

Using Taxes to Deter Illegal Fishing in ITQ Systems

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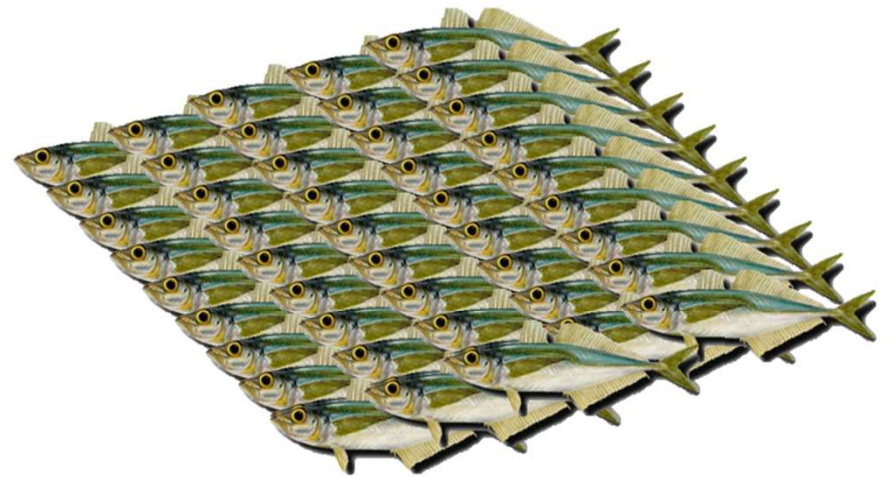
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Outline

1. Motivation and objectives.
2. ITQ fishery with taxes.
3. Results.
4. Conclusions.

1. Motivation and objectives...The problem...

Rivalry + non-exclusion = incentives for overinvestment in fishing capacity and processing plants.....



**Too many
vessels/boats, too
few fish!**

1. Motivation and Objectives: What do we do? Why?

- ITQ system offers an opportunity for fishery managers to achieve a given total allowable catch with maximum social benefit. The use of ITQs is increasing around the world, including developing countries.
- Implementation and management of an ITQ fishery involves significant costly administrative activities. These management systems have high institutional requirements, including funding of enforcement activities. (Arnason et al., 2000; Wallis and Flaaten 1999; Chávez and Stranlund 2013).

Motivation...

- In developing countries there is usually not enough funds to finance institutional changes and enforcement activities to induce compliance.
- A cost recovery system is needed to fund enforcement, marine and economic research, and other management activities.
- ITQs create wealth: *Could part of these rents be used to help fund higher/better enforcement?*



Enforcement....costly activities



Objectives

- To study fishers' behavior under different tax systems when used in fisheries management in combination with an ITQ system.
- We focus on the effects of different taxes on equilibrium quota price and violations under the assumption that enforcement is **imperfect** and **costly** (**monitoring and sanctioning costs**).
- We provide a numerical example of the effects of the tax systems discussed over quota market under illegal fishing.

Designing an ITQ system

quota + individual + transferable

- i) Define a global quota (TAC) .
- ii) Create/define rights over the TAC.
- iii) Distribute or allocate the permits/rights.
- iv) Allow quota transactions.
- v) Keep control of harvest/landings.**
- vi) Define a way to fund administrative costs.**
- vii) Evaluate the performance of the system.

Key elements of ITQs:

(1) Enforcement to induce compliance.

Potential problems:

-Quota violations

- Highgrading
- Bycatch discard

(2) Definition of TAC.

- How to set appropriate levels of TACs?

2. ITQ fishery with taxes

- We propose and explore an ITQ system combined with three type of taxes to fund enforcement/administrative activities:

-Proportional tax over value of harvest.

-Proportional tax over the value of quota holdings.

-Proportional tax over profits.

- We analyze the effects of these taxes over the functioning of the quota market. (Also a numerical simulation to a Chilean fishery).

3. Results

Comparative analysis between tax type

- All taxes **reduce harvest demand**, decreasing quota price, which indirectly reduces quota violations.
- All taxes generate revenue to **increase monitoring effort**, thus **increase quota demand**, which reduces quota violations.
- A **tax on quota holdings** also **reduces quota demand** (it creates incentives for illegal activities), directly increasing quota violations.
- A **tax on profits** has **information problems** for the regulator (it requires to observe costs of fishing and consequently profits).

Choosing a tax under ITQs

- An appropriate tax should have a double payoff on enforcement/compliance:

Reduces harvest demand and equilibrium quota violations.

Increase the funding for enforcement activities to increase quota demand.

- We propose to use a **tax over value of harvest**. Why?
 - reduce harvest demand,*
 - generate revenue for enforcement to induce more compliance,*
 - lower information requirements.*

Other results: how to set the tax level?

- We characterize the choice of tax level for a budget constrained regulator:

- (expected) enforcement costs (monitoring and sanctioning costs)*
- tax revenue*
- collection of sanctions*

The choice of the tax along with other elements, help to determine the level of monitoring effort, and the equilibrium in the quota market.

- We consider two scenarios:

- regulator is able to freely choose the tax to fund monitoring to induce perfect compliance.*
- tax is restricted (by political/social reasons).*

4. Conclusions/discussion

■ A tax over the value of fish is preferred because:

(i) It helps to fund enforcement.

(ii) Compared to a tax on quota holdings, the tax on the price of the final processed product does not induce more quota violations.

(iii) Compared to a tax on profits it has lower information requirements.

■ Setting the tax to induce more compliance may encounter practical and political difficulties.

■ Regulators should be careful to reduce the negative impacts from forcing fishers to move out from the activity. Preliminary information on profits margin.