to comply with current international regulations (“committed” States) and by vessels registered in flag States not party to RFMOs or to international conventions (“Non-Party” States). Among IUU fishing activities conducted by NPA vessels, a particular case concerns those IUU fishing activities that take place through flagging or re-flagging vessel in those “Non-Party” flag States which accept to register vessels without having a “genuine link” with companies owning the vessels and without having the ability or the willingness to ensure an effective control of their flag (“Flag of Convenience” or FOC States).

The second section presents the analytical framework, which draws on the general economics of crime and punishment. This theory suggests that an individual will commit an offence if and only if the private expected benefit from IUU fishing exceeds the expected sanction for doing so.

The third section examines each variable influencing the fishing profit function, in order to identify incentives for engaging in IUU fishing activities. The main economic, institutional and social factors creating such incentives are:

- Existence of excess or idle fishing capacities, which incite operators to engage in IUU activities to get higher revenues and which reduce fishing vessels and crew cost.
- Incompleteness of the international legal frameworks, which allows operators engaged in IUU fishing activities to face reduced operating and risk cost.
- Insufficient or ineffective enforcement of national and international regulations (including low MCS capacities and low level of sanction), which reduce the cost of risk faced by IUU operators.
- Existence of tax havens and other non-cooperative practices, which may provide IUU operators with low tax and reduce the cost of risk.
- Prevalence of poor economic and social conditions in some countries, which reduces the cost of fraud, crew costs, the cost of risk and the costs associated with maintaining appropriate safety and working standards.
- Existence of subsidies that reduce the cost of IUU fishing capacity.
- Existence of fiscal and foreign investment rules that reduce the cost of IUU fishing capacity.
- Underestimation and non-internalisation of the social cost generated by IUU fishing activities, which reduce the moral/reputation cost IUU operators might face.

¹ This document is partly based on a consultancy work (“Economic and Social Drivers of IUU Fishing”, Agnew and Barnes, 2004 [AGR/FI/IUU(2004)2]).

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The fourth section provides evidence that emergence of organised IUU fishing operations is likely to accelerate/enhance some of the incentives to engage in IUU fishing activities. Organised IUU fishing operations can increase the price of IUU catch and reduce administrative, fraud and risk costs.

Based on this analysis, the final section proposes measures that can be entertained to combat IUU fishing activities, including:

Reducing Revenues

- Reduce incompleteness of current international frameworks and reducing the possibilities for FOC registration
- Provide NPA states with appropriate incentives for joining RFMOs and financial “compensation” for de-registering FOC vessels.
- Improve compliance with current national and international obligations through better MCS capabilities, including broader cross country cooperation.
- Banning imports
- Listing of banned vessels/companies and countries of origin
- Introduce catch and trade document schemes, and labelling
- Encouraging education and promotional campaigns

Increasing Operating Costs

- Eliminate tax havens
- Restrict accessibility to goods and services for IUU operators (fuel, landing, insurance, communications and navigation services etc).
- Ratification and implementation of conventions relating to crews on fishing vessels.
- Improve economic and social situation in countries/regions supplying cheap crews.
- Apply extra territorial domestic sanctions to citizens engaged in IUU operations.
- Make flag states legally liable for lack of appropriate insurance.
- Augment MCS capacities
- Increase penalties and sanctions (prison, confiscation of vessels and catch)
- Harmonise flag state fine levels
- Identify beneficial ownership of vessels
- Encourage private initiatives (including wanted rewards schemes)
- Improve knowledge of the social, economic and environmental consequences of IUU through education programs
- Use cooperate governance initiatives and guidance programs
- Apply the OECD Convention to combat bribery of foreign public officials.

Increasing Capital Costs

- Setting and enforcing minimum vessel standards (port state control)
- Reduce vessel capacity potentially available for IUU operations (scrapping and appropriate management regimes)
- Restricting outward investment rules on IUU vessel capital
- Restrict banking laws use of IUU vessel capital as collateral
- Make flag states legally liable for damage resulting from the lack of appropriate maintenance
- Improve macroeconomic conditions in countries supplying low cost crew

TABLE OF CONTENTS

Key Highlights of the Document.....	2
Possible Avenues to Reduce IUU Revenues.....	3
Increase Operating Costs for IUU Activities.....	3
Increase Capital Costs of IUU Vessels.....	3
Introduction.....	5
1. Definition.....	5
2: Analytical Framework.....	8
The Model.....	9
3. Exploring the Incentives to Engage in IUU Fishing Activities.....	11
3.1. Incentives to engage in IUU fishing activities for vessels registered in committed States.....	11
3.1.1. The market side: Higher expected revenues.....	11
3.1.2. The cost side: insufficient disincentives.....	14
3.2. Incentives to engage in IUU/FOC fishing activities in the high seas.....	15
3.2.1. Market side: Higher Expected Total Revenues.....	15
3.2.2. The cost side: Lower Expected Costs and insufficient disincentives.....	16
3.3.3. Summing-up.....	21
3.4. Incentives to engage in IUU/FOC fishing activities within a foreign EEZ.....	23
4. Enlarging the framework.....	25
4.1. Organised/Coordinated IUU fishing activities.....	26
4.2. Dual-Flags.....	27
5. Possible Actions to Curb IUU Fishing Activities.....	27
5.1. Exploring ways to reduce total revenues.....	27
5.2. Exploring ways to increase operating costs of IUU/FOC vessels.....	30
5.3. Exploring ways to increase capital costs of IUU/FOC vessels.....	32
5.4. Exploring ways to increase cost of engaging in IUU fishing activities.....	34
Conclusion.....	36
BIBLIOGRAPHY.....	39
APPENDIX.....	41

Boxes

Box 1: Components of Total Cost (OP _i , CC _i , IUU _i).....	10
Box 2: Linkage between Revenue Differential and Probability of Being Apprehended.....	13
Box 3: The Capital Cost of FOC Vessels.....	19
Box 4: Expected Impact of the Fine on Expected Profit.....	25
Box 5: When Re-flagging Fails.....	25
Box 6: An Example of Organised IUU Fishing Activities.....	26
Box A.1: Examples of ITLOS Decisions.....	42

Introduction

1. IUU fishing is an economic activity. Incentives to engage in IUU fishing activities are thus economic by nature. They can encompass two distinct forms: to get higher revenues and to face lower costs than those expected if rules were observed.

2. The purpose of this paper is to identify and analyse the economic, institutional (regulatory) and social factors creating these incentives. The analysis in the paper compares the expected fishing profit for a vessel engaged in IUU fishing activity relative to a vessel conducting regular fishing activities. Based on this analysis, the paper proposes actions that can be taken to modify the incentive structure to engage in IUU fishing activities.

3. This paper is organised in five sections. Section 1 clarifies the concepts and terms used in the document. Section 2 presents the analytical framework, which draws on the general economics of crime and punishment. This theory suggests that an individual will commit an offence if and only if the private expected benefit from IUU fishing exceeds the expected sanction for doing so. Section 3 examines each variable influencing the fishing profit function, in order to identify:

- where incentives for engaging in IUU fishing activities exist and
- the economic, institutional and social factors creating the economic incentives

4. Section 3 first explores why a vessel registered in a State assumed to comply with current international regulations engages in IUU fishing (3.1). Second, the analysis investigates why some operators decide to register their vessel in a foreign State in order to engage in IUU fishing (3.2). In order to do so, IUU vessels are in both cases compared with vessels assumed to comply with rules and to conduct regular fishing activities.

5. Section 4 explores situations that are likely to modify the analytical framework developed in Section 2 including, among other things, the emergence of organised IUU fishing activities. Section 5 proposes actions that could be taken to modify the incentive structure to engage in IUU fishing activities.

1. Definition

6. The document deals with IUU fishing operations in general, as defined by the FAO. For the purpose of the analysis, it is assumed that the problem of IUU fishing can take two distinct, extreme forms². The first concerns IUU fishing operations conducted by vessels registered in flag States assumed to comply with current international regulations. These States, expected to enact and enforce appropriate regulations, are named “committed” States. Accordingly, vessels registered in these States are referred to as “committed³” vessels.

7. The second distinct form concerns IUU fishing operations conducted by vessels registered in flag States not party to RFMOs or to international conventions. These States, assumed to have no or little

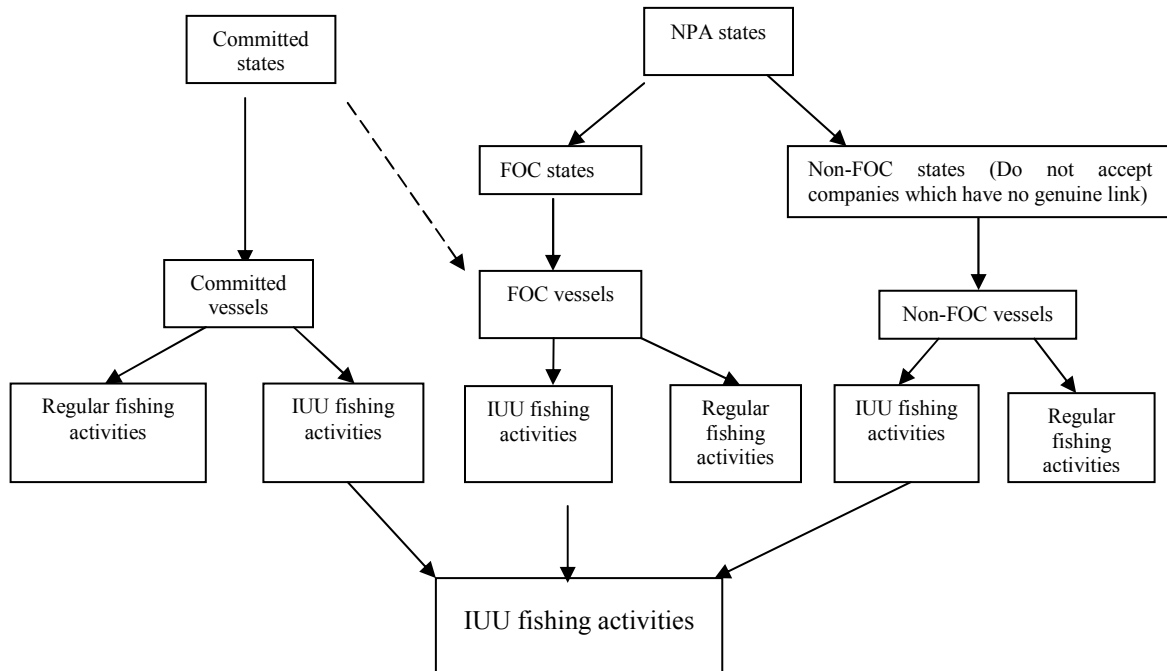
² In practice, such “black and white” approach needs to be considered with caution. Grey areas are often the rule rather than the exception, with committed States sometimes complying only with some international rules/agreements and Non-Parties States also complying with some international rules/agreements.

³ Respectively referred to as “responsible” and “standard” vessels in the Spanish and the Japanese works (see footnote 4).

regulations in place, are referred to as “Non-Party” (NPA) States. Accordingly, vessels registered in these States are referred to as “Non-Party” (NPA) vessels.

8. Among IUU fishing activities conducted by NPA vessels, a particular case concerns IUU fishing activities that take place through flagging or re-flagging vessel originating from committed countries in those “Non-Party” flag States which in addition accept to register vessels from other countries without having a “genuine link” with companies owning the vessels and without having the ability or the willingness to ensure an effective control of their flag. For the time being, such countries are referred to as “Flag of Convenience” (FOC) States. It should be noted that the term FOC is currently under consideration by the Secretariat and alternative terminologies explored. Among possible candidates are “Open Register” (OR) and Flag of Non Compliance (FONC). Those foreign vessels registered in FOC States in order to engage in IUU fishing are referred to as FOC vessels.

9. It should be noted that this does not imply that IUU fishing activities are only carried out by vessels registered in Non-Party States or in FOC States, nor that all vessels registered in these States are engaged in IUU fishing activities. When appropriate (i.e. when costs and benefits differ), the following may refer to “IUU/FOC vessels” and “IUU/committed vessels”. The acronym “IUU/FOC vessels” refers to those vessels registered in FOC States in order to engage in IUU fishing activities. The term “IUU/committed vessels” refers to those vessels engaged in IUU fishing activities and registered in committed States. Figure 1 below summarises the typology of IUU fishing activities

Figure 1. Typology of IUU Fishing Activities

Where:

- Committed States: flag States assumed to comply with current international regulations.
- NPA States: flag States not party to RFMOs or to international conventions.
- FOC States: those NPA flag States which in addition accept to register vessels from other countries without having a “genuine link” with companies owning the vessels and without having the ability or the willingness to ensure an effective control of their flag.
- Designs the engagement of committed States’ citizens into IUU/FOC fishing activities, either through the re-flagging of existing vessels originating from committed States or new investment in IUU fishing capacities.

