

Why do fishermen comply with regulations?

The role of preferences

Florian Diekert
University of Oslo

Linda Nøstbakken
Norwegian School of
Economics (NHH)

Andries Richter
University of
Wageningen

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NHH



Motivation

- Illegal and unreported landings is a serious problem in global fisheries
 - Estimates suggest that about 20% of global fish catches are illegal or unreported (Agnew et al. 2009)
 - Significant differences across regions, species, and over time

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- Illegal and unreported landings is a serious problem in **global** fisheries
 - Estimates suggest that about 20% of global fish catches are illegal or unreported (Agnew et al. 2009)
 - Significant differences across regions, species, and over time
- Also differences **across individuals** in how likely they are to violate regulations
 - Heterogeneity in expected marginal payoff from violating (costs, revenues)
 - Heterogeneity in individual **preferences** such as risk, loss, and social preferences

Research question

- RQ:
 - How do individual preferences, such as risk, loss, and social preferences, affect noncompliance in fisheries?
- What we do:
 - Web-based experiment and survey of Norwegian fishermen
 - Measure individual preferences
 - Learn more about their compliance behavior and attitudes
 - Empirical analysis to better understand how preferences affect behavior

Web-based survey and experiment

- Conducted in spring 2014
- Participants could win monetary prizes
- 253 fishermen responded (in addition: control group, 413 respondents), response rate just below 10%
- Respondents represent entire Norwegian coast, vessel owners and crew, small and large boats, all age groups, but almost entirely male respondents (98.4%)

The survey

- ① Socioeconomic background
- ② Lottery-based experiment to measure individual preferences
 - Risk preferences
 - Time preferences
 - Loss aversion
 - Social preferences
- ③ Selected questions from the *European Values Survey*
- ④ Fisheries specific questions
 - Background, type of fishery, investments/ownership
 - Non-compliance – violations of formal and informal rules

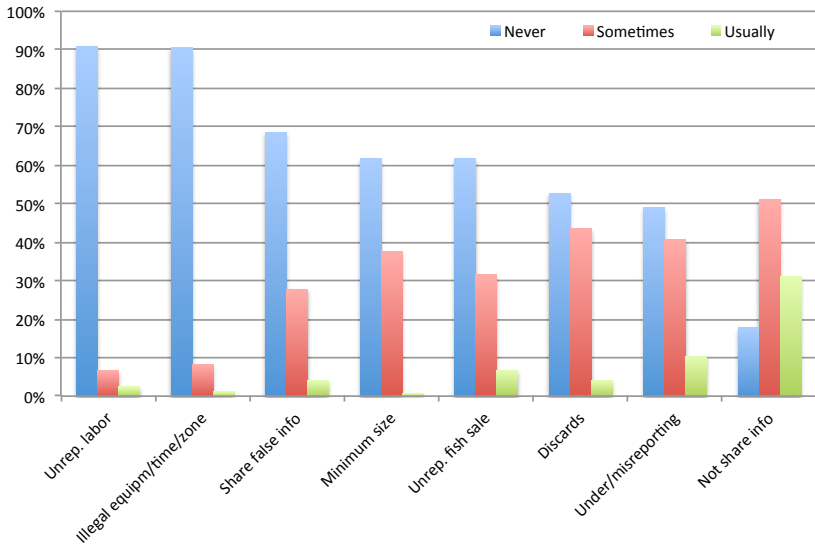
Survey questions about non-compliance

Fishermen answered the following questions about a range of formal and informal violations:

- ① Can the violation be justified?
- ② What is the main reason for you to comply?
- ③ How does your compliance behavior compare to that of the average fisherman?

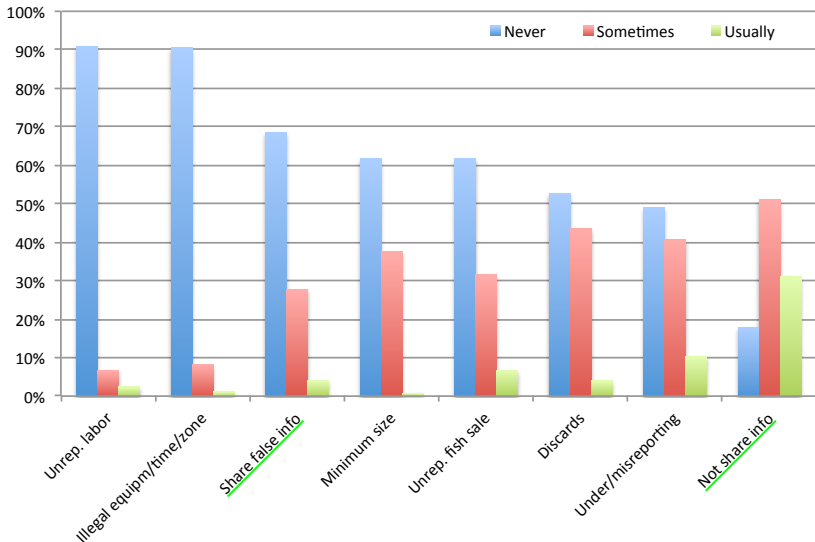
Q1. Can the violation be justified?

