

UNIVERSITY OF COPENHAGEN DEPARTMENT OF FOOD AND RESOURCE ECONOMICS

Faculty of Science

**“A matter of trust”  
- How trust influences organic  
consumption**

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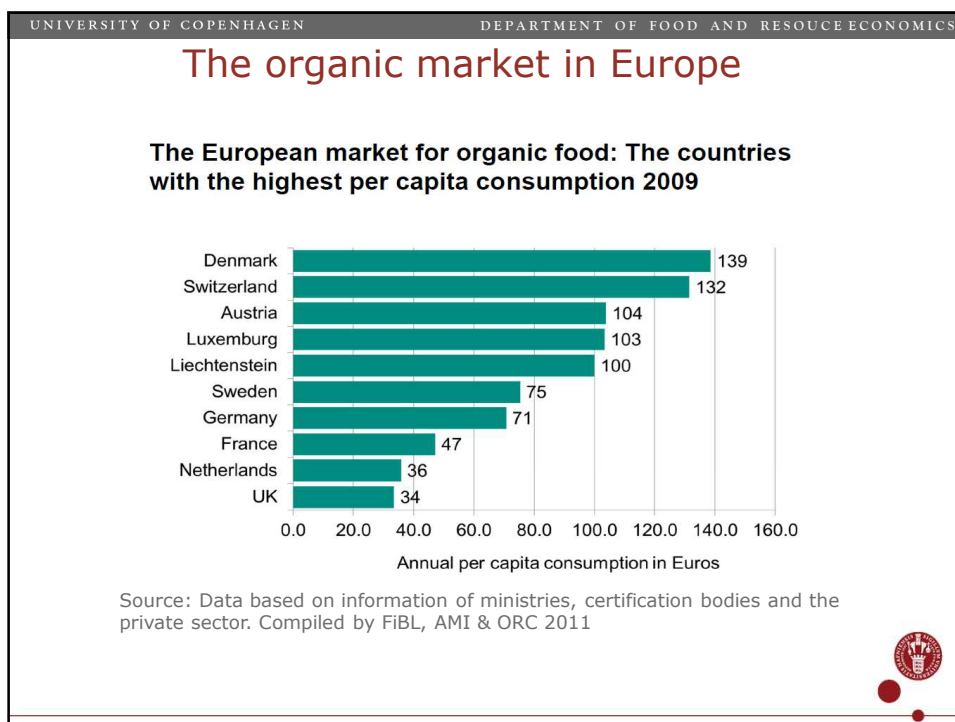
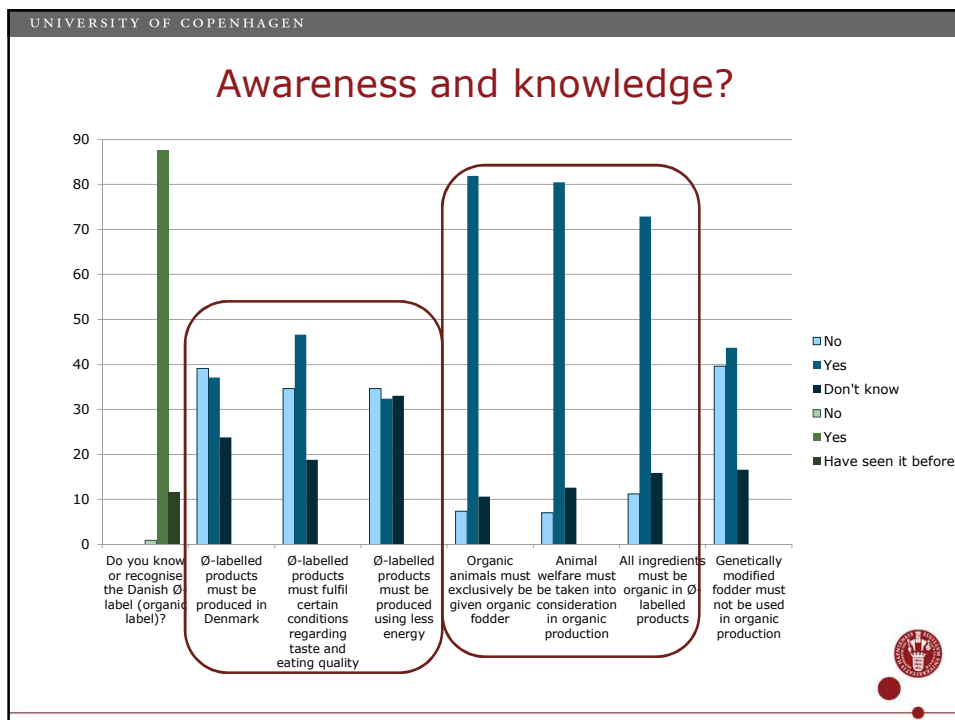


