



# Support to Fisheries: Levels and Impacts

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## Objectives of measuring and classifying support

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- Understand the scale and scope of policy effort in fisheries
- Identify how policies affect outcomes in fisheries
- Help countries match policy tools to objectives

*Provide a comprehensive global database of support to fisheries to the international community*



## An Implementation-based approach to support measurement

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- Focus on the way policies are designed and implemented.
- Sort policies into economically-relevant groupings to support further analysis.
- Does not depend on stated objectives.



# Two main types of support reported

## Transfers to individuals

Variable costs

Fixed costs

Income

Capacity reduction

## General transfers

Access to other EEZs

Infrastructure

Marketing and promotion

Community support

Education and training

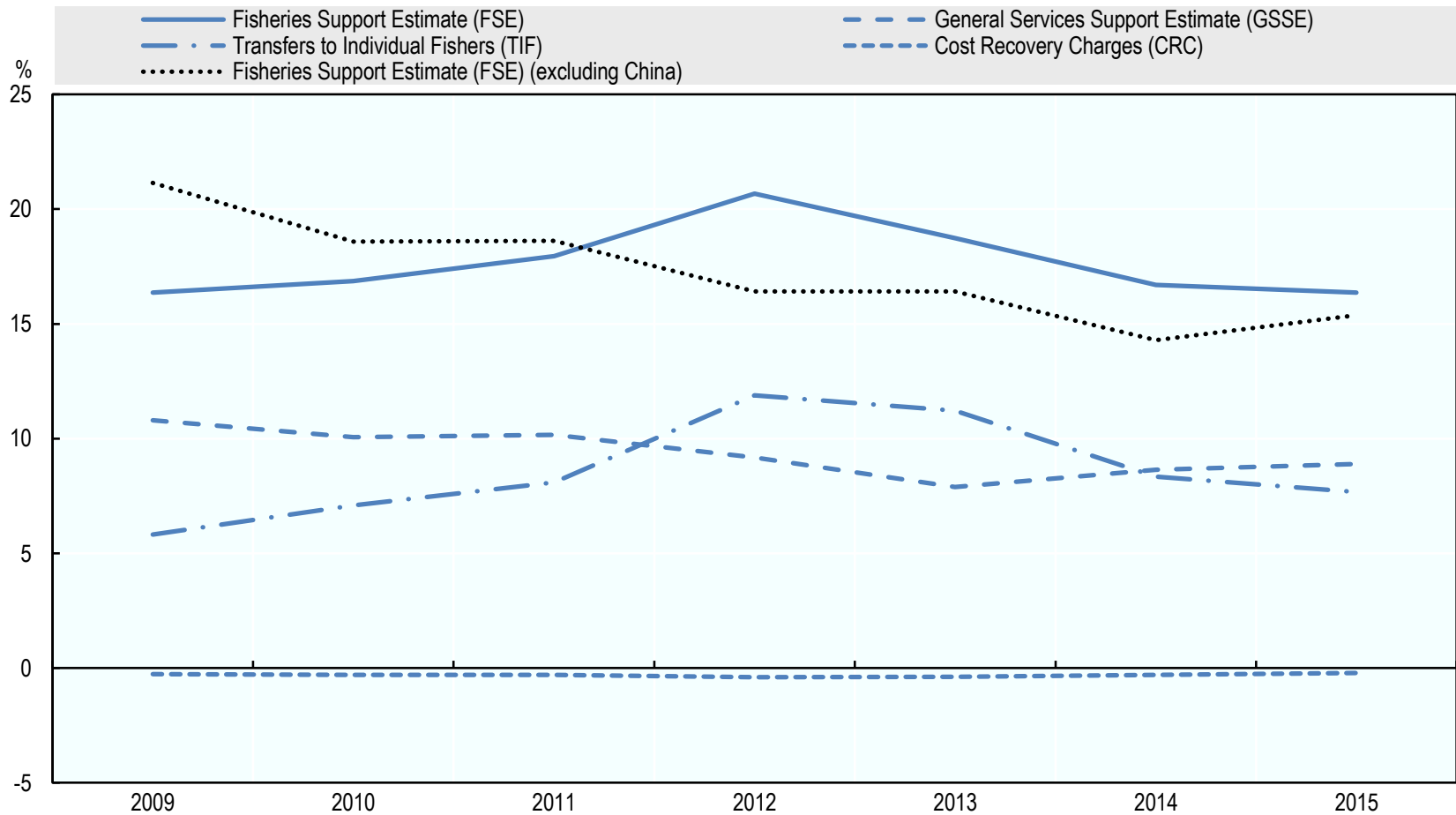
Research and Development

Management of Resources

[oe.cd/fse](http://oe.cd/fse)