Summary statistics



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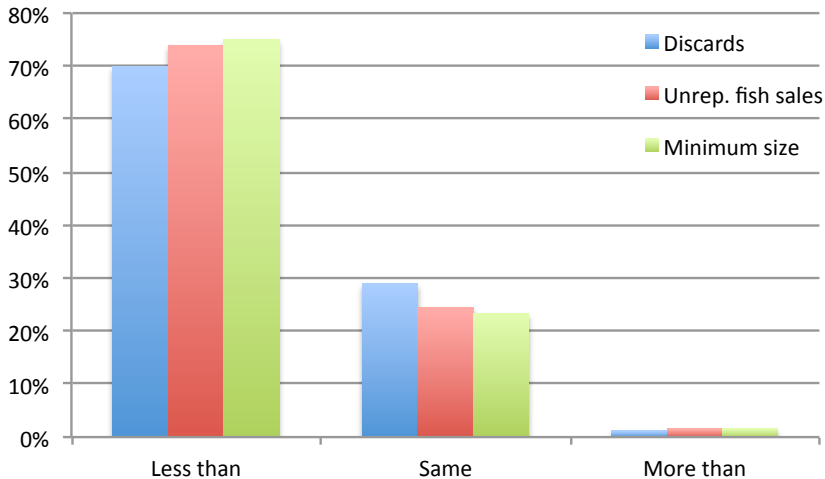
Q2. Why comply with regulations?

Summary statistics

	Fear of formal punishment	One should follow the law	Stock dev., future income	Unfair rel. to others	Reputation among fishers	Other
Unrep. labor	11.9%	63.6%	2.4%	10.3%	4.3%	7.5%
Illegal equipm/time/zone	10.3%	51.4%	27.3%	4.3%	4.0%	2.8%
Unrep. fish sales	11.1%	50.2%	16.2%	9.5%	2.4%	10.7%
Under/misreporting	13.8%	47.8%	23.3%	2.8%	4.0%	8.3%
Minimum size	5.1%	38.3%	48.6%	0.4%	2.4%	5.1%
Discards	6.3%	34.8%	47.8%	1.6%	3.2%	6.3%
Average formal viol.	9.8%	47.7%	27.6%	4.8%	3.4%	6.8%

Q3. Compliance relative to average

Summary statistics



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Empirical analysis

- Hypotheses:
 - ① Norms and attitudes to violations differ across fisheries, regions and socioeconomic groups
 - ② Higher altruism score yields more compliance, particularly for rules aimed to protect the (common) fish stock
 - ③ Higher individualistic score and more competitive yield less compliance
 - ④ More risk aversion yields more compliance
- Regression analysis:
 - What characterizes respondents who answer:
 - “Never” – how often the violation can be justified (Q1)
 - “Stock development” or “one should follow the law” or “formal punishment” as main reason for complying (Q2)
 - “Below average” – how much the respondent violates (Q3)

Q1. If violations can be justified

Results

- Socioeconomic characteristics matter
 - Older fishermen more likely to respond “never” (misreporting, illegal equipment/time/zone)
 - Fishermen who own boats/rights less likely to respond “never”
 - People with high salary less likely to respond “never” to violations affecting the stock (discards, misreporting, minimum size), more likely for other violations (illegal sales, unreported labor)

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- Fishery type matter:
 - Respondents in coastal and pelagic fisheries more likely to say “never” (discards, illegal sales, illegal equipment/time/zone)
 - But coastal fishermen less likely to say “never” for minimum size violations

Q1. If violations can be justified

Results (cont'd)

- Individual preferences matter
 - Responds who likes competition more likely to answer “never” for all stock related violations (all except sales and unrep. labor)
 - Higher altruism score makes respondent more likely to answer “never” (illegal equipment/time/zones)
 - Individualism and risk preference, no significant effect for any violation

Q2. Main reason for complying

Results

- Socioeconomic characteristics matter:
 - Respondents who are older or live in the south
 - more likely to report “one should follow the law,”
 - less likely to report “stock development and future income”
 - Fishermen who own boats/rights
 - less likely to report “fear of formal punishment”
- Fishery type matter:
 - Respondents in coastal and demersal fisheries
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 - Respondents in coastal and demersal fisheries
 - more likely to “fear formal punishment”
- Individual preferences matter
 - Respondents with higher altruism scores
 - more likely to report “stock development and future income”
 - less likely to report “one should follow the law”
 - No significant effects of risk attitude or individualism

Q3. Violations relative to average

Results

- Socioeconomic characteristics matter:
 - Younger fishermen and those without higher education
 - more likely to say they violate less than average
 - Fishermen who own boats/rights
 - more likely to say they violate discard rules less than avg
 - less likely to say they violate sales regulations less than avg
 - No regional differences after controlling for various individual preferences

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 - No regional differences after controlling for various individual preferences
- Individual preferences matter
 - More risk averse
 - more likely to “violate less than average”
 - Higher altruism score
 - less likely to violate less than average (discards, sales)

Conclusion

- Individual **preferences** affect compliance behavior and attitudes to violations
 - Fishermen's incentive base more complex than we often assume in economic models
 - Main reason for regulatory compliance is that “one should follow the law” (**norm**) – far fewer report fear of formal punishment
 - Implications for **stock development** a main reason to comply
- ⇒ Contradicts key assumption of self-interested agents made in many studies

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 - Implications for **stock development** a main reason to comply
- ⇒ Contradicts key assumption of self-interested agents made in many studies
- Policy implications:
 - Norms and individual preferences are important and should be taken into account in policy design
 - Norms that increase compliance levels valuable and should not be compromised