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Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich



The demand side of IPES – towards understanding the purchase behavior of the private sector

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IPES Review Meeting for 28 and 29 January

at UNEP, Geneva

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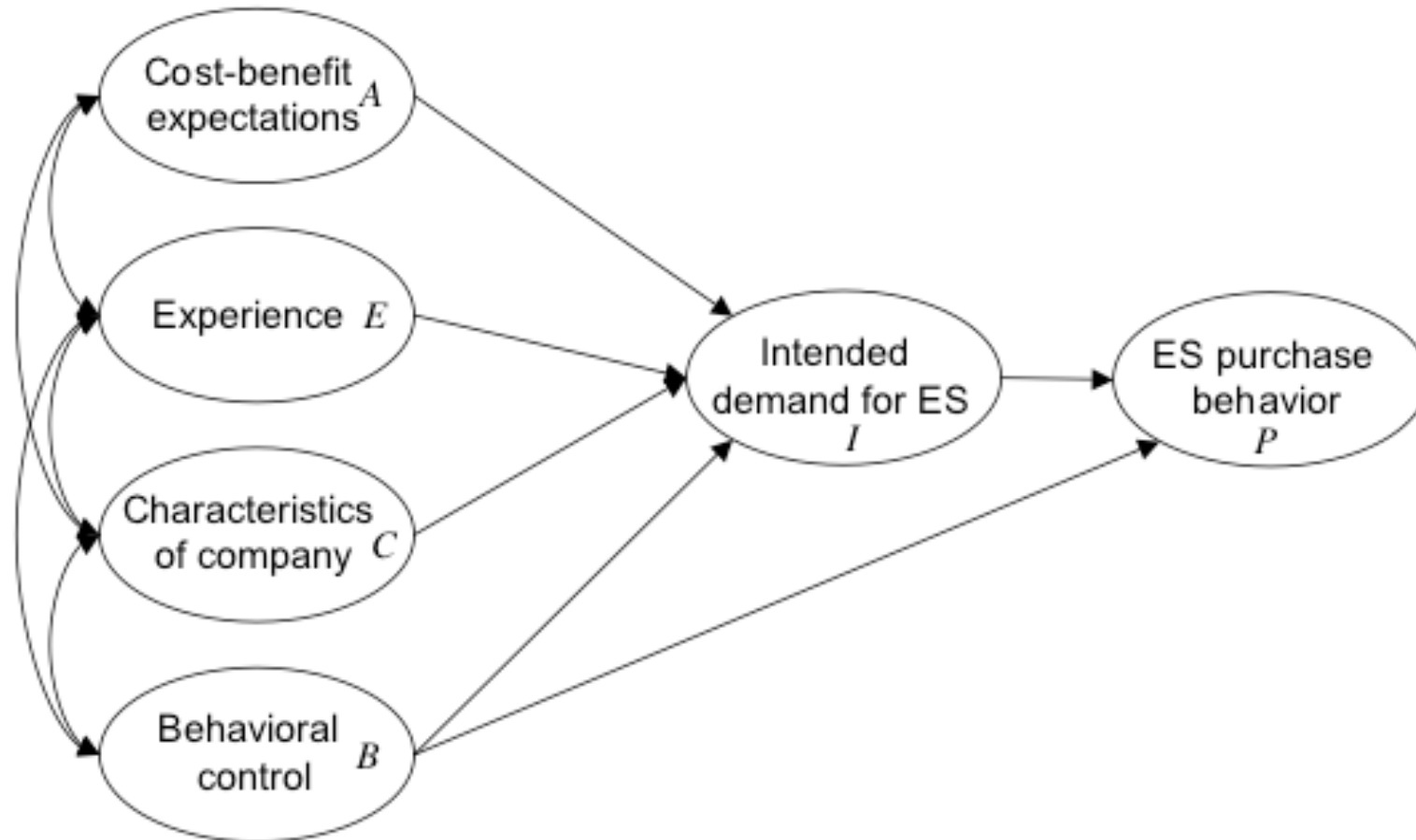
more info: www.nssi.ethz.ch/res/ssedm/eco/

What is the demand in \$ and what are motivations to buy?