2: Analytical Framework ⁴

10. The analytical framework draws heavily on the economics of crime and punishment, the basis of which are the work of Becker (1968) and Stieglar (1971). The main lesson/outcome of this theory is that a risk-neutral individual⁵ will commit an offence if and only if his private expected benefit [E(B)] exceeds the expected sanction [E(S)] for doing so, i.e., in this context, if the expected profit [E(π)] of IUU fishing is positive. In general terms, this result can be expressed:

$$(1) \text{ Expected profit from IUU} > 0 \leftrightarrow \text{Expected benefit} > \text{Expected sanction}$$

$$\text{or } (2) E(\pi) > 0 \leftrightarrow E(B) > E(S)$$

$$\text{or } (3) P2 \times (B) > P1 \times (S),$$

Where:

E(π): expected profit

E(B): expected benefit

E(S): expected sanction (in absolute value)

Prob1: probability of being punished,

Prob2: probability of not being punished, with $P2 = (1-P1)$,

11. The Study in particular seeks to understand why fishers engage in IUU fishing activities *rather* than in regular fishing activities. A risk-neutral individual will engage in IUU fishing activities if the private expected profit [E(π_{iuu})] exceeds the private profit expected when engaging in regular fishing activities [E(π_r)]⁶: $E(\pi_{iuu}) > E(\pi_r)$.

12. There are three key assumptions underlying this broad framework:

(a) The economics of crime and punishment makes the assumption that any individual's compliance decision is not influenced by the behaviour of other individuals; to the extent that several individuals simultaneously choose whether or not to commit the offence, it is assumed that their decisions are independent of each other (Jost, 2001). However, coordination may play an important role in the decision on whether or not to engage in illegal operation (Jost, 2001). The recent engagement of organised fleets of IUU vessels with common ownership may require particular attention in this case.

⁴ A similar approach was previously developed by Spain as part of the OECD Study "Towards Sustainable Fisheries" ("The quotient of convenience: Estimation of the cost relative to responsible fishing", in OECD 1997, pages 229-247; [OECD/GD(97)54]). A notable difference between the present paper and the work developed by Spain is that all the variables are translated into private and social cost of responsible fishing in the Spanish contribution. Japan also developed a similar approach in the framework of the OECD Study on "Market Liberalisation" ("The economy of Flag of Convenience Tuna Fishing Vessels"; OECD, 2003a, pp. 316-320). This latter work mainly focuses on the benefit and operating cost sides of the problem. Both works provide useful insights to the present document.

⁵ i.e. an individual that has neither particular preference nor aversion for the risk.

⁶ In the document, index *iuu* refers to IUU fishing activities; index *r* to regular/committed fishing activities; index *c* to FOC vessels.

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In addition, the factors affecting decision whether to engage or not in IUU fishing activities may not be same for individuals and companies (see section 4 and Agnew and Barnes, 2003).

(b) The framework makes the assumption that individuals are “risk-neutral”. While such an assumption may be considered as sound at a global level, it is not always verified in real world. For many years, “risk-preference” and “risk-adverse” behaviours have been identified in the specialised literature (see Varian, 1992). In the context of IUU fishing activities, it should be noted that the nature of an individual’s utility function is likely to play a particularly strong role in understanding (and modifying) IUU behaviours. This may be especially relevant when dealing with crew originating from low income countries.

(c) Finally, the economics of crime and punishment makes the assumption that fishers’ decisions about whether to fish illegally are based solely on profit-maximising criteria, with any penalties incurred being perceived as simply a “cost of doing business”. However, non pecuniary factors, based on moral and social considerations, can also play a major role in fisher decisions (Sutinen and Kuperan, 1999). This may require further exploration, in particular when IUU fishing activities are carried on either by individuals living within strong fishing communities or by established enterprises that might have an interest in paying attention to corporate governance issues. A variable denoting a “moral/reputation” dimension can be included in the model.

The Model

13. The model describes the expected profit function of fishing of a given risk-neutral, individual vessel owner, whether the vessel is engaged or not in IUU fishing activities. The expected profit function of vessel i is:

$$(4) \quad E(\pi_i) = E(B_i) - E(S_i)$$

$$E(\pi_i) = E[(1-r_i) \times (TR_i - TC_i)] - E(S_i)$$

Where:

r_i = profit tax rate in country i ,

TR_i = Total Revenue from fishing operation of the vessel i

TC_i = Total Cost of fishing operation of the vessel i

$E(S_i)$ = Expected sanction faced by the vessel i

$$(5) \quad \text{Total Revenue: } TR_i = Q_i \times P_i$$

Where:

Q_i = quantity of fish caught by the vessel i

P_i = price of fish receive by the vessel i

$$(6) \quad \text{Total Cost : } TC_i = OP_i + CC_i + IUUC_i$$

Where (see Box 1 for details of OP_i , CC_i , $IUUC_i$):

OP_i = Operating costs of fishing of the vessel i

CC_i = Capital Cost of the vessel i

$IUUC_i$ = Costs of engaging in IUU fishing activities for the vessel i ,

- (7) $E(S_i)$ = Expected sanction faced by the vessel i , which is a function of
the level of the penalty (Pen)
the probability of being apprehended ($Prob_i$)

Box 1: Components of Total Cost (OP_i , CC_i , $IUUC_i$)

- OP_i = Operating costs of fishing of the vessel i

- Fuel cost (FC_i) = fuel cost for fishing (FF_i) and steaming (FS_i)
- Crew cost (CR_i) = wage (W_i) and social insurance cost (SI_i) of
- Other running costs (OR_i) = gear (G_i), bait (B_i) and landing cost (L_i)
- Flagging and registration cost (FL_i)
- Monitoring, Control and Surveillance (MSC_i)
- Insurance cost (I_i)
- Repair and maintenance cost: M_i

- CC_i = Capital Cost of the vessel i

- Vessel capital cost (V_i) = purchase price of the vessel
- Safety Equipments cost (SE_i)
- Other Capital Costs (OC_i) = Onboard navigation, positioning, communication equipments (including satellite equipment)

- $IUUC_i$ = Costs of engaging in IUU fishing for the vessel i , including:

- Fraud cost (including corruption cost): FR_i
- Avoidance cost: AV_i
- Moral/Reputation cost: RE_i

Source: OECD

3. Exploring the Incentives to Engage in IUU Fishing Activities

14. Based on the analytical framework, this section explores the variables of the fishing profit function for which incentives to engage IUU fishing may exist. For each of these variables, the section identifies the factors at the origin of the incentives.

15. In order to do so, the methodology consists at comparing on a pair-wise basis a vessel engaged in IUU fishing activity to a vessel conducting regular fishing activities and registered in a committed State (i.e. a “reference” regular/committed vessel). First, section (3.1) presents the situation where both IUU and regular vessels are registered in a committed State. Second, section (3.2) compares the “reference” regular/committed vessel with an IUU/FOC vessel⁷.

3.1. Incentives to engage in IUU fishing activities for vessels registered in committed States

16. We first consider the general situation where flag States are assumed to comply with international agreements regarding resource conservation and work and safety conditions. In particular, States are assumed to have ratified current international conventions relating to fishing (UNCLOS, UNFSA) and to be member of regional organizations (RFMOs). As fishing activities are assumed to be regulated, we are thus considering mainly both illegal and unreported fishing activities.

17. In order to identify the incentives to engage in IUU activities, we compare two committed vessels, assumed to be technically identical and thus to both have the same capital and operating cost structure. Incentives to engage in IUU fishing activities would then depend on the difference between the expected total revenues and the cost of engaging in IUU fishing operations (i.e. fraud cost, avoidance cost, moral/reputation cost and the expected sanction).

3.1.1. The market side: Higher expected revenues

Quantity of fish caught (Q_i)

18. As fishing activities are assumed to be regulated by committed States, it is assumed that committed vessels are constrained both by output regulations (e.g. vessel quota under RFMO management, minimum fish size) and input regulation (effort limitations, e.g. seasonally closed areas under RFMO management, gear type and size, etc). A vessel may engage in IUU fishing activities to catch more fish than it could have expected when complying with rules: $Q_{iuu} > Q_r$

19. One of the fundamental factors influencing IUU fishing activities is the possibility for a vessel to catch more fish than it is entitled to. This can occur because of the imbalance between vessel’s fishing capacities and its’ fishing possibilities. The imbalance between fishing capacities and fishing possibilities can have various structural origins, such as the prevalence of general overcapacity in domestic fleet or inappropriate allocation of fishing rights. Both may result from inappropriate management regimes. It may also be due to temporary factors, such as the inter-annual variation in TAC for instance.

20. In the particular situation of RFMOs, IUU fishing activities may also take place because some Members are not granted “sufficient” fishing possibilities in comparison to their - sometimes emerging -

⁷

The situation of IUU fishing conducted by vessels registered in NPA is not discussed in the paper, as it doesn’t provide any additional insight compared to the section (3.1) which deals with two vessels flagging the same flag and to section (3.2) which deals with those NPA vessels engaged in IUU/FOC fishing. It should however be mentioned for the completeness of the approach.

fishing capacities. This may be due both to the closed nature of some RFMOs and the lack of fishing history of some Members which restricts their potential claims to greater shares of a TAC.

21. Additional factors may also affect this variable, and thus the incentive to engage in IUU fishing operations:

- As the resource become scarcer due, among other things, to IUU fishing activities, the “committed” quota may decline still further for vessels complying with regulations, while the amount fished by IUU vessels may remain unchanged. This feedback for stock assessment and fixing of quotas is one of the difficult questions faced by RFMOs in dealing with IUU fishing. If estimates of IUU catch and reported committed catch exceed the total allowable catch, should next year’s catch be reduced by that amount to ensure that the fishery is sustainable? It might seem obvious that it should, but this would mean that the cost of IUU fishing was disproportionately higher on committed fishers that would face a reduction in their quota (Agnew and Barnes, 2003). Furthermore, acting in such a way would be somewhat equivalent to acknowledging that IUU fishing was going to be as large next year as it was this year.
- The decline of stocks and quota may create market pressure, and thus lead to higher prices for both vessels. This may attract additional vessels in engaging in IUU fishing.
- The reduction of stocks resulting from IUU fishing is likely to have some effects on monitoring, control and surveillance activities (MCS):
 - A first effect is financial. Reduced stock sizes leads to lower revenue to Government from a fishery (either in the form of licence sales or tax receipts). This in turn leads to decreased MCS budgets at a time when the costs of MCS are increasing. Unless additional funds are explored (e.g. by increasing fines for IUU activity), this can increase the difficulties faced by a management body in adequately policing its waters.
 - The second effect has to do with presence. Some observers suggest that the presence of committed vessels can have a deterrent effect on IUU vessels (*e.g.* Agnew and Barnes, 2003, reporting on the CCAMLR situation). Further, committed vessels may have observers on board who have a statutory obligation to report all vessel sightings. Committed vessels also find their interests coinciding with those of management authorities when it comes to informing on poachers⁸. However, as stocks are depleted the fishing opportunities of committed vessels also decrease, with the effect that their effectiveness as a deterrent may be reduced.

Price of the fish (P_i)

22. It is assumed that both vessels have access to similar markets and are likely to receive the same price per kg of fish: $P_{i_{iuv}} = P_r$. The impossibility given current technology to physically differentiate between IUU products and regular products, in the absence of any appropriate labelling mechanism, underlies this assumption.

⁸ For instance, a licensed Australian trawler spotted a notorious IUU vessel, the *Eternal* (previously the *Arvisa 1*, *Kambott* or *Camouco*, using several flags) in French waters around Kerguelen, and after calling the French authorities took up hot pursuit until the *Eternal* was intercepted by the French naval vessel the *Albatross* on 3 July 2002, arrested and taken to Réunion. *La Voz de Galicia*, 9 July 2002.

Expected Total Revenues $E(TR_r)$

23. As a result, engaging in IUU activities is likely to generate higher revenues than may be expected when complying with rules: $TR_{iuu} > TR_r$. However, IUU catches have to be “converted” into revenues to make IUU fishing a profitable operation. This means that a vessel engaged in IUU fishing needs avoiding being identified/apprehended while acting in violation of legislations. If the vessel conducting IUU fishing activities is apprehended and proved guilty, its catches are expected to be confiscated, and its expected total revenues $E(TR_{iuu})$ would be zero. Conversely, vessels complying with regulations don't face any risk concerning their expected total revenues⁹.