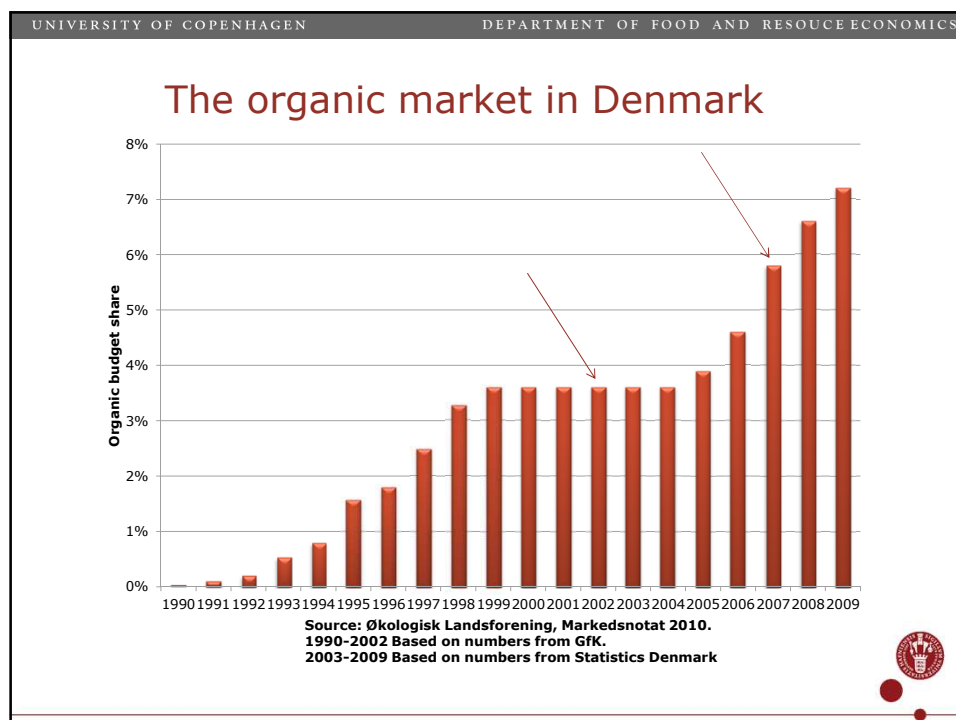

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**Eco-labelling**

- Organic foods contain credence attributes,
  - Consumers have no possibility to see, taste or experience if the product contain the promised characteristics
  - Information about the product is asymmetric
  - Consumers depends on labels to identify the organic products
  - Producers rely on labels in order to be able to charge a higher price for their products
- Eco-labels will be effective only if, consumers
  - are aware of the label and recognize it
  - understand what the label mean (i.e. have a relatively good understanding of the standards underpinning the label)
  - trust that the label guarantee for these standards







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### Aim of this paper


- Analyse whether the observed increase in the demand for organic products can be explained by an increased trust in the organic label
- The contribution of the paper is
  - Panel data from 2002 and 2007 (830 households)
  - Linking questionnaire data with observed purchase data (household level)
  - Fixed effects analysis controlling for other factors affecting organic consumption, hence deriving if an increase in trust on individual level increase the organic budget share

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### ....our data

```
graph TD; A[Household number] --- B[Purchase data]
```

- On average 2500 (monthly) households in the panel
- Daily registrations of quantity, price and store of purchased foods in 2002 and 2007
- Close to barcode level




