

**成本效益決策分析**  
**Cost Benefit Decision Analysis**  
**627 M5260**  
**627 U1220**  
**一一〇學年上學期**

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**授課對象：**大學部三年級及以上、碩博士班與修習「環境與自然資源經濟學領域專長」的大學部學生

**學分：**上學期3學分選修課

**上課地點：**農業綜合館 農經三教室

**課程目的：**本課程將介紹成本效益分析決策的基本原理、原則與方法，同時討論成本與效益用於公部門及私部門財貨或勞務評估的差異，及其與成本有效性評估的區別。除解析成本效益分析方法用於評估公部門財貨與勞務之個案外，並特別探討相關方法用於私部門財貨、勞務及企業社會責任之評估實例。

**課程要求：**(一) 上課參與及出席：不定期點名（一次以20分計）及分組討論之參與。

(二) 分組或個人規劃一個個案（是否需分組，視最後修課人數而定）：每一組（或個人）規劃一個個案，說明你（們）進行此個案前應考慮什麼項目與因素？又相關項目是否有適當的評估方法？如有、你（們）將採用本課程講授的那一種（些）評估概念或方法完成個案中某些項目的評估？你（們）不需要找任何數據資料完成評估，除非有現成的數據資料，大家的重點是以本課程所講授的方法，規劃將執行的個案、不是真的

需要完成一個評估而後決定是否將執行該計畫。(如需分組、該如何分組、各規劃所需完成的工作，屆時將有詳細指引與說明)

(三) 學期考試：學期末考一整學期講授過的內容，主要以申論說明為主，必要時配合與課程相關的簡單計算，是否需要計算機、考前會告知同學。

### 學期分數評分標準：

上課出席	30%
分組討論、報告及參與	40%
學期考試	30%

**主要用書**(以下所列書本有相對完整的成本效益分析學理及評估相關方法；部分書本也有個案，列於各主題下，是更多來自期刊文章的個案，以下所列示只是一些範例、然不限於這些範例、尚有更多，一篇文章雖列於某主題下，然可能亦橫跨於兩個及以上的主題)

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。

James, David and Herminia A. Francisco, ed. 2015. *Cost-benefit Studies of Natural Resource Management in Southeast Asia*. Singapore: Springer. 學校有電子圖書。

Organization for Economic Co-operation and Development (OECD), 2018. *Cost-Benefit Analysis and the Environment: Further Developments and Policy Use*. Paris: Organization for Economic Co-operation and Development Publishing. 學校有電子圖書。

上課講義與所發的相關文章。

接續列示的文獻如來自前述所列書本，則僅作者、年份及章節數，且一律列於各主題第一筆。

## 上課規矩：

另頁將有詳細規定，第一次上課講解，疫情其間，上課相關規定原則上依循學校所定的規則；又前三週的遠距上課方式如下頁所列。

## 課程綱要：

1. 成本效益分析之源起、意義、主要步驟(執行成本效益分析主要元素)
2. 成本效益分析之概念基礎
3. 成本效益分析背後之經濟學原理
4. 除成本效益分析外的其他決策方法(官僚體系如何看待成本效益分析)
5. 何謂環境或自然資源之效益(價值)？
6. 成本與效益之分配
7. 面對風險與不確定性的考量——敏感度分析
8. 成本效益分析選擇不同折現率的意義
9. 效益及損害評估之市場價值評估方法
10. 效益及損害評估之替代市場價值評估法
11. 效益及損害評估之假設市場(非市場)價值評估法
12. 環境成本或效益評估案例
  - 農業生態、文化多功能與田園自然景觀價值評估
  - 生態服務系統(包括森林、國家公園、濕地、保護區等)價值評估
  - 永續發展與自然資本價值評估
  - 能源及再生能源之社會成本及效益評估
  - 碳的社會成本(social cost of carbon)之評估
  - 灌溉水資源、地下水維護與集水區價值評估
  - 道路與交通運輸建設效益評估
  - 食品安全與食品特徵價值評估
  - (農)產品標示價值評估

- 觀光遊憩休閒價值評估
- 健康與生命價值評估 (value of statistical life, VSL)
- 企業社會責任的價值評估 (social return on investment, SROI)

