Does Country-of-Origin Labeling function as a food-safety cue for beef?

Kar Ho Lim [a]   Wuyang Hu [a]   Leigh Maynard [a]   Ellen Goddard [b]

2012

[a] Dept. of Agricultural Economics, University of Kentucky
[b] Dept. of Resource Economics & Environmental Sociology, University of Alberta
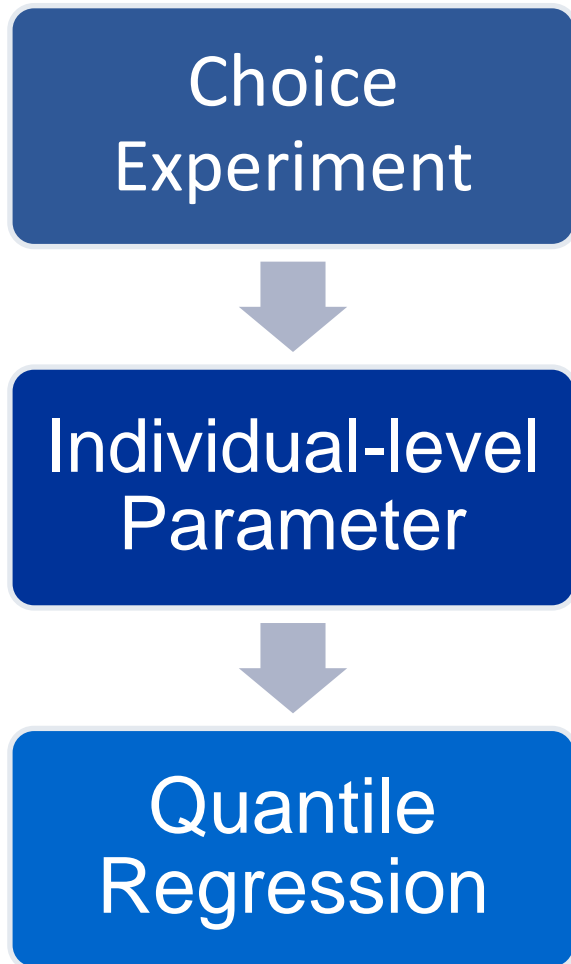
UK Ag
AG ECONOMICS

Consumer and Market Demand Network

1

Motivation and Objective

- U.S. consumers willing to pay more for beef originated from the U.S.
  - (Loureiro and Umberger 2003, 2005, 2007, Umberger et al 2005)

- The reason behind it is less well understood (Lusk et al. 2006)

  - Ethnocentrism?
  - Food Safety?
  - Right to know?

Method

Choice Experiment

- gather information on how much American consumers are willing to pay for imported beef

Individual-level Parameter

- generate individual WTP,
  - how much $ one willing to give up/pay to switch from US beef to imported beef

Quantile Regression

- regress on individual WTP on food safety variables
  - try to find out if American use COOL as food safety cue.

3

Data

- Choice experiment, featured product is one pound of strip loin steak

- Conducted Internet Survey on May 2010

- 1079 respondents from across the U.S. (994 beef eaters)

- 52.5% Female

- Mean Household Income $52,000

- Mean Education – Some college

- 83% Primary Shopper

- Mean Age = 56.62

Sample Choice Set

Steak Attribute	A	B	C
Price ($/lb.)	$12.50	$16.00	
Country of Origin	Australia	Canada	
Production Practice	Approved Standards	Natural	
Tenderness	Uncertain	Assured Tenderness	I would not purchase any of these products
Food Safety Assurance	Traceable and Animal Tested	None	
I would choose . . .	○	○	○

- Partial Factorial Orthogonal Design
- 191 choice sets produced
- Each respondent answered 10-14 choice sets.
- 14 version of choice sets

Beefsteak Attributes

Attributes				
Price ($/lb)	$5.50	$9.00	$12.50	$16.00
Country of Origin	USA	Canada	Australia	
Production Practices	Approved Standards	Natural		
Food Safety Assurance	None	Animal Tested	Traceable	Traceable and Animal Tested
Tenderness	Uncertain	Assured Tenderness		

Mixed Logit Model

$$U_{ijt} = \alpha' \text{price}_{ijt} + \boldsymbol{\beta}'_i \mathbf{x}_{ijt} + \varepsilon_{ijt}$$