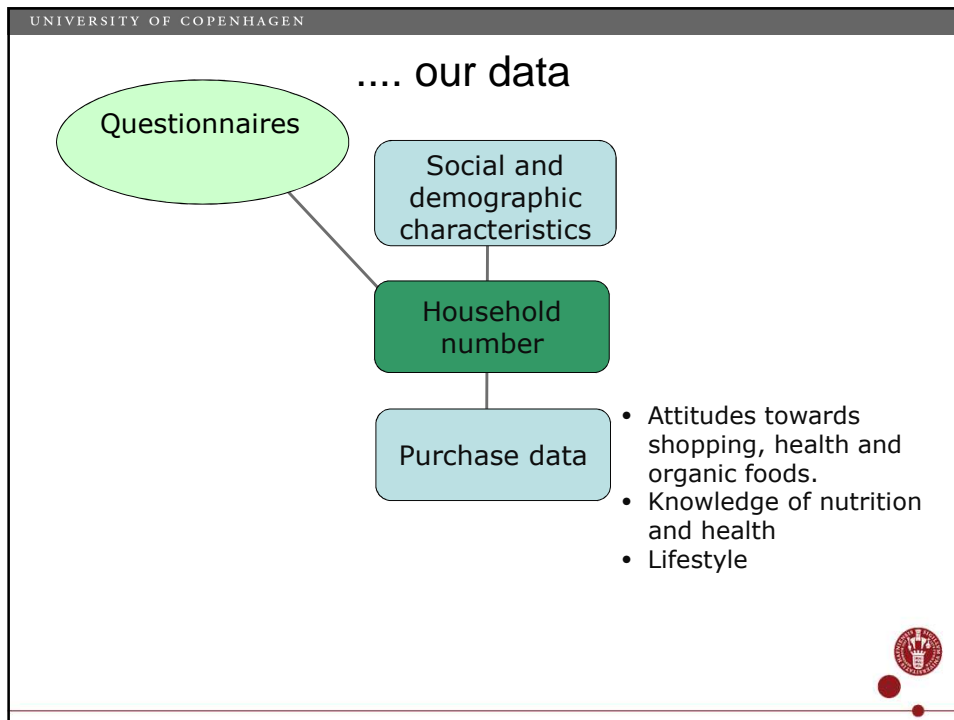
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### ....our data

```
graph TD; A[Social and demographic characteristics] --- B[Household number]; B --- C[Purchase data]
```

- Social and demographic characteristics
- Attitude questions
- Yearly observations




