

科技部人文社會科學研究中心
學術研究群成果報告

貿易、產業與公共經濟理論學術研究群

學術研究群編號：MOST 107-2420-H-002-007-MY3-SG10807

學術研究群執行期間：108 年 7 月 1 日至 109 年 6 月 30 日

學術研究群召集人：楊雅博教授

執行機構及系所：國立高雄大學經營管理研究所

中 華 民 國 109 年 7 月 31 日

補助學術研究群暨經典研讀班結案報告

貿易、產業與公共經濟理論學術研究群

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計畫召集人：楊雅博

計畫成員：楊雅博、吳世傑、蔡穎義、李仁耀、鄭義暉、
許淑嫻、蔡建樹、佘志民

兼任助理：王瑞升

中 華 民 國 109 年 7 月

補助學術研究群暨經典研讀班成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標（請說明）

說明：

2. 研究成果在學術期刊發表或申請專利等情形(請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊)

論文：已發表未發表之文稿 撰寫中 無

專書：已出版尚未出版撰寫中無

其他：研究群成員在補助期間共發表 10 篇論文。

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（敘述成果所代表之意義、價值、影響或進一步發展之可能性）。

本研究群在五年內共發表或被接受 31 篇期刊論文，其中包含 20 篇 SSCI 期刊(包含經學門 A 級：1 篇，B+ 級：6 篇，B 級：8 篇，其它：5 篇。)，TSSCI 經學門第一級：4 篇，其它期刊 7 篇。足見研究群多年的努力已達到預期提升南部地區經濟學學術研究水準的效果。

補助學術研究群暨經典研讀班成果彙整表

計畫主持人:楊雅博		計畫編號: MOST 107-2420-H-002-007-MY3-SG10807				
計畫名稱: 貿易、產業與公共經濟理論學術研究群						
		成果項目	量化	單位	質化 (說明:各成果項目請附佐證資料或細項說明,如期刊名稱、年份、卷期、起訖頁數、證號...等)	
國內	學術性論文	期刊論文		篇		
		研討會論文	2			
		專書		本		
		專書論文		章		
		其他		篇		
國外	學術性論文	期刊論文	6	篇	請參考下方欄位	
		研討會論文	2			
		專書		本		
		專書論文		章		
		其他		篇		
參與計畫人力	本國籍	教授	5	人次		
		副教授	3			
		助理教授				
		博士後研究員				
		專任助理				
	非本國籍	教授				
		副教授				
		助理教授				
		博士後研究員				
		專任助理				

其他成果

1. Wu, Shih-Jye and Chang, Yang-Ming (2020). Insecure Resources, Bilateral Trade, and Endogenous Predation: A Game-Theoretic Analysis of Conflict and Trade. *Southern Economic Journal*. (Accepted). (SSCI B+).
2. Qidi Zhang¹ and Leonard F.S. Wang and Yapo Yang² (2020). Indirect taxation with shadow cost of public funds in mixed oligopoly. *Managerial and Decision Economics*, 41(3), 415-425. (SSCI)
3. Chiang-Ming Chen, Chih-Min She and Yu-Chen Lin (2020). The effect of travel experience on price-satisfaction link - evidence from group package tours. *Current Issues in Tourism*. 23(3). 317-322 (SSCI).
4. Ku-ChuTsao, Shih-Jye Wu, Jin-Li Hu and Yan-Shu Lin (2019).Subcontracting Bargaining Power and the Trade Policy. *The Journal of International Trade & Economic Development* , 28(1), 82-100.(SSCI)
5. Sajal Lahiri, Yingyi Tsai (2019). Foreign Penetration and Domestic Competition. *Journal of Economics* 128, 27-45. (SSCI B).
6. Tsai, Ting-Chung., Cheng, Kuang-Feng., Hsu, Chu-Chuan., Tsai, Chien-Shu., Chen, Chien-chih. and Lee, Jen-Yao. (2019), Does Uniform Wage Decline the Welfare in a Budget-Constraint Mixed Market? *Modern*

	<i>Economy</i> , 10, 474-483. (EconLit)
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摘 要

