

環境評估理論與模型
Theory and Models of Environmental Evaluation
627 M1500
九十七學年度第二學期

授課老師：吳珮瑛

農業綜合館 214 室，3366-2663

e-mail:piwu@ntu.edu.tw

網頁：<http://www.agec.ntu.edu.tw/faculty/wpi/>

授課對象：碩士班、博士班

學分：3 學分(半年、選修)

課程目的：本課程主要目的是介紹評估環境資源的價值與效益之基本理論與模型，並列舉實證應用這些理論與模型於各種環境資源評估的方法、結果與分析。同時亦歸納各種應用的困難及未來發展方向。課程內容分為四大部份，第一部份介紹評估環境資源價值與效益在公共決策中之目的。第二部份介紹效益價值評估的基本理論。第三部份為環境資源評估的主要模型，分為市場、替代市場與假設市場三大類，同時也將討論，如果不是利用前述任何方法進行特定對象的評估，如何借用過去已完成之評估結果，推估所關心的環境資源財貨價值之效益移轉方法。第四部份為各類評估模型與理論之應用，應用對象為各種沒有市場價格之資源的價值評估，如自然景觀、國家公園、生物多樣性、環境美質、食品安全、業餘運動與休閒計畫、現在最熱門的議題如氣候變遷的影響、甚至 AIDS 疫苗等等。此外，這些理論與方法之應用，亦廣及環境污染改善效益之評估，與天然資源損害之評估。

課程要求：（一）各種評估方法應用研究分享

每人（組）自行選擇數篇與本課程第四部分有相關的內容以本課程所提及的任何環境自然資源財貨，採用本課程所涵蓋的評估理論與/或方法，由國內外期刊論文（國內外之研究成果都要有，不可全為國內期刊文章，或是全為國外期刊文章），由每人（組）輪流擔任主講，向大家介紹相關文獻的重點，評述這些文章可能進一步發展的空間與方向，並帶引大家一起討論。

這一部份的工作分成兩階段進行：

第一階段：

每人（組）輪流上台擔任主講，每人（組）上台的人

(組)次待修課人數確定後再決定。由於是集合雷同或是不同的文章數篇，故可以進行比較與對照。擔任主講時，視每人(組)的習慣與需要而決定是否要用 powerpoint。文章完成後請於上台報告至少一個星期前給我一份，我將影印給大家。

第二階段：

繳交一份所主講之所有主題文獻的簡介與評論 (critique) 內容最多 8 頁 (12 號字，單行)。簡介要以自己對所選文獻的瞭解，要以自己的文字寫出來，不要重述文獻現成的摘要，而評論則更是要彙整自己的對這些文獻的正負面評價。短文寫作格式請參閱吳珮瑛，2000。「『農業經濟叢刊』格式說明」，『農業經濟叢刊』。6 卷，1 期，143-160。

(二) 學期考試

涵蓋一學期所講授的全部內容。

(三) 實證操作

若時間許可，將利用課堂上所講的模型，配合現成的資料 (將會發給同學)，實際操作並感覺各模型的使用及使用後的結果。

主要用書：Boadway, Robin W. and Neil Bruce, 1984, *Welfare Economics*, New York: Basil Blackwell. (茂昌圖書公司) (置於總圖指定閱讀書單)

Freeman, A. M., 2003. *The Measurement of Environmental and Resource Value: Theory and Methods*. Second Edition. Washington, D. C.: Resources for the Future. (置於總圖指定閱讀書單)

Just, R. E., D. L. Hueth, and A. Schmitz, 2004. *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*. Cheltenham, UK: Edward Elgar. (置於總圖指定閱讀書單)

吳珮瑛，2009。『環境與自然與資源值多少？效益價值衡量之概念、理論、方法與應用』。台中：新新台灣文化教育基金會/台北：翰蘆圖書出版公司。

陳明健編，2003。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。

蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，2002。『環境保護之成本效益分析：理論、方法與應用』。台北：俊傑書局。

閱讀文獻：詳見文獻目錄 (除了前述所列課本上之章節外，每一位同學將能取得其他所有在期刊上的文章光碟一份)。

評分標準：	1.學期考試	50%
	2.各種評估方法應用研究分享	50%
	口頭報告	60%
	書面報告	40%

課程綱要：

I. 環境資源之評估與公共政策

- 柏拉圖準則 (Pareto criterion)
- 補償原則 (compensation principle)
- 潛在柏拉圖改善 (potential Pareto improvement)
- 柏拉圖安全 (Pareto safety)
- 社會福利函數 (social welfare function)

II. 經濟價值與效益衡量之基本理論

1. 環境資源經濟價值之哲學觀與內涵
 - 人類中心主義之環境倫理觀
 - 非人類中心主義之環境倫理觀
 - 修正人類中心之環境倫理觀
2. 環境資源總價值之成分與內涵
3. 個體經濟學對偶理論之回顧
4. 效用變動的貨幣衡量指標
 - 價格改變的福利衡量指標
 - 數量與品質改變之效益衡量指標
 - 願意支付額度與願意接受額度的關係
 - 各種福利衡量的真確值與近似值
 - 利用Hausman's 方式求算福利的真確值
 - 利用直接效用函數求算福利的真確值
 - 利用間接效用函數求算福利的真確值
 - 如何以Willig方式得知近似福利值之優劣
5. 多面向政策變動之效益衡量

