

The impact of risk, time, and social preferences on individual investment decisions in a fishery

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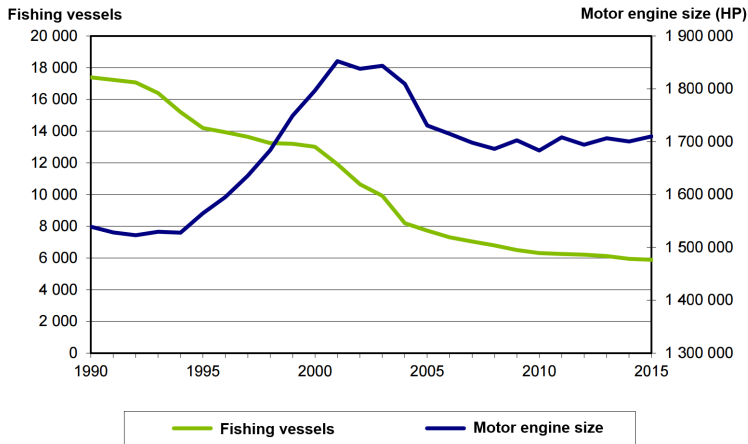
Overview of Norwegian fisheries management

Capacity remains high

Progress in Norwegian fisheries management since the 1970s
(Gullestad, 2014)

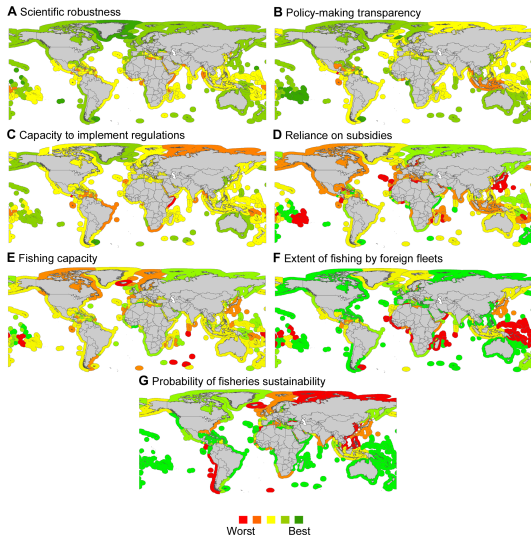
- Closing the commons
- Removing subsidies
- Allocating fishing rights
- Regulating capacity

Number of fishing vessels and engine power in Norway(1990–2015)



Source: Norwegian Directorate of Fisheries

Management effectiveness of the world's marine fisheries



Source: Mora et al. "Management effectiveness of the world's marine fisheries." PLoS Biol 7.6 (2009): e1000131.
Figure 3, Reprinted

Overcapacity raises challenges

to Norwegian and global fisheries

- Causes economic inefficiency
- Incentivizes illegal fishing
- Put fisheries sustainability at risk
- Increases regulating cost

Catch-share managed fisheries perform better (e.g, Costello, 2008), but may not be economically efficient.

Understanding investment drivers

Research question

Examine beyond the traditional investment drivers

- Need to understand what drives investments
- Nøstbakken (2012): economic factors at firm level
- This paper: also examines behavioral and socioeconomic factors at owner level

Experiments and survey

Unique dataset

- 164 vessel owners participated
- Economic experiments with real payoffs to elicit:
 - risk preferences
 - time preferences
 - competition preferences
- Survey
 - investments in quotas and vessels (2008-2013)
 - socioeconomic backgrounds
 - perceptions of future profitability, environment, policy
 - attitudes towards work
 - attitudes towards regulation compliance
 - Attitudes towards competition, income distribution

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Summary statistics

Number of investments made (2008–2013), by individuals

N of inv.	Quota	Vessel
0	111	71
1	33	71
2	12	15
3	2	4
4	2	0
5	4	3
Total	164	164
Mean	0.55	0.78
Variance	1.05	0.87

► Inv by year

Results

Quota investments

Estimate Poisson model: factors that drive quota investments

- More likely to increase quota if
 - plan to work longer
 - more intrinsically motivated to work
 - Attitude on competition (incentivize people)
 - Attitude on income distribution (effort needs to be rewarded)
- Less likely to increase quota if
 - concerned about future profit
 - concerned about nature issues (stock, climate)
 - read only Fiskeribladet (a conservative newspaper pre-2008)

► Regression table

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Vessel investments

Estimate Poisson model: factors that drive vessel investments

- More likely to invest in vessel if
 - plan to work longer
 - care more about own payoffs (individualistic)
 - went to college
- Less likely to increase quota if
 - more risk averse

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Conclusion

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Quota and vessel investments are driven by non-traditional investment drivers.

- Quota
 - Social preferences
 - Political views (on income distribution, competition, compliance)
 - Motivations to work
 - Perceptions of future (profitability, nature)
 - Media influence
- Vessel
 - Risk attitude
 - Individualism
- (Non-efficiency) Factors that we considered explain more variations in quota investments than in vessel investments

Future work

Next step

- Try estimate zero-inflated poisson model on quota investments
 - need to convince Stata

Thank you!