「貿易、產業與公共經濟理論」研究群原先是南部地區中山大學、高雄大學、南台科技大學、高苑科技大學四所大專院校貿易、產業與公共經濟理論等領域的師生所組成的經濟學跨校研究成長社群，於 100 年 5 月成立，迄今已有 8 年多的歷史。研究社群的主要目的是希望集結南部地區在國際貿易、產業經濟學、環境經濟學、公共經濟理論等相關領域的學者，齊聚於高雄大學，每週排定固定的時間，討論除了討論上述相關領域最新的研究成果外，也希望能邀請國內外在這些領域研究傑出的學者，到本社群來分享其最新的研究成果及其研究心得，提昇南部地區經濟學相關領域的研究質量，以期縮小南北經濟學研究的差距。

本研究群在五年內共發表或被接受 31 篇期刊論文，其中包含 20 篇 SSCI 期刊(包含經學門 A 級：1 篇，B+ 級：6 篇，B 級：8 篇，其它：5 篇。)，TSSCI 經學門第一級：4 篇，其它期刊 7 篇。根據以上成果足見研究群的努力達到預期的成效，希望研究群能夠繼續獲得經費的補助，在更多及更好的期刊發表，以提升南部的研究水準。

關鍵詞：國際貿易、產業組織、公共經濟

Abstract

Trade 、 Industrial and Public Economic Theory Workshop was established in May 2011. Members in the Workshop includes the faculty members and students of National Sun Yat-Sen University, National University of Kaohsiung, Kao Yuan University, Southern Taiwan University of Science and Technology in south Taiwan. We discuss published Journal and working papers on trade 、 industrial and public economics every week. We also invited distinguished scholars in these fields to share their recently work. We expect the workshop can improve both the quantity and quality of economic research in south Taiwan.

We had published or been accepted 31 economic journal papers in 5 years, including 20 in SSCI Journals (**1 classified as level A, 6 classified as B⁺**, 8 classified as B and 5 others), 4 in TSSCI economic journals (classified as level A) and 8 in others.

Keywords : International Trade 、 Industrial Organization 、 Public Economics

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一 前言

本研究群的構想、目的及重要性如下：

(一) 背景

自 1980 年代以 Brander and Spencer 為首的學者，發表一系列以不完全競爭市場及賽局理論為分析架構的國際貿易論文以來，此一領域的研究，不但在理論上獲得許多有趣的成果，在實務上，也提供了許多關於貿易自由化及區域經濟整合相當有價值的政策涵義，因此，「策略性貿易」儼然成為國際貿易理論最重要的一支。當前「策略性貿易」的研究也不因時間已久而退色，近年來與產業經濟學理論、環境經濟理論及公共經濟理論有更加緊密的結合趨勢，而且使得相關領域的研究論文更加豐富而有趣。職是之故，本研究社團擬結合南部地區有志於研究國際貿易、產業經濟學論、環境經濟理論及公共經濟理論等相關領域的年輕學者，每週齊聚一堂，探討相關議題，以期提升南部地區經濟學的研究能量。

(二) 目的及重要性

「貿易、產業與公共經濟理論」研究群原先是南部地區中山大學、高雄大學、南台科技大學、高苑科技大學四所大專院校貿易、產業與公共經濟理論等領域的師生所組成的經濟學跨校研究成長社群，於 100 年 5 月成立，迄今已有 5 年多的歷史。研究社群的主要目的是希望集結南部地區在國際貿易、產業經濟學、環境經濟學、公共經濟理論等相關領域的學者，齊聚於高雄大學，每週排定固定的時間，討論除了討論上述相關領域最新的研究成果外，也希望能邀請國內外在這些領域研究傑出的學者，到本社群來分享其最新的研究成果及其研究心得，提昇南部地區經濟學相關領域的研究質量，以期縮小南北經濟學研究的差距。

南台灣的學術研究風氣及成果，一直被學術界公認為落後北部地區甚多，經濟學界也不例外。本研究社群的主要目的是希望集結南部地區在國際貿易、產業經濟學、環境經濟學、公共經濟理論等相關領域的學者，齊聚於高雄大學，每週排定固定的時間，討論除了討論上述相關領域最新的研究成果外，也希望能邀請國內外在這些領域研究傑出的學者，到本社團來分享其最新的研究成果及其研究