## 以下是供同學下載 U-meeting 軟體及 如何進入前三週上『成本效益決策分析』之 ID 說明

各位同學！

我已排定第一、二及三週上課，請記下各週上課 ID，每週均不同：

課程名稱及課號：成本效益決策分析（627 M5260；627 U1220）

每週實際上課時間是下午 2:20 至 5:20，開設時間稍早、結束時間稍晚，是給同學可經由此 ID、遠距交換訊息或聊天，一旦開設即可進入，然過了時間該 ID 就關了，無法進入。

ID 開放時間：2021/09/28 14:00 ~ 2021/09/28 18:00

ID 開放時間：2021/10/05 14:00 ~ 2021/10/05 18:00

ID 開放時間：2021/10/12 14:00 ~ 2021/10/12 18:00

如果你的電腦尚未安裝 U-meeting，請先選此連結

<http://u.cyberlink.com/download>

請用學校計算機中心帳密登錄，如此才可連續看，否則半小時會被切掉。

如您的電腦已安裝 U-meeting，在畫面呈現請你輸入 ID 時，請將下面相關週數的 ID 貼入，請注意、每週的 ID 都不同，我開設後才會有 ID，我先將這三週的 ID 開設好如下：

**2021/09/28 日的 ID：**

<https://u.cyberlink.com/meeting/146775263>

會議（上課） ID：146-775-263

**2021/10/05 日的 ID：**

<https://u.cyberlink.com/meeting/377230729>

會議（上課） ID：377-230-729

**2021/10/12 日的 ID：**

<https://u.cyberlink.com/meeting/621595367>

會議（上課） ID：621-595-367

### 其他注意事項：

†第一、二、三週請同學先看桌面的 ppt 聽講，可隨時插撥討論、發問（無法面對面、無法知道發言者，因此發言時請報你的名字、讓我知道是誰在發言），實體上課後我會將課綱連同 ppt 紙本印給同學，故課綱請先看 ppt，或由課程網上下載

†開鏡頭時、請呈現你本人的真實畫面，請不要呈現相片或其他貼圖

以下文獻供各位參酌、瞭解世界各國如何使用相關方法，完成成本效益評估之完整個案，或任何個案中部分效益或損害之評估，是給大家一個開頭，輕鬆閱讀、儘量理解、未有壓力！

### 1.農產業生態、文化多功能、田園自然景觀價值評估

- 1.1.朱美琴、蔡明芳，2016。「農業生態系統服務之效益評估-以台南休閒農場為例」，『首府休閒學報』，2卷，1期，39-64。
- 1.2 沈明展、林淑雯、邊泰明，2005。「台灣地區工業園區公共服務價值評估之研究」，『臺灣土地研究』，18卷，2期，49-71。
- 1.3.林正生、陳志成，2010。「農業生活文化與生態環境功能之經濟價值評估」，『農林學報』，59卷，4期，339-358。
- 1.4.胡志平，2005。「新竹科學園區設置之環境風險認知分析與價值評估」，『建築與規劃學報』，6卷，1期，63-80。
- 1.5.洪鴻智、李承嘉、詹士樑、林華慶、蕭婷允、文熾翔，2013。「水梯田濕地生態與景觀之保育與價值評估」，『臺灣土地研究』，16卷，2期，1-22。
- 1.6.陳凱俐、林雲雀、謝明修、陳琬琪、江佳玲、李家豪，2006。「水田經濟效益評估」，『宜蘭大學生物資源學刊』，3卷，1期，1-14。
- 1.7.萬鍾汶、林妙孺，2010。「消費者專業背景對基因改造產品願付價值之分析」，『生物產業科技管理叢刊』，1卷，2期，63-91。
- 1.8.熊杏華、朱博湧、曾雅榕、王若蓮，2009。「無形資產價值驅動因子之研究—以台灣生化科技產業為例」，『評價學報』，1期，29-43。
- 1.9. Bernués, A., T. Rodríguez-Ortega, F. Alfnes, M. Clemetsen, and L.O. Eik, 2015. “Quantifying the Multifunctionality of Fjord and Mountain Agriculture by Means of Sociocultural and Economic Valuation of Ecosystem Services,” *Land Use Policy*, 48:170-178.
- 1.10. Casesson, S. 2011. “The Value and Valuation of Maritime Cultural Heritage,” *International Journal of Cultural Property*, 18(1):61-80.