# Support averages about 20% of value of landings

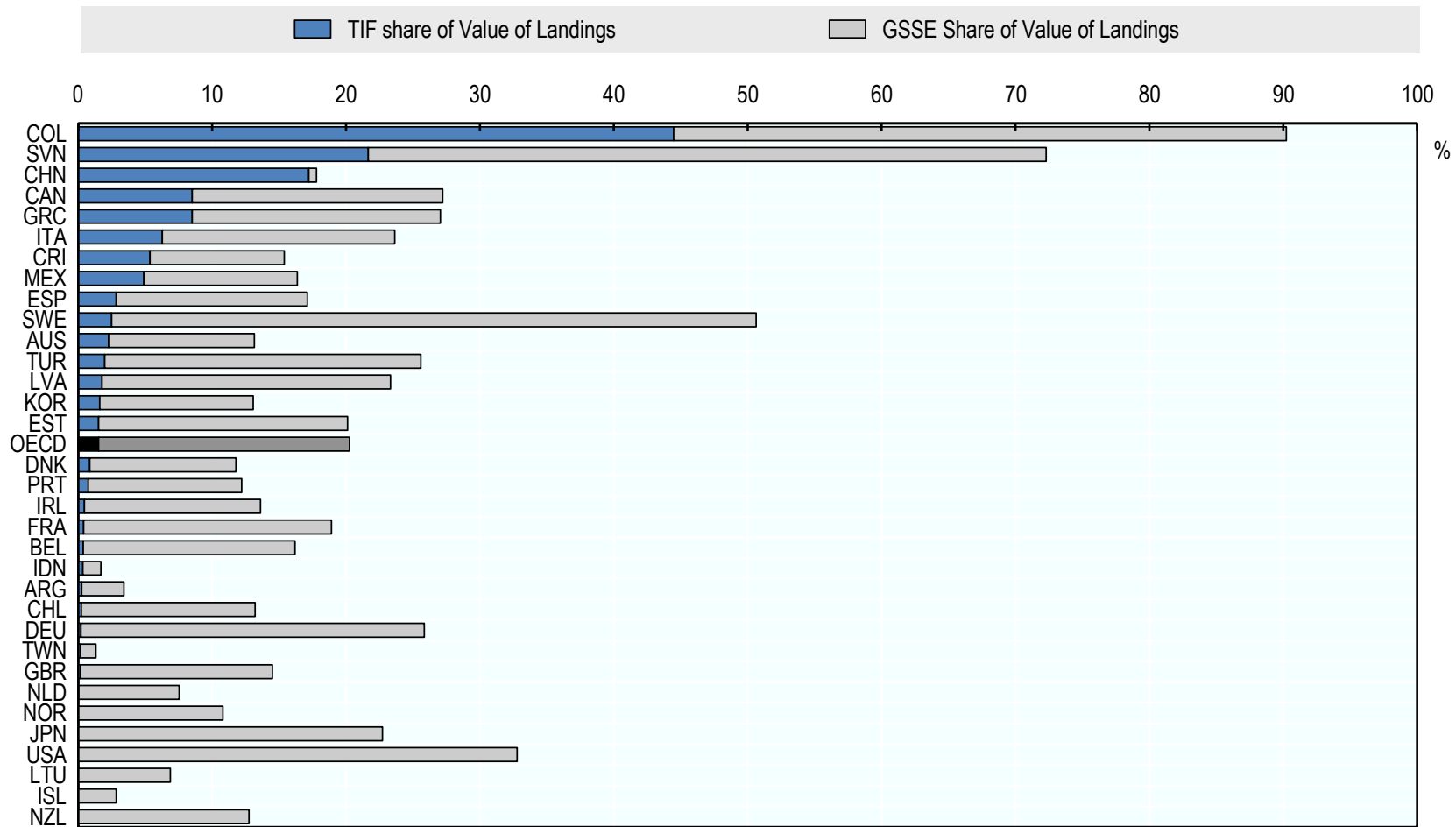




# Most support for general services, with some exceptions.

**Figure 3.2 Budgetary support to fisheries as a share of value of landings, 2015**

Disaggregated into Transfers to Individual Fishers (TIF) and General support to the sector (GSSE)



Note: Missing figures for value of landings have been estimated using data from 'The 2016 Annual Economic Report on the EU Fishing Fleet' (Belgium, Fra

The GSSE numbers reported here include estimations for management and enforcement expenditures, where missing. Further details on the estimation me



# MODELLING THE IMPACTS OF SUPPORT POLICIES



## Impacts occur on different dimensions

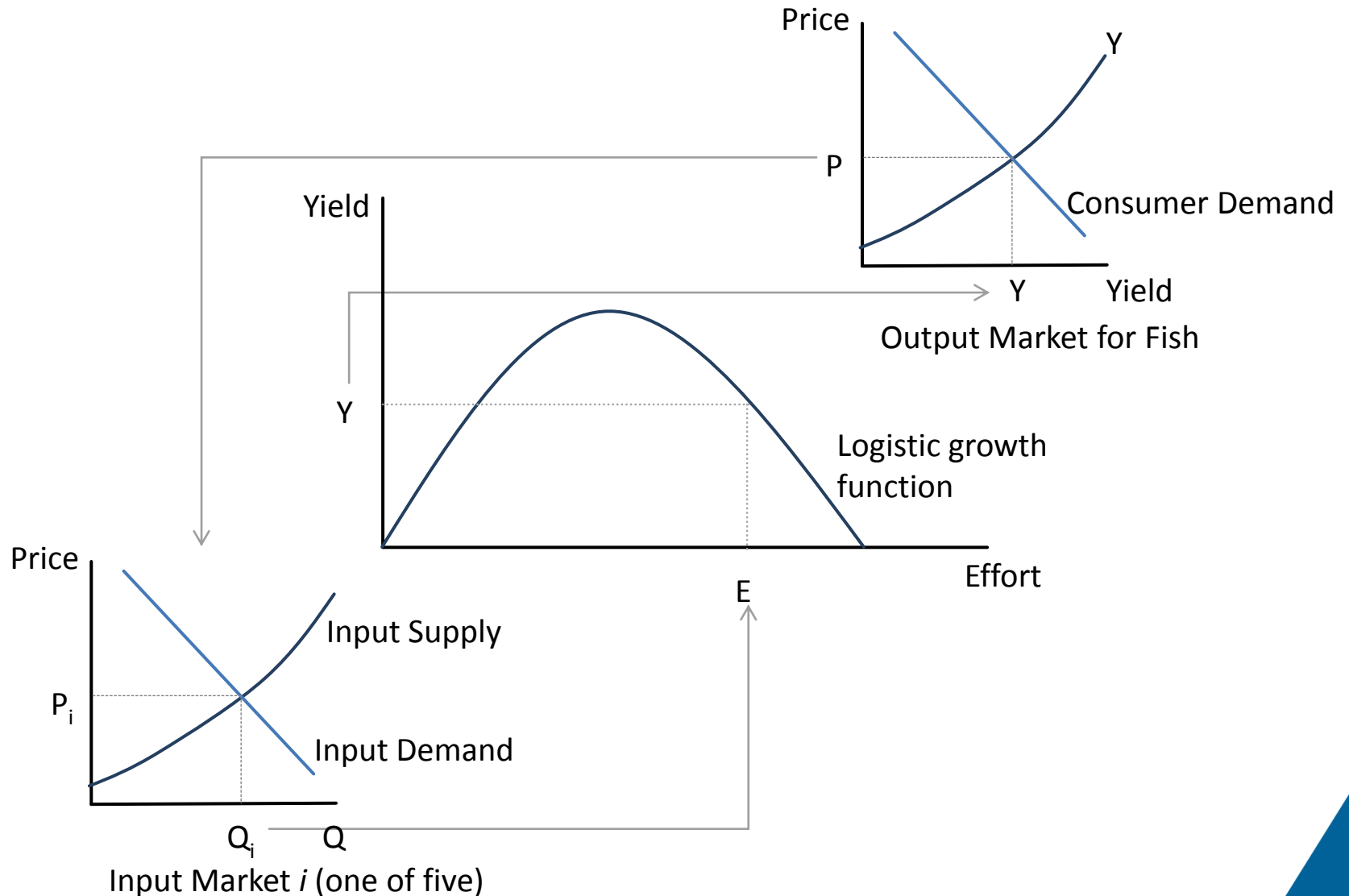
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- Fishing effort
- Harvest and stock status
- Fleet capacity and investment
- Fishers incomes and rent generation
- Welfare distribution
- More...