III. 衡量與評估環境變動與自然資源效益的各種方法

1. 市場評估法
 - 市場評估法之基本概念
 - 市場價值之計算
2. 替代市場評估法
 - 旅行成本法 (travel cost method)
 - 特徵價格法 (hedonic price method)
3. 假設市場評估法 (hypothetical market valuation method)
 - 條件評估法 (contingent valuation method)
 - 聯合分析法 (conjoin analysis)
4. 效益移轉 (benefit transfer)
 - 直接效益移轉 (direct benefit transfer)
 - 效益函數移轉 (benefit function transfer)
 - 統合效益移轉 (meta benefit analysis)

IV. 各種評估方法之應用

1. 生命價值之評估
2. 降低死亡風險之願付價格的評估
3. 改善健康之效益評估
4. 水質改善之效益評估

5. 空氣污染改善之效益評估
6. 機場噪音改善之效益評估
7. 各種污染改善對農業效益之評估
8. 廢木料回收的價值評估
9. 遊憩效益之福利評估
10. 生活品質改善之效益評估
11. 稀有及野生動植物保存之效益評估
12. 保護海獅及大象等動物之效益評估
13. 生態維護之效益評估
14. 野生動物觀賞旅遊對保育生物多樣性價值的評估
15. 美質與能見度改善之效益評估
16. 濕地資源之經濟價值評估
17. 天然資源損害之經濟價值評估
18. 生態旅遊需求之效益評估
19. 都市林的景觀美值效益評估
20. 國家公園價值之評估
21. 農業景觀維護之效益評估
22. 熱帶雨林價值之評估
23. 文化資產價值之評估
24. 生物多樣性價值之評估
25. 河川水流再生價值之評估
26. 食品安全價值的評估
27. 滑雪纜車票價的評估
28. 業餘運動與休閒計畫的價值評估
29. 氣候變遷對房價影響的評估
30. 居民對社區林業價值的評估
31. 對HIV與AIDS疫苗願付價值的評估

閱讀文獻：

I. 環境資源之評估與公共政策

- 1-1 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，第2章。
- 1-2 Boadway and Bruce, Chapters 1, 2, 3, 5, 6.
- 1-3 Just, Hueth, and Schmitz, Chapters, 1, 2, 3.

II. 經濟價值與效益衡量之基本理論

- 2-1 吳珮瑛，第1、2、3、4、5章。
- 2-2 劉錦龍，1999。「評『多環境品質改善之效益分析：各種福利衡量指標之比較』」，『經濟論文』。27卷4期，543-559。
- 2-3 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，第2章。
- 2-4 Adamowicz, W. L., J. J. Fletcher, and T. Graham-Tomasi, 1989. "Functional Form and the Statistical Properties of Welfare Measures," *American Journal of Agricultural Economics*, 70:414-421.
- 2-5 Bateman, I. J., B. H. Day, S. Georgiou, and I. Lake, 2006. "The Aggregation of Environmental Benefit Values: Welfare Measures, Distance Decay and Total WTP," *Ecological Economics*, 60: 450-460.
- 2-6 Blackorby, C. and D. Donaldson, 1990. "A Review Article: The Case Against the Use of the Sum of Compensating Variations in Cost-Benefit Analysis," *Canadian Journal of Economics*, 23:471-494.
- 2-7 Boadway and Bruce, Chapters 7, 8, 9.
- 2-8 Bockstael, N. E. and K. E. McConnell, 1980. "Calculating Equivalent and Compensating Variation for Natural Resource Facilities," *Land Economics*, 56:56-63.
- 2-9 Brookshire, D. S., A. Randall, and J. R. Stoll, 1980. "Valuing Increments and Decrements in Natural Resource Flows," *American Journal of Agricultural Economics*, 62:478-488.
- 2-10 Cameron, T. A., 1992. "Nonuser Resource Values," *American Journal of Agricultural Economics*, 74: 1133-1137.
- 2-11 Chipman, J. S. and J. C. Moore, 1980. "Compensating Variation, Consumer's Surplus, and Welfare," *American Economic Review*, 70:933-949.
- 2-12 Cicchetti, C. J. and L. L. Wilde, 1992. "Uniqueness, Irreversibility, and the Theory of Nonuse Values," *American Journal of Agricultural Economics*, 74: 1121-1125.
- 2-13 Currie, J. M., J. A. Murphy, and A. Schmitz, 1971. "The Concept of Economic Surplus and Its Use in Economic Analysis," *The Economic*

Journal, 81:741-799.