心得，提昇南部地區經濟學相關領域的研究質量，以期縮小南北經濟學研究的差距。

近年來國內外經濟學界的研究水準大幅提升，使得投稿於具水準的國內外期刊難度也愈來愈高，新進教師承受相當大的研究壓力。本研究社群由資深教授帶領，對資淺社團群成員提供研究的議題的建議，對紓緩升等壓力，提昇研究動能，可收事半功倍之效；對資深教授而言，也獲得教學相長的助益，共創「雙贏」的利益，使南部地區的經濟學研究質量更因此而獲得提升，可謂一舉多得。

二 研究群成員

「貿易與產業經濟理論」研究社群於 100 年 5 月成立，迄今已有 5 年多的歷史，是南部地區四所大專院校師生所組成的經濟學跨校研究成長社群。目前研究社群成員包括中山大學政治經濟系 1 位、高雄大學經營管理所 1 位、高雄大學應用經濟系 3 位、高雄大學應用科技大學 1 位、南台科技大學國際企業系 1 位、高苑科技大學國際商務系 1 位，共 8 位教師所組成，並邀請高雄大學經營管理所及應用經濟系幾位學生參與討論。本研究群如下表 1 所示：

表 1 研究群成員資料表

姓 名	服務單位	職 稱	社群職稱
楊雅博	高雄大學經營管理研究所	教授	召集人
吳世傑	中山大學政治經濟學系	教授	副召集人
李仁耀	高雄應用科技大學國際企業系	教授	社群成員
蔡穎義	高雄大學應用經濟學系	教授	社群成員
鄭義暉	高雄大學應用經濟學系	副教授	社群成員
蔡建樹	高苑科技大學國際商務系	副教授	社群成員
許淑嫻	南台科技大學國際企業系	副教授	社群成員

姓名	服務單位	職稱	社群職稱
余志民	高雄大學應用經濟學系	助理教授	社群成員

三 研究群的執行方式

本研究群除春節連假期間外，不分寒暑假，原則上「每週」於週一下午一時至下午四時在高雄大學經營管理研究所之管 423 教室聚會一次，每次研討時間約三小時，運作模式包括下列五種方式：

- (一) **由本研究群成員負責報告一至二篇重要文獻：**藉著研讀重要參考文獻，可增進成員對現有貿易、產業及公共經濟理論文獻及研究發展趨勢的了解，再透過彼此的腦力激盪，尋求可行的研究議題。
- (二) **由本研究群成員報告其最新的研究成果：**透過演講者的報告，聽眾的詢問，可協助釐清論文的經濟涵義，或文中存在的缺陷，有助於尋找研究主題，改善論文品質以及日後投稿學術期刊的被接受率。
- (三) **邀請國內經濟學者共同切磋並分享其最新的研究成果：**本計畫將不定期邀請國內研究表現優異的經濟學者演講，互相切磋，增進彼此的研究水準。
- (四) **邀請國際知名的經濟學者交流訪問：**邀請國際知名的經濟學者交流訪問，探索貿易、產業經濟、環境經濟、公共經濟理論的熱門議題並分享其最新的研究成果，可促進本研究群成員對上述領域熱門議題的了解，也可提昇本研究群的國際觀與研究水準。
- (五) **設立專屬網站推廣研究成果：**本計畫預定將以上四種研討項目的演講資訊與成果定期公佈於本研究群之網站（路徑：至國立高雄大學經營管理研究所網頁 <http://iem.nuk.edu.tw>，點選「學術活動/貿易、產業與公共經濟理論研究社群」），期盼與國內經濟學界共同分享與成長。