$$\mathbf{x}_{jt} = [\text{WOULD-NOT-BUY, AUS, CAN, BSE, TRACE,}$$

$$\text{BSE\_TRC, TENDER, NAT}]_{jt}$$

price – with fixed parameter α

$\mathbf{x}$ – with random parameters $\boldsymbol{\beta}$

Mixed Logit Results

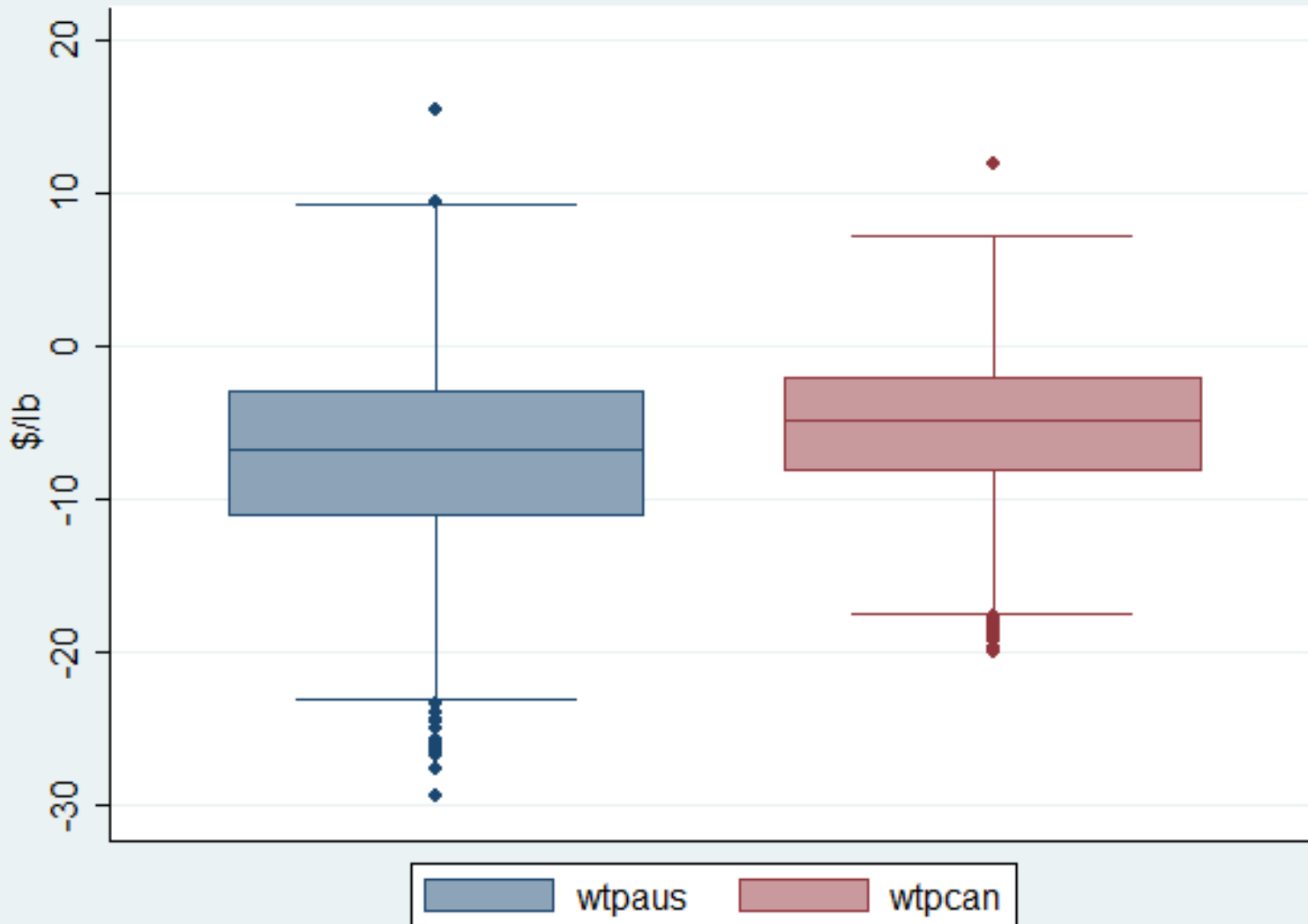| Variable		Coefficient Estimates			
		mean		std dev	
PRICE		-0.26	***		
Would-Not-Buy		-2.08	***	0.68	***
Australian Beef		-1.88	***	2.42	***
Canadian Beef		-1.38	***	2.31	***
BSE-tested Beef		1.33	***	2.30	***
Traceability		1.34	***	1.45	***
Traceable and BSE-tested		1.96	***	2.29	***
Tenderness Assured		1.05	***	1.38	***
Natural Beef		0.00		1.10	***
Log Likelihood Score		-9931.13			
McFadden R2		0.334			