24. Whether or not expected total revenues derived from IUU fishing activities are greater than those derived from regular operations is thus not easy to determine. Incentives to undertake IUU activity exist as long as total revenues differential $[(TR_r - TR_{iuu}) / TR_{iuu}]$ is higher than the probability of being arrested (Prob1; see Box 2 below): $E(TR_{iuu}) > E(TR_r)$

Box 2: Linkage between Revenue Differential and Probability of Being Apprehended

- Prob₁: probability of being apprehended and punished (equals 0 for regular/committed operations),
- Prob₂: probability of not being apprehended and punished, with Prob₂ = 1-Prob₁,
- TR_{iuu}: total revenues derived from IUU fishing activities if not apprehended. Otherwise, total revenues equal zero (assuming the confiscation of the catch)
- TR_r: total revenue derived from regular fishing activities (certain)
- $E(TR_{iuu}) > E(TR_r)$
- $\leftrightarrow \text{Prob1} \times 0 + (1 - \text{Prob1}) \times TR_{iuu} > 0 \times TR_r + 1 \times TR_r$
- $\leftrightarrow \text{Prob1} < (TR_r - TR_{iuu}) / TR_{iuu}$

Source : OECD

25. IUU fishing activities will therefore be influenced by MCS capacities and ability or willingness of States to enforce regulations. This will influence the probability for a vessel of being apprehended (Prob1). It should be added that “ineffective” MCS does not solely result from the inability of the flag State to implement appropriate actions. It may also be derived both from insufficient MCS capacities of all RFMOs' Parties States and lack of cooperation between those States.

26. In addition, the probability to be apprehended may also be affected by the avoidance behaviour/strategy of IUU vessels (including the number of vessels operating IUU fishing activities in the same fishing ground at the same time; see below discussion on cooperative behaviour in section 4).

⁹ Other types of uncertainty (Gates, 1984) are not considered here, as it is assumed that they affect similarly both types of vessels.

3.1.2. *The cost side: insufficient disincentives*

Avoidance cost (AV_i).

27. To avoid being detected acting in contravention of management rules, IUU vessels are likely to incur avoidance costs, in the form of additional steaming time, steaming fuel costs, “research” operation (e.g. costs associated with the detection of MCS vessels, including electronic equipment costs) or any other associated transaction cost. This cost is not likely to be supported by regular vessels. As a result, $AV_{iuu} > AV_r$.

28. Incentives to engage in IUU fishing activities exist as long as the avoidance cost is not considered “sufficiently” high by vessels operators. While the appropriate level of avoidance cost may vary among IUU operators (e.g. due their relative preference/aversion for the risk), it is nevertheless linked to insufficient MCS capacities.

Fraud Cost (FC_i)

29. To convert IUU catches into revenues, IUU vessels need to circumvent reporting, labelling, fiscal or any other regulatory measures in place. In doing so, IUU vessels are likely to face a fraud cost which is not likely to be supported by regular vessels so that $FC_{iuu} > FC_r$.

30. This cost may even include the cost of financing corruption where State officials are involved in either tacitly or actively assisting fraud. A particular avenue for IUU companies to take would be to disguise their fish through misnaming catches, repackaging and re-labelling (Agnew and Barnes, 2003). Although there are genetic methods of identifying the species from fish product, these methods are usually expensive and not available routinely for control authorities. Therefore, attempts to disguise fish products may go unnoticed.

31. Incentives to engage in IUU fishing activities exist as long as the fraud cost is not considered “sufficiently” high by vessels operators. Low level of fraud cost may be explained by insufficient MCS capacities. It may also result from the low level of sanction faced. The higher the expected sanction is, the higher the return to engage in fraud operations should be.

Moral/Reputation Cost (RE_i)

32. When engaging in IUU fishing activities, both individuals and companies may face a moral/reputation cost. This could, for example, take the form of being outlawed from the fishing community or boycotted. While this cost may be seen as a non-monetary one, it may nevertheless be transformed into loss of revenues or cost to “recover” the reputation. This cost is not likely to be supported by regular vessels so that $RE_{iuu} > RE_r$.

33. Incentives to engage in IUU fishing activities exist as long as the moral/reputation cost is not considered “sufficiently” high by IUU operators. Low level of moral cost may be explained by three main drivers. First, IUU fishing activities may not be easily perceived as a “genuine” crime. There is no “scene of crime” helping people understand the environmental and social damages that result from IUU fishing (Boostrom, 2000). Second, despite the overall recognition that fishing stocks are limited by nature, some people go on thinking they are eternal. Third, with respect to the particular situation of high seas, some people consider that IUU operators are stealing “anonymous owners’ resources”. As showed by Hatcher *et al.* (2000), this may play an important role, as social/community-based moral considerations may not apply anymore.

Expected sanction $E(S_i)$

34. Any committed vessel acting in contravention of its flag State's rules face the risk to be prosecuted and sanctioned, wherever in the world it may be. Vessels complying with rules do not face this risk ($E(S_r)=0$), so that $E(S_{iuu}) > E(S_r)$.

35. Incentives to engage in IUU fishing activities exist as long as the expected sanction is not considered "sufficiently" high by vessel operators. The level of expected sanction is positively linked to two main factors, the probability to be apprehended (P_{rc}) and the fine/sanction level (S_c).

36. Together with the insufficient MCS capacities or willingness (resulting in the insufficient probability for a vessel to be apprehended), an additional factor is then the inability to apply sufficiently high sanction (see Box 4 for an illustration of the impact of fine on the expected profit).

3.2. Incentives to engage in IUU/FOC fishing activities in the high seas

37. Consider now the particular situation where a fishing operator originating from a committed State decides to register its vessel in a "Non-Party" State, with the explicit objective to engage in IUU fishing activities through circumventing domestic regulations. If it is assumed that this "Non-Party" State accepts to register vessels from other countries without having a "genuine link" with companies owning the vessels, then this State is a "Flag of Convenience" State, and vessels registered in FOC States are "FOC vessels".

38. In order to identify the incentives to engage in such IUU/FOC fishing operations, we explore the differences between a FOC vessel and a committed vessel engaged in the high seas, for each component of the profit function.

3.2.1. Market side: Higher Expected Total Revenues

39. With respect to the definition of FOC vessels, it should be recalled that on the high seas, even in a fishing area under RFMO jurisdiction, a FOC vessel is not bound by international rules and is effectively beyond the reach of international law. In addition, as long as the FOC State fails to control fishing activities, the probability of a FOC vessel of being apprehended and punished in the high seas is zero¹⁰. Accordingly, the Expected Total Revenues of FOC vessels may be considered as "certain"¹¹, and equal to Total Revenues ($Q_i \times P_i$) so that $E(TR_c) = TR_c$.

40. Committed vessels engaged in high seas fishing activities are expected to comply with national, regional (when operating under RFMO's jurisdiction) and international regulations. Their probability of being punished is thus zero: $E(TR_r) = TR_r$.

41. As in both cases total revenues are certain, this section only focuses on the factors influencing the catches and the prices.

Quantity of fish caught (Q_i)

42. A committed vessel is in general constrained both by output regulations (e.g. vessel quota under RFMO management, minimum fish size) and input regulation (effort limitations, e.g. seasonally closed areas under RFMO management, gear type and size, etc ...). Conversely, a FOC vessel is in general *legally*

¹⁰ Except in the case of "hot pursuit" (see below)

¹¹ See footnote 9

not constrained by regulations in the high seas. As a result, a FOC vessel is likely to catch more fish than it could have expected when complying with rules, *i.e.* more than can expect a similar committed vessel: $Q_c > Q_r$ ¹². An illustration of this expectation can be found in the Japanese case study (see OECD, 2003a), where it is suggested that the catch amount of FOC vessels is 10 % larger than “standard” operating vessel.

43. A number of factors contribute to this incentive. First, from an institutional perspective, the incompleteness of international legal frameworks (including insufficient liability of FOC states) and failure of States to implement international obligations increase the likelihood that FOC vessels will fish more than similar vessels complying with rules.

44. Second, there is a global imbalance between fishing capacities and fishing possibilities. In the particular situation of RFMOs, IUU fishing activities may for instance take place because some Non-Parties States, when being considered for accession to RFMOs, are not offered “sufficient” fishing possibilities in comparison to their fishing capacities. An additional factor concerns the appropriateness of national management regimes in force in the IUU/FOC fishing operator’s country of origin. The stronger the domestic regulations in place, the greater the incentives to circumvent them through engaging in IUU/FOC fishing activities. As noted above, there may be a cumulative advantage in engaging in IUU fishing activities, as such a behaviour is likely to reduce stocks and thus lead to more restricting regulations (e.g. in the form of reduced domestic TAC).

Price of the fish (P_i)

45. In absence of any measures, a FOC vessel is likely to receive the same price per kg of fish as a committed vessel: $P_c = P_r$ ¹³.

46. As a result, and due to the quantity caught, it is most likely that expected revenues derived from IUU/FOC fishing activities are greater than those expected when complying with rules: $E(TR_c) > E(TR_r)$.

3.2.2. The cost side: Lower Expected Costs and insufficient disincentives

47. In addition to the incentives resulting from the circumvention of domestic regulations and related to higher catch and revenues, IUU operators may also find other advantages to register in FOC countries, in the form of lower costs.

Fishing company tax rate (R_i):

48. Tax evasion has been often cited as one incentive to engage in IUU/FOC fishing activities (Agnew and Barnes, 2003; Upton and Vangelis, 2003). Indeed, most FOC countries are likely to apply lower taxation rates than other countries, so that $r_c < r_r$.

49. A number of the countries which have been known to act inconsistently with regional and international conservation rules by relevant RFMOs (e.g. ICCAT), or to have been involved in ITLOS¹⁴ cases (such as Belize, Panama, St. Vincent and the Grenadines, Seychelles, etc.) were also listed in 2000 by OECD as tax havens. A comprehensive list of jurisdictions identified as tax havens is provided in Table A.1 in Appendix. Box A.1 in Appendix provides a number of examples of cases brought under ITLOS.

¹² Although there may be quality differences (e.g. small fish), which is captured in price effects.

¹³ Except if the quality is lower, in which case the price received by a FOC vessel is expected also to be lower: $P_c < P_r$.

¹⁴ International Tribunal for the Law of the Sea (<http://www.itlos.org/>)

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50. More generally, among the twenty-eight countries declared FOCs by the ITF¹⁵ (see the comprehensive list of jurisdictions declared FOC by ITF provided in Table A.2 in Appendix), eleven (i.e. 40%, highlighted in bold in table A.1 and A.2) were also listed in 2000 by OECD as tax havens: Antigua and Barbuda, Bahamas, Barbados, Belize, Gibraltar, Marshall Islands, Netherlands Antilles, Panama, St. Vincent and the Grenadines, Tonga and Vanuatu.

51. It should be noted that most jurisdictions listed as tax havens in 2000 have since made commitments to co-operate with the OECD in addressing harmful tax practices. What this means in practice is that these jurisdictions have agreed to introduce, on a phased basis, the regulatory and administrative measures to implement the agreed standards of transparency and exchange of information for tax purposes, including transparency of ownership, and that they are expected to implement measures by the 1 January 2006, at which date observed progress would be measured. However, it should be further noted that two of the six jurisdictions still listed as un-cooperative tax havens have significant shipping registers: Liberia and Marshall Island [OECD (2003d)¹⁶ and Fensby T., *pers. com.*].

Fuel cost (F_i):

52. As vessels are assumed to be technically identical, fuel costs of fishing (FF_i) and fuel cost of steaming (FS_i) from any place (e.g. the landing port) to the fishing grounds are expected to be similar: $F_c = F_r$.

53. Yet, operators may have an incentive to engage in FOC activities when fuel cost is lower than in committed countries due to tax distortion: $F_c < F_r$ ¹⁷.

Monitoring, Control and Surveillance (MCS_i)

54. Under RFMOs' framework, committed vessels may have to carry additional costs associated with monitoring, control, surveillance and verification, such as on-board observers, regular inspections, VMS etc. For instance, the purchase cost of a VMS unit is about USD 3000-5000, the operating cost of VMS is estimated at around USD 400-1000 per vessel per year (polling every four hours; Kelleher, 2002), an observer may cost up to USD 300-500 a day. In 1993, communication costs per Spanish vessel operating in NAFO amounted to around USD 26 000 per year [OECD/GD(97)54]. Such costs are by nature not charged to / supported by IUU/FOC vessels, and thus $MCS_c < MCS_r$.

55. Beside these direct financial costs, indirect costs may also occur in the form of transaction and opportunity costs, including loss of fishing time and fish quality through delays and inspections, maintenance of records required for control and reporting purposes, and increasingly complex regulations which require vessel operators to invest time in their interpretation and discussion with authorities (Kelleher, 2002).

56. These direct and indirect costs related to MCS operations may play an additional role in the decision to engage in IUU/FOC fishing activities. In this context, it is worth noting that MCS operations conducted at quay and on land could reduce the costs faced by committed vessels, and thus the economic incentive to engage in IUU/FOC fishing activities. In particular, if MCS operations were directed to main purchasers, committed vessels operators wouldn't be the *only ones* to be charged for it, as purchasers are

¹⁵ The International Transport Workers' Federation (ITF) is a federation of 621 transport trade unions in 137 countries, representing around 5 million workers (<http://www.itf.org.uk>).