四 研究群執行收穫及成果

本研究群計畫執行一年後主要成果如下：

(一) 本研究群成員及學生負責報告重要文獻

本研究群一年內共執行 46 週，報告 49 篇文章，歷次討論文章如表 2 所示。

執行期間之簽到表與會議記錄請參考附件一。

表 2 研究群歷次討論文章

項次	日期	報告人	篇名	出處
1	2019/07/08	王瑞升	Strategic product variety and quality choice	Economics Letters 182 (2019) 10–14
2	2019/07/15	許峻瑋	Mergers of complements and entry in innovative industries	International Journal of Industrial Organization 65 (2019) 302–326
3	2019/07/22	洪子洋	Corporate social responsibility, vertical product differentiation and international competition	Review of International Economics, 27(4), 1108-1125.
4	2019/07/29	郭柔廷	The equivalence of emission tax with tax-revenue refund and emission intensity regulation	Economics Letters 182 (2019) 126–128
5	2019/08/05	陳正融	Welfare-enhancing Trade Unions in an Oligopoly with Excessive Entry	The Manchester School, 88(1), 60-90.
6	2019/08/12	洪子洋	Optimal Licensing Contract: The Implications of Preference Function	Arthaniti: Journal of Economic Theory and Practice, 19(1), 61-67.
7	2019/08/19	許峻瑋	Markets with technological progress: pricing, quality, and novelty	J Econ (2018) 124:121–137

項次	日期	報告人	篇名	出處
8	2019/08/26	王瑞升	Emission reduction and profit-neutral permit allocations	Journal of Environmental Economics and Management 93 (2019) 239–253
9	2019/09/02	郭柔廷	Multiproduct oligopoly and trade between asymmetric countries	Review of International Economics, 26(3), 524-538.
10	2019/09/09	王鳳生	Downstream Collusion under Asymmetric Costs with Network Externalities	Working paper
11	2019/09/16	陳正融	Input price discrimination in the presence of downstream vertical differentiation	Economics Letters 184 (2019) 108622
12	2019/09/23	洪子洋	Vertical integration and disruptive cross-market R&D	Journal of Economics & Management Strategy, 29(1), 51-73.
13	2019/09/30	郭柔廷	Technology licensing and innovation	Economics Letters 120 (2013) 499–502
14	2019/10/07	楊雅博	Patent Licensing from a High-Cost Firm to a Low-Cost Firm	THE ECONOMIC RECORD, VOL. 86, NO. 274, SEPTEMBER, 2010, 384–395
15	2019/10/14	許峻璋	The Nash bargaining solution in vertical relations with linear input prices	Economics Letters 145 (2016) 291–294
16	2019/10/21	王瑞升	How to Compete? Cournot versus Bertrand in a Vertical Structure with an Integrated Input Supplier	Southern Economic Journal 2019, 85(3), 796–820
17	2019/10/28	陳正融	Ad Valorem Versus Per-Unit Royalty Licensing in a Cournot Duopoly	The Manchester School 1–12 May 2019

項次	日期	報告人	篇名	出處
			Model	
18	2019/11/04	洪子洋	1. On the Licensing of Innovations under Strategic Delegation 2. Patent Licensing under Strategic Delegation	1. Working paper 2. Journal of Economics & Management Strategy, Volume 11, Number 2, Summer 2002, 225–251
19	2019/11/11	吳世傑	Internal Transfer Pricing, External Technology Licensing, and Market Performance	Working paper
20	2019/11/18	許峻瑋	International Review of Economics and Finance	International Review of Economics and Finance 29 (2014) 455–465
21	2019/11/25	王瑞升	Environmental regulation and horizontal mergers in the eco-industry	Economic theory and applications, No. 2008,46
22	2019/12/2	王光正	自費醫療與醫院的品質競爭	Working paper
23	2019/12/9	郭柔廷	Foreign direct investment, unionised labour markets and welfare	International Review of Economics and Finance 58 (2018) 330–339
24	2019/12/16	黃智楷 謝明宏	1. Labour unionisation structure and product innovation 2. Competitive persuasive advertising under consumer loss aversion	1. International Review of Economics and Finance 55 (2018) 98–110 2. Economics Letters 185 (2019) 108690
25	2019/12/23	鄭義暉	Cost pass-through, bargains, and vertical contracts	Working paper
26	2019/12/30	蔡建樹	Privatization of state holding corporations	J Econ (2017) 120:171–188
27	2020/1/6	黃聖詠、蔣宜臻	1. Optimality of Emission Pricing Policies Based on Emission	1. Working paper 2. ECONOMIC RECORD, VOL. 94,