Individual-Level Parameters
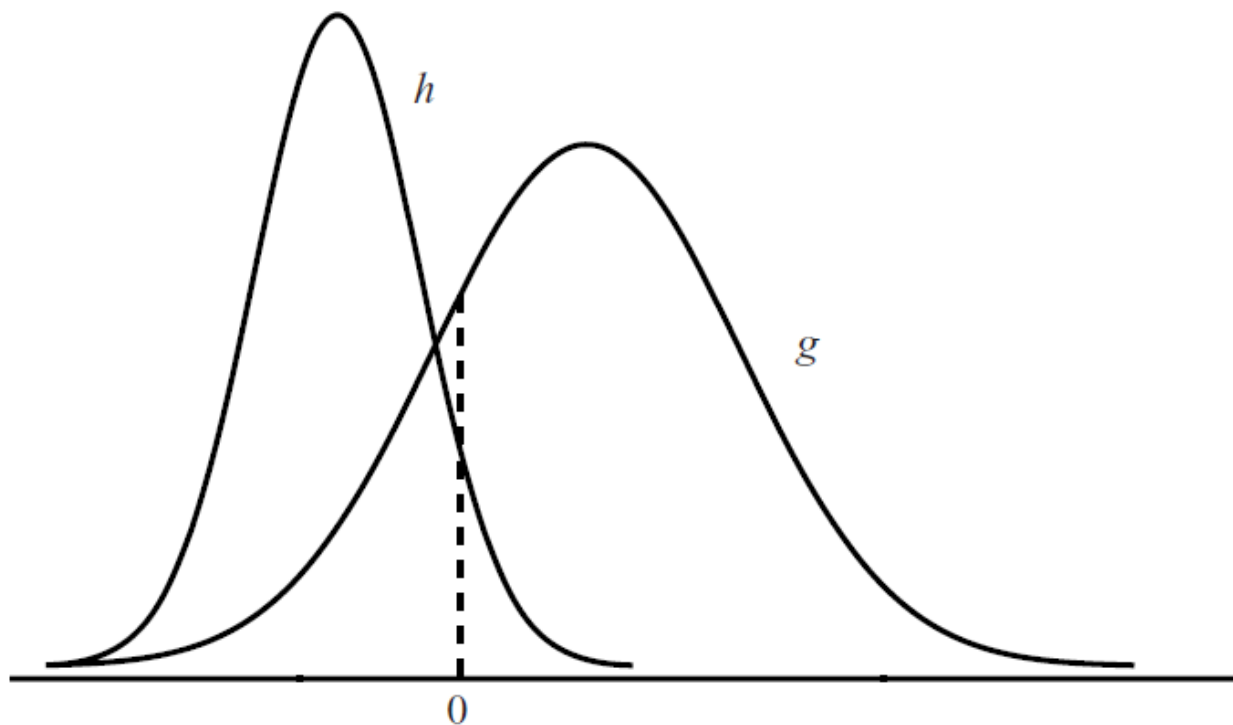
Source: Train (2003)