- 1.11. Gibbons, S., S. Mourato, and G.M. Resende, 2014. "The Amenity Value of English Nature: A Hedonic Price Approach," *Environmental and Resource Economics*, 57:175-196.
- 1.12. Hackl, F. and G. J. Pruckner, 1997. "Towards more Efficient Compensation Programmes for Tourists' Benefits from Agriculture in Europe," *Environmental and Resource Economics*, 10(2): 189-205.
- 1.13. Hanley, N., M. Whitby, and I. Simpson, 1999. "Assessing the Success of Agri-environmental Policy in the UK," *Land Use Policy*, 16(2): 67-80.
- 1.14. Moon, W. and J. W. Griffith, 2011. "Assessing Holistic Economic Value for Multifunctional Agriculture in the US," *Food Policy*, 36: 455-465.
- 1.15. Pruckner, G. K., 1994. "Agricultural Landscape Cultivation in Austria: An Application of the CVM," *European Review of Agricultural Economics*, 22: 173-190.
- 1.16. Rasul, G., 2009. "Ecosystem Services and Agricultural Land-use Practices: A Case Study of the Chittagong Hill Tracts of Bangladesh," *Sustainability: Science, Practice, & Policy*, 5(2):15-27.
- 1.17. Rogers, A. A., M. E. Kragt, F. L. Gibson, M. P. Burton, E. H. Petersen, and D. J. Pannell, 2015. "Non-market Valuation: Usage and Impacts in Environmental Policy and Management in Australia," *Australian Journal of Agricultural and Resource Economics*, 59:1-15.
- 1.18. Swallow, S. K., 2013. "Demand-side Value for Ecosystem Services and Implications for Innovative Markets: Experimental Perspectives on the Possibility of Private Markets for Public Goods," *Agricultural and Resource Economic Review*, 42(1): 33-56.
- 1.19. Swinton, S. M., F. Lupi, G. P. Robertson, and S. K. Hamilton, 2007. "Ecosystem Services and Agriculture: Cultivating Agricultural Ecosystems for Diverse Benefits," *Ecological Economics*, 64: 245-252.
- 1.20. Venn, T. J. and J. Quiggin, 2007. "Accommodating Indigenous Cultural Heritage Values in Resource Assessment: Cape York Peninsula and the Murray-Darling Basin, Australian," *Ecological Economics*, 61:334-344.
- 1.21. Voltaire, L. L. Lévi, F. Alban, and J. Boncoeur, 2017. "Valuing Cultural



World Heritage Sites: An Application of the Travel Cost Method to Mont-Saint-Michel,” *Applied Economics*, 49(16): 1593-1605.

## 2. 生態服務系統（包括森林、國家公園、濕地、保護區等）價值評估

2.1. James and Francisco, 2015. Chapter 11, 12, 13, 14.

2.2. 王怡平、邱祈榮，2017。「臺灣森林生態性服務價值估算初探」，『臺灣林業科學』，43卷，1期，3-11。

2.3. 汪大雄、王培蓉、林振榮，1999。「扇平自然教育區遊憩效益之經濟評估」，『臺灣林業科學』，14卷，4期，457-468。

2.4. 吳珮瑛、蘇明達，2001。「墾丁國家公園資源經濟效益評估——兼論資源保育之哲學觀與資源價值之內涵」，『國家公園學報』，11卷1期，1-29。

2.5. 吳珮瑛、廖珮吟，2008。「台灣主要國家公園之效益評估—納入時間成本之需求體系旅行成本法」，『農業經濟叢刊』，13卷，2期，1-44。

2.6. 陳麗琴、林俊成、張欣儀、劉瓊霖，2005。「台灣地區森林遊憩經濟價值之效益移轉」，『台大實驗林研究報告』，19卷，4期，271-279。

2.7. 陳麗琴、汪大雄、黃進睦、林國銓，2002。「福山植物園遊憩經濟效益之評估」，『台灣林業科學』，17卷，3期，375-385。

2.8. 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.