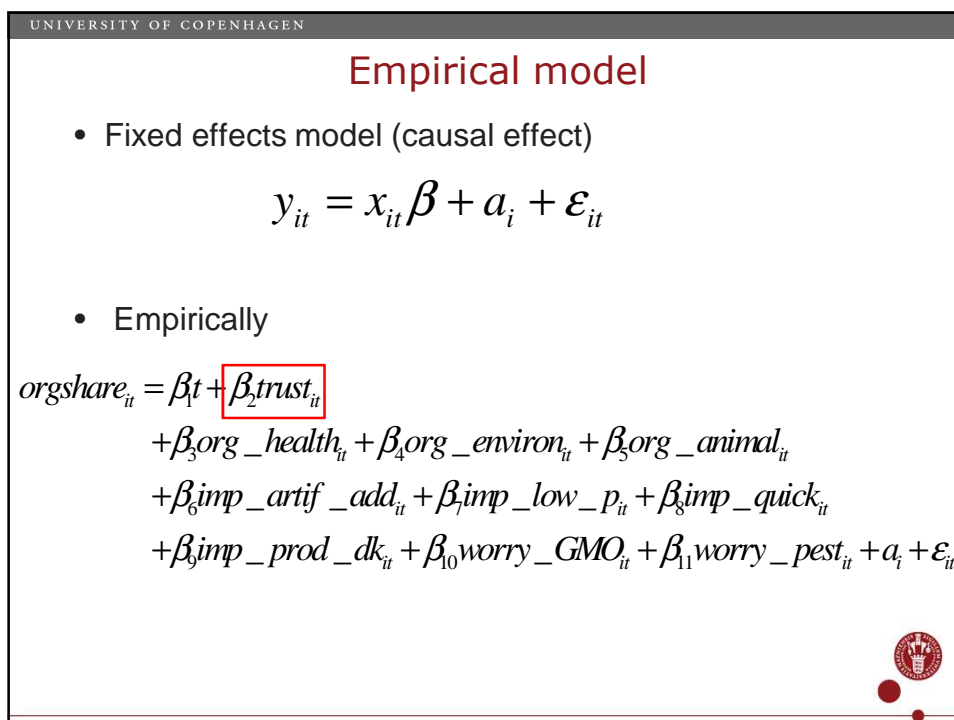
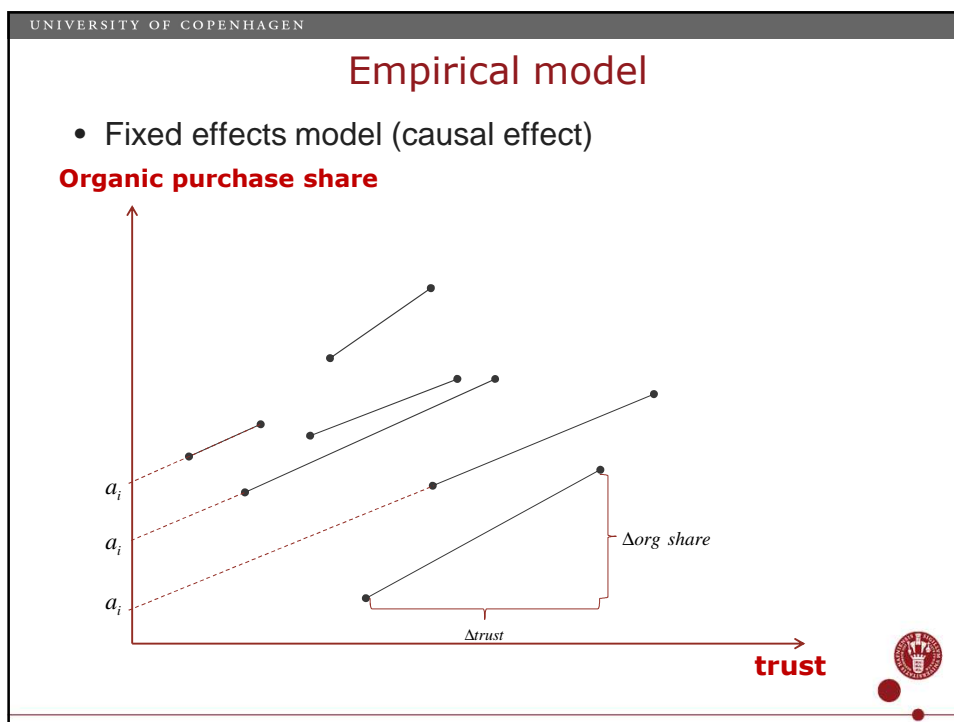


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### Empirical model

- Fixed effects model (causal effect)

$$y_{it} = \beta_0 + \sum_{j=1}^K x_{ijt} \beta_j + a_i + \varepsilon_{it}$$




## Construction of the trust variable

To what extent do you agree with the following statements about buying organic products?

	name	label	Totally disagree	Partially disagree	Neither agree nor disagree	Partially agree	Totally agree	Don't know	Answ.	Miss.	Answ.%
2002	q28_09	Organic foods are just a fashionable fad. Soon it'll be something else you have to buy	10.5	16.5	30.6	24.6	17.8		1581	28	98.3
	q28_13	I usually don't buy organic products because there is too much cheating with the organic label	18.8	22.8	37.1	14.7	6.6		1583	26	98.4
2007	q34_03	Organic foods are just a fashionable fad	35.8	17.6	23.8 (29.9)*	11.5	5.2	6.1 (0)	1997	25	98.8
	q34_04	I usually don't buy organic products because there is too much cheating with the organic label	21.8	16.3	25.6 (37.4)	16.0	8.6	11.8 (0)	2007	15	99.3

\*: Numbers in brackets show the result after re-coding of 'don't know' answers in 2007.



## Empirical model

- Fixed effects model (causal effect)

$$y_{it} = x_{it}\beta + a_i + \varepsilon_{it}$$

- Empirically

$$orgshare_{it} = \beta_1 + \beta_2 trust_{it}$$

$$\begin{aligned}
 & + \beta_3 org\_health_{it} + \beta_4 org\_environ_{it} + \beta_5 org\_animal_{it} \\
 & + \beta_6 imp\_artif\_add_{it} + \beta_7 imp\_low\_p_{it} + \beta_8 imp\_quick_{it} \\
 & + \beta_9 imp\_prod\_dk_{it} + \beta_{10} worry\_GMO_{it} + \beta_{11} worry\_pest_{it} + a_i + \varepsilon_{it}
 \end{aligned}$$




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## Is change in trust a driving factor?