¹⁶ OECD (2003d) "Marine Security - Ownership and control of ships: options to improve transparency".

¹⁷ Tax fuel exemption also exists in some committed countries.

likely to “transfer” similarly part of the cost associated with MCS operations on both FOC and committed operators.

Flagging / registration cost (FL_i)

57. In general, the cost of registration/re-flagging in a FOC country which has established open registers, accepting vessels from other countries without having a genuine link between the flag state and the vessel, is minimal (around USD 1 000-5 000, mainly legal costs), relatively simple and fast, and can often be done at sea¹⁸. Conversely, for committed vessels which need to maintain registration with reputable countries (i.e. not FOC parties), transfers of flag are much more costly, and may involve protracted administrative procedures. The cost of registration / re-flagging in a FOC country is thus lower than in a country which fully undertakes its obligation under international regulations: $FL_c < FL_r$.

Insurance cost (IN_i)

58. In many cases FOC vessels may not be fully insured, or not insured at all (which is however in contravention to international regulations). Hence, the cost of insurance is likely to be lower for a FOC vessel in comparison to a regular vessel, in particular when the capital insured has little value (see discussion on vessel capital cost below): $IN_c < IN_r$.

Repair and maintenance cost (M_i)

59. This variable is partly linked to the previous one, as FOC vessel owners are not likely to pay for maintenance to standards required by international regulations. Conversely, committed vessels in general need to get maintenance done, as they can be prevented from fishing if the state of the vessel is found “unsatisfactory” by competent authorities: $M_c < M_r$.

60. While this factor may have dramatic social (and environmental) consequences, it also mainly results from the prevalence of poor economic and social conditions in some countries. As cheap, non-informed and ready labour exists, owners of FOC vessels may neglect the state of the vessel. This factor may also be influenced by the lack of efficiency of Port States’ control in committed States, where most vessels have to stop at least from time to time.

Crew cost (CR_i)

61. In many cases the crew on FOC vessels may not be operating under standard health and safety conditions required by ILO and IMO regulations, as controls over working conditions and workers’ rights are more limited. As a result, crew cost, including medical insurance, is in general lower for FOC vessels: $CR_c < CR_r$.

62. For example, in the case of the CCAMLR longline fishery, it is reported that very cheap labour is used, as Indonesian, Chinese and other developing country crew are paid approximately USD 100/month (Agnew and Barnes, 2003).

63. The availability of low crew cost probably reflects social conditions. Large disparities in incomes/economies of developed and developing countries create a ready and cheap labour pool for IUU/FOC vessels (many crew are Indonesian, Chinese or Filipino). The opportunity cost of labour¹⁹ is

¹⁸ It should also be noted that vessel flag transfers also reduce the traceability of vessels and compromises MCS attempts to control IUU fishing, since the legitimacy of hot pursuit ceases if a vessel changes its flag.

¹⁹ I.e. the remuneration of the labour engaged in the next best alternative activity.

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close to zero in most developing countries, and excessive supply of labour pushes salaries to very low levels, whatever the conditions and risks associated. For instance, the poaching of trochus in Australian waters in the early 1990s was mostly due to the extreme poverty of Indonesian fishermen, who undertook the activity despite the potential of facing heavy penalties and imprisonment (Peachey, 1991).

64. Another factor relates to the existence of excess or idle capacity that may lead to lower costs of crews to FOC vessels. Transfer of capacity actually does not only concern vessel (see vessel capital cost below), but also fishers. In particular, when scrapping funds are made available, fishing communities are likely to face multiple job losses through multiplier effects of fishing opportunity losses, which depresses the job market in these areas. Vessels engaged in IUU / FOC fishing will therefore find that their costs are doubly reduced, firstly by not having to remain idle at the dockside and secondly because the labour market will be cheaper.

Vessel capital cost (VCi)

65. The capital cost of FOC vessels may be influenced by several factors. While some of these factors may be partly contradictory, they are all likely to reduce the cost. First, it is often assumed that a part of the IUU/FOC fishing fleet consists of old vessels. This is for example the case for tuna vessels transferred off the Chinese Teipei and Japanese flags since 2000 (Agnew and Barnes, 2003). Hence, the vessel capital cost is likely to be lower for FOC vessels (see example in Box 3), so as $VCc < VCr$.

Box 3: The Capital Cost of FOC Vessels

In the case of FOC vessels undertaking longline fishing for toothfish in CCAMLR waters, vessels may be relatively inexpensive to buy. Information is hard to come by, but there have been a number of cases of contested bonds of arrested IUU vessels brought to the International Tribunal of the Law of the Sea²⁰ which are relevant. Valuations of vessels in court cases are likely to be lower than the market price, since they are the subject of negotiations on damages. The “Camuoco” was originally valued at about USD 3 million by the French authorities which arrested it, but this was contested at the ITLOS court by Panama and it was decided that the value for bond purposes was USD 345 000. In the “Monte Confurco” case (Seychelles v France) the vessel was originally valued at USD 1.5 million by France and USD 500 000 by Seychelles, the Court upholding the value of USD 500 000. In the case of the “Grand Prince” (Belize v France) France valued the vessel at USD 2 million and the respondent at USD 360 000, although the court does not seem to have made a judgement between these two figures. In all these cases there are strong vested interests, for the respondent in having a high valuation (to increase the bail amount) and the applicant having a low valuation (to reduce the amount of bail). Therefore the “true” value of the ship is likely to lie somewhere between them, at an average of about USD 1.2 million. While these examples may not be transferable, they serve as an illustration of the relatively limited value of the capital engaged in IUU/FOC fishing activities.

Source: Agnew and Barnes, 2003

66. Second, various other “capacity factors” may also explain the low cost of FOC vessels, and thus the incentive to engage in IUU activities:

- Excess or idle capacity has the potential to be an extremely additional powerful driver for IUU fishing, as excess in supply is expected to lead to a decrease in the value of fishing capacity, i.e. mainly in the value of vessels²¹.
- Some programs aiming at regulating local or regional excess capacity may have adverse effects on the value of FOC vessels. In particular, when subsidies are granted to operators to sell vessels,

²⁰ Copies of the court proceedings and judgements in the ITLOS cases can be found on the ITLOS website, <http://www.itlos.org/>

²¹ The extent to which excess capacity drives IUU fishing activities is also debated in Hatcher (2004).

and if these vessels subsequently become available to the “FOC vessel market”, the subsidies may act to artificially depress the purchase cost (some authors estimate that the cost may be reduced sometimes by as much as 30%, e.g. see Agnew and Barnes, 2003).

- Shipbuilding subsidies may also artificially decrease the capital cost of FOC vessels, and thus have the potential to be a driver for IUU fishing. For instance, there are some signs that new longliners are being purpose-built for the IUU fishery on toothfish (Agnew and Barnes, 2003). The number of such vessels available has increased and their purchase costs may be decreased by subsidies for building new and more efficient fishing vessels.

67. Vessel capital cost may also be affected by fiscal and financial factors. The following examples serve as illustration only, and are based on sparse and anecdotal information.

- The shared objective of free circulation of capital may have adverse effects in the context of IUU/FOC fishing activities, as it often implies little restriction on investment, and in particular on foreign direct investment (FDI). As a result, OECD residents may quite easily and inexpensively invest their capital in FOC countries (e.g. some Estonian vessels involved in IUU fishing activities in NAFO areas are reported to operate under Icelandic ownership, OECD, 2003b).
- Some banking facilities may also reduce capital cost, for instance when the attribution of loans are allowed to be based on the existence of a FOC vessel as mortgage.
- Fiscal rules regarding depreciation of the capital may also act as an incentive to engage in IUU activities, as they may artificially reduce the cost of the capital engaged. For instance, in some countries, the law allows the capital to be depreciated in 8 years, while the lifespan of a vessel may be around 20 or 30 years. As a result, a vessel can be written off the books after 8 years in some cases. A modification to such a fiscal rule may change the incentive to sell a vessel, and hence may change the incentive to engage in IUU/FOC activities. This area could be further explored in the future.

Safety Equipment cost (SE_i)

68. It should be further noted that in many cases, FOC vessels are not likely to comply with general safety and pollution requirements of the IMS/MARPOL etc. As committed vessels have to comply with such national and international regulations: $SE_c < SE_r$.

69. Once again, this variable is likely to be influenced by the existence of poor social outlook with few employment opportunities in some developing countries, as the labour supply remains high despite the risk incurred.

Fraud Cost (FC_i)

70. In the high seas, whether or not under RFMO’s jurisdiction, IUU/FOC vessels are not forbidden to fish under the current maritime law. However, some trade measures are in place, attempting to prevent IUU/FOC vessels from selling catches taken in violation of international agreements. IUU/FOC vessels can then face fraud cost in order to circumvent such trade measures, as evidenced by the Japanese experience with the difficulty of ensuring that tuna from ICCAT IUU-listed vessels is not imported. This cost is not likely to be supported by regular vessels: $FC_c > FC_r$.

71. This cost may also include the cost of financing corruption where state officials are involved in either tacitly or actively assisting fraud. A particular avenue for IUU companies to take would be to

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disguise their fish through repackaging and re-labelling (Agnew and Barnes, 2003). Although there are genetic methods of identifying the species from fish product, these methods are usually expensive and not available routinely for customs authorities. Therefore, attempts to disguise fish products may go unnoticed.

72. Fraud costs are likely to be heavily influenced by the global and local economy imbalances. Local economy collapses, for instance, are likely to increase the incentive for corruption, decreasing its cost, therefore decreasing the cost of this part of the IUU/FOC fishing vessel's equation. It is also likely to be influenced by some organisational factors related to organised IUU/FOC fishing operations (see Section 3).

Avoidance cost (AV_i).

73. Even if IUU/FOC vessels are not likely to be controlled in the high seas, except in the case of "hot pursuit", they are likely to have an interest in not being identified. So, they are likely to support avoidance costs, in the form of steaming time, steaming fuel costs (see above) or "research" operation (e.g. costs associated with the detection of MCS vessels, including electronic equipment costs). One particular reason explaining this behaviour is the willingness of not being listed as IUU/FOC vessels. This cost is not likely to be faced by regular vessels: $AV_c > AV_r$.

Moral/Reputation Cost (RE_i).

74. Due to their activities, IUU/FOC fishing companies are unlikely to face strong moral/reputation costs. While the drivers identified in the general case still work (i.e. lack of recognition of the gravity of the problem), a strong additional factor is the form of the confidentiality allowed by some jurisdictions (e.g. tax haven). The lack of transparency in international information indeed reduces the possibility of identifying those individuals or companies on which actions could be directed.

Expected sanction $E(S_i)$

75. In the high seas, whether or not under RFMO's jurisdiction, IUU/FOC vessels are not forbidden to fish under the current maritime law. Thus, even when they undermine fisheries management, IUU/FOC vessels can't be punished for doing so. As it is assumed that committed vessels comply with national, regional and international regulations, the expected sanctions in the high seas are identical and equal to zero, so that $E(S_c) = E(S_r) = 0$.

3.3.3. Summing-up

76. Table 1 summarises the differences that may arise between IUU/FOC vessels and committed vessels engaged in high seas fishing. In particular, the table indicates, for each component of the fishing profit function, which vessel may have an advantage and the main factors influencing each variable.

Table 1: Incentives to Engage in IUU/FOC Fishing Activities

Variables	Comparison between IUU/FOC vessel and committed vessel	Main factors influencing the variable
Quantity of fish	$Q_c > Q_r$	IUU/FOC vessels not bound by international regulations; Existence of excess or idle capacity; Insufficient responsibilities of FOC countries
Price of fish	$P_c \leq P_r$	Insufficient premium for certified / labelled fish; Possibilities to disguise catches;
Expected Total Revenues	$E(TR_c) > E(TR_r)$	
Company tax rate	$R_c < R_r$	Existence of tax haven;
Fuel cost	$F_c < F_r$	Tax system distortion;
Other running cost	$OR_c \leq OR_r$	Insufficient restriction to port / facilities access; Insufficient need for avoidance behaviour;
Crew cost	$CR_c < CR_r$	Existence of ready and cheap labour, resulting from poor economic situation/outlook in developing countries; Existence of excess or idle capacity; No extra-territorial application of domestic rules;
MCS costs	$MCS_c \leq MCS_r$	IUU/FOC vessels are not bound by national and international regulations (if charged to committed vessels)
Flagging / Registration costs	$FL_c < FL_r$	Existence of FOC countries; Re-flagging international rules (IMO)
Insurance costs	$IN_c < IN_r$	IUU/FOC vessels are not bound by national and international regulations; Poor economic and social situation/outlook in developing countries (existence of ready and cheap labour)
Vessel purchase cost	$VC_c < VC_r$	Subsidies to build or export vessels; Existence of excess or idle capacity; Insufficient fiscal and foreign investment rules
Repair and maintenance;	$MC_c < MC_r$	IUU/FOC vessels are not bound by national and international regulations; Poor economic and social situation / outlook in developing countries
Safety equipment cost	$SE_c < SE_r$	IUU/FOC vessels are not bound by national and international regulations; Poor economic and social situation / outlook in developing countries
Fraud Costs	$FC_c > FC_r$	Insufficient control of trade measures to circumvent (repackaging / re-labelling), Existence of global or local economic imbalances
Moral/Reputation Cost	$RE_c > RE_r$	Lack of recognition of the gravity of the problem Lack of transparency in companies ownership
Avoidance Costs	$AV_c > AV_r$	Insufficient MCS capacities; Insufficient "black listing"
Expected sanction	$E(S_c) = E(S_r)$ (high seas)	IUU/FOC vessels not bound by national, regional and international regulations → can't be punished under current regulations;

Index *iuu*: IUU fishing activities; Index *r*: regular/committed fishing activities;

Source: OECD Secretariat

3.4. Incentives to engage in IUU/FOC fishing activities within a foreign EEZ

77. It is now assumed that FOC vessels and committed vessels are engaged in fishing activities within a given foreign country's Exclusive Economic Zone (including under RFMO jurisdiction if one exists) and that both types of vessels are technically identical. Compared to the high seas case, the main difference is that any FOC vessel may be controlled and prosecuted if proven guilty. As in most of the cases, FOC vessels don't have access rights, it is assumed here that when fishing within an EEZ, FOC vessels operate illegally, i.e. in violation with national (and international) regulations.