Appendix

Eliciting risk preferences

Row	Lottery A P(High)=30% P(Low)=70%	EV	Lottery B P(High)=10% P(Low)=90%	EV
1	High = 83kr Low = 21kr	39.6kr	High=141kr Low=10kr	23.1kr
2	High = 83kr Low = 21kr	39.6kr	High=155kr Low=10kr	24.5kr
3	High = 83kr Low = 21kr	39.6kr	High=172kr Low=10kr	26.2kr
⋮	⋮	⋮	⋮	⋮
7	High = 83kr Low = 21kr	39.6kr	High=311kr Low=10kr	40.1kr
⋮	⋮	⋮	⋮	⋮
14	High = 83kr Low = 21kr	39.6kr	High=3521 Low=10kr	361.1kr

Eliciting time preferences

	Choice A (Today)	Choice B (8 months later)	Implied r (annualized)
1	700kr	700kr	2.58%
2	700kr	712kr	5.40%
3	700kr	725kr	8.00%
4	700kr	737kr	10.68%
5	700kr	749kr	13.35%
6	700kr	761kr	16.27%
7	700kr	774kr	18.98%
8	700kr	786kr	21.72%
9	700kr	798kr	24.47%
10	700kr	810kr	27.48%
11	700kr	823kr	30.28%
12	700kr	835kr	35.00%

Eliciting competition preferences

Situations	Choice A		Choice B	
	You	Other	You	Other
1	+230	-100	+180	-180
2	+100	+230	+180	+180
3	+250	+0	+230	-100
4	-180	+180	-100	+230
5	+180	+180	+230	+100
6	-250	+0	-230	+100
7	-100	-230	-180	-180
8	+0	+250	+100	+230
9	+100	-230	+0	-250
10	-230	-100	-250	+0
11	-180	-180	-230	-100
12	+230	+100	+250	+0
13	+180	-180	+100	-230
14	-230	+100	-180	+180
15	-100	+230	+0	+250
16	+0	-250	-100	-230

Views on controversial issues

- Responsibility
 - 1 People should take more responsibility to fend for themselves
 - 10 The public should take greater responsibility to ensure everyone has what they need
- Competition
 - 1 Competition is healthy. It stimulates people to work hard and develop new ideas
 - 10 Competition is bad
- Income
 - 1 There should be greater equality between people's incomes
 - 10 Personal effort should be awarded higher

Perceptions of future profitability, environment, policy

Profit Crew situation (finding qualified workers)

Profit Costs (salaries of crew, fuel, maintenance, etc.).

Profit Price and market situation of fish

Nature Fish population development

Nature Natural disasters, climate change, etc.

Policy Political uncertainty in relation to fishing licenses

Policy Regulation complexity

Policy Quota policy

Other Generational

What do you think are important about jobs

Rate from 1 (least important) to 5 (most important)

- Good salary
- Good colleagues
- Not much stress
- Safe work place
- Good working hours
- Community
- Long vacation
- Responsibility
- Meeting people
- Being treated equally
- Family friendly
- Opportunity to be initiative
- Feeling of accomplishment
- Interesting
- Meet my own abilities
- Learn new skills
- Being heard in making decisions

Motivations of obeying laws

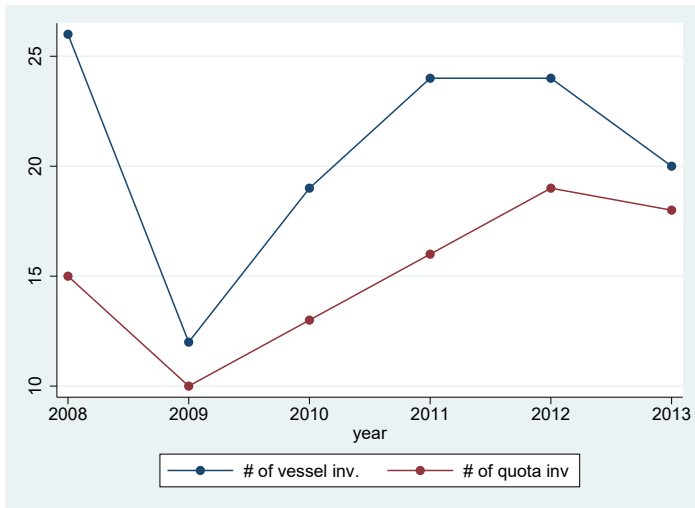
The following behavior

- discard
- under-report
- sell to outside organizations
- illegal gears
- undersized catches
- hire illegal labor
- withhold info
- spread wrong info

can

- never be justified
- sometimes be justified
- usually be justified

Number of investments by year



Regression results on number of investments

	Total number of inv in quota	Total number of inv in vessel
Years to retire	0.035*** (0.009)	0.025*** (0.007)
Discount rate	-0.760 (1.423)	-0.587 (0.971)
Risk aversion	0.127 (0.370)	-0.550** (0.279)
Social type: individualistic	0.212 (0.240)	0.339** (0.160)
Intrinsic motive to work	0.306*** (0.091)	0.045 (0.047)
Attitude on competition	0.172** (0.086)	-0.014 (0.045)
Attitude on income	0.101** (0.041)	0.023 (0.029)
Attitude on compliance	-0.291 (0.604)	-0.766 (0.491)
Only read <i>Fiskeribladet</i>	-0.561* (0.311)	-0.146 (0.196)
Profit Concern	-1.601** (0.660)	-0.544 (0.360)
Nature Concern	-1.924*** (0.687)	-0.138 (0.385)
College	-0.108 (0.246)	0.401*** (0.151)
Constant	-4.524*** (1.085)	-0.738 (0.548)
Observations	164	164
Pseudo R^2	0.238	0.096