# The Fisheries Policy Evaluation Model



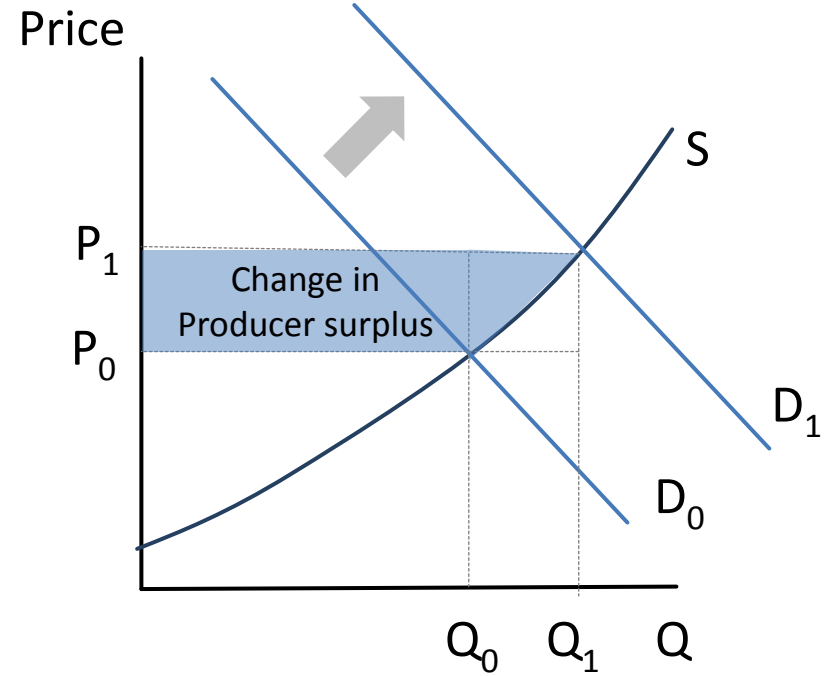
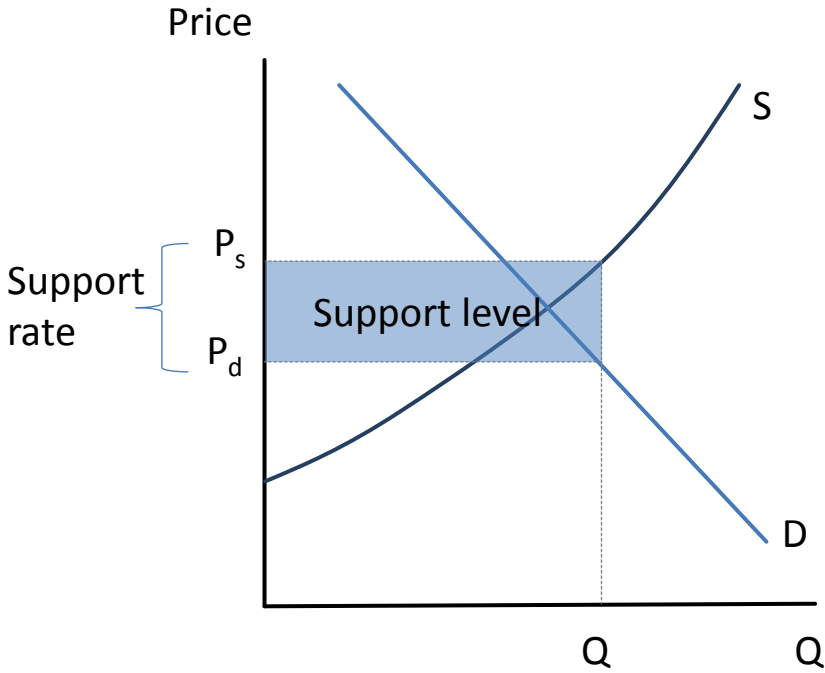


# Data

	<b>Data Type</b>	<b>Examples</b>	<b>Sources</b>
<b>Policy data</b>	Baseline	Support levels	FSE Database
		TAC	Policy Setting
<b>Market data</b>	Parameters	Input supply elasticities	Academic literature
		Demand elasticity for fish	Academic literature
<b>Cost data</b>	Baseline	Input costs shares for fishing effort	Observed cost data
<b>Production data</b>	Parameters	Elasticities of input substitution	Academic literature
<b>Biological data</b>	Baseline	Carrying capacity, intrinsic growth rate	Fishery data
		Initial effort, harvest, stock level	Fishery data