Variable	Description	Range	Mean			% change <sup>1</sup>
			2002	2007		
Orgshare	Organic budget share	Potentially 0 to 100	4.21	5.71	97.95	
T	Trend	0 = 2002, 1 = 2007	0.00	1.00	100.00	
Trust	Constructed variable See data section	0 to 8	3.88	4.42	74.70	
Org_health	"I think that the rules regarding organic production are good enough to create improvements for..."	"...my and my family's health" "...nature, e.g. wild animals and plants" "...animal welfare"	-2 = Totally disagr. -1 = Disagree 0 = Neither nor 1 = Agree 2 = Totally agree	0.34 0.51 0.52	0.86 1.26 1.25	60.00 68.43 66.51
Imp_artif_add	Answer to the statement: "It is important for me whether..."	"... my food does not contain artificial additives" "...the price is low" "...the product is quick to prepare" "...the product is produced in Denmark"	0 = No importance 1 = Minor importance 2 = Some importance 3 = Very important	2.14 1.91 1.57 2.04	1.37 1.32 0.87 1.61	65.42 65.18 67.35 56.63
Worry_GMO	Answer to the statement: "How often do you worry about..."	"...that food products may be genetically modified" "...whether there are pesticides or medicine residues in food products"	0 = Never 1 = Seldom 2 = Once in a while 3 = Often 4 = Very often	1.91 1.60	2.00 2.33	78.43 79.04


<sup>1</sup> Share of households with change in this variable  
Source: Questionnaires and background data from GfK Consumer Tracking, 2002 and 2007.



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## Is change in trust a driving factor?

Variable	Description	Estimate	Std. Error	t-value	Pr(> t )
T	Trend	1.65	0.388	4.255	0.000 ***
Trust	Trust	0.28	0.101	2.763	0.006 **
<b>Expected positive effects from organics related to...</b>					
org_health	...health	0.57	0.194	2.949	0.003 **
org_environ	...environment	0.09	0.305	0.292	0.770
org_animal_welf	...animal welfare	-0.32	0.202	-1.582	0.114
<b>Generally important when shopping food:</b>					
imp_artif_add	Avoiding artificial additives	0.56	0.206	2.699	0.007 **
imp_low_p	Low price	-0.50	0.202	-2.495	0.013 *
imp_quick	Quick to prepare	0.19	0.192	0.974	0.330
imp_prod_dk	Produced in Denmark	0.30	0.211	1.431	0.153
<b>Worries about ... in food consumed</b>					
worry_GMO	Genetically Modified Organisms (GMO)	0.12	0.129	0.895	0.371
worry_pest	Pesticides	-0.07	0.134	-0.499	0.618
<b>R-Squared</b>		9.8%			
<b>Adj. R-Squared</b>		4.8%			





## Explaining the fixed (unit) effects

- Fixed effects model (causal effect)

$$y_{it} = x_{it}\beta + a_i + \varepsilon_{it}$$

- Explaining the systematic variation in the fixed effects

$$a_i = z_i\alpha + v_i$$

- OLS estimation (correlation)

$$a_i = \gamma_0 + \gamma_1 imp\_health_i + \gamma_2 imp\_environm_i + \gamma_3 imp\_animal\_welf_i \\ + \gamma_4 male_i + \gamma_5 age_i + \gamma_6 age\_sq_i \\ + \gamma_7 urban_i + \gamma_8 capital_i + \gamma_9 voc_i + \gamma_{10} short_i + \gamma_{11} long_i \\ + \gamma_{12} kids06_i + \gamma_{13} kids714_i + \gamma_{14} kids1520_i + \gamma_{15} inc\_low_i + \gamma_{16} inc\_high_i + \xi_i$$