2.9. Bartczak, Anna, 2015. “The Role of Social and Environmental Attitudes in Non-market Valuation: An Application to the Bialowieza Forest,” *Forest Policy and Economics*, 50:357-365.

2.10. 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.

2.11. Bogale, A., 2011. “Valuing Natural Forest Resources: An Application of Contingent Valuation Method on Adaba-Dodola Forest Priority Area, Bale Mountains, Ethiopia,” *Journal of Sustainable Forestry*, 50:

518-542.

- 2.12.Harrison, Jane Lindsay, 2011. “Contingent Valuation Study on Willingness-to-Pay for Sustainable Forest Products,” *Journal of Environmental Assessment Policy and Management*, 12(4): 469-489.
- 2.13.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.
- 2.14.Kosz, M., 1996, “Valuing Riverside Wetlands: The Case of the ‘Donau-Auen’ National Park,” *Ecological Economics*, 16: 109-127.
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- 2.16.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.
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- 2.18.Riera, P. and J. Mogas, 2004. “Finding the Social Value of Forests through Stated Preference Methods: A Mediterranean Forest Valuation Exercise,” *Silva Lusitana, n<sup>o</sup> especial*:17-34.
- 2.19.Tyrväinen, L., 1997. “The Amenity Value of the Urban Forest: An Application of the Hedonic Pricing Method,” *Landscape and Urban Planning*, 37: 211:222.
- 2.20. Wilson, Jeffrey J., Van A. Lantz, and David A. MacLean, 2010. “A Benefit–cost Analysis of Establishing Protected Natural Areas in New Brunswick, Canada,” *Forest Policy and Economics*, 12: 94-103.

### 3.永續發展與自然資本價值評估

#### 3.1. OECD, 2018. Chapter 12

- 3.2. Aoum, Dani, 2015. "Assessing the Economic Sustainability of Managing Protected Areas Using the CVM and CBA Approaches," *Management of Environmental Quality*, 27(4): 374-389.
- 3.3. Becken, S. and D. Simmons, 2008. "Using the Concept of Yield to Assess the Sustainability of Different Tourist Types," *Ecological Economics*, 67: 420-429.
- 3.4. Dunuwila, Pasan, V.H.L. Rodrigo, and Naohiro Goto, 2020. "Improving Financial and Environmental Sustainability in Concentrated Latex Manufacture," *Journal of Cleaner Production*, 255, 120202, DOI: 10.1016/j.jclepro.2020.120202.
- 3.5. Egorova, Svetlana, Irina Bogdanovich, Natalia Kistaeva, and Anastasia Kulachinskaya, 2019. "Environmental Costs as an Indicator of Sustainable Development," *E3S Web of Conferences*, 140, 09007, DOI: 10.1051/e3sconf/201914009007.
- 3.6. Hashemi, Shervin and Siamak Boudaghpour, 2020. "Economic Analysis and Probability of Benefit of Implementing onsite Septic Tank and Resource-oriented Sanitation Systems in Seoul, South Korea," *Environmental Technology & Innovation*, 18, 100762, DOI:10.1016/j.eti.2020.100762.
- 3.7. Lynch, John, Trevor Donnellan, John A. Finn, Emma Dillon, and Mary Ryan, 2019. "Potential Development of Irish Agricultural Sustainability Indicators for Current and Future Policy Evaluation Needs," *Journal of Environmental Management*, 230:434-445.
- 3.8. Lopez, Neil Stephen, Jimwell Soliman, Jose Bienvenido Manuel Biona, and Lewis Fulton, 2020. "Cost-benefit Analysis of Alternative Vehicles in the Philippines Using Immediate and Distant Future Scenarios," *Transportation Research Part A*, 23, 102308, DOI:10.1016/j.trd.2020.102308.
- 3.9. Martin, Fernand, 1994. "Sustainability, the Discount Rate, and Intergenerational Effects within a Regional Framework," *The Annals of Regional Science*, 28:107-123.
- 3.10. Ningsih, Kustiawati, Halimatus Sakdiyah, Herman Felani, Rini Dwiastuti, and Rosihan Asmara, 2020. "Economic Valuation for Organic Farming of Dragon Fruit: Cost Benefit Analysis Approach,"

*International Conference on Environment and Technology*, 469, 012082, DOI:10.1088/1755-1315/469/1/012082.