- 2-14 Dodgson, J. S., 1983. "Compensating and Equivalent Variation Measures of Investment Benefits with Multiple Price Changes," *Public Finance*, 38: 16-26.
- 2-15 Dubourg, W. R., M. W. Jones-Lee, and G. Loomes, 1994. "Imprecise Preferences and the WTP-WTA Disparity," *Journal of Risk and Uncertainty*, 9:115-133.
- 2-16 Freeman, Chapters 1, 2, 3, 4, 5, 8.
- 2-17 Hausman, J. A., 1981. "Exact Consumer's Surplus and Deadweight Loss," *American Economic Review*, 71:662-676.
- 2-18 Hicks, J., 1943. "The Four Consumer's Surpluses," *Review of Economics and Statistics*, 11:31-41.
- 2-19 Hoehn, J. P., 1991. "Valuing the Multidimensional Impacts of Environmental Policy: Theory and Methods," *American Journal of Agricultural Economics*, 73:289-299.
- 2-20 Just, Hueth, and Schmitz, Chapter 5, 6.
- 2-21 Krutilla, J. V., 1967. "Conservation Reconsidered," *American Economic Review*, 57:777-786.
- 2-22 Larson, D. M., 1992. "Can Nonuse Value Be Measured from Observable Behavior?" *American Journal of Agricultural Economics*, 74:1114-1120.
- 2-23 Lazo, J. K., W. D. Schulze, G. H. McClelland, and J. K. Doyle, 1992. "Can Contingent Valuation Measure Nonuse Values," *American Journal of Agricultural Economics*, 74:1126-1132.
- 2-24 McKenzie, G. W., 1979. "Consumer's Surplus Without Apology: Comment," *American Economic Review*, 69:465-468.
- 2-25 Nunes, P.A. L. D. and L. C. J. M. van den Bergh, 2001. "Economic Valuation of Biodiversity: Sense or Nonsense," *Ecological Economics*, 39: 203-222.
- 2-26 Plott, C. R. and K. Zeiler, 2005. "The Willingness to Pay-Willingness to Accept Gap, the "Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations," *American Economic Review*, 95:530-545.
- 2-27 Plottu, E. and Béatrice Plottu, 2006. "The Concept of Total Economic Value of Environment: A Reconsideration within a Hierarchical Rationality," *Ecological Economics*, 61: 52-61.
- 2-28 Pollak, R. A., 1991. "Welfare Comparisons and Situation Comparisons," *Journal of Econometrics*, 50:31-48.

- 2-29 Quiggin, J., 1998. "Existence Value and the Contingent Valuation Method," *Australian Economic Papers*, 37:312-329.
- 2-30 Randall, A. and J. Stoll, 1980. "Consumer's Surplus in Commodity Space," *American Economic Review*, 70:449-455.
- 2-31 Randall, A., 1991. "Total and Nonuse Values," in John B. Braden and Charles D. Kolstad, eds., *Measuring the Demand for Environmental Quality*. Amsterdam, The Netherlands: North-Holland.
- 2-32 Randall, A., 2004. 「Pricing the Outputs of Multifunctional Agriculture」, 『農業經濟叢刊』。9卷1期, 1-25。
- 2-33 Shechter, M., B. Reiser, and N. Zaitser, 1998. "Measuring Passive Use Value," *Environmental and Resource Economics*, 12: 457-478.
- 2-34 Smith, V. K., 1983. "Non-use Values in Benefit-Cost Analysis and the Treatment of Option Value," *Southern Economic Journal*, 54:19-26.
- 2-35 Smith, V. K., 1983. "Option Value: A Conceptual Overview," *Southern Economic Journal*, 49:654-668.
- 2-36 Van Kooten, G. C., 1988. "Economic Impacts of Supply Management: Review and Comparison of Alternative Measures of Consumer Welfare Loss," *Canadian Journal of Agricultural Economics*, 36: 425-441.
- 2-37 Veisten, K., H. F. Hoen, S. Navrud, and J. Strand, 2004. "Scope Insensitivity in Contingent Valuation of Complex Environmental Amenities," *Journal of Environmental Management*, 73: 317-331.
- 2-38 Willig, R. D., 1976. "Consumer's Surplus Without Apology," *American Economic Review*, 66:589-597.

III. 衡量與評估效益的各種方法

- 3-1 吳珮瑛, 第6、7、8、9、10、11、12、13、14、15、16章。
- 3-2 陳凱俐、吳珮瑛, 2003. 「非市場財貨的價值衡量方法」, 刊於陳明健編。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北: 雙業書廊。
- 3-3 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪, 第6、7、8章。
- 3-4 Anderson, G. D. and R. C. Bishop, 1986. "The Valuation Problem," in *Natural Resource Economics: Policy Problem and Contemporary Analysis*, pp. 89-137, edited by Daniel W. Bromley, Boston, Mass., Kluwer Nijhoff Publishing.
- 3-5 Arrow, K., R. Solow, E. Leamer, P. Portney, R. Randner, and H. Schuman, 1993. "Report of the NOAA Panel on Contingent Valuation," *Federal Register*, 58: 4600-4614.

