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Estimating benefits of new Baltic salmon fisheries management program: Applications of contingent valuation and choice experiment methods

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The XIXth EAFE Conference,
6-8 July 2009 Malta

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■ ■ ■ Background

- n EU Commission
- n New program for Baltic salmon fisheries
- n Socioeconomic assessment
 - n economic analyses
 - n sociological analyses
- n Scarse valuation literature





Methods and main objectives of study

n Contingent valuation method (CVM)

- n anglers WTP for the implementation of a new salmon fisheries program as whole
- n classic and interval open-ended (CIOE) valuation question (Håkansson, C. 2008)

n Choice experiment method (CE)

- n marginal rates of substitution between the characteristics of fisheries management program
- n unlabeled alternatives, orthogonal design for main effects



Survey data

n Anglers in the river
Tornionjoki-area

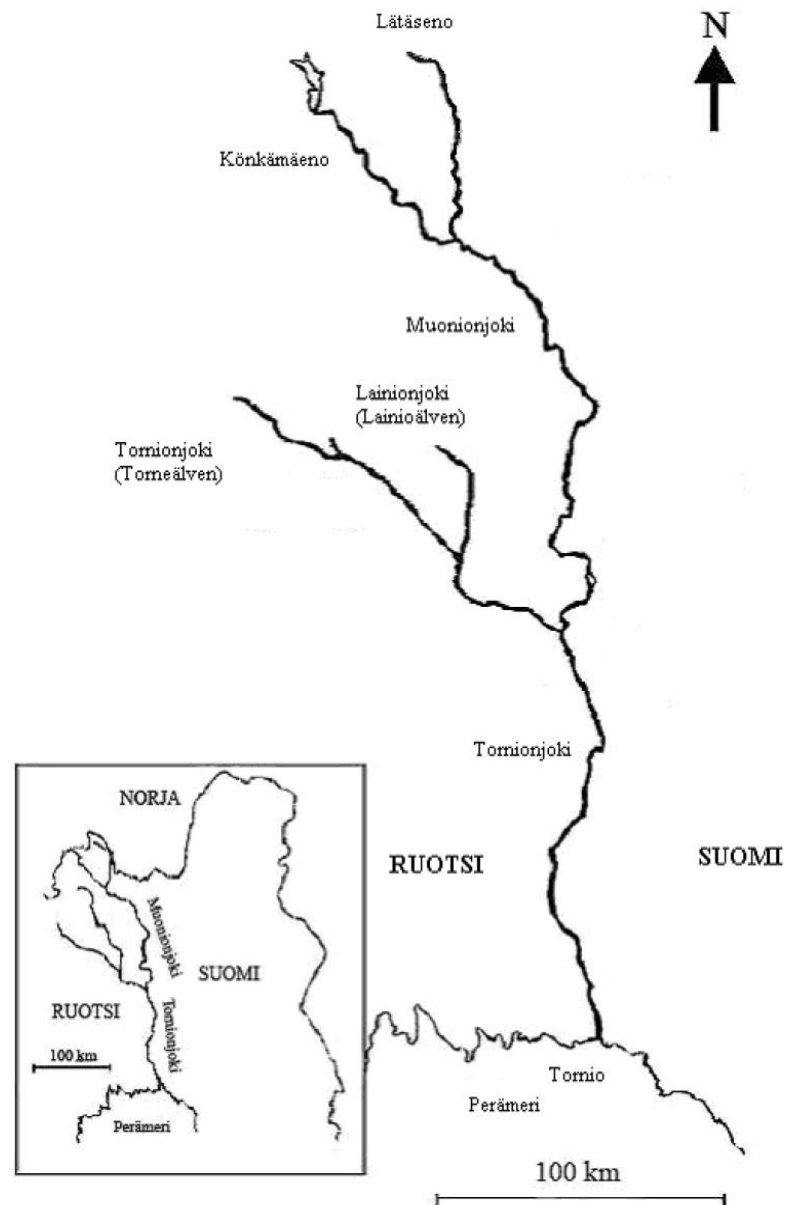
n Sample size 1 170

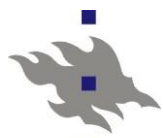
n Swedish 450

n Finns 720

n Mail survey 2008/2009

n Response rate 59%





▪ **Descriptive statistics of samples** ▪ **(N = 618)**

	FI	SW
n Local (river Tornio valley)	71%	26 %
n Mean age	49	56
n Fishing years	33	41
n Mainly targeting the salmon species	98 %	72 %
n Renewieving the fishery regulation is important	84 %	18 %
n The questionnaire provided enough information for respondents	65 %	51 %



CVM question 1: support the change?

