Why do Swedish fishermen leave the sector?

Johan Blomquist & Staffan Waldo
Employment and salary in Nordic fisheries

• Project for the Nordic Council of Ministers

• Aim of the project:
  1. Identify the level of income in Nordic fisheries, both from fishing activities and other sources
  2. Analyse why fishermen exit the sector
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Background

• Understanding entry and exit decisions is important for
  – fisheries management
  – coastal policy

• Empirical studies on entry and exit of vessels (e.g. Pradhan & Leung 2004, Tidd et al. 2011)
  – Entry and exit depends on revenue potential, stock size, size of the fleet, fuel costs, etc.
  – Supports the theoretical predictions
Background

• What about the effects of other (socioeconomic) factors?
  – Local labour market conditions, multiple job holdings, individuals characteristics (education etc.)

• Very little empirical evidence
  – Studies using survey data (mainly in developing countries)
Aim of the study

• What factors affect the exit decision?

• Special focus on:
  – Alternative employment opportunities
    • Are fishermen faced with a lack of alternative employment opportunities more likely to stay in the sector?
  – Income from other sources
    • Does income from other sources affect the exit decision?

• Other socioeconomic factors (education, age etc.)
Data

- Statistics Sweden: Longitudinal integration database for health insurance and labour market studies (LISA)
  - Employment (fishing and other), income, education, age, etc.
  - Panel data (before/after exit from fisheries)
  - 2005-2012
Fisherman for 3 years in the period 2005-2008?

- Yes (N=1,355)
- No

Retirement benefits in 2009-2012?

- Yes (N=328)
- No (N=1,027)

Fisherman in the period 2009-2012?

- Yes (N=867)
- No (N=160)

Excluded
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Excluded
Empirical model

• Dependent variable, $Exit_i$

\[ Exit_i = \begin{cases} 
0 & \text{if fisherman in the period 2009 - 2012} \\
1 & \text{otherwise.} 
\end{cases} \]

• Variables ($X_i$):
  – Average income from fisheries (2005-2008)
  – Average income from other sources (during years of fishing)
  – Unemployment rate in municipality
  – Dummy for rural area (far away from a city)
  – Individual characteristics (age, gender, marital status, years of schooling)
  – Fishery specific (gear type, coastal area)
Empirical model

Dummy definition:
• Municipality with at least 50% of the population in rural areas

Variables ($X_i$):
– Average income from fisheries (2003-2007)
– Average income from other sources (during years of fishing)
– Unemployment rate in municipality
– **Dummy for rural area (far away from a city)**
– Individual characteristics (age, gender, marital status, years of schooling)
– Fishery specific (gear type, fishing area, vessel owner)
Empirical model

Dummy definition:
- Municipality with at least 50% of the population in rural areas

Definition of rural area (Eurostat):
- Less than 300 inhabitants per km²
- No more than 5,000 inhabitants

Variables ($X_i$):
- Average income from fishing
- Average income from other sources (excluding years of fishing)
- Unemployment rate in municipality
- Dummy for rural area (far away from a city)
- Individual characteristics (age, gender, marital status, years of schooling)
- Fishery specific (gear type, fishing area, vessel owner)
Empirical model

Dummy definition:
• Municipality with at least 50% of the population in rural areas

Definition of rural area (Eurostat):
• Less than 300 inhabitants per km²
• No more than 5 000 inhabitants

Definition of far away from a city:
• Over 50% of the population in the municipality have more than 45 minutes travel by car to a city with at least 50 000 inhabitants

Variables ($X_i$):
- Average income from farming
- Average income from other sources (during years of fishing)
- Unemployment rate in municipality
- Dummy for rural area (far away from a city)
- Individual characteristics (age, gender, marital status, years of schooling)
Empirical model

- Discrete choice model

\[ \text{Prob}(\text{Exit}_i = 1 \mid \mathbf{X}_i) = F(\mathbf{X}_i \mathbf{\beta}), \]

- F normal dist. (probit model)
- Interaction terms
  - Income from fisheries and other income
  - Income from fisheries and rural dummy
## Summary statistics

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<td>Years of schooling</td>
<td>10.74</td>
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Results – income from fisheries

- Income negatively related to probability of exit?
  If income increases 30%, from 170 TSEK to 220 TSEK, Pr(Exit) decreases from 16 to 13%
Results – income from fisheries

- Income negatively related to probability of exit?
  - Not always!

![Graph showing predictive margins with 95% CIs (Other inc=150)]
Results – income from fisheries

- Effect of fisheries income depends on the level of other incomes
Results – income from fisheries

- Effect of fisheries income in urban areas (or rural areas close to a city)
Results – income from fisheries

- Effect of fisheries income in remote rural areas
Results – income from fisheries

- Effect of fisheries income depends on the area of residence
Results

- Other variables related to probability of exit
  - Education: One more year of schooling increases the probability of exit by 1.3 percentage points
  - Unemployment rate not significant
Conclusions

• Higher income from fisheries lowers the probability of exit
Conclusions

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But...
Conclusions

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But...

• This effect is small:
  – In remote rural areas
  – If income from other sources is high
Thank you for your attention!