- 3-6 Barton, D. N. and S. Mourato, 2003. "Transferring the Benefits of Avoided Health Effects from Water Pollution between Portugal and Costa Rica," *Environment and Development Economics*, 8: 351-371.
- 3-7 Bartik, T. J., 1987. "The Estimation of Demand Parameters in Hedonic Price Models," *Journal of Political Economy*, 95:81-88.
- 3-8 Bateman, I. J., I. H. Langford, A. P. Jones, and G. N. Kerr, 2001. "Bound and Path Effects in Double and Triple Bounded Dichotomous Choice Contingent Valuation," *Resource and Energy Economics*, 23: 191-213.
- 3-9 Bergstrom, J. C. and L. O. Taylor, 2006. "Using Meta-Analysis for Benefits Transfer: Theory and Practice," *Ecological Economics*, 60: 351-360.
- 3-10 Boyle, K.J. and J. C. Bergstrom, 1992. "Benefit Transfer Studies: Myths, Pragmatism, and Idealism," *Water Resource Research*, 28: 657-663.
- 3-11 Brander, L. M., R. J. G. M. Glorax, and J. E. Vermaat, 2006. "The Empirics of Wetland Valuation: A Comprehensive Summary and a Meta-Analysis of the Literature," *Environmental & Resource Economics*, 33: 223-250.
- 3-12 Brown, J. N. and H. S. Rosen, 1982. "On the Estimation of Structural Hedonic Price Models," *Econometrica*, 50:765- 768.
- 3-13 Cameron, T. A., 1988. "A New Paradigm for Valuing Non-market Goods Using Referendum Data: Maximum Likelihood Estimation by Censored Logistic Regression," *Journal of Environmental Economics and Management*, 15:355-379.
- 3-14 Cameron, T. A. and J. Quiggin, 1994. "Estimation Using Contingent Valuation Data from a "Dichotomous Choice with Follow-Up" Questionnaire," *Journal of Environmental Economics and Management*, 27:218-234.
- 3-15 Carson, R. T., 2000. "Contingent Valuation: A User's Guide," *Environmental Science and Technology*, 34:1413-1418.
- 3-16 Champ, P. A. and R. C. Bishop, 2006. "Is Willingness to Pay for a Public Good Sensitive to the Elicitation Format?" *Land Economics*, 82(3): 162-173.
- 3-17 Concu, G. B., 2007. "Investigating Distance Effects on Environmental Values: A Choice Modelling Approach," *The Australian Journal of Agricultural and Resource Economics*, 51; 175-194.
- 3-18 Cropper, M., L. D. Deck, and K.E. McConnell, 1988. "On the Choice of Functional Forms for Hedonic Price Functions," *Review of Economics and Statistics*, 70:668-675.
- 3-19 DeSerpa, A. C., 1971. "A Theory of the Economics of Time," *Economic Journal*, 81:828-846.
- 3-20 Desvousges, W. H., M. C. Naughton, and G. R. Parsons, 1992. "Benefit

Transfer: Conceptual Problems in Estimating Water Quality Benefits Using Existing Studies,” *Water Resources Research*, 28: 675-683.

- 3-21 Dziegielewska, D. A. and R. Mendelsohn, 2007. “Does ‘No’ Mean ‘No’? A Protest Methodology,” *Environmental Resource Economics*, 38: 71-87.
- 3-22 Eulàlia, D. –M., 2001. “Alternative Approaches to Obtain Optimal Bid Values in Contingent Valuation Studies and to Model Protest Zeros: Estimating the Determinates of Individuals’ Willingness to Pay for Home care services in Day Case Surgery,” *Health Economics*, 10: 101-118.
- 3-23 Freeman, Chapters 10, 11, 12, 13.
- 3-24 Freeman, A. M., III, 1979. "Hedonic Prices, Property Values and Measuring Environmental Benefits: A Survey of the Issues," *Scandinavian Journal of Economics*, 81:154-173.
- 3-25 Garrod, G. D. and K. G. Willis, 1997. “The Non-use Benefits of Enhancing Forest Biodiversity: A Contingent Ranking Study,” *Ecological Economics*, 21: 45-61.
- 3-26 Glass, G., 1976. “Primary, Secondary and Meta-analysis of Research,” *Educational Researcher*, 5: 3-8.
- 3-27 Green, P. E. and V. Srinivasanm, 1990. “Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice,” *Journal of Marketing*, 54: 3-19.
- 3-28 Guria, J. J. Leung, M. Jones-Lee, and G. Loomes, 2006. “The Willingness to Accept Value of Statistical Life Relative to the Willingness to Pay Value: Evidence and Policy Implications,” *Environmental & Resource Economics*, 32: 113-127.
- 3-29 Hanemann, W. M., 1984. "Welfare Evaluations in Contingent Valuation Experiments with Discrete Responses," *American Journal of Agricultural Economics*, 66:332-341.
- 3-30 Hanemann, M., J. Loomis, and B. Kanninen, 1991. "Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation," *American Journal of Agricultural Economics*, 73:1255-1263.
- 3-31 Heberlein, T. A., M. A. Wilson, R. C. Bishop, and N. C. Schaeffer, 2006. “Rethinking the Scope Test as a Criterion for Validity in Contingent Valuation,” *Ecological Economics*, 50: 1-22.
- 3-32 Herriges, J. A. and J. F. Shogren, 1996. “Starting Point Bias in Dichotomous Choice Valuation with Follow-up Questioning,” *Journal of Environmental Economics and Management*, 30(1): 112-131.
- 3-33 Iovanna, R. and C. Griffiths, 2006. “Clean Water, Ecological Benefits, and Benefits Transfer: A Work in Progress at the U. S. EPA,” *Ecological Economics*, 60: 473-482.