Additional Resources:
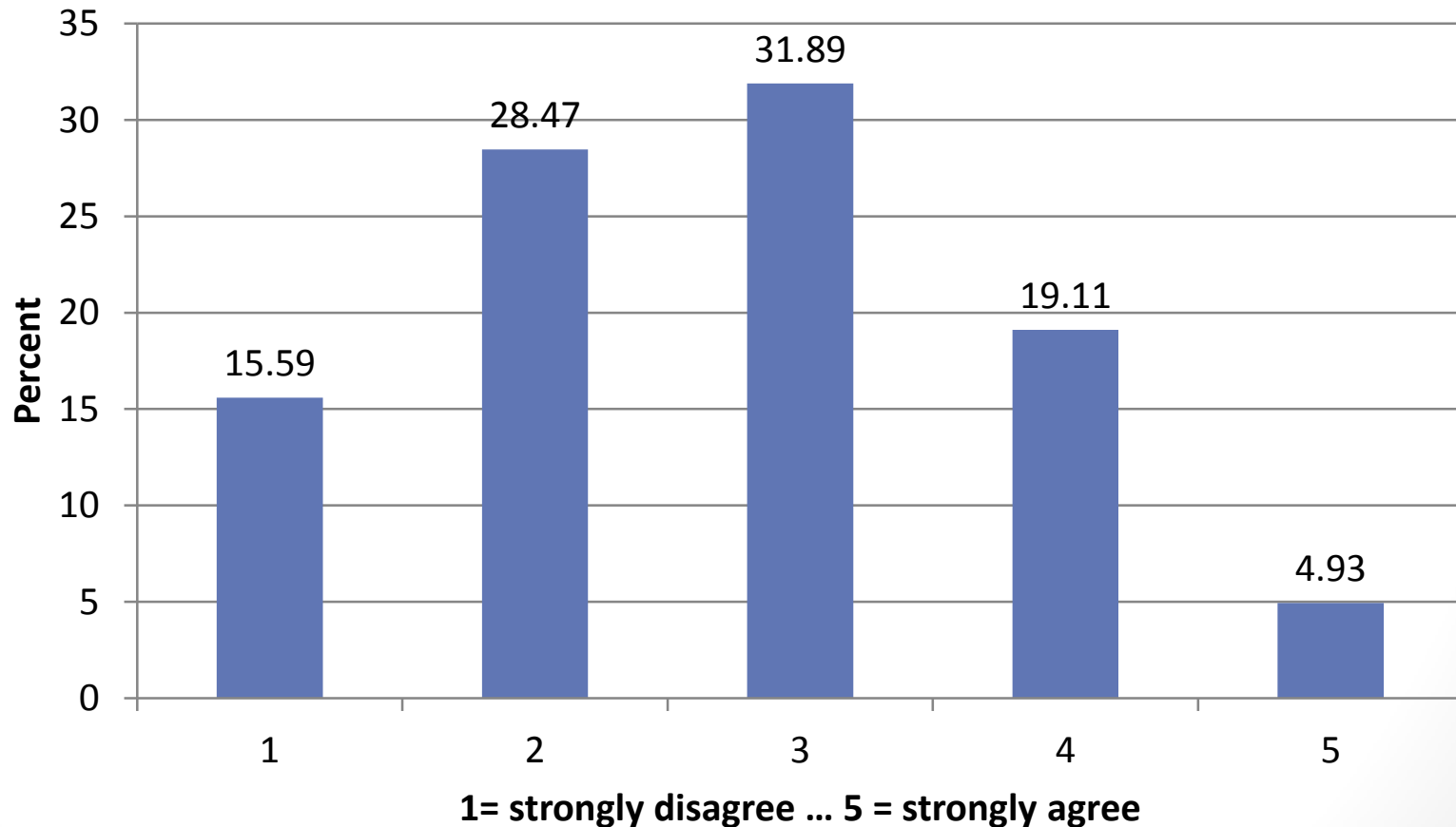Train 2003. Discrete Choice Methods with Simulation
Greene, Hensher and Rose 2005 "Using Classical Simulation-
Based Estimators to Estimate Individual WTP Values".
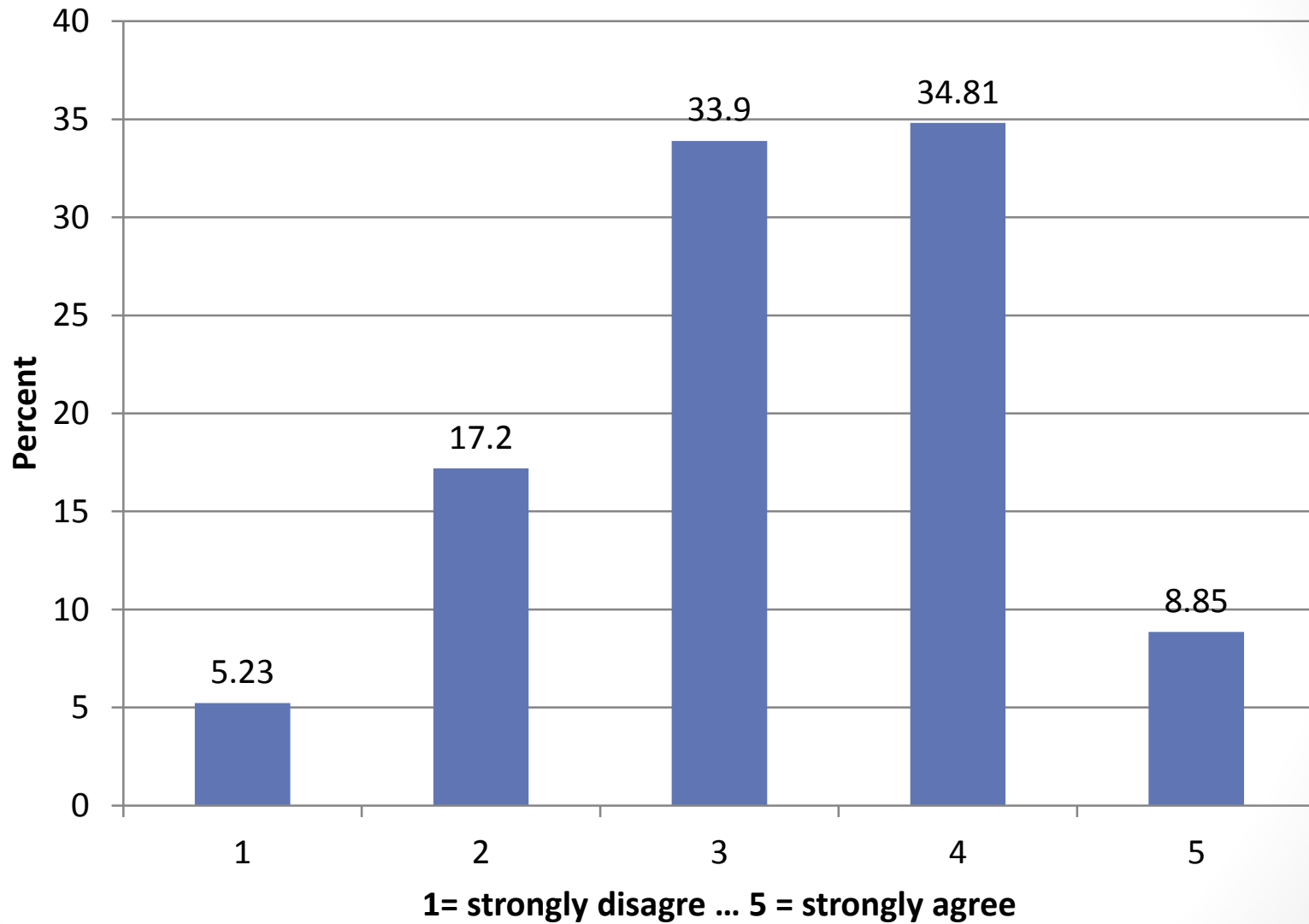
Box Plot: Individual WTP