15. Which regulation program in its entirety would you choose from the ones below, the current or the new regulation program?

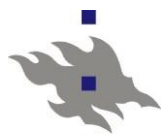
	Current regulation program:	New regulation program:
Salmon catch in sea fishery	110 000 salmon	70 000 salmon
Fishing control	1 000 hr	2 000 hr
Number of license, no constrained/quota	10 000, no quota	10 000, quota
Days needed to catch one salmon	7 days	3 days
Number of smolts	1 million	1, 5 million
New working places in river area	0	30
Salmon management fee (years 2010–2019)	no	yes
In my opinion the best alternative is	<input type="checkbox"/>	<input type="checkbox"/>

If you chose the current regulation program

→ Proceed to question 17.

If you chose the new regulation program

→ Proceed to question 16.



- **CVM question 2: the CIOE format**
- **(classical-interval open-ended)**

16. What is the maximum amount that you would be willing to pay for the new regulation program described above? Salmon management fee would be paid annually when purchasing the fishing license payment for the duration of the program period (years 2010 - 2019).

You may state your willingness to pay as a specific amount of money or give a range of sums. Please, keep in mind the other alternative fishery opportunities for river Tornionjoki-area. Also, a salmon management fee reduces disposable income.

I am willing to pay at most _____ euro **OR** at most _____ - _____ euro as an annual salmon management fee in order that the new regulation program would be implemented.



Choice task with follow-up questions (8)

Compare the alternative regulation programs (current regulation, options 1 and 2) with respect to the presented factors (salmon catch in the sea fishery etc.). In every choice situation, choose the best alternative in your opinion. The values of different factors may be contradictory due the used research method. Consider the expenses that the new regulation program will bring along.

Choice situation 1

	Current regulation:	Regulation option 1:	Regulation option 2:
Salmon catch in sea fishery	110 000	0	70 000
Fishing control	1 000 hr	2 000 hr	3 000 hr
Number of license, no constrained/quota	10 000, no quota	10 000, quota	8 000,quota
Days needed to catch salmon	7 days	5 days	3 days
Number of smolts	1 million	2 mil.	1,5 mil.
New workplaces in river area	0	0	30
Salmon management fee (2010 – 2019)	0 €/year	60 €/year	15 €/year
In my opinion the best alternative is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

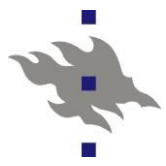
How difficult was it for you to make the choice between the given regulation options?

Mark the point that best describes the difficulty on the line with cross (--x--).

Very difficult Not difficult at all
|-----x-----|

How certain do you feel about the choice that you have made?

Very unsure Totally sure
|-----x-----|



Preliminary CVM results

CVM question 1: Support the change (N = 583)?

	Frequency		Percent	
	FI	SW	FI	SW
Current program	52	45	15 %	20 %
New program	303	183	85 %	80 %



How respondents stated their WTP answer (N = 436)?

	Frequency		Percent	
	FI	SW	FI	SW
Open-ended	167	79	59 %	50 %
Interval	65	57	23 %	37 %
Missing (OE and Interval)	50	18	21 %	13 %