78. As the ownership situation remains unchanged, the results presented in Table 1 are still valid for all but four variables of the profit function: the expected total revenue $E(TR)$, the access fees, the avoidance costs and the expected sanction.

Expected Total Revenues $E(TR_i)$

79. As in the high seas, FOC vessels are likely to fish more than committed vessels within the EEZ for a given period of time by not complying with input or output regulations. Yet, an important difference may occur compared to the high seas situation. As FOC vessels fish in violation of national and international rules, they need to avoid controls to convert the catches into revenues. If they are controlled, their catch would be confiscated, and the Total Revenues would be zero. Conversely, committed vessels don't support any risk concerning their expected total revenues²².

80. The difference in expected total revenues between FOC and committed vessels then depends on the probability of being controlled (Prob1), which is influenced by the following factors:

- The MCS capacity of the country concerned,
- The proximity of the fishing ground to the high seas,
- The avoidance behaviour / strategy,
- The number of IUU/FOC vessels operating in the same fishing ground at the same time (see below cooperation behaviour in section 4),

81. Whether or not expected total revenues derived from IUU/FOC fishing activities are greater than those expected when complying with rules is thus not easy to determine. Again, incentives exist as long as total revenue differential is higher than the probability of being apprehended (prob1; see above).

Access Fees (AF_i)

82. Within the EEZ, in particular in some developing countries (e.g. in Africa), an access fee to the resource may be charged to foreign fleets. By definition, vessels engaged in IUU/FOC fishing activities don't support this cost. When the access right is charged to committed vessels: $AF_c < AF_r$.

Avoidance costs (AV_i)

83. When fishing within the EEZ in violation of national and international regulations, IUU/FOC vessels run the risk of being caught. Thus, they have an incentive to avoid being observed while fishing illegally, and are likely to spend time and money on the avoidance behaviour. In particular, fuel cost of

²² As mentioned above, other types of uncertainty are not considered here (Gates, op.cit.).

steaming may increase dramatically, as well as cost associated with "technological survey" (i.e. means to spy the initiatives of management authorities): $AV_c \gg AV_r$.

84. The avoidance costs are likely to be affected by various factors, including the enforcement capacity of the EEZ country, the quality of MCS operations, the size of the fishing ground and whether or not the fishing ground is close to the high seas. The latter factor relates to the fact that, when steaming in the high seas, IUU/FOC vessels can't be arrested, except in the case of "hot pursuit".

Expected sanction $E(S_i)$

85. Within the EEZ, an important cost difference between FOC vessels and committed vessels may consist of the level of the expected punishment / sanction, as this cost is only likely to be faced by IUU/FOC vessels under current assumptions: $E(S_c) > E(S_r)$.

86. The expected sanction is likely to depend on various factors, including the probability of an IUU/FOC vessel of being caught (Prob_c) and the value of the expected fine/sanction (S_c).

87. As mentioned, the probability of being caught is likely to depend on the enforcement capacity of the EEZ country, the quality of MCS operations, the size of the fishing ground and whether or not the fishing ground is close to high seas. It should also be noted that the enforcement capacity and the quality of MCS operations are likely to be influenced by some general factors, including financial facilities/capacities and national economic situation. For example, illegal fishing in Somali waters is largely due to the ineffective patrolling and enforcement of the Somalian EEZ, itself a function of the economic and political situation in the country²³. A poor economic outlook may also force states to make cuts in surveillance coverage, often an early casualty of worsening economic conditions.

88. In theory, the financial sanction level should be decided by the authorities of the EEZ country, and should reflect the marginal cost of the violation (Becker, 1968; Charles, 1999). Yet, in practice, the level of the fine has been strongly influenced by the decision of the International Tribunal Law Of the Sea (ITLOS), and the level of penalty remains one of the problems that is being faced by MCS authorities. Illustrations in Box A.1 in Appendix suggest that the level of bond that the Tribunal regards as appropriate is lower than the expected annual profit of an IUU vessel. However, it is also clear that what is most important to ITLOS is the value of the vessel and its cargo, not the overall damage that the vessel can do to the resource. This is an important factor influencing the incentive to engage or not in IUU/FOC fishing activities. In order to illustrate the role that can be played by the level of the fine (i.e. the financial sanction), Box 4 presents an example, derived from the Japanese case study presented at the 87th Session of the OECD Committee for Fisheries (see OECD, 2003a).

²³ Hassan, MG, Marine resources in Somali waters: opportunities & challenges. 6th Asian Fisheries Forum Book of Abstracts. p. 93. Asian Fisheries Society (quoted in Agnew and Barnes, 2003).

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Box 4. Expected Impact of the Fine on Expected Profit

In the Japanese case study, IUU/FOC vessels are assumed to receive a net sales profit of JPY 56.5 million per year (USD 434 500), while “standard” vessels record a loss of around JPY 16 million a year. Assuming that the catches of IUU/FOC vessels are realised within EEZ (even partly), IUU/FOC vessels may thus be apprehended and punished. Assuming in addition that the probability of being arrested is 10%.

The expected profit of an IUU/FOC vessel is given by the equation:

$$E(\pi) = P2 \times 434\,500 - P1 \times E(S)$$

With P1, the probability of being controlled, equal 0.1; P2, the probability of not being controlled, equal 0.9.

If the fine value is USD 2.8 million (see Box A.1 in Appendix), the expected profit is thus:

$$E(\pi) = 0.9 \times 434\,500 - 0.1 \times 2\,800\,000 = 111\,050 \text{ USD}$$

In this example, to make illegal fishing unprofitable, the fine level should be USD 3 910 500.

Source: OECD Secretariat

89. It is important to note that the expected sanction may be negatively affected by one important institutional factor. It relates to the possibility to re-flag vessels quite easily under the current IMO legal framework, since the legitimacy of “hot pursuit” ceases as a vessel changes its flag. In theory, even if a vessel is observed fishing illegally in the EEZ, and is pursued and apprehended in the high seas, it can only be prosecuted under the same flag. The expected sanction incurred may thus be strongly reduced. It should however be noted that a recent ITLOS decision took this feature into account (see Box 5), which may contribute to deter IUU/FOC fishing activities.

Box 5. When Re-flagging Fails

Re-flagging problems seem to have acted against the vessel *Grand Prince*, convinced of IUU fishing. During the time that she was arrested by the French authorities (12 December 2000) and when the court in La Réunion set the bond of FF 11.4 M, her registration with Belize lapsed (Agnew, 2002). The ITLOS questioned apparent irregularities in the Belize registry of this vessel. In its decision, the tribunal held that,

“the assertion made on behalf of Belize that the Grand Prince was still considered as registered in Belize did not provide sufficient basis for holding that Belize was the flag State of the vessel for the purposes of making an application under article 292 of the Convention [paragraph 85].”²⁴

Source: Agnew and Barnes, 2003

4. Enlarging the framework

90. This section explores situations that modify the analytical framework, including the emergence of organised IUU fishing activities and dual-flag operations. In turn, it deals with the relaxation of the assumption that vessels were deciding whether to engage or not in IUU fishing activities based on their private interest (see section 2).

²⁴

ITLOS press release 48

4.1. Organised/Coordinated IUU fishing activities.

91. Several years ago most IUU vessels fishing were thought to be acting relatively independently. More recently, however, the existence of organised IUU fleets of vessels with common ownership and control links has been reported (see example in Box 6).

Box 6: An Example of Organised IUU Fishing Activities

Two major companies based in the Far East – Pacific Andes and P. T. Sun Hope Investments (Jakarta), are reported to manage an organised IUU fleet, although Pacific Andes officially denies this. The Austral Fisheries press release states that “the ‘alphabet’ boats are owned by dummy companies in (at various times) the British Virgin Islands, Russia, Belize, Bolivia and elsewhere”²⁵.

Source Agnew and Barnes, 2003

92. The development of highly complex company ownership structures has several effects which affect the economic balance sheet for these vessels:

- First, mixing IUU catch along with regularly obtained catch (e.g. the company Pacific Andes is a major purchaser of fish caught by committed vessels) will allow the price of IUU fish to be higher than would otherwise be the case. In this regard, there is considerable evidence for fraud in the documentation accompanying toothfish catch documents, as there is in the certificates of registry required by Japan for import of tuna.
- Second, it is not sufficient to simply examine the economics of a single vessel, when a company runs a series of IUU vessels, because single vessels can quite easily be sacrificed to the overall benefit of the fishery. For example, there are allegations that the two vessels arrested by the Australian navy in February 2002 (the Volga and the Lena) were the oldest and most dispensable in the IUU fleet fishing around Heard Island (Agnew and Barnes, 2003). Thus the actual disincentive of arrest may be much less (for the company) than would be assumed for a single vessel. After the arrest of the most inefficient vessels which are used as decoys, the efficient fleet is practically assured of a period of fishing, uninterrupted by a patrol vessel.
- Third, a large company will have the ability to disguise fleet movements through rapid re-flagging, name changing, and modification of vessels which may thwart legal cases (e.g. in the case when two vessels are identical but carry different flags, it is practically impossible to prove that it was sighted in a particular area unless a vessel is boarded).
- Finally, a fleet and large company operation can much more easily afford the administration costs required for rapid disguising tactics, including (i) access to worldwide markets, so that they can split consignments and confuse customs authorities, (ii) access to bulk processing facilities, with further opportunities for disguising/hiding IUU catch, (iii) access to sophisticated communications and early warning systems and (iv) complex company ownership structures, which are costly for MCS authorities to trace and easy to change.

93. These factors all tend to reduce the costs that an IUU vessel would usually expect to pay. One should bear in mind that for committed vessels some of the same advantages might be enjoyed when they are owned by a large company.

²⁵ Page 3 of the Austral Fisheries document. It should be emphasised that at the moment these are simply allegations from Austral Fisheries.

NOT FOR QUOTATION

94. It should be further noted that some of these factors may be worsened when IUU fishing companies are also involved in other illegal trade, such as drug and weapons (Upton, 2003; ITF, 2002). When this is the case, some possible actions may be no longer effective, due to the financial and bribing power of such companies.

4.2. Dual-Flags

95. In addition to the arguments above for company size, the make-up of the fleet in a company is particularly important. Companies attempting to operate fleets of both IUU and committed vessels can expect lower operating costs (through paying less in licence fees and other access requirements) than companies operating only committed vessels. A number of companies are suspected of operating this strategy (Agnew and Barnes, 2003).

96. However, an added risk factor with this strategy is the increasing propensity of licensing authorities to take into account this feature when allocating fishing rights or licences. For example, a way of deterring IUU/FOC activities could consist in refusing any licence worldwide to a company if one of its vessels was proven guilty. This trend, if strengthened, could well redress the balance of the equation and create an overall cost rather than benefit from adoption of this strategy.

5. Possible Actions to Curb IUU Fishing Activities

97. Based on the insights of section 3 dealing with the drivers that create economic incentives to engage in IUU fishing activities, this section proposes some possible actions directed at affecting these drivers, in order to modify the incentive structure of IUU fishing operators.

98. In undertaking such an analysis, the document seeks to identify areas where further research would be best directed, in order to reduce incentives for IUU fishing activities and assist in its elimination.

99. In line with the general structure of the model used, this section first examines action directed at reducing total operating revenues (the market side). The section then examines actions directed at increasing, respectively, operating costs, capital cost and cost of engaging in IUU fishing activities (i.e. avoidance, fraud, moral/reputation and penalty costs).