Regressors

I purchase beef based on country of origin (COOL)

1= strongly disagree … 5 = strongly agree

11

I purchase beef based on price (PRICE)

Percent values by response:
- 1: 5.23
- 2: 17.2
- 3: 33.9
- 4: 34.81
- 5: 8.85

1= strongly disagre ... 5 = strongly agree
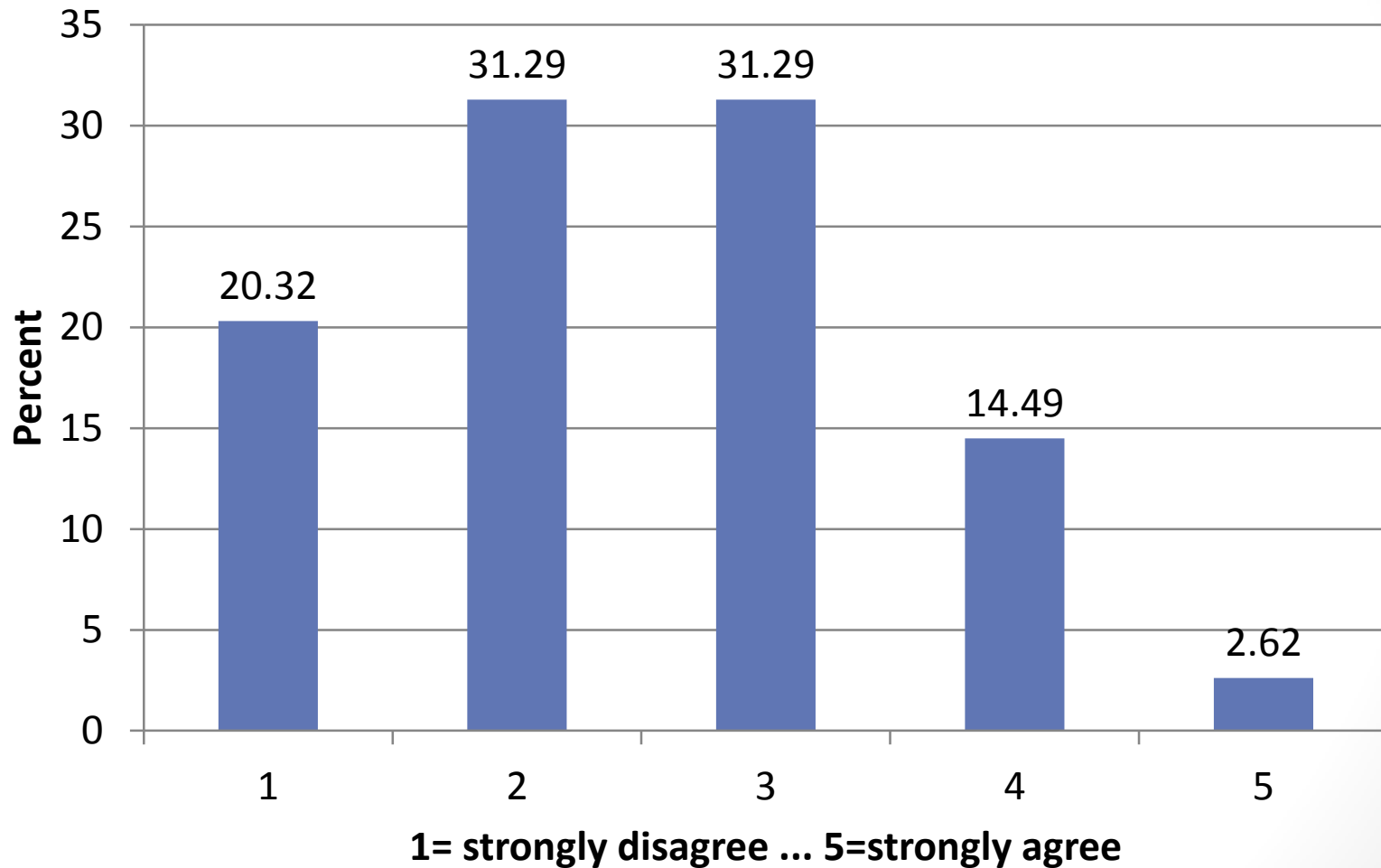
12