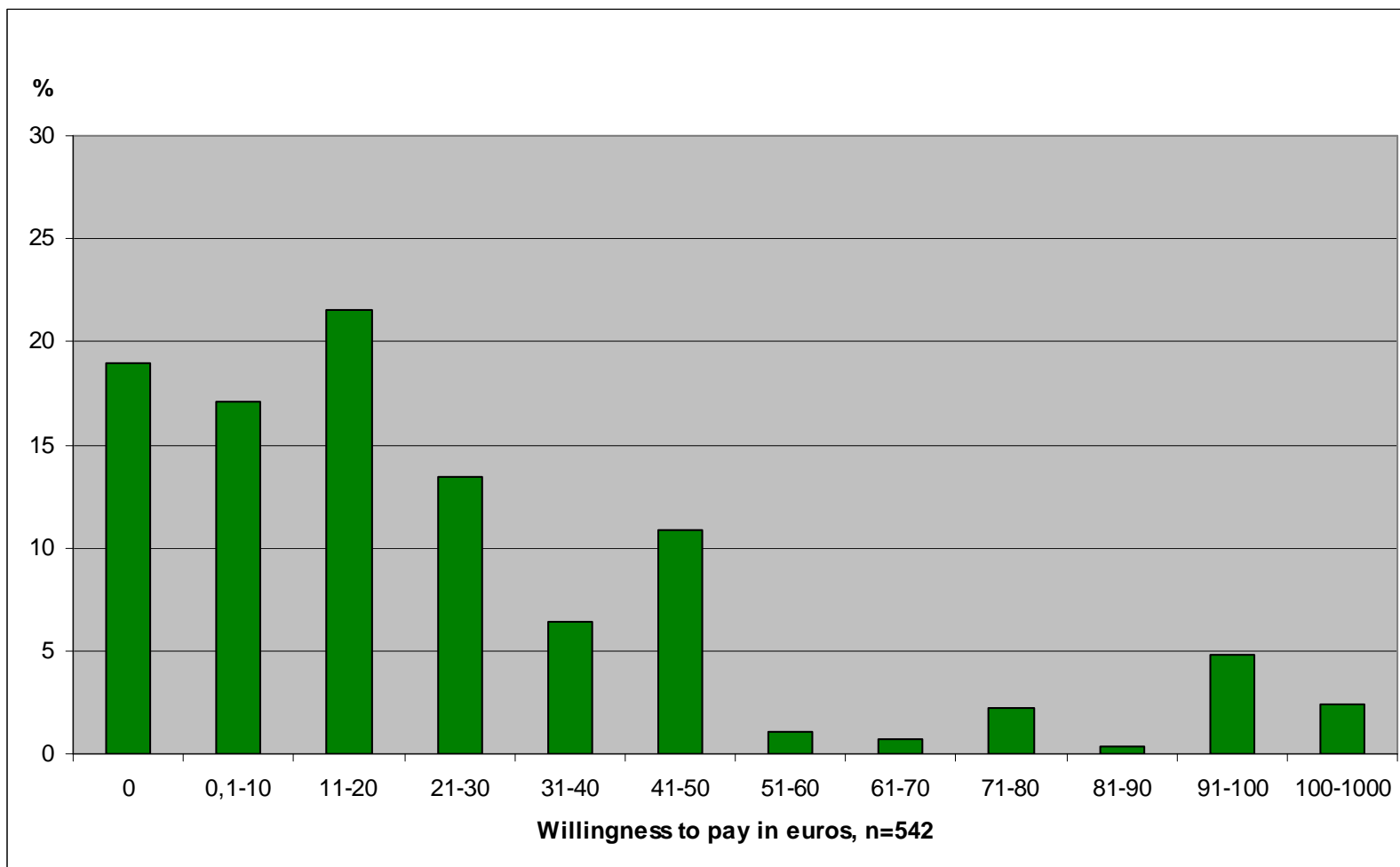


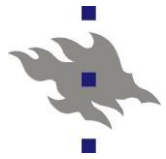
WTP measures: descriptive statistics

	N		Min/Max		Mean		Std. Dev.	
	FI	SW	FI	SW	FI	SW	FI	SW
WTP, classical open-ended	167	79	1/1000	5/100	37.3	30.5	79.3	22.7
WTP, lower bound of the interval	66	66	0/500	0.1/70	27.9	17.5	61.9	14.8
WTP, upper bound of the interval	66	66	5/700	2/200	55.8	42.9	88.8	33.5



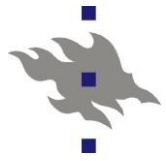
Overview of WTP amounts using the categories





Summary

- n CIOE format - may perform better in a survey with sub-samples from different nationalities
- n Anglers support the renewal of salmon fishery policies
 - n Share of supporting responses and WTP differ between Finnish and Swedish
- n Most important characteristics of program (CE data)
 - n enhance the wild salmon stocks
 - n decreasing salmon catch on sea fishery, but not banning it completely



Following stages of study

n CVM data

- n analysis of WTP e.g. logit, probit, middle censored method
- n analysis of WTP differences between Finns and Swedish

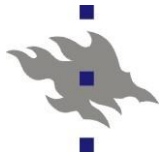
n CE data

- n analysis with different models (MNL, NL etc.)
- n analysis of preference heterogeneity among anglers (e.g. LCM)
- n analysis of choice difficulty and uncertainty associated to respondents choices in CE

n Representativeness of data

n Bayesian Belief Networks

- n synthesising biological, economic, sociological knowledge

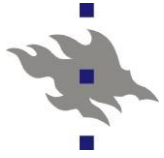


Discussion

- n Differences between Swedish and Finnish anglers might be higher than expected
 - n analysis of heterogeneity

- n CIOE captures both WTP and preference uncertainty
 - n correlation with other uncertainty questions (4)
 - n analysis of "missing responses" i.e. OE and interval answers

- n High acceptance rates of the highest bid levels (60 and 120 €) in CE – not accordance with the CVM results



Thank You!

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