- Goal
 - Quantification of demand of companies in \$
 - Professional motivations for buying ecosystem services
- Universe: Multinational companies chosen from MSCI World (and Costa Rican Companies)
- Method: Questionnaire, Discriminant Analysis, Multiple Regression

1. Model of firms' demand for ecosystem services

Model of institutional decision-making



Based on Ajzen 1991 Theory of planned behavior
(subjective norms, attitude, behavioral control)

2. Method

Questionnaire

- General introduction
 - explanation of forest types and ecosystem services,
 - framework for payments for ecosystem services,
- Central question part
 - (i) company's willingness to pay per ha and year in \$,
 - (ii) willingness to purchase certificates in N per year,
 - (iii) motivations to purchase ecosystem service certificates,
 - (iv) external factors influencing decision to buy ecosystem services certificates and, finally,
 - (v) background information about the company and the respondent.

Surveyed companies

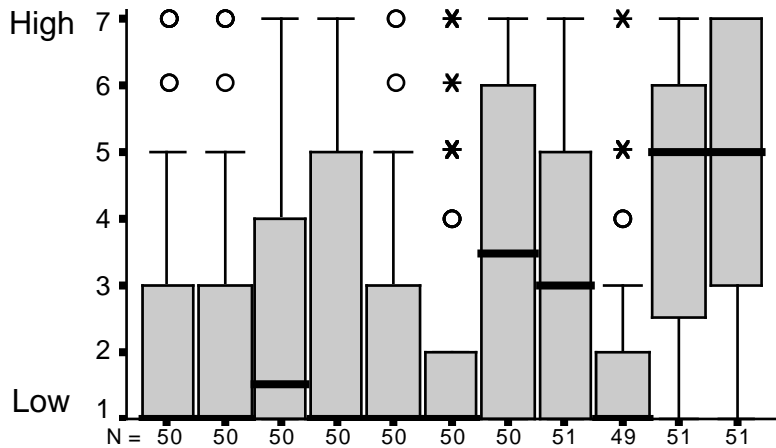
	INTERNATIONAL					COSTA RICA SAMPLE				
	Surv eyed		Com plete d		Resp onse rate	Surv eyed		Com plete d		Res pons e rate
	N	%	N	%	%	N	%	N	%	%
INDUSTRIES (1+2+3+8)	328	53.5	17	54.8	5.2	139	37.1	10	34.5	7.2
CONSUMERS (4+5+6)	143	23.3	9	29.0	6.3	163	43.5	13	44.8	8.0
FINANCIALS (7)	142	23.2	5	16.1	3.5	73	19.5	6	20.7	8.2
Total	613	100	31	100	5.1	375	100	29	100	7.7

3. Results

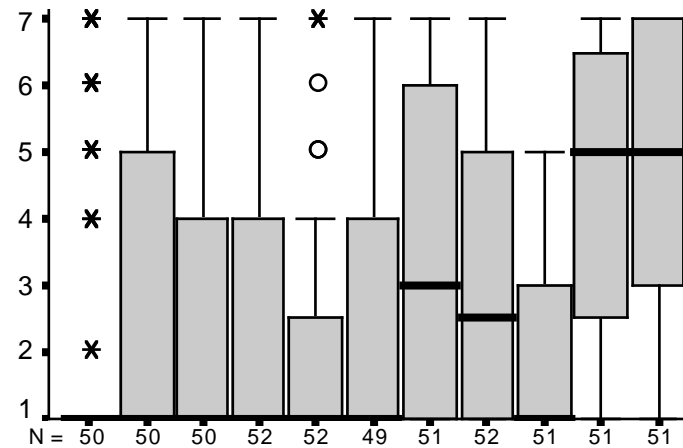
Willingness to pay in \$ per certificate (a)

	INTERNATIONAL				COSTA RICAN				Total			
	Mean	Std Dev	Median	Valid N	Mean	Std Dev	Median	Valid N	Mean	Std Dev	Median	Valid N
BIO	14	32	0	20	63	109	40	24	40	86	0	44
CA	65	143	0	21	88	148	15	24	77	144	10	45
SC	10	29	0	22	78	203	10	24	46	150	0	46
WA	11	30	0	21	82	132	50	25	50	105	11	46