項次	日期	報告人	篇名	出處
			Intensity Targets under Imperfect Competition 2. Technology Licensing in a Network Product Market: Fixed-Fee versus Royalty Licensing	NO. 305, JUNE, 2018, 168–185
28	2020/1/13	洪子洋	Content provision and compatibility in a platform market	Economics Letters 124 (2014) 478–481 Contents lists
29	2020/2/3	陳正融	Strategic environmental policy; eco-dumping or a green strategy?	Journal of Environmental Economics and Management 45 (2003) 692–707
30	2020/2/10	許峻瑋	Network Effects and Technology Licensing with Fixed Fee, Royalty, and Hybrid Contracts	Journal of Management Information Systems, 23(2), 91-118.
31	2020/2/17	王瑞升	Wholesale price discrimination: Innovation incentives and upstream competition	Journal of Economics & Management Strategy, 28(3), 510-519.
32	2020/2/24	郭柔廷	Trade liberalization, absorptive capacity and the protection of intellectual property rights	Review of International Economics, 26(5), 997-1020.
33	2020/3/2	洪子洋	Multi-product bargaining, bundling, and buyer power	Economics Letters 188 (2020) 108936
34	2020/3/9	陳正融	Apportioning indivisible damage and strategic diffusion of pollution abatement technology	J Econ (2019) 126:19–42
35	2020/3/16	許峻瑋	Price competition in the	J Econ (2019) 126:43–73

項次	日期	報告人	篇名	出處
			presence of a web aggregator	
36	2020/3/23	王瑞升	Consumer surplus bias and the welfare effects of price discrimination	Journal of Regulatory Economics (2019) 55:33–45
37	2020/4/13	洪子洋	Partial Privatization Policy and The R&D Risk Choice in a Mixed Duopoly Market	The Manchester School Vol 87 No. 1 60–80 January 2019
38	2020/4/20	郭柔廷	Dynamic Privatization Policy	The Manchester School Vol 87 No. 1 37–59 January 2019
39	2020/4/27	陳正融	Overlapping ownership, endogenous quality, and welfare	Economics Letters 190 (2020) 109074
40	2020/5/4	許峻瑋	Two Rationales for Insufficient Entry	The BE Journal of Theoretical Economics, 20(1).
41	2020/5/11	王瑞升	On the firstmover advantage in Stackelberg quantity games	Journal of Economics (2019) 126:249–258
42	2020/5/18	李仁耀	Optimum Discriminatory Tariffs under Oligopolistic Competition	Canadian Journal of Economics, 693-702.
43	2020/5/25	郭毓妮	Vertical integration without intrafirm trade	Economics Letters 192 (2020) 109180
44	2020/6/1	蔡冠緯	On competition and welfare enhancing policies in a mixed oligopoly	J Econ (2019) 126:259–274
45	2020/6/8	佘志民	Market structure and quality determination for complementary products: Alliances and service	International Journal of Industrial Organization 68 (2020) 102557 Contents lists

項次	日期	報告人	篇名	出處
			quality in the airline industry	
46	2020/6/15	蔡建樹	Privatization of a multi-product public firm	Asia-Pacific Journal of Accounting & Economics, 1-11.
47	2020/6/22	許淑嫻	1. Agriculture and aggregate productivity: A quantitative cross-country analysis	Journal of Monetary Economics 55,2008, 234-250
48	2020/6/29	吳世傑	Friction in Related-Party Trade When a Rival Is Also a Customer	Management Science, 54(11), 1850-1860.

(二) 邀請國內、外經濟學者互動交流

研究群邀請之國內外講員如下表 3，過程中大家討論熱烈，也收獲許多。

表 3 研究群邀請之國內外講員

來訪日期	姓名	任職單位與職稱	報告題目
2019/09/09	王鳳生	國立高雄大學榮譽講座教授	Downstream Collusion under Asymmetric Costs with Network Externalities
2019/12/2	王光正	長庚大學工商管理學系與通識中心教授兼台塑企業文物館館長	自費醫療與醫院的品質競爭

(三) 研究群成員一年來的研究成果

本研究群成員的學術研究成果如下：

- (1) 五年來發表期刊論文共31篇，SSCI經學門20篇(含A級：1篇，B⁺級：6篇，B級：8篇，其它：5篇)，TSSCI經學門第A級：4篇，其它：7篇。研討會論文共9篇。進行中論文共8篇。碩士論文5篇(進行中)。