- 3-34 Jiang, Y., S. K. Swallow, and M. P. Mcgonagle, 2006. "Context-Sensitive Benefit Transfer Using Stated Choice Models: Specification and Convergent Validity for Policy Analysis," *Environmental & Resource Economics*, 31: 477-499.
- 3-35 Just, Hueth, and Schmitz, Chapter 13.
- 3-36 Johnson, K. and K. Button, 1997. "Benefit Transfers: Are They a Satisfactory Input to Benefit Cost Analysis? An Airport Noise Nuisance Case Study," *Transportation Research Part D: Transport and Environment*, 2: 223-231.
- 3-37 Kirchoff, S., B. G. Colby, and F. T. LaFrance, 1997. "Evaluating the Performance of Benefit Transfer: An Empirical Inquiry," *Journal of Environmental Economics and Management*, 33: 75-93.
- 3-38 Kling, C. L., 1997. "The Gains from Combining Travel Cost and Contingent Valuation Data to Value Nonmarket Goods," *Land Economics*, 73:428-439.
- 3-39 Kristofersson, D. and S. Navrud, 2006. "Validity Tests of Benefit Transfer: Are We Performing the Wrong Tests?" *Environmental & Resource Economics*, 30: 279-286.
- 3-40 Loomis, J., M. Creel, and T. Park, 1991. "Comparing Benefit Estimates from Travel Cost and Contingent Valuation Using Confidence Intervals for Hicksian Welfare Measures," *Applied Economics*, 23:1725-1731.
- 3-41 Loomis, J., K. Traynor, and T. Brown, 1999. "Trichotomous Choice: A Possible Solution to Dual Response Objectives in Dichotomous Choice Contingent Valuation Questions," *Journal of Agricultural and Resource Economics*, 24: 572-583.
- 3-42 Loomis, J. L. Ellingson, A. Gonzalez-Caban, A. Seidl, 2006. "The Role of Ethnicity and Language in Contingent Valuation Analysis" A Fire Prevention Policy Application," *American Journal of Economics and Sociology*, 65(3): 559-586.
- 3-43 McComb, G. V. Lantz, K. Nash, and R. Rittmaster, 2006. "International Valuation Databases: Overview, Methods and Operational Issues," *Ecological Economics*, 60:461-472.
- 3-44 Mendelsohn, R. J. Hof, G. Peterson, and R. Johnson, 1992. "Measuring Recreation Values with Multiple Destination Trips," *American Journal of Agricultural Economics*, 74:926-933.
- 3-45 Meyerhoff, J., 2006. "State Willingness to Pay as Hypothetical Behavior: Can Attitudes Tell Us More?" *Journal of Environmental Planning and Management*, 49(2): 219-226.
- 3-46 McConnell, K. E., 1992. "On-Site Time in the Demand for Recreation," *American Journal of Agricultural Economics*, 74:918-925.

- 3-47 Morrison, M. and O. Bergland, 2006. "Prospects for the Use of Choice Modelling for Benefit Transfer," *Ecological Economics*, 60: 420-428.
- 3-48 Pearce, D. and D. Moran, 1995. "Methodologies for Economic Valuation," in *The Economic Value of Biodiversity*, Chapter 5, by David Pearce and Dominic Moran, London: Earthscan Pub. Ltd.
- 3-49 Piper, S. and W. E. Martin, 2001. "Evaluating the Accuracy of the Benefit Transfer Method: A Rural Water Supply Application in the USA," *Journal of Environmental Management*, 63: 223-235.
- 3-50 Polome, P., A. van der Veen, and P. Geurts, 2006. "Is Referendum the Same as Dichotomous Choice contingent Valuation?" *Land Economics*, 82(2): 174-188.
- 3-51 Ready, R. and S. Navrud, 2006. "International Benefit Transfer: Methods and Validity Tests," *Ecological Economics*, 60: 429-434.
- 3-52 Ren, X., A. Patunru, and J. B. Braden, 2008. "Language-related Differences in Environmental Benefits Estimation: Evidence from a Mail Survey," *Contemporary Economic Policy*, 26(1): 13-31.
- 3-53 Rosen, S., 1974. "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy*, 82:34-55.
- 3-54 Scarpa, R. and I. Bateman, 2000. "Efficiency Gains Afforded by Improved Bid Design versus Follow-up Valuation Questions in Discrete-Choice CV Studies," *Land Economics*, 76: 299-311.
- 3-55 Seller, C., J. R. Stoll, and J.-P. Chavas, 1985. "Validation of Empirical Measures of Welfare Change: A Comparison of Nonmarket Techniques," *Land Economics*, 61:156-175.
- 3-56 Shrestha, R. K. and J. B. Loomis, 2003. "Meta-analytic Benefit Transfer of Outdoor Recreation Economic Values: Testing Out-of-sample Convergent," *Environment & Resource Economics*, 25: 79-100.
- 3-57 Shrestha, R. K. and J. B. Loomis, 2001. "Testing a Meta-analysis Model for Benefit Transfer in International Outdoor Recreation," *Ecological Economics*, 39: 67-83.
- 3-58 Smith, V. K., 1991. "Household Production Functions and Environmental Benefit Estimation," in John B. Braden and Charles D. Kolstad, ed., *Measuring the Demand for Environmental Quality*. Amsterdam, The Netherlands: North-Holland.
- 3-59 Stevens, T. H., T. A. More, and R. J. Glass, 1994. "Interpretation and Temporal Stability of CV Bids for Wildlife Existence: A Panel Study," *Land Economics*, 70: 355-363.
- 3-60 Su, M.-T. and P.-I. Wu, 2003. "Value of a Biological Diversity Resource: Willingness to Pay for the Black-faced Spoonbill Protected Area in

Taiwan,” Paper Presented at 2003 Taiwan-Korea International Seminar on Agricultural and Resource Economics. Taiwan : National Taiwan University , August 17-21.