# Policy shocks





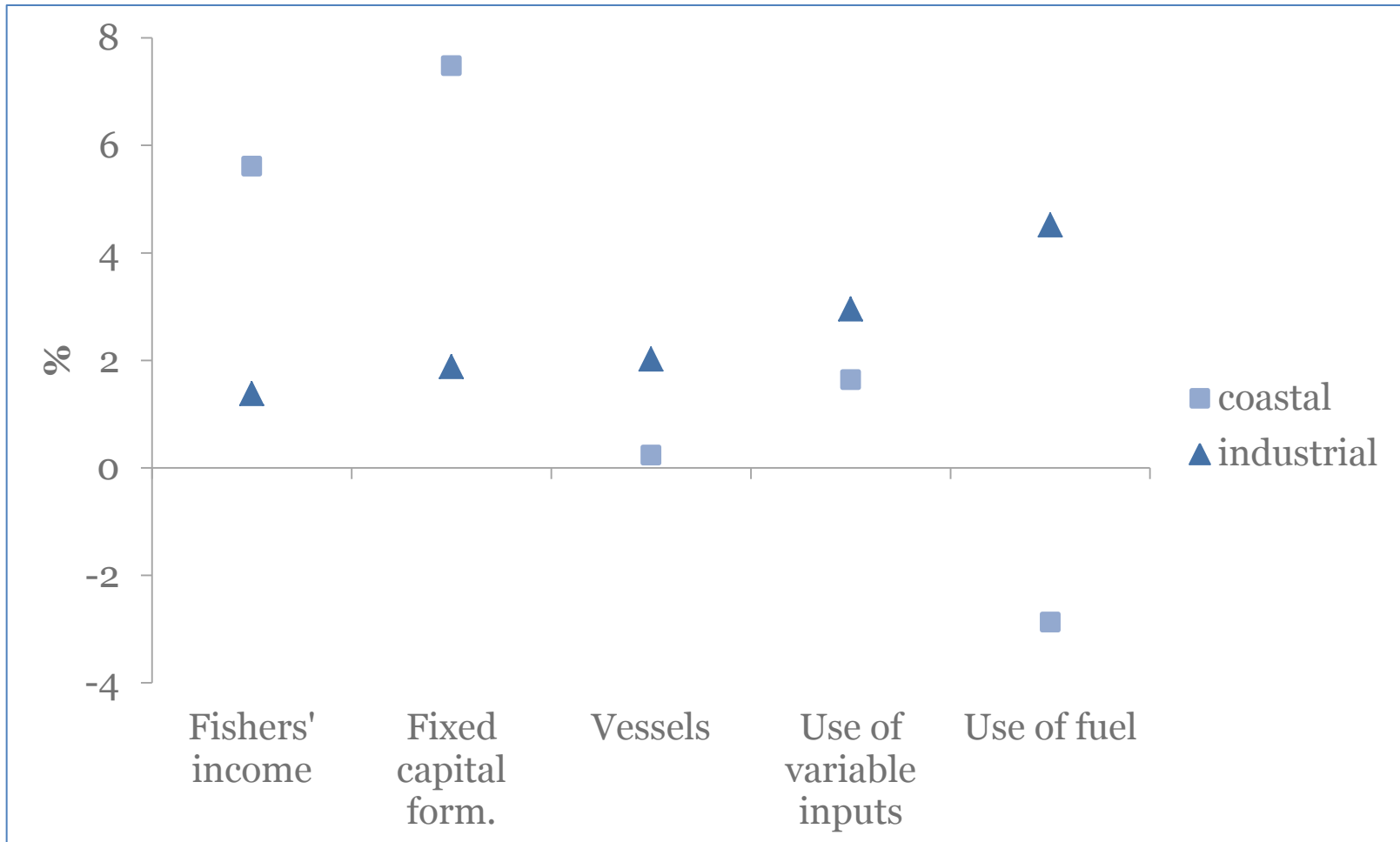
# Policies can accrue to multiple inputs

Policies (in the form of transfers to):

	Fishers' income	Vessels	Fixed capital formation	Variable input use	Fuel use	Output
Fuel				1	1	1
Hired crew	1			1		1
Other purchased goods				1		1
Vessels (by segment)	1	1				1
Fishers' own capital (by segment)	1		1			1

