

Comparing Contingent Valuation and Life Satisfaction Measures of Welfare: An Application to the Value of Olympic Medals

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“Feel-Good”

- Mega-events generate economic activity but the visitor spending is often offset by reduced local spending.
- Nevertheless, subsidies for mega-events have the potential to generate positive net benefits since they are unique, high profile experiences and may generate public goods such as civic pride.
- Maennig and Du Plessis (2007) and Allmers and Maennig (2009) argue that the value of civic pride and other “feel-good” forms of value be included in economic assessments of subsidies to mega-events.

CVM of Mega-Events

- Johnson (2007); Johnson and Whitehead (forthcoming)
 - Construct hypothetical policy scenarios and elicit WTP in survey settings
- Atkinson et al. (2008); Walton et al., (2008)
 - British aggregate WTP is high but falls short of the projected cost of hosting the 2012 Olympics

Temporal Reliability

- Heyne, Maennig, and Sussmuth (2009)
 - German WTP rose substantially after hosting the 2006 soccer World Cup
- Johnson et al. (2010)
 - Canadian WTP rose substantially after hosting the 2008 Winter Olympics
 - WTP for training Canadian elite athletes far exceed the costs

Life Satisfaction Method (LSM)

- $u = u(X, Y)$
- $MRS = \frac{\partial u / \partial X}{\partial u / \partial Y}$
- $LS = \alpha + \beta X + \gamma Y$
- $WTP = \frac{\beta}{\gamma}$

Benefits and Costs

- LSM > revealed preference methods
 - Does not require correlation of actual choice with amenity changes
 - Does not require market equilibrium
- LSM > stated preference methods
 - Does not require hypothetical policy scenarios and incentive compatible valuation questions
- On the other hand
 - LSM requires that simple survey questions elicit accurate measures of utility
 - Disregards the axiom that choice reveals value (Smith, 2008).

Environmental Applications

- An increasing number of applications in the environmental economics literature
- Values tend to be “too large” due to downward biased income coefficients
 - measurement error
 - relative, not absolute, income influences happiness
 - omitted variables such as lagged income

Sports Applications

- Kavetsos and Szymanski (2008)
 - 12 European countries from 1974 to 2004
 - Hosting soccer championships had a positive and significant short term effect on life satisfaction.
 - National sport success had no effect.
- Huang and Humphreys (2010)
 - U.S. data
 - Participation in sports leads to greater life satisfaction (with sports facilities as an instrumental variable)

This Paper

- First empirical comparison of CVM and LSM
- Survey before and after the 2010 Winter Olympics
- $E(\text{medals})$, WTP, LS
- Accuracy
 - Validity
 - Reliability

CVM Scenario

- Federal government spends about C\$120 million per year, or about C\$10 per household, to support athletes for both the Summer and Winter Olympic Games.
- Own the Podium program: a federal program aimed at increasing Canada's medal count in the 2010 Winter Games
 - Accounted for \$3 of annual spending per Canadian household

First Referendum

- “Suppose that continuing to use federal money to fund the training of elite athletes for the Olympic Games were put to a vote. If more than half of all voters were in favour of the proposal then it would pass. Remember, if the proposal passed a typical household would continue to pay about \$13 per year. If the proposal does not pass, the typical household would have about \$13 more to spend on other things each year. Do you think that you would vote for or against the proposal?”

Expansion of OTP

- Hypothetical scenario about expanded funding of Own the Podium for the 2014 Winter Olympic Games.
- The program would be financed by an annual income tax surcharge for three years
- They were asked if this could increase the number of medals won by Canadians in the 2014 Winter Games.
 - If they said yes, they were asked a series of follow-up questions to determine how many more total and gold medals Canadians might win.

Second Referendum

- “Suppose continuing and expanding the Own The Podium program beyond 2010 were put to a vote. If more than half of all voters were in favor of the proposal then it would pass. Remember, if the proposal passed your household would have \$A less to spend on other things each year. Do you think that you would vote for or against the proposal?”

Life Satisfaction

- “All things considered, on a scale of 1 to 10, with 1 being not satisfied at all and 10 being very satisfied, how satisfied are you with your life as a whole these days?”

Data

- Before: n=1540, 20% response rate.
- After: n=1660, 33% response rate
 - n=758 who responded to the first survey, 49% response rate
- We drop cases with missing values for CVM, LSM or income.
- Missing values for other variables were imputed with the mean from the reporting cases.
- Final sample: n=926 cases from the pre-Olympic survey; n=1236 cases from the post-Olympic survey.