1. Wu, Shih-Jye and Chang, Yang-Ming (2020). Insecure Resources, Bilateral Trade,

- and Endogenous Predation: A Game-Theoretic Analysis of Conflict and Trade. *Southern Economic Journal*. (Accepted). (SSCI B+).
2. Qidi Zhang¹ and Leonard F.S. Wang and Yapo Yang² (2020). Indirect taxation with shadow cost of public funds in mixed oligopoly. *Managerial and Decision Economics*, 41(3), 415-425. (SSCI)
 3. Chiang-Ming Chen, Chih-Min She and Yu-Chen Lin (2020). The effect of travel experience on price-satisfaction link - evidence from group package tours. *Current Issues in Tourism*. 23(3). 317-322 (SSCI).
 4. Ku-Chu Tsao, Shih-Jye Wu, Jin-Li Hu and Yan-Shu Lin (2019). Subcontracting Bargaining Power and the Trade Policy. *The Journal of International Trade & Economic Development*, 28(1), 82-100. (SSCI)
 5. Sajal Lahiri, Yingyi Tsai (2019). Foreign Penetration and Domestic Competition. *Journal of Economics* 128, 27-45. (SSCI B).
 6. Tsai, Ting-Chung., Cheng, Kuang-Feng., Hsu, Chu-Chuan., Tsai, Chien-Shu., Chen, Chien-chih. and Lee, Jen-Yao. (2019), Does Uniform Wage Decline the Welfare in a Budget-Constraint Mixed Market? *Modern Economy*, 10, 474-483. (EconLit)
 7. Jingjing Zhang, Riccardo Leoncini, Yingyi Tsai (2018). Intellectual property rights protection, labour mobility and wage inequality. *Economic Modelling*, 70, 239-44. (SSCI).
 8. Cheng, K.F., C.S. Tsai, C.C. Hsu, S.C. Lin, T.C. Tsai, and J.Y. Lee, (2018), Emission Tax and Compensation Subsidy with Cross-Industry Pollution, *Sustainability*, 11, 998.
 9. Chen, D., L.F.S. Wang, and J.Y. Lee, (2018), Foreign Ownership, Privatization and Subsidization with Shadow Cost of Public Funds, *North American Journal of Economics and Finance*. (SSCI)
 10. Hsu, Su-Ying and Chu-Ping Lo (2018), "Market Concentration and Licensing Royalty in Asymmetric Oligopoly," *Academia Economic Papers*, 46(4), 637-670. (TSSCI一級)
 11. Tsung-Kai Chu, Han-Yu Liu and Su-Ying Hsu (2018), "A Comparative Study of Customer Behaviors in Brand Image and Peer Pressure-the Case of S University," *Journal of Advertising and Public Relations*, 1(2), 1-8.
 12. Novak, Marko and Su-Ying Hsu (2018), "Profitability of Banks in the Serb Republic," *Applied Science and Management Research* 5(1).