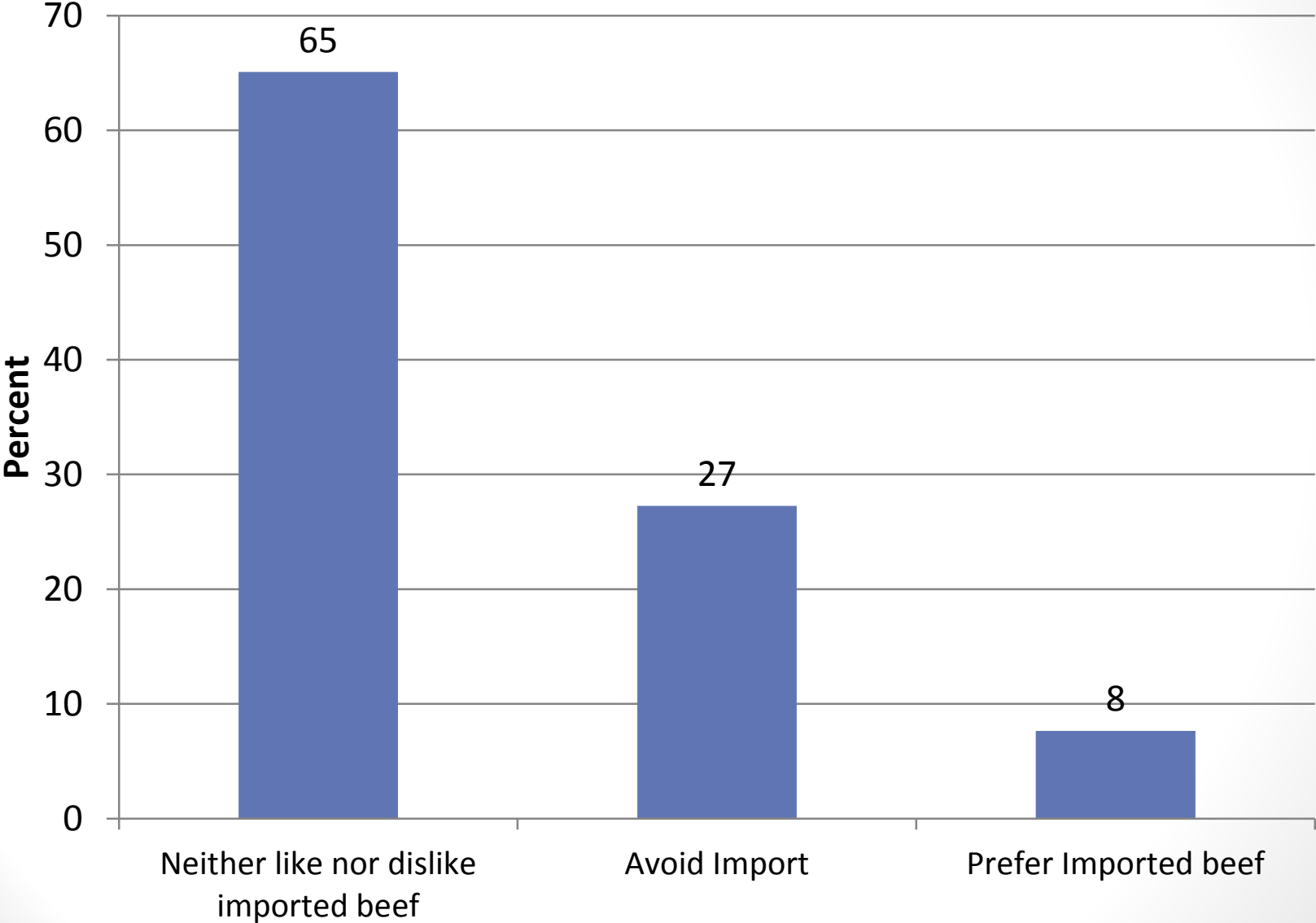How much risk do you think there is to you personally of experiencing negative consequences from eating unsafe foods?