Table 1. Summary Statistics

	Pre Olympics		Post Olympics	
Variable	Mean	Std.Dev.	Mean	Std.Dev.
BOTH	0.50	0.50	0.43	0.50
FOR	0.59	0.49	0.60	0.49
SATISFY	2.48	1.35	2.57	1.34
TAX	31.88	19.99	55.56	35.19
GOLD	11.75	6.21	15.54	2.87
OTHMEDAL	18.20	6.01	13.40	2.94
AGREE	15.47	5.25	11.03	3.36

Table 2. Willingness-to-pay Frequencies

	Pre Olympics Survey	Post Olympics Survey
Tax	% For	% For
5	65%	
10	67%	
15		74%
20	65%	
25		69%
30-50	~50%	
35-65	~49%	~59%
75-150		~50%

Table 3. Life Satisfaction Frequencies

	Pre Olympics		Post Olympics	
Satisfy	Frequency	Percent	Frequency	Percent
4	303	33%	410	35%
3	154	17%	213	18%
2	252	27%	292	25%
1	116	13%	127	11%
0	101	11%	122	10%

Table 4. Probit Willingness-to-pay Models

	Pre-Olympics		Post-Olympics		Panel (Both=1)		Pooled (Both=0)	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	-3.866	-7.234	-4.954	-8.889	-5.349	-6.037	-3.914	-8.394
TAX	-0.007	-2.934	-0.006	-5.327	-0.009	-3.466	-0.006	-5.102
GOLD	0.112	10.595	0.157	8.966	0.198	8.864	0.112	9.956
OTHMEDAL	0.054	5.216	0.120	7.244	0.108	6.766	0.068	6.078
AGREE	0.026	2.713	0.065	5.037	0.063	3.657	0.029	2.942
INCOME	0.007	4.946	0.008	6.173	0.009	3.916	0.008	6.536
BOTH	0.135	1.437	0.022	0.263				
POST					0.068	0.402	0.195	1.652

Table 5. OLS Life Satisfaction Models

	Pre Olympics		Post Olympics		Panel (Both=1)		Pooled (Both=0)	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	-0.026	-0.060	-0.525	-1.159	0.388	0.695	0.487	0.959
GOLD	0.002	0.219	0.044	3.263	0.004	0.481	0.005	0.521
OTHMEDAL	-0.003	-0.415	-0.008	-0.608	-0.002	-0.243	-0.014	-1.392
AGREE	0.009	1.063	-0.004	-0.372	0.017	1.714	0.017	1.643
INCOME	0.006	5.452	0.003	2.882	0.005	3.738	0.006	4.839
BOTH	0.174	2.108	0.207	2.722				
POST					0.124	1.495	0.066	0.621

Table 6. CVM Willingness-to-pay Estimates

	Pre-Olympics		Post-Olympics		Panel (Both=1)		Pooled (Both=0)	
	WTP	S.E.	WTP	S.E.	WTP	S.E.	WTP	S.E.
GOLD	16.55	5.90	25.60	5.49	21.05	5.90	17.93	3.94
OTHMEDAL	8.00	3.09	19.53	4.41	11.45	3.42	10.99	2.75

Table 6. LSM Willingness-to-pay Estimates (\$1000)

	Pre-Olympics		Post-Olympics		Panel (Both=1)		Pooled (Both=0)	
	WTP	S.E.	WTP	S.E.	WTP	S.E.	WTP	S.E.
GOLD	0.24	1.12	14.09	6.70	0.78	1.64	0.82	1.59
OTHMEDAL	-0.47	1.13	-2.51	4.19	-0.41	1.69	-2.35	1.74

Accuracy

	CVM	LSM
Convergent Validity	No	No
Internal Validity	Yes	No
Temporal Reliability	Yes	No

Conclusions

- We find that CVM produces generally valid and reliable estimates, but LSM does not.
- These results suggest that LSM may not be an appropriate approach for estimating the value of the public goods benefits generated by sporting events.

Caveats

- Large national surveys may be required to detect the happiness effects of sports.
- Our results may also suffer from omitted variable bias as spatially related variables should be included in the life satisfaction models.

Future Research

- Future research that addresses measurement of the marginal utility of income seems paramount.
- Future sports applications should include:
 - effects of professional team movement and construction of new stadiums and arenas on life satisfaction using large national datasets with spatial and temporal variation (e.g., General Social Survey).
 - attempts to value sports-related and other amenities using the life satisfaction approach should consider an investigation of the validity and reliability of estimates.
 - consideration of the convergent validity of the LSM with RP and SP methods.