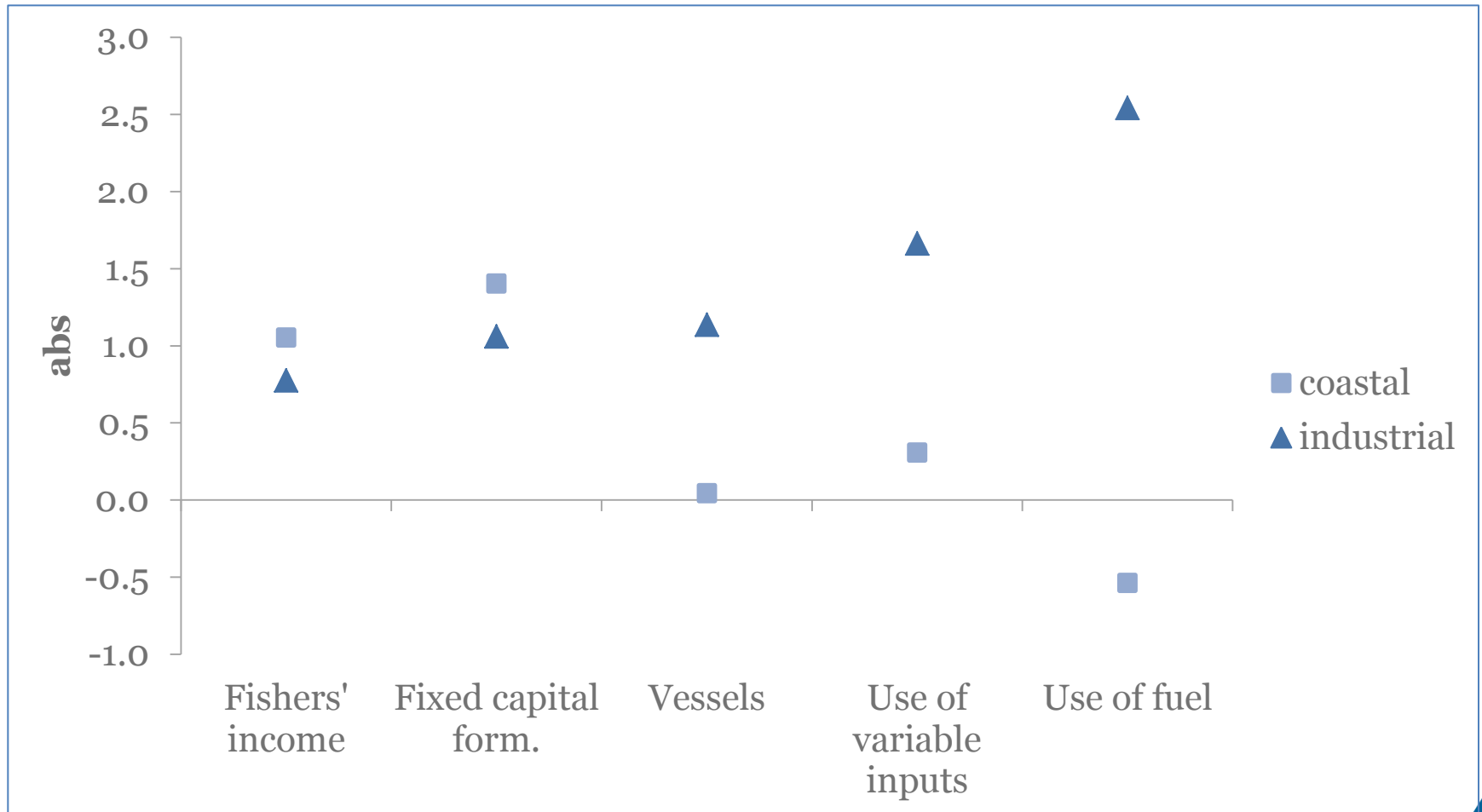


# Change in fishing effort under open access



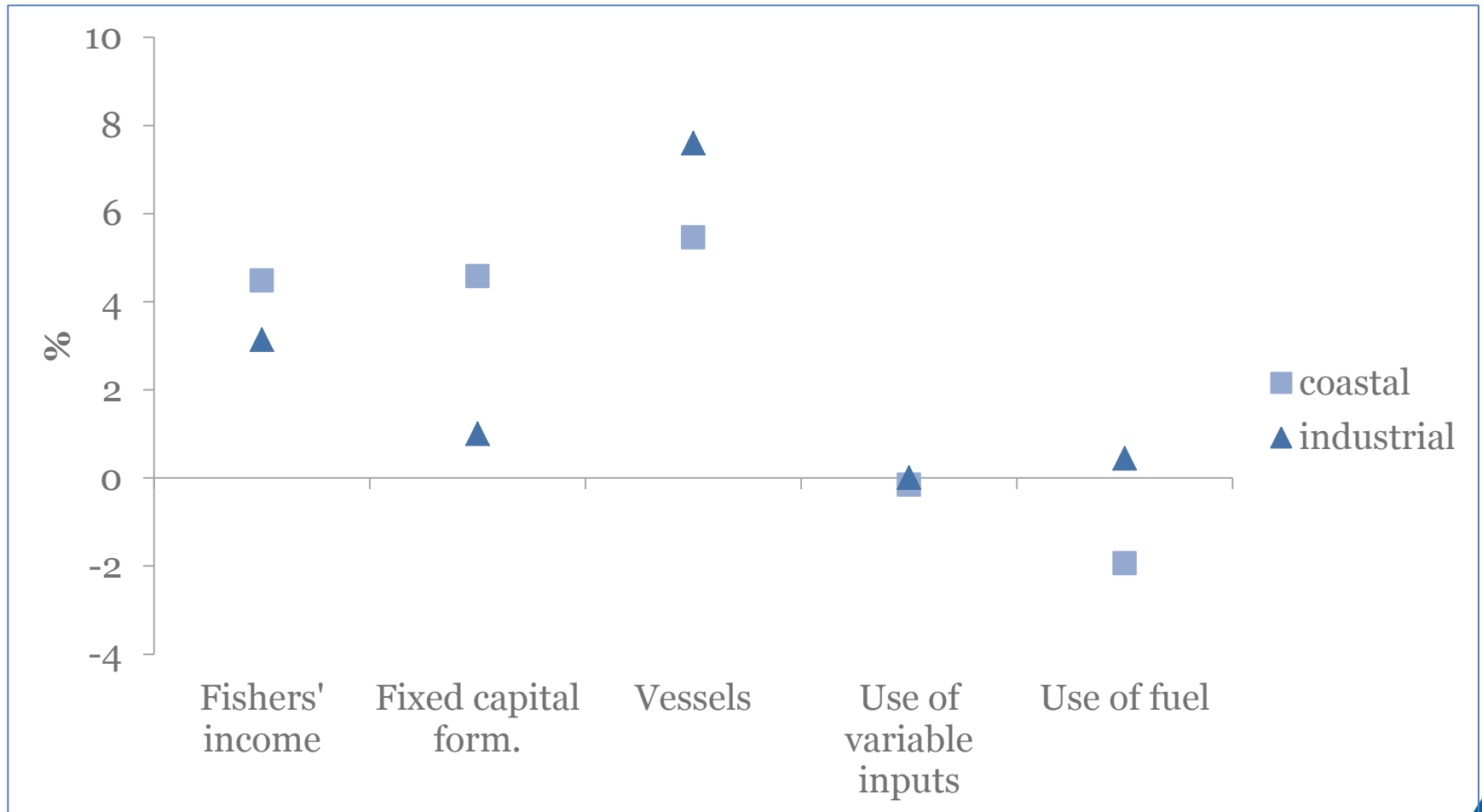


# Change in fishing effort under open access



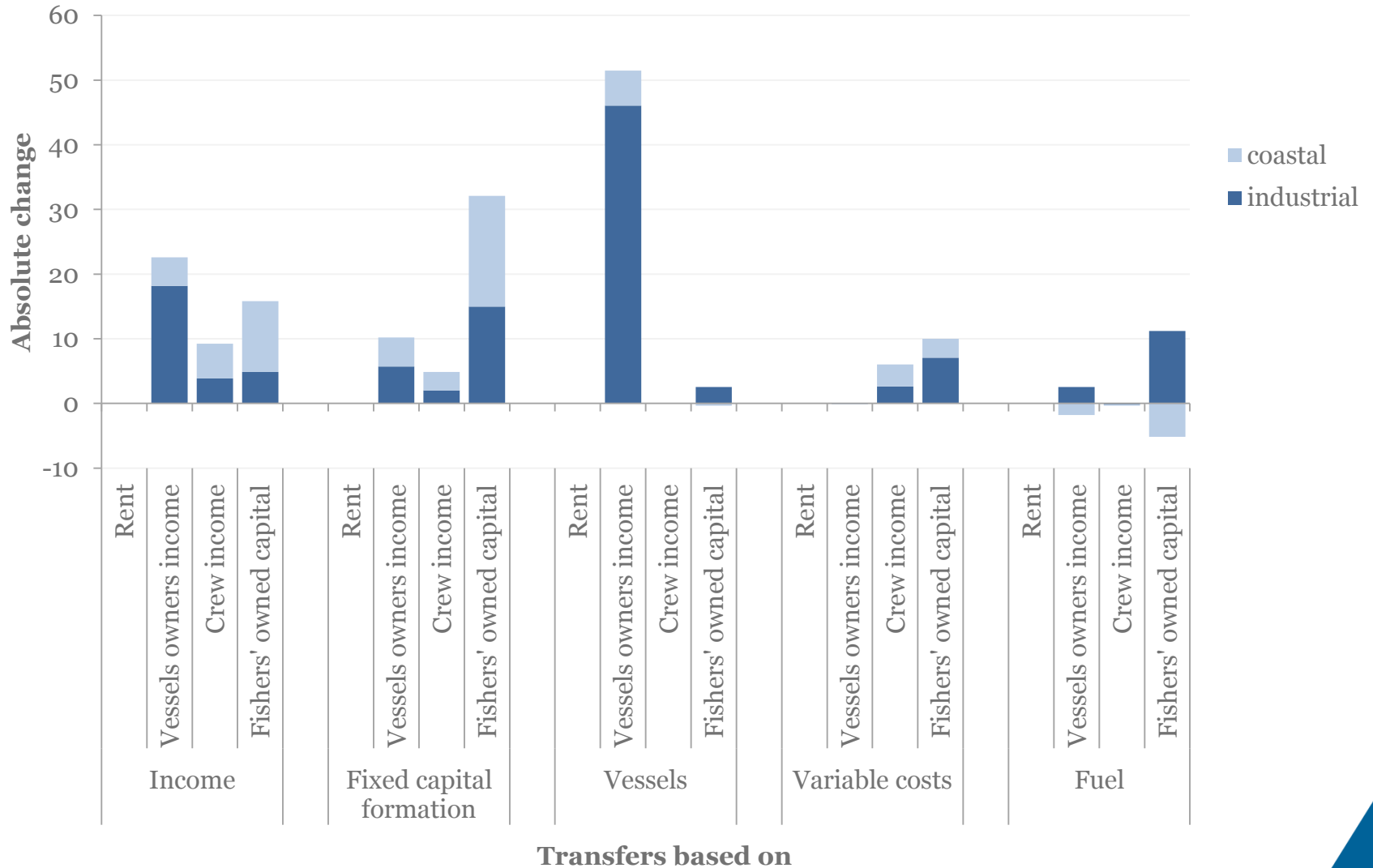


# Change in fleet size under open access





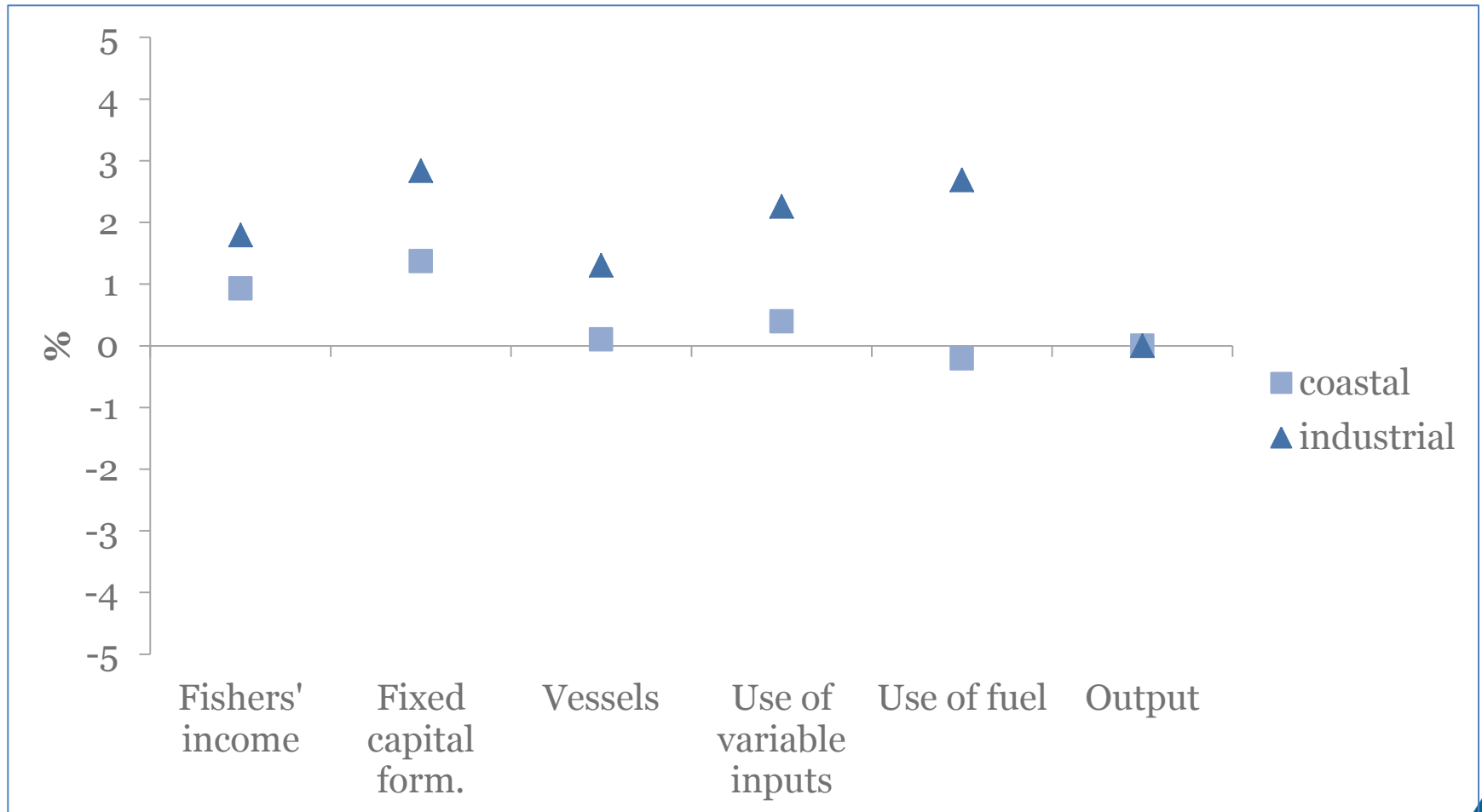
# Change in incomes under open access





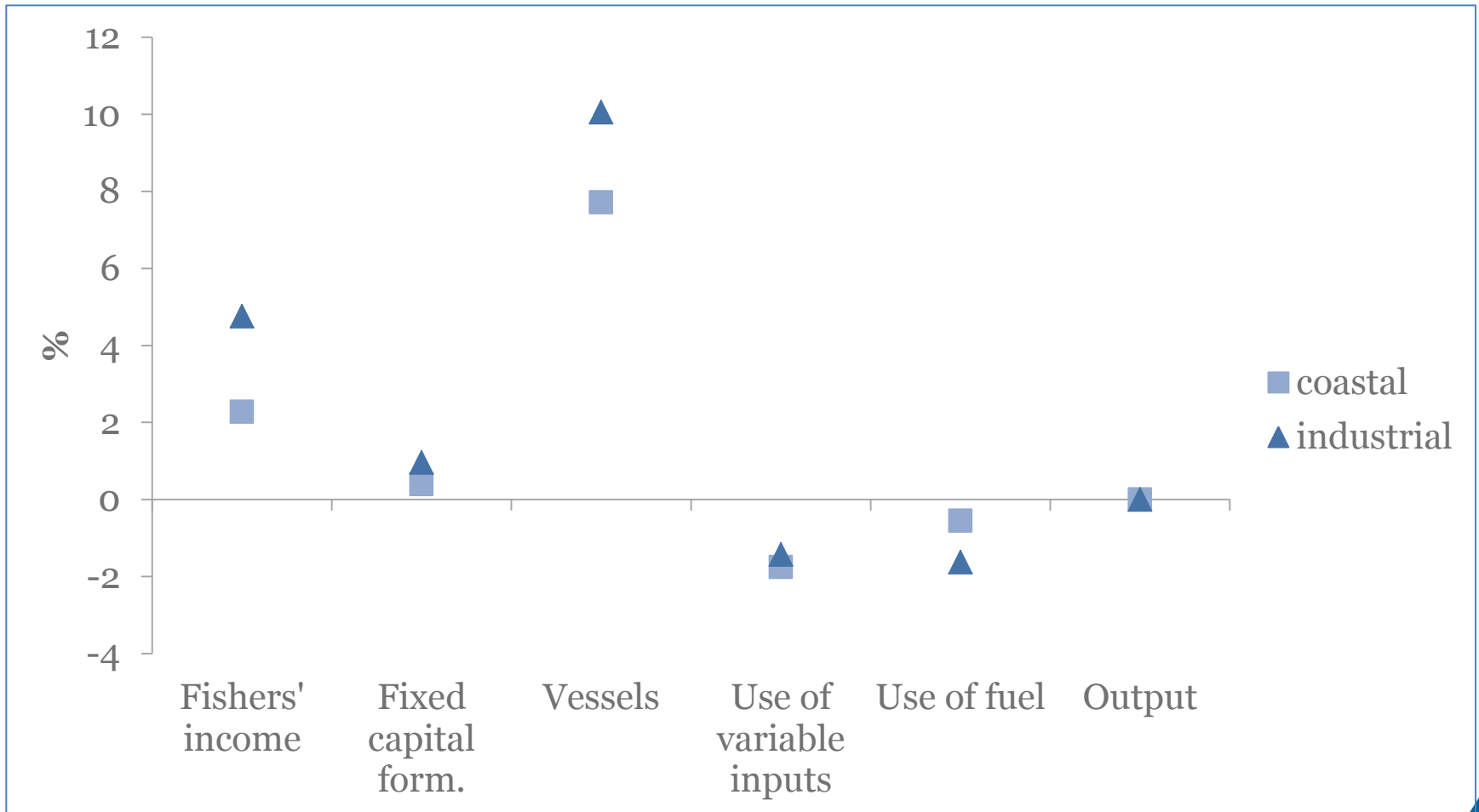


# Change in effort under a TAC



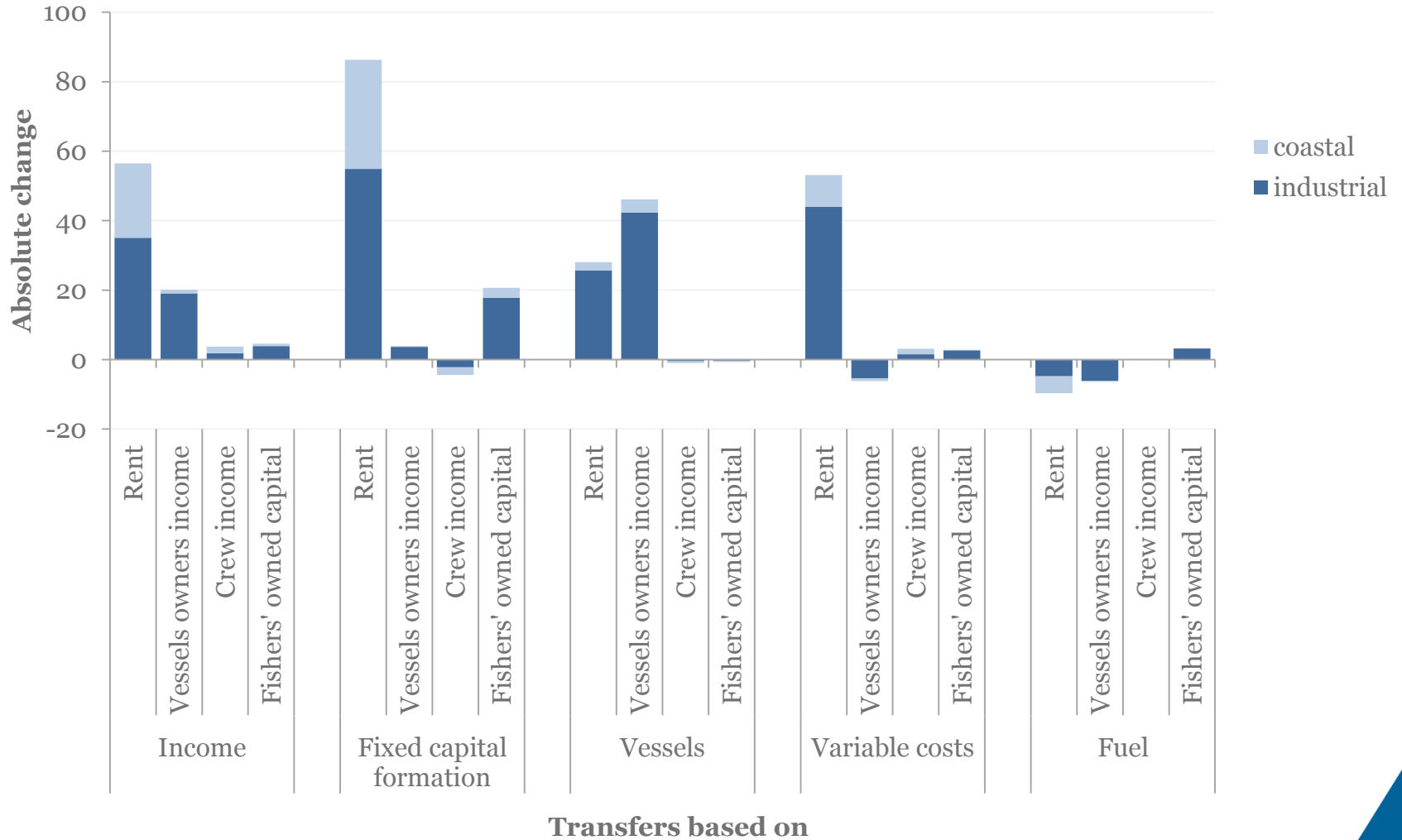


# Change in fleet size under a TAC



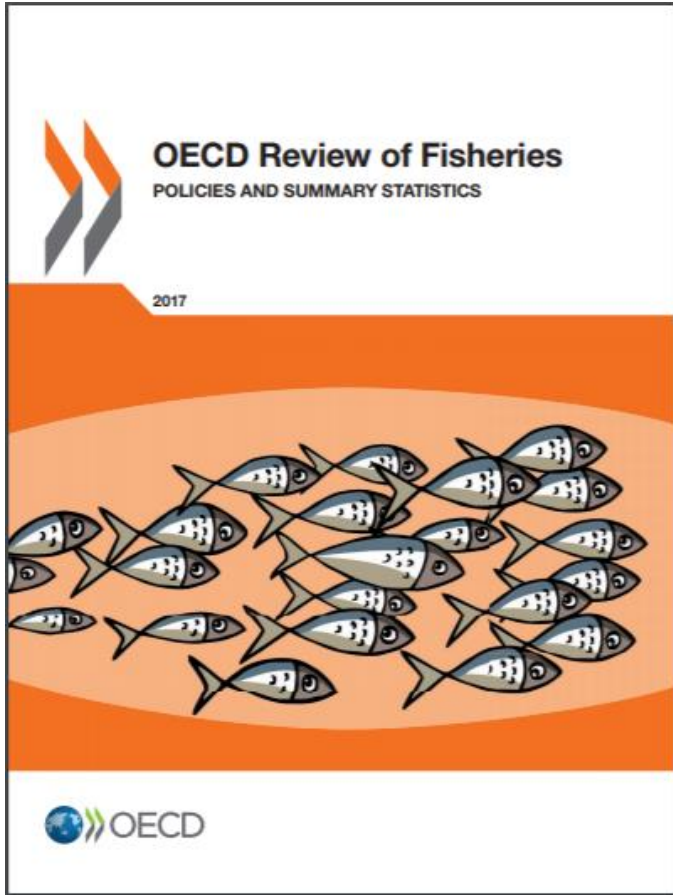