5.1. Exploring ways to reduce total revenues

100. Several actions may be taken to reduce operating revenues of IUU fishing activities, including through limiting IUU catches, limiting IUU sales and trade (trade measures), or giving a price premium to regular catches in order to reduce the gap between IUU and regular revenues.

Possible avenues to limit IUU catches (Qi)

101. To reduce IUU catches on the high seas, a first set of actions can be taken or promoted to reduce the incompleteness of the current international legal framework in place.

- Ratification of all international conventions by all flag states (incl. UNCLOS, UNFSA, etc.), in order to provide a comprehensive legally binding framework;
- Establishment of RFMOs wherever (IUU) fishing takes place;
- Adhesion to all RFMOs by involved flag States.

102. Such improvements in the comprehensiveness of the system could in particular reduce the possibility for a vessel to be registered in a FOC State. Appropriate incentives should be found to convince FOC countries to join any RFMO or become a contracting party. Due to the lack of fishing capacities and the related “closed” nature of some RFMOs, such an initiative may not be straightforward. Two distinct situations might occur.

103. If a FOC country is a fishing nation with some national fishing interest in a RFMO area, it may be necessary to enlarge the club of RFMO members to include this country, although this would generate a cost for existing members in the form of reduction in quotas. In addition, as most of FOC countries are indeed developing countries with limited budget capacities, actions could be taken to facilitate the active and effective participation of FOC countries. For instance, while participation in RFMOs may be costly and time consuming, member states could provide newcomers with incentives such as offering financial and human assistance (including fee reduction, training, etc.).

104. Conversely, if the main aim of a FOC country is to generate “register income” (which is likely to be the most frequent situation), an alternative incentive could be to give this country a financial compensation, “equivalent” to the register income, in order to - permanently- remove all FOC vessels from its register. At first sight, such latter action may appear inappropriate, as it might be seen as a reward for non compliance behaviour. Yet, two important factors need to be taken into account. First, the current legal framework for the sea provides any state with the right to access marine resources on the high seas. A financial compensation could then be seen as committed operators buying of implicit fishing rights (the question of who should be charged for the cost is not addressed here). Second, such action has a strong theoretical background. The reciprocal²⁶ nature of the Coase theorem shows that it is *socially* equivalent to compensate for the non-emission of an externality or to charge the externality (Coase, 1960)²⁷.

105. A second set of actions can be taken to improve the effectiveness of the current international legal framework in place:

- Developing minimum and enforceable guidelines/standards/requirements for Parties to international agreements. This may include, for instance, an enforceable definition and application of the principle of “genuine link”, as well as the definition of other minimum control requirements.
- Ensuring compliance from all contracting Parties to international agreements, including through the use of legal appeal/procedures. In this regard, it is worth remembering that the subjects of international law are States, not individuals or legal persons (unless there is some provision in the domestic law which makes the rule in question applicable and enforceable as a matter of domestic law; FAO, 2000, p.21).
- Improvement of MCS capacities, whether on the high seas, within national EEZ or at land. This could “traditionally” take place through a greater resort to usual observation mechanisms: more observers onboard, more patrol vessels, greater implementation of VMS systems, etc. Such an approach would require additional financial resources, synonymous with a further increase of the

²⁶ Coase says that the problem of social cost cannot be restricted to knowing how to prevent A for inflicting harm on B. It should also consider that avoiding the harm to B inflicts harm on A. In the absence of well-defined property-rights, both externalities need to be taken into account.

²⁷ Due to the nature of the fishing production function, IUU fishing activities generate two types of negative externalities: short run crowding externalities and long run stock externalities.

NOT FOR QUOTATION

budget burden²⁸. But it can also take place through a greater collaboration between committed states, including through sharing some “platform” costs and information. In this regard, a recent 2003 treaty between Australia and France establishing co-operative surveillance in the Southern Ocean in the EEZ around Heard Island and McDonald Islands and France’s EEZ around Kerguelen Island is worth noting. In this context, it should also be noted that specific actions to provide RFMOs with adequate management capacities and powers need to be envisaged.

Possible avenues to limit IUU sales and trade (Qi)

106. Some measures can also be taken to reduce the possibility of the catches from being “converted” into revenues. Such measures, because they aim at preventing IUU catches from entering regular markets, are of a trade nature. They can take the form of embargo or any other form of import restriction for fisheries products. For instance, ICCAT asked Contracting Parties to introduce commercial measures aimed at banning imports of swordfish from Belize, Honduras and Equatorial Guinea in 2000²⁹. Similar measures were asked in 2001³⁰ for bigeye tuna from Belize, Honduras, Cambodia, Equatorial Guinea and Saint Vincent and the Grenadines. In 1999, the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted a Catch Documentation Scheme designed at preventing IUU toothfish catches from entering markets in CCAMLR member countries. The sale of Patagonian toothfish is limited to certified catches.

107. While both initiatives have the same objective, they are not based on the same logic. In the ICCAT case, trade measures require the establishment of a “black list” of countries supporting IUU fishing activities. Such a black listing procedure requires strong monitoring capacities that need to be comprehensive and effective. On the other hand, in the CCAMLR case, trade measures are based on a “positive list approach” (white list), as only those vessels complying with rules are allowed to sell certified toothfish. While the white list approach focuses on catches and individual vessels, the black list approach experienced seeks a collective sanction, as trade measures are expected to apply on all products imported from black listed States.

108. It should be noted that in the case of the white listing procedure, the burden of the proof may be charged to vessel operators, which may reduce RFMOs’ need of monitoring. Recent empirical evidences suggest that “black list” measures have proved hardly effective under the current problems of fish laundering and use of forged documents³¹. As a result, ICCAT adopted in 2003 new measures based on positive list (as well as IATTC and IOTC).

109. In support of these multilateral initiatives, importing states can also envisage taking domestic actions to limit the sales of IUU products into their domestic market. For instance, the Japanese

²⁸ In particular it is worth noting that reinforcement of MCS operations may result in additional costs for committed fishers (either physical or opportunity costs). Paradoxically, while improved MCS schemes should be seen as a prerequisite to limit IUU catches, they also may contribute to further development of the phenomenon.

²⁹ Under the "1995 Resolution": *Resolution for an Action Plan to Ensure the Effectiveness of the Conservation Program for Atlantic Swordfish*.

³⁰ "The 1998 Resolution": *Resolution Concerning the Unregulated and Unreported Catches of Tuna by Large-Scale Longline Vessels in the Convention Area*.

³¹ Presentation of Japan at the International Conference of Illegal, Unreported and Unregulated Fishing. Santiago de Compostela. 25-26 November 2002.

Government requires traders importing tuna to submit a report indicating the fishing vessel's name³². Furthermore, in response to recommendations from international organisations, the Japanese Government strengthened measures against IUU vessels by requesting tuna traders to voluntarily terminate imports of fish products from IUU vessels.

Possible avenues to reduce the difference of expected revenues (Pi)

110. While the two first sets of measures aim at reducing IUU sales, i.e. the absolute revenues of IUU fishing operators, this third set of measures reduces the relative difference in revenues between IUU and regular/committed fishing operators by increasing the price of regular catches. The fundamental logic underlying such a measure is that consumers may be willing to provide committed operators with a price premium in order to "reward" their responsible behaviour³³. Such measures require the use of labelling, certification using a catch document or any other trade tracing document. There is evidence from the CCAMLR situation that fish certified using a catch document scheme may command higher prices than uncertified fish, as the current premium on fish carrying CCAMLR Catch Documents is 20 – 30% (Agnew and Barnes, 2003). The success of other labelling programs that promote responsible fishing practices (e.g. Marine Stewardship Council certification scheme) indicates that consumers react positively to these types of initiatives (despite the additional cost it represents), provided that appropriate information and communication is available. In this regard, it should be noted that educational activities may sustain the success of such labelling schemes. While educational activities may have a cost in the short term, they could allow for a long term boycott of IUU products without sizeable costs and efforts (OECD, 2003a). It is worth noting that private initiatives may play a significant role in this context, as a complement to public programs. For example, some aquarium networks propose programs designed to educate children about ocean matters, including IUU ones, along the line of some UN agencies recommendations³⁴.

111. However, the success of such labelling programs to deter IUU fishing activities strongly depends on the level of the price premium attributed for acting responsibly. While reporting that first initiatives were encouraging, some authors also indicate that the premium was not sufficiently high to incite operators to comply with rules (e.g. see the Japanese case study; OECD, 2003a; Agnew and Barnes, 2003). In addition, all trade measures face traceability difficulties that can limit their effectiveness (labelling fraud, etc.).

112. Organised IUU activities that aim to mix IUU catch with regularly obtained catch (see section 4) can complicate the situation. The more sophisticated organised IUU is, the greater is the need for MCS capacities. Organised IUU may thus generate an important pressure on public budget.

5.2. Exploring ways to increase operating costs of IUU/FOC vessels

Fishing company tax rate (Ri):

113. Section 2 suggested that the registration of a fishing company in a FOC country, if considered as a tax haven, may create an incentive to engage in IUU/FOC activities. In this regard, a direct way of modifying the incentive structure is to promote the elimination of tax havens, as well as to address any

³² On the basis of the "Law Concerning Special Measures to Strengthen Conservation and Management of Tuna Resources"

³³ One additional possible reason for this premium relates to the fact that a FOC vessel has an incentive to sell the product as soon as possible, in general at a lower price (in practice, "black" fish is often sold under a false name, belonging to a lower price species; OECD, 2003a).

³⁴ E.g. see the Intergovernmental Oceanographic Commission (IOC) - UNESCO web site for interesting examples; <http://ioc.unesco.org>

NOT FOR QUOTATION

other tax distortions that may sustain IUU fishing activities. As highlighted above, the OECD is undertaking initiatives on this issue, with the establishment of criteria that should be used to improve the transparency in tax systems.

114. Reciprocally, actions may also be directed at “equalising” tax rates prevailing in both States by reducing tax levels in committed States³⁵. This is indeed one of the purposes of “second registers”, i.e. registers created for fiscal and labour (see below) matters by industrialised countries attempting to check “national tonnage flight”. In this regard, Llacer (2003) clarifies that a distinction can be made between “offshore second registers” (created by a State in an overseas territory under its sovereignty) and a “special register” (created by a State within its own national territory)³⁶.

Fuel cost (Fi) and Other Running cost (ORi):

115. Section 2 showed that physical operating costs are often similar for both FOC and committed vessels (fuel, other commodities and services). To reduce IUU/FOC fishing activities, trade measures can be taken to restrict the provision of some goods and services to FOC vessels, in order to increase their costs. For instance, preventing FOC vessels from landing their catch in a given port is likely to increase the fuel cost of steaming (e.g. the ban from Canadian port of Estonian vessels in 2002). In some instances, alternative places of landing may even be far enough to remove IUU fishing from a given area.

116. Other restrictions may be established either on fishing input goods (e.g. ice; navigation, detection or communication device) or on services such as maintenance or repair of vessels, satellite connections, etc... While such measures may be technically circumvented, they are likely to generate additional costs (including some transaction and opportunity costs) that may act as a disincentive to engage in IUU/FOC vessels. In addition, it should be noted that for some goods and services (e.g. engine, sonar, insurances, communication, etc.), providers may be of sufficiently small number that it may be possible to establish a real embargo.

Crew cost (CRi):

117. Due to its relative importance in any fishing operation, the crew cost is likely to be an area where strong incentives to engage in IUU/FOC fishing exist. Three types of actions can be envisaged to increase the crew cost of FOC vessels.

118. A first type of action, concerning all crews, is of regulatory nature. It concerns the ratification and implementation by all flag States of any international convention regarding the working conditions of fishers, and in particular the ILO conventions. It is worth noting that ILO Convention 163 (Seafarers' Welfare Convention) and Convention 180 (Seafarers' Hours of Work and the Manning of Ships Convention) have only been ratified by 12 and 15 countries, respectively³⁷.

119. A second type of action concerns unskilled crew mainly originating from developing countries. Section 2 pointed out that a major factor affecting this variable is the prevalence of cheap and ready labour in some developing countries. Any action aiming at improving the economic and social situation/outlook in these countries is likely to increase the opportunity cost of labour in that economy, and should thus

³⁵ While both approaches may be equivalent from the tax perspective, confidentiality issues remain in the case of tax haven.

³⁶ Examples of which are respectively The Isle of Man (UK), The Netherlands Antilles or Kerguelen Islands (France) for offshore registers; NIS (Norway), DIS (Denmark), GIS (Germany), Canary Islands (Spain) or Madeira (Portugal) for special registers.

³⁷ ILOLEX: <http://www.ilo.org/ilolex/english/newratframeE.htm>

contribute to increase the wage of unskilled crew. While such actions for development may be considered in a middle and long term perspective, they are nevertheless likely to generate a durable disincentive to engage in IUU/FOC fishing operations.