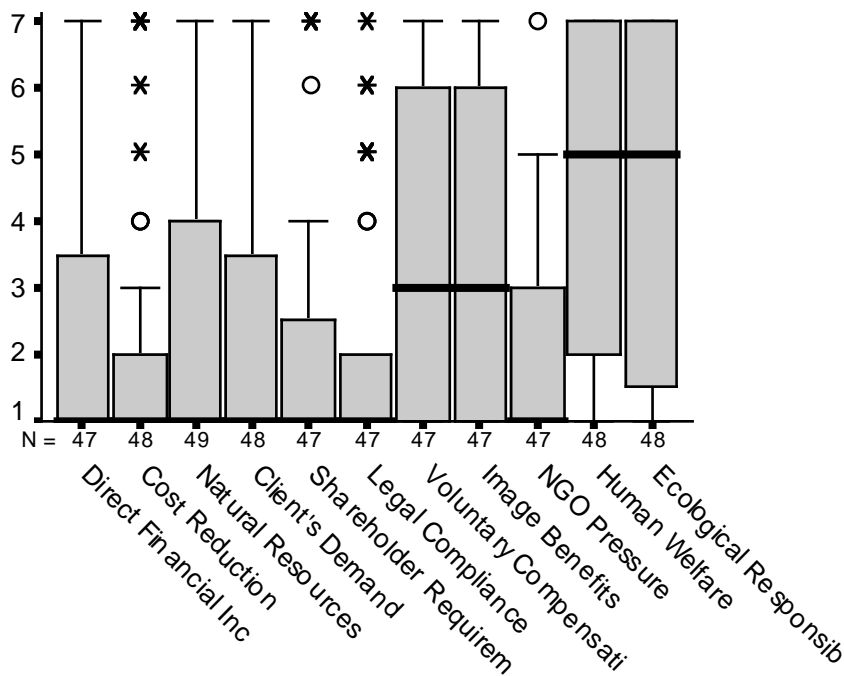
Benefit expectations



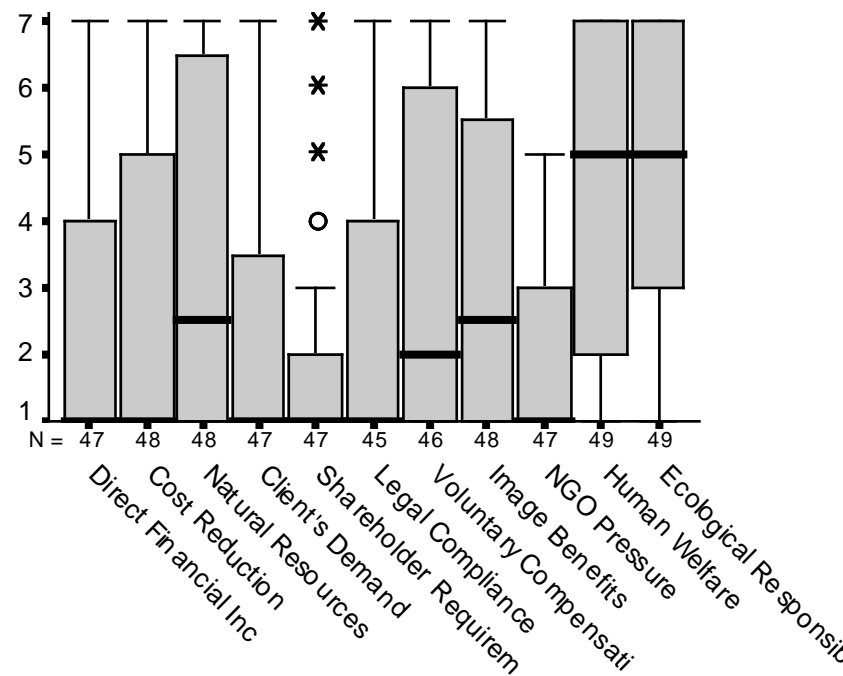
(A) Biodiversity conservation



(B) Carbon sequestration



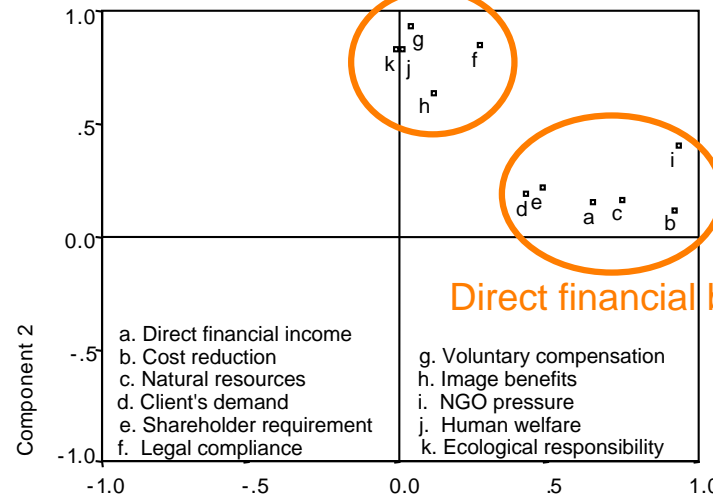
(C) Scenic beauty



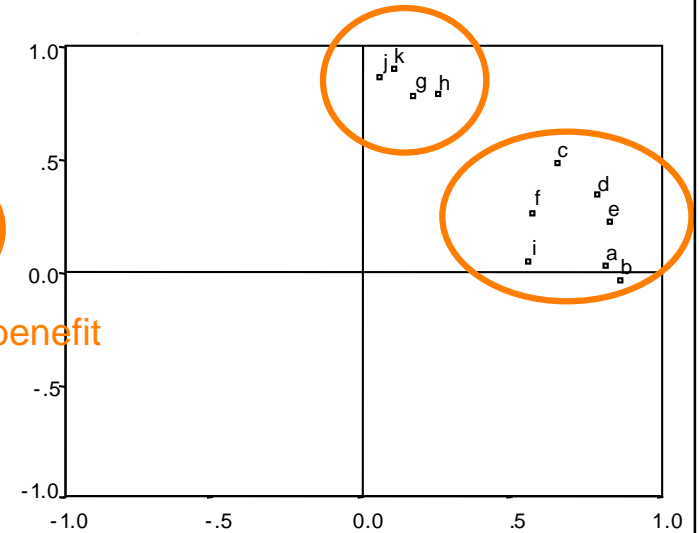
(D) Watershed protection

Factor analysis of expected benefits

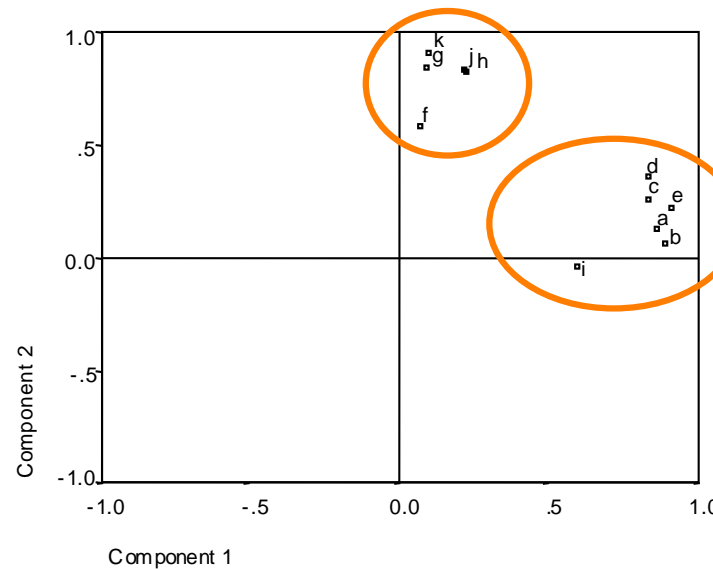
Indirect/non financial benefit



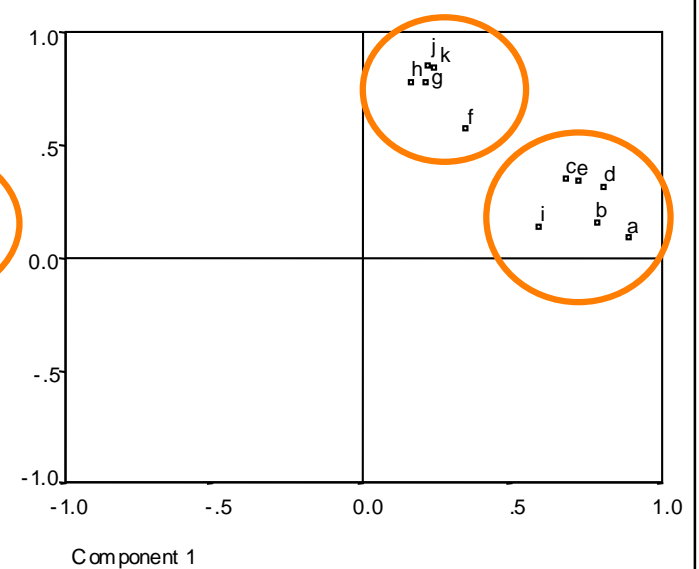
(A) Biodiversity conservation



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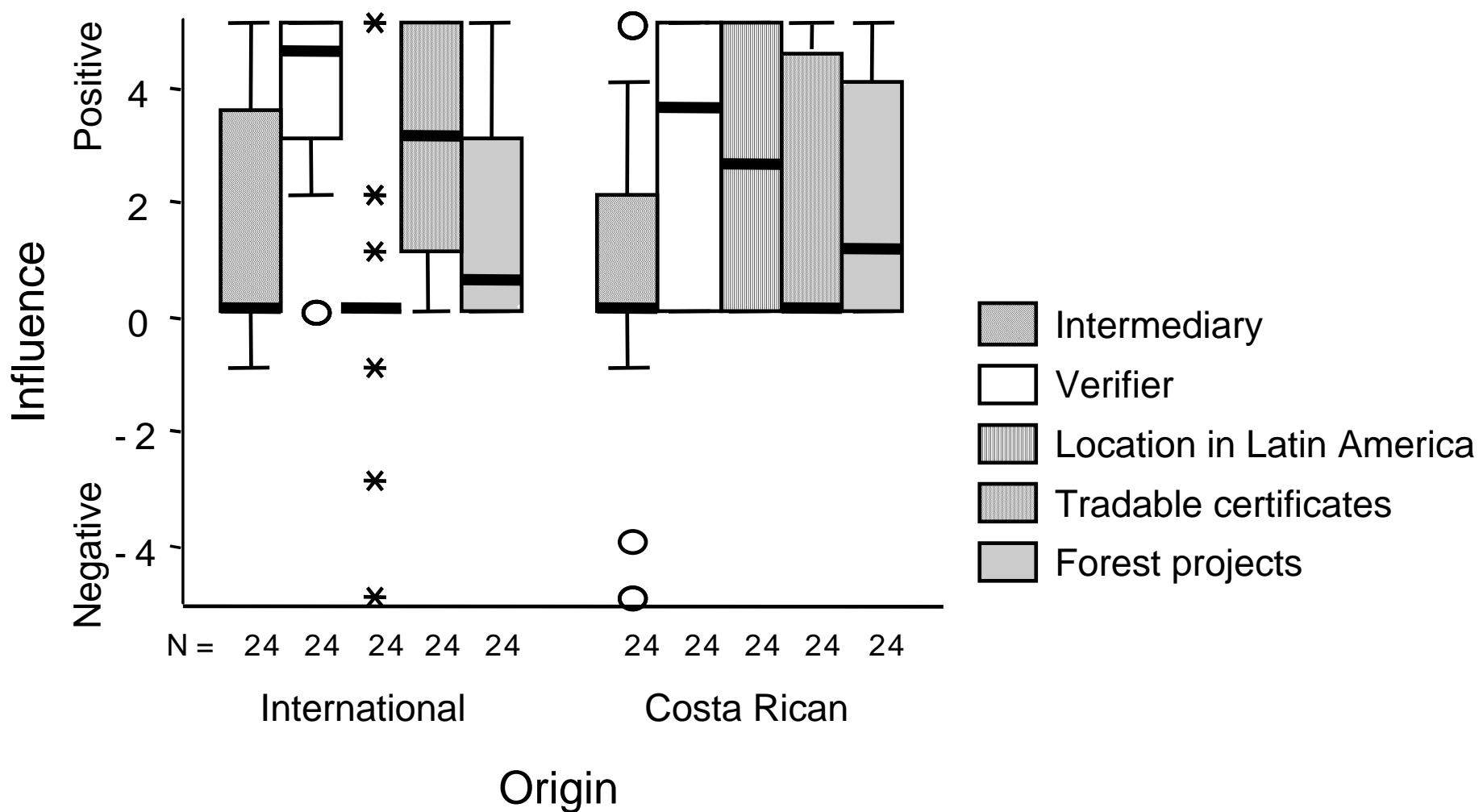


(C) Scenic beauty



(D) Watershed protection

Behavioral control of intended demand for ecosystem services



4. Discussion and conclusion

Conclusions 1

- Firms' current intended demand for ecosystem services from tropical forests is low
 - In total the 45 companies would purchase certificates representing
 - 819 km² of forest for carbon sequestration,
 - 52 km² for watershed protection,
 - 4.8 km² for biodiversity conservation and
 - 2.5 km² for scenic beauty
- In Costa Rica 4200 km² are under PES

Conclusions 2

- Motivation has financial and non-financial aspects depending on sector and service
 - Image benefit of biodiversity conservation
 - Voluntary compensation for sectors energy, materials
 - NGO pressure is surprisingly low
 - Answers might reflect personal motivation
 - International companies: 9 heads & 21 manager, mostly of dep. of safety, health, env.
 - Costa Rican: 4 respondents are member of the environmental department, 2 are member of the operations, 2 of sales and 15 are member of the general management