- 3-61 Veisten, K., S. Navrud, J. S. Y. Valen, 2006. “Lexicographic Preference in Biodiversity Valuation: Tests of Inconsistencies and Willingness to Pay,” *Journal of Environmental Planning and Management*, 49(2): 167-180.
- 3-62 Venkatachalam, L., 2004. “The Contingent Valuation Method: A Review,” *Environmental Impact Assessment Review*, 24:89-124.
- 3-63 Vossler, C. A. and M. Mckee, 2006. “Induced-value Tests of Contingent Valuation Elicitation Mechanisms,” *Environmental & Resource Economics*, 35: 137-168.
- 3-64 Whitehead, J. C., T. C. Haab, and J. C. Huang, 1998. " Part-Whole Bias in Contingent Valuation: Will Scope Effects be Detected with Inexpensive Survey Methods?" *Southern Economic Journal*, 65: 160-168.
- 3-65 Wilson, M. A. and J. P. Hoehn, 2006. “Valuing Environmental goods and Services Using Benefits Transfer: The State-of-the Art and Science,” *Ecological Economics*, 60: 335-342.
- 3-66 Wu, P.-I. and C.-L. Huang, 2001. “Actual Averting Expenditure versus Stated Willingness to Pay,” *Applied Economics*, 33:277-283.
- 3-67 Wu, P.-I., S.-K. Wu, and S.-L. Yang, 2007. “The Consistency of the Theoretical Duality of Utility and Expenditure Interpretation and Their Empirical Implication for the DB CV Responses,” *The Empirical Economics Letters*, 6(6): 545-558.

IV. 各種評估方法之應用

- 4-1 吳珮瑛，第 17、18、19、20、21、22 章。
- 4-2 吳珮瑛、施伯宜，2003。「台灣各縣市生活品質水準之比較」，刊於陳明健編。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。
- 4-3 吳珮瑛，2003。「經濟發展與環境品質」，刊於陳明健編。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。
- 4-4 陳凱俐，2003。「台灣濕地的價值評估—生態評估與經濟評估之結合」，刊於陳明健編。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。
- 4-5 鄭蕙燕，2003。「生態資源之經濟價值」，刊於陳明健編。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。

- 4-6 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，第 11、12、13、14、15 章。
- 4-7 Adamowicz, W., P. Boxall, M. Williams, and J. Louviere, 1998. "State Preference Approaches for Measuring Passive Use Values: Choice Experiments and Contingent Valuation," *American Journal of Agricultural Economics*, 80: 64-75.
- 4-8 Alberini, A., A. Hunt, A. Markandya, 2006. "Willingness to Pay to Reduce Mortality Risks: Evidence from a Three-country Contingent Valuation Study," *Environmental & Resource Economics*, 33: 251-264.
- 4-9 Amirnejad, H., S. Khalilian, M. H. Assareh, and M. Ahmadian, 2006. "Estimating the Existence Value of North Forests of Iran by Using a Contingent Valuation Method," *Ecological Economics*, 58: 665-675.
- 4-10 Bandara, R. C. Tisdell, 2004. "The Net Benefit of Saving the Asian Elephant: A Policy and Contingent Valuation Study," *Ecological Economics*. 48: 93-107.
- 4-11 Baarsma, B., 2003. "The Valuation of the IJmeer Nature Reserve Using Conjoint Analysis," *Environmental and Resource Economists*, 25(3): 343-356.
- 4-12 Bateman, I., K. Willis, and G. Garrod, 1994. "Consistency Between Contingent Valuation Estimates: A Comparison of Two Studies of UK National Parks," *Regional Studies*, 28:457-474.
- 4-13 Blomquist, G. C., M. C. Berger, and J. P. Hoehn, 1988. "New Estimates of Quality of Life in Urban Areas," *American Economic Review*, 78:89-107.
- 4-14 Bockstael, N. E., W. M. Hanemann, and C. L. Kling, 1987. "Estimating the Value of Water Quality Improvements in a Recreational Demand Framework," *Water Resources Research*, 23:951-960.
- 4-15 Boyle, K. J. and R. C. Bishop, 1987. "Valuing Wildlife in Benefit-Cost Analysis: A Case Study Involving Endangered Species," *Water Resources Research*, 23:943-950.
- 4-16 Brookshire, D. S., C. I. Berry, and W. D. Schulze, 1976. "The Valuation of Aesthetic Preferences," *Journal of Environmental Economics and Management*, 3:325-346.
- 4-17 Casey, J. F., J. R. Kahn, and A. Rivas, 2006. "Willingness to Pay for Improved Water Service in Manaus Amazonas, Brazil," *Ecological Economics*, 58: 365-372.
- 4-18 Chase, L. C., D. R. Lee, W. D. Schulze, and D. J. Anderson, 1998. "Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica," *Land Economics*, 74:466-482.
- 4-19 Cropper, M. L., L. Deck, N. Kishor, and K. E. McConnell, 1993. "Valuing Product Attributes Using Single Market Data: A Comparison of