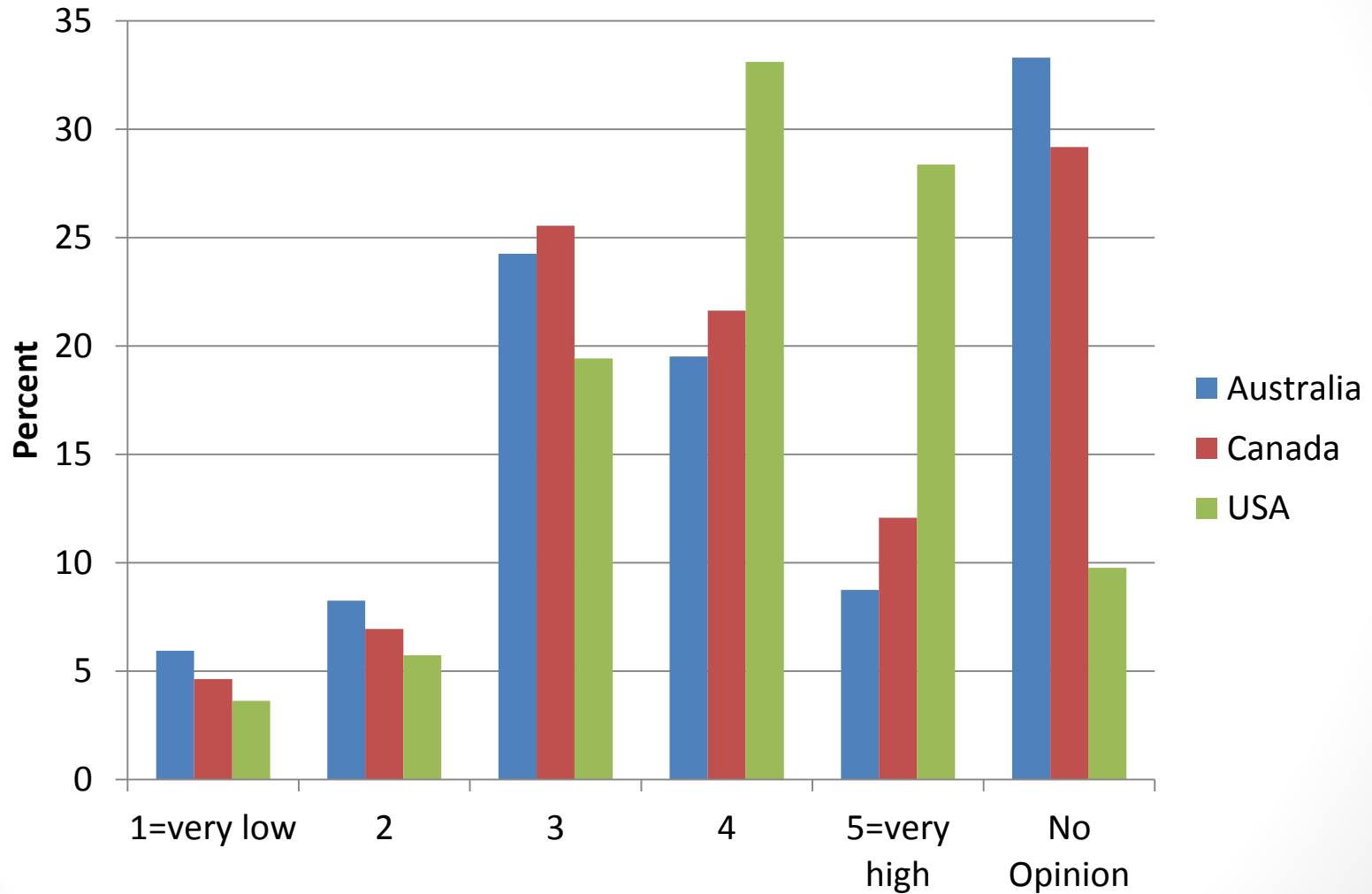(PERSONAL RISK)
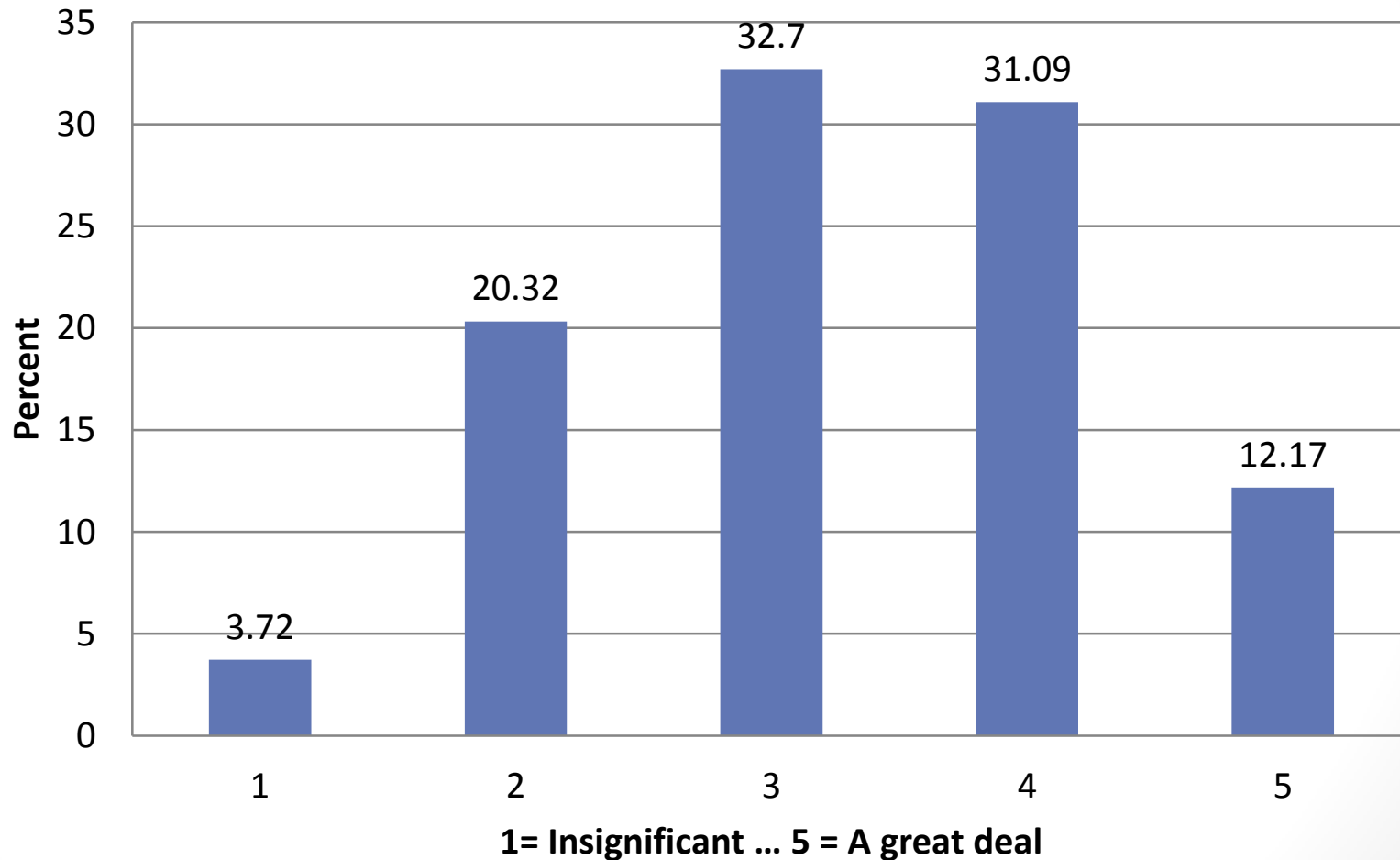
The safety of food products cannot be controlled, but mainly determined by coincidental factors (COINCIDENTAL)