- 3.11. Roy, M. and S. Chakraborty, 2014. "Developing a Sustainable Water Resource Management Strategy for a Fluoride-affected Area: A Contingent Valuation Approach," *Clean Technologies and Environmental Policy*, 16:341-349.
- 3.12. Suprayoga, Gede B., Martha Bakker, Patrick Witte, and Tejo Spit, 2020. "A Systematic Review of Indicators to Assess the Sustainability of Road Infrastructure Projects," *European Transport Research Review*, 12, 19, DOI: 10.1186/s12544-020-0400-6.
- 3.13. Wu, Pei-Ing, 1998. "Economic Development and Environmental Quality: Evidence from Taiwan," *Asian Economic Journal*, 12:395-412.

#### 4. 再生能源之社會成本及效益與損害評估

- 4.1. James and Francisco, 2015. Chapter 4, 6.
- 4.2. Choumert, J. and P. Phélinas, 2015. "Determinants of Agricultural Land Values in Argentina," *Ecological Economics*, 110: 134-140.
- 4.3. Hanson, E.D., B.J. Sherrick, and T. H. Kuethe, 2018. "The Changing Roles of Urban Influence and Agricultural Productivity in Farmland Price Determination," *Land Economics*, 94(2): 199-205.
- 4.3. Isgin, T. and D.L. Forster, 2006. "A Hedonic Price Analysis of Farmland Option Premiums under Urban Influences," *Canadian Journal of Agricultural Economics*, 54: 327-370.
- 4.4. Lai, Mei-Chun, Pei-Ing Wu, Je-Liang Liou, Yi Chen, and Hanhui Chen, 2019. "The Impact of Promoting Renewable Energy in Taiwan: How Much Hail Is Added to Snow in Farmland Prices?" *Journal of Cleaner Production*, 241: 118519, DOI:10.1016/j.jclepro.2019.118519.
- 4.5. Myrna, O., M. Odening, and M. Ritter, 2019. "The Influence of Wind Energy and Biogas on Farmland Prices," *Land*, 8, 19, DOI:10.3390/land8010019.
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- 4.7. Sheng, Y., T. Jackson, and K. Lawson, 2018. “Evaluating the Benefits from Transport Infrastructure in Agriculture: A Hedonic Analysis of Farmland Prices. *Australian Journal of Agricultural and Resource Economics*, 62: 237-255.
- 4.8. Spiertz, H., 2013. “Challenges for Crop Production Research in Improving Land Use, Productivity and Sustainability,” *Sustainability-Basel*, 5: 1632-1644.
- 4.9. Spiess, W.E.L., 2013. “Does Biofuel Production Threaten Food Security? In: S. Yanniotis, P. Taoukis, N. G. Stoforos, and V. T. Karathanos, (Eds.) *Advances in Food Process Engineering Research and Applications, Food Engineering Series*. New York: Springer, pp. 629-644.
- 4.10. Zhang, W. and C.J. Nickerson, 2015. “ Housing Market Bust and Farmland Values: Identifying the Changing Influence of Proximity to Urban Centers,” *Land Economics*, 91(4):605-625.

## 5. 碳的社會成本 (social cost of carbon) 之評估

- 5.1. OECD, 2018. Chapter 14.
- 5.2. Abdallah, Mohamed, Abdallah Shanableh, Ahmad Shabib, and Mohamad Adghim, 2018. “Financial Feasibility of Waste to Energy Strategies in the United Arab Emirates,” *Waste Management*, 82: 207-219.
- 5.3. Brown, P. and A. Daigneault, 2014. “Cost–benefit Analysis of Managing the Invasive African Tulip Tree (*Spathodea campanulata*) in the Pacific,” *Environmental Science & Policy*, 39:65-76.
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