- Hedonic and Discrete Choice Approaches,” *Review of Economics and Statistics*, 75: 225-232.
- 4-20 Ellingson, L. and A. Seidl, 2006. “Comparative Analysis of Non-Market Valuation Techniques for the Eduardo Avaroa Reserve, Bolivia,” *Ecological Economics*, 60: 517-525.
- 4-21 Falk, M., 2008. “A Hedonic Price Model for Ski Lift Tickets,” *Tourism Management*, 29: 1172-1184.
- 4-22 Giraud, K., B. Turcin, J. Loomis, and J. Cooper, 2002. “Economic Benefit of the Protection Program for the Steller Sea Lion,” *Marine Policy*, 26: 451-458.
- 4-23 Goldberg, I. and J. Roosen, 2007. “Scope Insensitivity in Health Risk Reduction Studies: A Comparison of choice Experiments and the Contingent Valuation Method for Valuing Safer Food,” *Journal of Risk and Uncertainty*, 34: 123-144.
- 4-24 Gossling, S., 1999. “Ecotourism: A Means to Safeguard Biodiversity and Ecosystem Functions? *Ecological Economics*, 29:303-320.
- 4-25 Graves, P., J. C. Murdoch, M. A. Thayer, and D. Waldman, 1988. "The Robustness of Hedonic Price Estimation: Urban Air Quality," *Land Economics*, 64:220-233.
- 4-26 Hanley, N., M. Whitby, and I. Simpson, 1999. “Assessing the Success of Agri-Environmental Policy in the UK,” *Land Use Policy*, 16: 67080.
- 4-27 Horton, B., G. Colarullo, I. J. Bateman, and C. A. Peres, 2003. “Evaluating Non-user Willingness to Pay for a Large-scale Conservation Programme in Amazonia: A UK/Italian Contingent Valuation Study,” *Environmental Conservation*, 30: 139-146.
- 4-28 Johnson, B. K., J. C. Whitehead, D. S. Mason, G. J. Walker, 2007. “Willingness to Pay for Amateur Sport and Recreation Programs,” *Contemporary Economic Policy*, 25(4): 553-564.
- 4-29 Kim, Y.-S. and R. L. Johnson, 2002. “The Impact of Forests and Forest Management on Neighboring Property Values,” *Society and Natural Resources*, 15: 887-901.
- 4-30 Kopp, R. J. and A. J. Krupnick, 1987. "Agricultural Policy and the Benefits of Ozone Control," *American Journal of Agricultural Economics*, 69:956-962.
- 4-31 Kotchen, M. J. and S. D. Reiling, 2000. “Environmental Attitudes, Motivations, and Contingent Valuation of Nonuse values: A Case Study Involving Endangered Species,” *Ecological Economics*, 32: 93-107.
- 4-32 Kosz, M., 1996, “Valuing Riverside Wetlands: The Case of the “Donau-Auen” National Park,” *Ecological Economics*, 16: 109-127.

- 4-33 Kramer, R. A. and D. E. Mercer, 1997. "Valuing a Global Environmental Good: U.S. Residents' Willingness to Pay to Protect Tropical Rain Forests," *Land Economics*, 73:196-210.
- 4-34 Kuriyama, K. and Y. Ishii, 2000. "Estimation of the Environmental Value of Recycled Wood Wastes: A Conjoint Analysis Study," *Journal of Forest Research*, 5(1):1-6.
- 4-35 Leggett, C. G. and N. E. Bockstael, 2000. "Evidence of the Effects of Water Quality on Residential Land Prices," *Journal of Environmental Economics and Management*, 39: 121-144.
- 4-36 Lindberg, K., R. L. Johnson, and R. P. Berrrens, 1997. "Contingent Valuation of Tourism Development with Tests of Scope and Mode Stability," *Journal of Agricultural and Resource Economics*, 22: 44-60.
- 4-37 Lim, C., 1999. "A Meta-analytic Review of International Tourism Demand," *Journal of Travel Research*, 37: 273-284.
- 4-38 Loehman, E. T., S. Park, and D. Boldt, 1994. "Willingness to Pay for Gains and Losses in Visibility and Health," *Land Economics*, 70:478-498.
- 4-39 Loomis, J., M. Lockwood, and T. DeLacy, 1993. "Some Empirical Evidence on Embedding Effects in Contingent Valuation of Forest Protection," *Journal of Environmental Economics and Management*, 24:45-55.
- 4-40 Loomis, J. P., P. Kent, L. Strange, K. Fausch, and A. Covich, 2000. "Measuring the Total Economic Value of Restoring Ecosystem Services in an Impaired River Basin: Results from a Contingent Valuation Survey," *Ecological Economics*, 33: 103-117.
- 4-41 Loomis, J. B. and D. S. White, 1996. "Economic Benefits of Rare and Endangered Species: Summary and Meta-analysis," *Ecological Economics*, 18: 197-206.
- 4-42 Loomis, J. B., L. S. Bair, and A. Gonzale-Caban, 2002. "Language-related Differences in a Contingent Valuation Study: English versus Spanish," *American Journal of Agricultural Economics*, 84: 1091-1102.
- 4-43 Maharana, I., S. C. Rai, and E. Sharma, 2000. "Valuing Ecotourism in an Sacred Lake of the Sikkim Himalaya, India," *Environmental Conservation*, 27: 269-277.
- 4-44 Mladenov, N. J. R. Gardner, N. E. Flores, J. E. Mbaiwa, G. Mmopelwa, and K. M. Strzepek, 2007. "Development Southern African, 24(3): 409-423.
- 4-45 Nelson, J. P., 1981. "Three Mile Island and Residential Property Values," *Land Economics*, 57:363-372.
- 4-46 Ojeda, M. I., A. S. Mayer, and B. D. Soloman, 2008. "Economic Valuation of Environmental Services Sustained by Water Flows in the Yaqui River Delta," *Ecological Economics*, 65: 155-166.