120. A third set of actions more specifically concerns skilled crews (master, engine “chief”), as they are often reported to be citizens of OECD Member countries (Agnew and Barnes, 2003). It consists in the “extra-territorial” application of domestic sanctions to the citizens of individual countries wherever in the world those citizens may be, and whatever flag they may be working under. In this perspective, the possibilities for “extra-territorial” sanctions, combined with the level of applicable domestic sanctions, is likely to influence the wage of IUU/FOC fishers (see below the discussion on expected sanction for further details).

Insurance cost (INi):

121. The cost of insuring FOC vessels may be increased by making the flag State legally liable for the lack of insurance of a FOC vessel. Such an evolution could act as an incentive for FOC States to subject the attribution of their flag to verify if “genuine” insurance is available.

Repair and maintenance cost (Mi):

122. Section 2 suggested that a strong factor is the prevalence of cheap and ready labour force in some countries. Improving the economic and social situation in these countries may thus also contribute to the increase of repair and maintenance cost of FOC vessels. If safe alternatives exist, workers are likely to be reluctant to engage in an activity that may prove risky because of the poor state of the vessel. To engage in IUU fishing, a FOC vessel operator would either have to pay for maintenance to keep up with standards required by international regulations or to increase wages. The reason is that wages are expected to reflect the opportunity costs of labour for a given level of risk. As insufficient maintenance operations increase the level of risk, a premium should be offered to reward it. In both case however, operating costs of IUU/FOC vessels would increase.

5.3. Exploring ways to increase capital costs of IUU/FOC vessels

Vessel capital cost (VCi):

123. Section 2 showed that three major factors may explain the low cost of FOC vessels compared to committed vessels: the poor state of vessels, the prevalence of overcapacity and the inappropriateness of some investment and fiscal rules.

124. To increase the vessel capital cost, a first set of actions can aim at improving the state of FOC vessels, either directly (e.g. through the definition and application of enforceable minimum standards, in accordance with existing international regulations) or indirectly (i.e. through improvement of the economic situation/ outlook).

125. A second set of actions can be envisaged to reduce local and global imbalances between fishing possibilities and fishing capacities (i.e. overcapacity). As pointed out in section 2, excessive supply of capacity leads to a low value of most FOC vessels (for which the “committed” opportunity cost is close to zero). As a result, time-limited scrapping programs could be conducted in order to reduce global imbalances³⁸. In this regard, it should be noted that such an action have a high cost. For instance, EC

³⁸ The overall efficiency of scrapping schemes in a given fishery depends on various factors, including the management regime in place. Yet, notwithstanding these management issues, physical scrapping schemes are likely to increase the price of remaining vessels.

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Member countries granted EUR 32 million for permanent capacity reduction in 2000 (both national and EC funding), while Korea spent up to KRW 254.5 billion (USD 197 million) for the same purpose in 2001 (OECD, 2003b). Alternative, less costly measures, such as the adoption of management regimes which would permanently reduce fishing capacities or prevent further development of capacities, could be envisaged. On the other hand, any subsidies which are likely to artificially reduce the value of vessels (e.g. shipbuilding subsidies) should be eliminated.

126. A third set of actions that may be taken to increase FOC vessels capital cost are restrictions on investment. One type of such restriction concerns outward investment. For instance, a way of increasing the capital cost of IUU fishing activities could consist in submitting OECD residents' foreign direct investment in FOC countries to prior notification to fiscal authorities³⁹, in order to prove that the investment are not dedicated to IUU fishing activities. While such a measure may be possible to be circumvented, it could nevertheless increase the cost of the investment (including the transaction cost), and hence reduce the incentive to engage in IUU/FOC activities. An interesting example of such restriction to outward direct investment can be found in the Japanese reservation lodged under the OECD Code of Liberalisation of Capital Movements (OECD, 2003c)⁴⁰. This reservation states that direct investment abroad by residents should only apply to investment in an enterprise engaged in fishing regulated by international treaties to which Japan is a party or fishing operations coming under the Japanese Fisheries Law. Similarly, in Spain, while foreign investment is not restricted, national investment in third countries is regulated, especially when government aids to reduce the internal fishing effort can be obtained. In Portugal, chartering is subject to prior authorisation by the Government. The authorisation is issued for a period not exceeding two years.

127. Another type of restriction on investment consists in preventing IUU operators from using FOC vessels as mortgage. In particular, when loans are attributed by banks residing in OECD countries, such a practice could be discouraged. In doing so, loans dedicated to IUU fishing activities may be more difficult or more costly to secure, which also may increase the cost of investment (including the transaction cost), and hence reduce the incentive to engage in IUU/FOC activities.

Safety Equipment cost (SEi):

128. The cost of safety equipment often avoided by FOC vessels may be increased by making the flag State legally liable for any non compliance with general safety and pollution requirements. This could act as an incentive for these States to condition the attribution of their flag to vessels properly equipped. In this regard, enforceable minimum standards would have to be clarified.

129. An additional way of increasing the cost of compulsory safety equipment would be of a trade nature, as it deals with restrictions on access to goods and services. For instance, restriction in the provision of some satellite equipments could result in higher costs for FOC vessels. As pointed out above, providers of safety equipment may however be of sufficiently small number that the establishment of an embargo may be a possibility.

130. Lastly, as section 2 suggested that a major factor in the low safety cost for FOC vessels is due to the prevalence of poor social outlook in some countries, any actions designed to improve macroeconomic conditions are likely to increase this cost item.

³⁹ As a key initiative for eliminating IUU fishing activities which could consist in addressing IUU fishing activities operated from OECD countries or by OECD residents.

⁴⁰ The Code is actually a Decision of the OECD Council, which is legally binding on OECD member governments. See OECD Codes of Liberalisation of Capital Movements and Current Invisible Operations: Users' Guide, April 2003, p. 6.

5.4. Exploring ways to increase cost of engaging in IUU fishing activities

131. The costs of risk include the cost related to fraud, corruption and avoidance behaviours, the cost of expected sanction and the “moral/reputation” cost.

Expected sanction E (Si):

132. As pointed out in section 2, the level of expected sanction is positively linked to two main factors, (1) the probability to be apprehended and (2) the sanction level.

133. To increase the probability of being apprehended (i.e. the detection likelihood), a first set of actions can aim at improving “traditional” MCS capacities (notwithstanding budgetary implications). A second set of actions is of regulatory nature, as it concerns the enlargement of the risk incurred, for example through the “extra-territorial” application of domestic sanctions. While different countries have different attitudes to the extra-territorial application of their laws to their citizens, the approach is becoming more widespread (its extension to certain types of sex tourism is a recent example). In the context of IUU fishing activities, it is worth noting that several OECD countries have passed or are considering passing such regulations (e.g. New Zealand and Spain).

134. This can also take place through the resort to so-called “long-arm approaches”, which allow for prosecution by a government of a national who acted in contravention to a foreign law. Such a mechanism is often referred to as “Lacey Act” provision or contravention. The Lacey Act, which was passed in the US to outlaw interstate traffic in birds and other animals illegally killed in their State of origin, can apply to the acts of landing, importing, exporting, transporting selling, receiving, acquiring, possessing or purchasing any fish taken, possessed, transported or sold contrary of the law of another State (Kuemlangan, 2000⁴¹). A recent example of the use of the US Lacey Act involves both foreign and US nationals who were illegally importing large quantities of Honduran spiny lobster⁴².

135. Related to this, a third and direct way to enlarge the scope of possible sanctions in any country could consist in making any trade of IUU fish an offence (i.e. in particular the enlargement of sanctions to downstream operators, including up to final consumers). It should be noted that committed vessels shouldn't be affected by such a regulatory measure, as they are expected to comply with national, regional and international regulations. In addition, such a measure is also likely to have an indirect effect on the price offered for IUU products, as any operator facing the risk of being pursued may likely require a “premium” for this risk.

136. Concerning the level of sanction, several actions can be envisaged to raise the cost side of IUU/FOC vessels, whether at national or at international level. A first set of actions concerns the level of fine. At international level, section 2 suggested that fines were not sufficiently high due to, inter alia, some ITLOS decisions (see Box A.1). While these decisions appear to be justified from a legal point of view (e.g. in stating that bonds should be reasonable, i.e. inter alia “related” to the value of the vessel and the cargo size, etc.), they nevertheless seem to under-estimate the seriousness of the short and long term effects of IUU fishing activities. In this context, any actions designed to ease international courts to allow for increased fine level should be encouraged.

⁴¹ Kuemlangan reports that at least one prosecution of an offence committed against a Lacey Act provision has been conducted outside the US (IUU operator from Papua New Guinea convicted and penalised for catching fish in Salomon Island without appropriate rights).

⁴² See the US “Draft National Plan of Action to Prevent, Deter, and Eliminate Illegal, Unregulated, and Unreported Fishing” (2003); <http://www.state.gov/g/oes/rls/or/18488.htm>

NOT FOR QUOTATION

137. A second, related set of actions concerns the level of fine set by individual States to their nationals involved in IUU fishing activities (including under extra-territorial and “long-arm” prosecutions). The primary rationale for this is to increase the expected sanction incurred in order to prevent nationals from engaging in IUU fishing activities. However, it should also be noted that ITLOS often bases its decisions on the penalties imposed or imposable under the laws of the concerned state (i.e. for instance that the fine faced by FOC vessels can hardly be greater than the “current” domestic fine levels). In this regard, it should be further noted that any action to harmonize fine levels across flag states could be encouraged (e.g. see European Commission, 2001)⁴³.

138. A third set of actions concerns the form of the penalty incurred. Up to now, the paper has only focussed on direct monetary penalties. Yet, sanctions can also take the form of physical actions, such as vessel and catch confiscation or prison sentences. While vessel or catch confiscation can easily translate into reduced profits for IUU/FOC vessels’ operators (in the form of additional capital cost or loss of revenues), the later only acts indirectly, due to the prevalence of ready labour force in some countries. For instance, when crew members are sentenced to jail, IUU/FOC vessel’s owners rarely face additional costs (except due to the loss of fishing time). Crew members are often just abandoned by their employers, as they can be replaced at a low cost, while “real” owners are hardly prosecuted, due to the lack of transparency in company structures.

139. To complement these potential measures, a fourth set of actions can thus be envisaged that affect the IUU/FOC vessels capital owner, by identifying the “beneficial ownership”. As a major reason for lack of transparency is the possibility for confidential registration of fishing companies in some countries, any action seeking the elimination of tax havens or other non cooperative territories/jurisdictions could be encouraged. In this regard, it should be noted that the OECD is also at the front of international initiatives on these issues through the Financial Action Task Force on Money Laundering.

Avoidance cost (AVi):

140. As pointed out in section 2, IUU/FOC vessels are likely to face avoidance costs, in the form of steaming time, steaming fuel costs or “research” operation (e.g. costs associated with the detection of MCS vessels, including electronic equipment costs). While these costs can currently be considered as insufficient to prevent IUU/FOC fishing activities, they could be mechanically increased through the improvement of public MCS capacities (see discussion above on the budgetary implications).

141. In addition to public actions, it should be noted that private initiatives may also contribute to increase the avoidance cost of IUU/FOC vessels. For instance, in the Antarctic toothfish fishery, legal operators gathered to form the COLTO (Coalition Of Legal Toothfish Operators⁴⁴) and established a “wanted” reward scheme in order to improve the identification of IUU/FOC vessels. As a result, IUU/FOC vessels need to avoid to be seen not only by official patrol vessels, but also by any committed fishing vessels. While the overall outcomes of the scheme are still unknown, such an initiative is likely to increase avoidance cost of IUU/FOC vessels.

Moral/Reputation Cost (REi)

142. Section 2 suggested that moral/reputation costs faced by IUU fishing operators was often insufficient due to a general lack of recognition of the gravity of this activity. Any action directed at

⁴³ Communication from the Commission to the Council and the European Parliament, *Behaviour which seriously infringed the rules of the common fisheries policy in 2000*. COM(2001) 650 final, Brussels, 12.11.2001.

⁴⁴ For further details see: <http://www.colto.org>

improving the social knowledge of the adverse economic, social and environmental effects of IUU fishing could be encouraged. In particular, the valuation of environmental, economic and social damages incurred could provide useful information. Once again, it is worth noting that private initiatives may play a significant role in this context, as a complement to public programs. For example, this may be done through educational programs, information dissemination, public campaign, etc.

143. With regard to the particular case of established companies that might have an interest in paying attention to corporate governance issues, it can be further noted that IUU *shaming* initiatives may play a significant role. In this context, Stokke and Vidas (2003) suggest that “typical” agents of shaming are business and environmental NGO that provide detailed information on IUU companies and their suppliers in order to increase the costs incurred. As an illustration, the authors report that the disengagement of Norwegian vessel owners from IUU operations in Antarctic waters is believed to be a consequence of ISOFISH publications having named them.