Thank you very much



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Backup-slides



WTP in the company context

- If companies are the beneficiaries of environmental changes “... measure the benefits [of environmental improvement] by objective technological analysis of increased output or decreased cost”. (Arrow 1999)

Expected utility of ecosystem services

- The utility is the summation of the economical gain and the non-financial benefits involved in the decision problem

$$E(U) = p(v(R - C) + wA)$$

Investment Donation

$E(U)$: Expected utility

p : Probability

R : Revenue

C : Cost

A : Altruism

v, w : weights

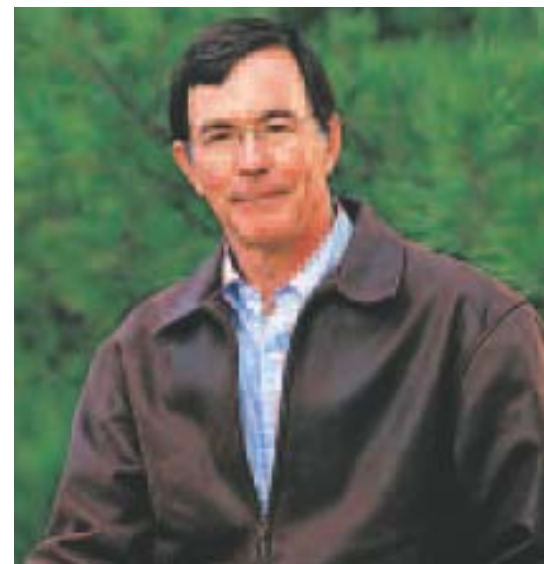
In our model the CEO can have two roles ...

- ... one as a manager and one as a good citizen.

CEO of MeadWestvaco



(Financial Report 2003)



(Sustainability Report 2003)

Logistic regression for biodiversity conservation N=37 (23 missing)

		Variables in the Equation							Omnibus Tests of M R Squ Perce					
		B	S.E.	Wald	df	Sig.	Exp(B	95.0% Lower Upper		Chi-sq	df	Sig.		
Step 1	FOREST	0.96	0.68	2.04	1	0.15	2.62	0.7	9.84	24.3	11	0.01	0.66	81.1
	PLANTATION	-0.25	0.79	0.1	1	0.75	0.78	0.16	3.66					
	SECTOR			1.19	2	0.55								
	SECTOR(1)	0.79	1.02	0.59	1	0.44	2.2	0.3	16.4					
	SECTOR(2)	-1.07	1.37	0.61	1	0.44	0.34	0.02	5.02					
	ORIGIN	0.16	1.37	0.01	1	0.91	1.18	0.08	17.1					
	EMPLOYEES	0	0	0.76	1	0.38	1	1	1					
	KNOWLEDGE	0.07	0.46	0.02	1	0.89	1.07	0.44	2.61					
	PUBLIC_BIO	-1.33	0.72	3.45	1	0.06	0.27	0.07	1.08					
	ENGAGE_BIO	-1.13	0.53	4.47	1	0.04	0.32	0.11	0.92					
	DIRFIN_BIO	0.38	0.27	2	1	0.16	1.46	0.87	2.46					
INDFIN_BIO	-0.04	0.12	0.09	1	0.76	0.96	0.76	1.23						
Constant	0.58	2	0.08	1	0.77	1.79								
Step 7	FOREST	0.56	0.28	4.15	1	0.04	1.76	1.02	3.02	18	4	0	0.52	78.4
	PUBLIC_BIO	-1.21	0.5	5.85	1	0.02	0.30	0.11	0.8					
	ENGAGE_BIO	-0.74	0.36	4.31	1	0.04	0.48	0.24	0.96					
	DIRFIN_BIO	0.28	0.13	4.83	1	0.03	1.32	1.03	1.7					
	Constant	-0.21	1	0.04	1	0.83	0.81							

Variables explaining binary WTP

- Biodiversity conservation
 - FOREST (+)
 - PUBLIC_BIO (-)
 - ENGAGE_BIO (-)
 - DIRFIN_BIO (+)
- Carbon sequestration
 - FOREST (+)
- Scenic beauty
 - PUBLIC_SC (-)
 - INDFI_SC (+)
- Watershed protection
 - ORIGIN (+)

Public should pay?