- 4-47 Poor, P. J., 1999. "The Value of Additional Central Flyway Wetlands: The Case of Nebraska's Rainwater Basin Wetlands," *Journal of Agricultural and Resource Economics*, 24: 253-265.
- 4-48 Powell, J. R., D. J. Allee, and C. McClintock, 1994. "Groundwater Protection Benefits and Local Community Planning: Impact of Contingent Valuation Information," *American Journal of Agricultural Economics*, 76:1068-1075.
- 4-49 Pruckner, G. K., 1994. "Agricultural Landscape Cultivation in Austria: An Application of the CVM," *European Review of Agricultural Economics*, 22: 173-190.
- 4-50 Randall, A., B. Ives and C. Eastman, 1974. "Bidding Games for Valuation of Aesthetic Environmental Improvements," *Journal of Environmental Economics and Management*, 1:132-149.
- 4-51 Rehdanz, K. and D. Maddison, 2008. "The Amenity Value of Climate to Households in Germany," *Oxford Economic Papers*, 61: 150-167.
- 4-52 Riera, P. and J. Mogas, 2004. "Finding the Social Value of Forests through Stated Preference Methods: A Mediterranean Forest Valuation Exercise," *Silva Lusitana, n^o especial*:17-34.
- 4-53 Stevens, T. H., T. A. More, and R.J. Glass, 1994. "Interpretation and Temporal Stability of CV Bids for Wildlife Existence: A Panel Study," *Land Economics*, 70:355-363.
- 4-54 Togridou, A. T. Hovardas, and J. D. Pantis, 2006. "Determinants of Visitors' Willingness to Pay for the National Marine Park of Zakynthos, Greece," *Ecological Economics*, 60: 308-319.
- 4-55 Treiman T. and J. Gartner, 2006. "Are Residents Willing to Pay for Their Community Forests? Results of a Contingent Valuation Survey in Missouri, USA," *Urban Studies*, 43(9): 1537-1547.
- 4-56 Tuan, T. H. and S. Navrud, 2007. "Valuing Cultural Heritage in Developing Countries: Comparing and Pooling Contingent Valuation and Choice Modelling Estimates," *Environmental and Resource Economics*, 38: 51-69.
- 4-57 Tyrväinen, L., 1997. "The Amenity Value of the Urban Forest: An Application of the Hedonic Pricing Method," *Landscape and Urban Planning*, 37: 211:222.
- 4-58 Tyrväinen, L. and A. Miettinen, 2000. "Property Prices and Urban Forest Amenities," *Journal of Environmental Economics and Management*, 39: 205-223.
- 4-59 von Keyserlingk, C. and B. Rhodes, 2007. "Using Contingent Valuation in Hypothetical Settings: Estimating the WTP for an HIV/AIDS Vaccine," *The Journal of Interdisciplinary Economics*, 18: 71-89.

- 4-60 Walsh, R. G., D. M. Johnson, and J. R. McKean, 1992. "Benefit Transfer of Outdoor Recreation Demand Studies, 1968-1988," *Water Resource Research*, 28: 707-713.
- 4-61 Whitehead, J. C. and T. L. Cherry, 2007. "Willingness to Pay for a Green Energy Program: A comparison of Ex-ante and Ex-post Hypothetical Bias Mitigation Approaches," *Resource and Energy Economics*, 29: 247-261.
- 4-62 Woodward, R. T. and Y.-S. Wui, 2001. "The Economic Value of Wetland Services: A Meta-analysis," *Ecological Economics*, 37: 257-270.
- 4-63 Wu, P.-I., 1998. "Economic Development and Environmental Quality: Evidence from Taiwan," *Asian Economic Journal*, 12:395-412.
- 4-64 Wu, P.-I., J.-L. Liou, and M. T. Su, 2007. "Examining Diverse View of Sustainable Development: Environmental Kuznets Curve Reaffirmation and Social Kuznets Curve Discovering," Manuscript. Department of Agricultural Economics, National Taiwan University.