Fraud Cost (FCi):

144. In order to circumvent regulations in force, IUU/FOC vessels face some fraud costs (repackaging and re-labelling; faking VMS positions in support of misreporting, etc.), including in the form of cost of financing corruption. Section 2 showed that a major factor allowing for this behaviour was of social nature (global and local economic imbalances). As a result, actions aiming at improving the economic and social situation/outlook in some countries are likely to increase the cost of fraud for IUU/FOC vessels.

145. In addition, increasing the level of expected sanctions for people involved in fraud mechanisms should also contribute to raise the cost of fraud, as they would ask for a higher risk premium. In line with the previous discussion on expected sanctions, improved MCS capacities, as well as the resort to extra-territorial and “long-arm” measures, are also likely to increase the cost of fraud for IUU/FOC vessels.

146. With respect to the involvement of officials in fraud operations, it should be noted that the OECD is at the front of issue, e.g. through the OECD Convention to combat bribery which went into effect on 15 February 1999⁴⁵. This convention makes it a crime to offer, promise or give a bribe to a foreign public official in order to obtain or retain international business deals. Countries that have signed the Convention are required to put in place subsequent legislation.

Conclusion

147. The paper identifies two major drivers behind IUU fishing activities. First, the prevalence of overcapacity in the worldwide fishing fleet, which incites operators to find the most profitable - although not permitted in their country of origin - way to use their capacities. Second, the incomprehensiveness and weakness of the current international framework for the sea, which allows both for the prevalence of FOC vessels and for some fishing practices to be beyond the reach of national and international regulations. In sum, by circumventing national and international conservations measures, the advantage of IUU/FOC vessels is that it can produce more than when complying with rules.

148. Several additional drivers may also play a role to engage in IUU fishing activities, by allowing it to be as profitable as it is, either by creating higher revenues or lower costs. Some are of institutional nature, such as the insufficient level of MCS operations (leading to a low probability to be apprehended, even within national EEZ) and the insufficient level of penalty (fine and non-monetary sanction). Some are of economic nature, such as the prevalence of tax distortion system (e.g. tax haven), inappropriate

⁴⁵ The “OECD Convention on the Bribery of Foreign Public Officials”.
http://www.oecd.org/department/0,2688,en_2649_34859_1_1_1_1_1,00.html

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management regimes, prevalence of some forms of subsidies, and some investment or fiscal rules (leading to artificially low cost of vessels). Some are of social nature, such as the prevalence of poor economic and social conditions and outlooks in some countries (leading inter alia to low crew and maintenance costs).

149. While all these factors may not necessarily play a role at the same time, they all create an incentive to engage in IUU fishing activities. Without changes in the current regulatory and economic situation, IUU fishing is thus likely to continue. Moreover, emergence of “organised IUU fishing operations” can facilitate and accelerate the development of IUU fishing by reducing monetary and transaction costs faced when engaging in IUU fishing (mainly the cost of risk and avoidance, fraud, registration operations). Rapid actions should be implemented to curd such a threatening development.

150. While most of the possible actions discussed in the paper already exist within regulators’ legislative “toolkit”, they often need to be clarified or designed for the particular situation of IUU/FOC fishing activities. Actions can first take place at the multinational regulatory level, in order to reduce or close current “loopholes” and weaknesses. In particular, actions aiming at inciting all flag States to accede international agreements and RFMOs, at conditioning the flagging of a vessel to the prevalence of a defined, enforceable “genuine link”, or at defining minimum, liable requirements for the flag State could be envisaged. Yet, while such actions could be effective and not expensive, experience provided by recent multinational negotiations nevertheless suggests that they are difficult to agree to⁴⁶. Also at the multinational level, actions can be envisaged to facilitate comprehensive, active participation of all involved flag States in RFMOs, e.g. through fee exemption and support from existing Parties. Alternatively, it could be envisaged to compensate Non-Parties States for not accepting any FOC vessels on their registers. In both case, actions could effectively contribute to the elimination of FOC vessels.

151. Notwithstanding future initiatives related to this incomprehensiveness of the international legal framework, actions could be taken nationally to insure the enforcement of current regulations. First, MCS capacities in committed countries could be improved, in order to better identify IUU fishing activities (including the establishment of black and white lists) and to increase the probability of being apprehended. Yet, the analysis pointed out that traditional MCS means are costly, and that alternatives could be explored (e.g. coordination between committed States, inland MCS operations). Second, the level of the penalties incurred could be raised, in order to act as a genuine disincentive. In this regard, it is noted that penalties could better reflect the total cost of IUU fishing activities, including long term stock externalities. Finally, some actions can be taken to increase the scope of punishable operations. In particular, committed States could envisage taking extra-territorial measures against any of their citizen involved in IUU fishing activities (e.g. New-Zealand and Spanish initiatives) and to apply so-called “long arm approaches” which allow for prosecution by a government of a national who acted in contravention to a foreign law.

152. A second set of measures concerns trade measures, which may be designed to affect both revenue and cost. On the revenue side, restrictions may apply to the trade of IUU products, e.g. through embargoes (e.g. ICCAT initiatives), boycott (e.g. *shaming* actions) or traceability and labeling scheme (e.g. CCAMLR documentation scheme). While the effectiveness of such schemes is likely to differ from case to case, it would always carry a social cost in the form of price increase. On the cost side, restrictions may apply to the provision of goods and services, such as landing (port closures), transshipment, fishing inputs (e.g. refueling, insurance, satellite communication) and outward investment (e.g. Japanese reservation lodged under the OECD Code of Liberalisation of Capital Movements). Recent examples suggest that such measures may be efficient in some situation, at a relatively limited cost.

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Vukas and Vidas (2001) show how the concept of requiring a genuine link between Flag State and vessel was repeatedly watered down in the negotiations leading up the the 1982 UNCLOS agreement.

153. A third set of measures is of economic nature, as it is designed at regulating the economic imbalances that facilitate IUU activities to exist. These actions aim, inter alia, at improving the economic and social outlook in some countries, at reducing overcapacities (e.g. through the implementation of appropriate management systems in all fisheries) or at improving transparency in banking operations.

154. It should be noted that all these possible actions carry an inevitable cost, which would be charged either to the public, the industry, the consumers, or all three. Further analysis is needed to determine which actions, or mix of actions, could be the more appropriate to curb IUU fishing activities. In close collaboration with relevant stakeholders and IGO, the OECD contributes actively to such an analysis.

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APPENDIX

Table A.1: The 2000 List of Jurisdictions Identified as Meeting the OECD Criteria for being Considered a Tax Haven⁴⁷

<p>Andorra Anguilla – Overseas Territory of the United Kingdom Antigua and Barbuda Aruba – Kingdom of the Netherlands¹ Commonwealth of the Bahamas Bahrain Barbados Belize British Virgin Islands – Overseas Territory of the United Kingdom Cook Islands – New Zealand² The Commonwealth of Dominica Gibraltar – Overseas Territory of the United Kingdom Grenada Guernsey/Sark/Alderney – Dependency of the British Crown Isle of Man – Dependency of the British Crown Jersey – Dependency of the British Crown Liberia</p>	<p>The Principality of Liechtenstein The Republic of the Maldives The Republic of the Marshall Islands³ The Principality of Monaco Montserrat – Overseas Territory of the United Kingdom The Republic of Nauru Netherlands Antilles – Kingdom of the Netherlands¹ Niue – New Zealand² Panama Samoa The Republic of the Seychelles St. Lucia The Federation of St. Christopher & Nevis St. Vincent and the Grenadines Tonga Turks & Caicos – Overseas Territory of the United Kingdom US Virgin Islands – External Territory of the United States The Republic of Vanuatu</p>
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Notes:

¹ The Netherlands, the Netherlands Antilles, and Aruba are the three countries of the Kingdom of the Netherlands.² Fully self-governing country in free association with New Zealand.³ Fully self-governing country in free association with United-States

Source: OECD, 2000

Table A.2: List of Jurisdictions Declared FOCs by the ITF's (July 2003)

<p>Antigua and Barbuda Bahamas Barbados Belize Bermuda (UK) Bolivia Burma/Myanmar Cambodia Cayman Islands (UK) Comoros Cyprus Equatorial Guinea German International Ship Register (GIS) Gibraltar (UK)</p>	<p>Honduras Jamaica Lebanon Liberia Malta The Republic of the Marshall Islands Mauritius Netherlands Antilles Panama São Tomé and Príncipe St. Vincent and the Grenadines Sri Lanka Tonga Vanuatu</p>
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Source : ITF, 2003 (http://www.itf.org.uk/seafarers/foc/Body_foc.html)⁴⁷

Jurisdictions present in both lists are highlighted in bold.

Box A.1: Examples of ITLOS Decisions

In response to large-scale IUU fishing around Kerguelen for toothfish, France has arrested a number of vessels and has fined them with large bonds. In three cases, now, the flag state of the IUU vessel has taken France to the International Tribunal on the Law of the Sea (ITLOS), seeking immediate release of the vessel and considerable reductions in the level of the bond set. In the first case, regarding the Camuoco (Panama vs France), France had set a bond of FF 20 M (USD 3.1 M). Despite drawing attention to the seriousness of IUU fishing around Kerguelen (estimated by France to be in excess of USD 56 M to that date) on 7 February 2000 the Tribunal found that the bond set by France was too high, and reduced it to FF 8 M (USD 1.2 M). The following factors were cited by the Tribunal in reaching its decision that the original bond was unreasonable⁴⁸:

“ The Tribunal, in a previous judgment in the 1997 M/V "Saiga" (Prompt Release) case, had determined that: “the criterion of reasonableness encompasses the amount, the nature and the form of the bond or financial security” and that the “overall balance of the amount, form and nature of the bond or financial security must be reasonable”.

The Tribunal, in today’s Judgment, reiterated that conclusion and elaborated on a number of factors that are relevant in an assessment of the reasonableness of the bond or financial security. The Tribunal considers the following to be of relevance:

- *The gravity of the alleged offences;*
- *The penalties imposed or impossible under the laws of the detaining State;*
- *The value of the detained vessel and of the cargo seized; and*
- *The amount of the bond imposed by the detaining State and its form”.*

In a second test case (18 December 2000), the Tribunal again decided that a 56.4M FF (USD 8.7 M) bond set by France on the Seychelles flagged Monte Confurco was not reasonable, and reduced it to FF 18 M (USD 2.8 M). However, in the final French case (regarding the Belize registered Grand Prince, 20 April 2001), the Tribunal found “that it had no jurisdiction under article 292 of the Convention to entertain the Application”. The Tribunal stated that the “documentary evidence submitted by the Applicant fails to establish that Belize was the flag State of the vessel when the Application was made”. France’s bond of EUR 1.7 M (USD 1.7 M) was therefore upheld (Belize had asked for its reduction to EUR 206,149)⁴⁹.

A similar case has recently been brought by the Russian Federation against Australia. This stems from the arrest on 7 February 2002 of the Volga, which was boarded by Australian military personnel from a military helicopter on the high seas in the Southern Ocean for alleged illegal fishing in the Australian fishing zone. The vessel was directed by an Australian warship to proceed to Perth, where it was still detained. The crew of the vessel were repatriated to their respective home countries after a period of detention with the exception of three officers, of Spanish nationality, who remain in Perth under court orders. The catch which had been on board the vessel at the time of boarding was sold by the Australian authorities for the amount of AUD 1,932,579.28. The Australian authorities set the amount of the security for the release of the vessel and the crew at AUD 4,177,500. The Russian Federation requested the Tribunal to order the Respondent to release the Volga and the officers upon the posting of a bond or security in an amount not exceeding AUD 500,000. What is particularly interesting about this case is that Australia actually made the arrest in high seas waters adjacent to its EEZ around Heard Island.

In making its judgement, the ITLOS tribunal has obviously learned from its previous experiences. It set a bond consisting of the value of the vessel, fuel/lubricants and fishing gear (AUD 1.9 M). Significantly, they did not consider that the proceeds of the sale of fish and bait from the vessel, which is being held on trust by the Australian authorities pending the outcome of domestic proceedings, should form part of the bond. This departs from their previous judgements, and is an important principle because it means that the company must find an *additional* AUD 1.9 M for a

⁴⁸ ITLOS press release 35

⁴⁹ La Voz de Galicia, 13 April 2002. The fine was not, ultimately, paid, and France sank the vessel off La Reunion in early 2002.

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bond guarantee. However, they disallowed an application by Australia to include the sum of AUD 1 M within the bond for a VMS system on board the vessel. This would have been a “good behaviour” guarantee pending full trial in Australia, because as was pointed out during the ITLOS hearing, IUU vessels are usually repeat offenders. For instance the Camuoco, which following the January 2000 ITLOS hearing of Panama v France was released on bail, was arrested on 3 July 2002 by French authorities around Kerguelen Island (again), this time named the ‘Eternal’ (previously ‘Arvisa 1’, previously Camuoco). However, at least one judge disagreed with the court finding, and opined that such a good behaviour mechanism would be appropriate given the high level of re-offending of such vessels.