# Change in income under a TAC





Thanks for your attention!





# Relative effect of different types of support

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Production of an output,  $x$  (fishing effort), that depends on two inputs,  $a$  and  $b$ , and landings which depends on both effort and stock size (as reflected in  $cpue$ ). This analysis excludes stock effects and focusses on desired fishing effort. It is therefore most representative of the case of highly schooling fish stocks. The six following equations define the economic system:

Production Function:

$$x = f(a, b)$$

Equality of value of marginal product (VMP) to factor price:

$$f_a P_x = P_a$$

$$f_b P_x = P_b$$

Factor supplies:

$$a = g(P_a)$$

$$b = h(P_b)$$

Product demand:

$$x = D(P_x)$$



# Relative effect of different types of support

The goal is to solve this as a system of equations via substitution. The first step however is to take total differentials of all equations, convert these differentials to percentage changes by dividing by the relevant variable. For the production function, this results in:

$$dx = f_a da + f_b db$$

$$\frac{dx}{xab} = \frac{P_a}{P_x x b} \frac{da}{a} + \frac{P_b}{P_x x a} \frac{db}{b} \quad \left( \text{dividing by } xab \text{ and using } f_i = \frac{P_i}{P_x} \right)$$

$$\frac{dx}{x} = \frac{P_a a}{P_x x} \frac{da}{a} + \frac{P_b b}{P_x x} \frac{db}{b} \quad \left( \text{multiply by } ab \right)$$

$$EX = K_a Ea + K_b Eb \quad (1)$$

Where  $E$  is the percentage change operator and  $K_i$  is the value share of factor  $i$ . Equation 1 indicates that the percentage change in effort is equal to the percentage change in inputs multiplied by their factor shares.