Would You Buy Imported Beef

What is your perception of the level of food safety of beef by country of origin

Regression on Willingness to pay for Australian Beef

	SUR	10%	25%	50%	75%	90%
Demographic						
Age	-0.03*		-0.04*	-0.03*		
Income						
Education	0.24*	0.45*	0.28*	0.28*		
Buy based on						
Price	0.50*		0.74*	0.61*		
COOL	-0.41*		-0.62*	-0.42*		
Food Safety Variables						
Coincidental	-0.37*			-0.56*		
Personal Risk					0.42*	0.84*
Safety of Australian Beef						
Very Low	-2.78*		-4.51*		-3.16*	
Low		2.88*				
Moderate	1.15*	2.65*		1.22*		
High	2.75*	5.35*	3.78*	2.92*	1.06*	
Very High	2.26*	4.09*	2.90*	2.01*		
Buy Imported Beef						
No import	-3.61*	-4.88*	-4.56*	-3.29*	-2.92*	-2.34*
Prefer import						
CONSTANT	-9.63*	-20.09*	-14.45*	-10.37*	-5.66*	-2.91
R2 and Pseudo R2	0.19	0.18	0.14	0.10	0.07	0.05

Regression on Willingness to pay for Canadian Beef

	SUR	10%	25%	50%	75%	90%
Demographic						
Age	-0.02*		-0.03*			
Income						
Education	0.19*		0.26*	0.18*	0.15*	
Buy based on						
Price	0.45*		0.61*	0.74*	0.36*	
COOL	-0.28*			-0.38*	-0.37*	
Food Safety Variables						
Coincidental	-0.31*	-0.61*		-0.43*		
Personal Risk					0.42*	0.57*
Safety of Canada Beef						
Very Low						
Low		3.12*			1.63*	
Moderate	0.31*	1.77*	1.16*			
High	0.45*	3.52*	2.31*	1.94*	0.83*	
Very High	0.39*	3.06*	2.37*	1.53*	1.08*	
Buy Imported Beef						
No import	-3.14*	-4.53*	-4.17*	-2.84*	-2.27*	-1.32*
Prefer import	1.26*	1.42*				
CONSTANT	-7.30*	-12.29*	-11.13*	-7.86*	-5.80*	-1.62
Pseudo R2	0.16	0.17	0.14	0.09	0.07	0.05

Conclusion

- Is COOL a food-safety cue?

  - Evidence from this study suggest YES
  - Implied by significant coefficients on perception of food safety by country.
    - How one view the safety level of imported product significantly influenced the WTP.

  - Some who perceived they are under higher food safety risk are willing to pay more for imported beef
  - People who thinks food safety risk is coincidental tends to willing to pay less for imported beef.

- Future research
  - Why do some Americans perceived imported beef as less safe?
  - This could be address with risk communication program.

Thank you!

khlim2@uky.edu