Variable	Description	Range	Mean	Std. dev	% change <sup>1</sup>
Imp_health	Answer to the statement: "It is important for me whether..."	"...the food I buy is healthy" -1 = Disagree 0 = Neither agree nor disagree 1 = Agree	0.77	22.53	22.53
Imp_environ		"...the food I buy is environmentally friendly" 0 = No importance 1 = Minor or some importance 2 = Very important	1.31	31.45	31.45
Imp_animal_welf		"...animal welfare has been taken into account when producing the food I buy"	1.32	32.77	32.77
Male	The main shopper is male	0/1 dummy	0.27	0.45	7.59
Age	Age of main shopper <sup>2</sup>	Years	54.07	12.89	99.64
Rural	Rural is the base category for urbanization	0/1 dummy	0.35	0.48	3.37
Urban	Living in an urban municipality	0/1 dummy	0.46	0.50	3.01
Capital	Living in the Capital area	0/1 dummy	0.19	0.40	1.33
Low	Highest level of education in the household: No or low education is the base category	0/1 dummy	0.22	0.42	9.40
Voc	Vocational education	0/1 dummy	0.32	0.47	16.51
Short	Up to three years of non-vocational further education	0/1 dummy	0.20	0.40	13.98
Long	More than three years of non-vocational further education	0/1 dummy	0.26	0.44	8.07
Kids06	Children 0 – 6 years old in household	0/1 dummy	0.06	0.25	5.30
Kids714	Children 7 – 14 years old in household	0/1 dummy	0.11	0.31	10.12
Kids1520	Adolescents 15 – 20 years old in household	0/1 dummy	0.11	0.31	12.89
Inc_low	Household belongs to the lowest third of the OECD scaled income distribution.	0/1 dummy	0.34	0.47	13.86
Inc_middle	Household belongs to the middle third of the income distribution. This is the base category	0/1 dummy	0.32	0.47	26.99
Inc_high	Household belongs to the highest third of the income distribution	0/1 dummy	0.34	0.48	18.43



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## Describing the heterogeneity


		Estimate	Std. Error	t value	Pr(> t )
(Intercept)	Intercept	0.13	1.634	0.081	0.936
<b>Generally important when purchasing food:</b>					
<i>Imp_Health</i>	Health	0.40	0.441	0.918	0.359
<i>Imp_Environ</i>	Environment	2.16	0.611	3.538	0.000 ***
<i>Imp_Animal_welf</i>	Animal welfare	0.30	0.515	0.575	0.566
<b>Socio demographics</b>					
<i>Male</i>	Main shopper is male	-0.63	0.512	-1.240	0.215
<i>Age-20</i>	Age in years, 20 is base	-0.22	0.102	-2.200	0.028 *
<i>(Age-20)<sup>2</sup></i>	Age square/100	0.29	0.158	1.840	0.066 .
<b>Degree of urbanization, rural municipality is control</b>					
<i>Urban</i>	Urban municipality	1.49	0.541	2.763	0.006 **
<i>Capital</i>	Capital area	2.49	0.725	3.435	0.001 ***
<b>Highest level of education in household, no further education is control</b>					
<i>Voc</i>	Vocational further education	-0.25	0.613	-0.413	0.680
<i>Short</i>	Less than three years of further non-vocational education	0.34	0.801	0.428	0.669
<i>Long</i>	More than three years of further non-vocational education	2.19	0.809	2.712	0.007 **
<b>Children in household, no children is control</b>					
<i>Kids06</i>	Children 0 to 6 years in household	-1.24	1.093	-1.137	0.256
<i>Kids714</i>	Children 7 to 14 years in household	2.03	0.985	2.062	0.039 *
<i>Kids1520</i>	Children 15 to 20 years in household	-0.84	0.733	-1.140	0.255
<b>Income, middle 33% is control</b>					
<i>Inc_low</i>	Lowest income tertile	0.26	0.623	0.412	0.681
<i>Inc_high</i>	Highest income tertile	0.74	0.619	1.194	0.233
<b>R-Squared</b>		8.3%			
<b>Adj. R-Squared</b>		6.5%			



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## The influence of knowledge and trust on organic consumption

- Consumers trust in the organic label increases consumption
- Consumers perception of that organic consumption is associated with private health effects likewise increases consumption
- Focus on a low price decreases organic consumption
- Focus on avoiding artificial additives increases organic consumption
- Other factors correlated with a high organic consumption is
  - Level of education, Urban residence, Environmental concern, Children 7 – 14 years in the household



## Policy implications

- This implies that
  - Eco-labels must be designed in a way that generate trust in the label as a guarantee that labelled products deliver the qualities that consumers expect them to do.
  - State verification lead to the highest level of consumer confidence in the eco-label (but only in countries where consumers have a high level of institutional trust)
  - Campaign activities could focus on the absence of artificial additives in organic foods and/or on the difference in the healthiness of organic and conventional products e.g. the absence of residues in organic foods.
  - Decreasing the price will always increase consumption



**Thank you for your attention!!**