13. 佘志民、楊雅博、吳世傑 (2017), 「啞鈴模型與風險趨避廠商的區位選擇」, *經濟論文*, 45:4, 頁 627-659。(TSSCI一級)
14. Hwang, Horn, Mai, Cho-Cheng, and **Wu, Shih-Jye** (2017), “Tariff escalation and vertical market structure”, *The World Economy*, Vol. 40, 1597-1613. (SSCI B+)
15. **Lee, J.Y.**, and Leonard F.S. Wang (2017), “Foreign Competition and Optimal Privatization with Excess Burden of Taxation,” *Journal of Economics*. (Accepted) (SSCI B)
16. Hsu, C.C., **J.Y. Lee** and Leonard F.S. Wang, (2017), Consumers Awareness and Environmental Policy in Differentiated Mixed Oligopoly, *International Review of Economics and Finance*, 51, 444-454. (SSCI B+)
17. Angela C. Chao, **Jen-yao Lee** and Leonard F.S. Wang (2017), “Stackelberg Competition, Innovation and Social Efficiency of Entry,” *The Manchester School*. 85(1),1-12. (SSCI, B).
18. Alireza Naghavi, Shin-Kun Peng, Yingyi Tsai* (2017). Relationship-specific Investments and Intellectual Property Rights Enforcement with Heterogeneous Suppliers. *Review of International Economics*, 25(3), 626-648. (SSCI B+)
19. Yingyi Tsai* and Arijit Mukherjee (2017). Domestic patenting systems and foreign licensing choices. *Journal of Economics*, 121 (2); 173-191. (SSCI B).
20. Lei Yang, Yingyi Tsai* and Arijit Mukherjee (2016). Intellectual Property Rights and the Quality of Transferred Technology in Developing Countries. *Review of Development Economics*, 20(1), 239-249. (SSCI B) . .
21. Lo, C. P. and Hsu, S. Y. (2016). International Outsourcing, FDI, and Middleman Strategy. *Transylvanian Review* , Vol 14 (5), 421-431.
22. Yingyi Tsai, Arijit Mukherjee, Jong-Rong Chen (2016). Host market competition, foreign FDI and domestic welfare. *International Review of Economics and Finance*, 42(1), 13-22. (SSCI, B+).
23. 蔡明芳、楊雅博, (2016)。“技術授權與最適貿易政策”, *經濟論文叢刊*, 44(4),641-658。(TSSCI 一級)。
24. Shih-Jye Wu ,Yang-Ming Chang and Hung-Yi Chen (2016). Imported Inputs and Privatization in downstream mixed oligopoly with Foreign Ownership. *Canadian Journal of Economics* 49(3),1179-1207.(SSCI A)
25. Arijit Mukherjee; Yingyi Tsai* (2015). Does two-part tariff licensing agreement enhance both welfare and profit?. *Journal of Economics*, 116 (1), 63-76. (SSCI B).

26. Alireza Naghavi, Yingyi Tsai (2015). Cross-border intellectual property rights: contract enforcement and absorptive capacity. *Scottish Journal of Political Economy*, 62(2), 211-26. (SSCI B).
27. 許淑嫻 楊雅博 胡均立，(2015)。“環境污染型式、市場集中度與環境政策”。*經濟論文*。43，45-80。(TSSCI一級)
28. Hong Hwang and Chao-Cheng Mai and Ya-Po Yang (2015), “Specific vs. Ad Valorem Strategic Export Subsidies with Taxation Distortion” *Review of Development Economics*, 19, 820-828. (SSCI B).
29. Leonard F.S. Wang, Angela C. Chao, Jen Yao Lee (2015). “R&D and Social Inefficiency of Entry.” *Journal of Industry, Competition and Trade*. 15(2) 181-187.
30. Chih-Min She (2015), “What Determines the Technology Adoption of Firms under Optimal Tax?” *International Review of Economics and Finance*, 37, 274-89. (SSCI, B+).
31. 楊雅博，許淑嫻，(2015)“開放經濟體系下之環境政策：跨界污染與區域污染”，*東吳經濟商學報* 88期 45-72.

(2)五年內研討會論文(共9篇)

1. Chih-Min She, Y. P. Yang, and Wu, Shih-Jye,(2019). “Fixed Cost, Location and Social Welfare.” 第八屆網路與貿易研討會議程,中央研究院人社中心制度與行為研究專題中心暨國立臺灣大學經濟學系。
2. Ya-Po Yang, Li-Cheng Chen (2019), Certification of Green goods and Export Policy : Tokyo 38th International Conference on “ Business, Economics, Social Science & Humanities- BESSH-2019”
3. Ya-Po Yang, Chih-Yung Wang, (2019), Trade Policies, Collusion and Welfare : Tokyo 38th International Conference on “ Business, Economics, Social Science & Humanities- BESSH-2019”
4. 楊雅博與廖鈺琳：“混合寡占與進口政策”, 2019 國際商務研討會 主辦單位：淡江大學國際企業學系
5. 吳世傑、楊雅博與余志民(2016)，啞鈴模型與風險趨避廠商的區位選擇，台

灣經濟學會2016年年會暨當代經濟議題學術研討會。

6. 余志民與楊雅博(2016)，Endogenous Location and Spatial Discrimination in Input Market with Fixed Cost，台灣經濟學會2016年年會暨當代經濟議題學術研討會。許竹筌、李仁耀與蔡建樹(2016)，Production Externality, Bargaining Wage, Pollution Tax and Compensation Schemes，台灣經濟學會2016年年會暨當代經濟議題學術研討會。
7. Chih-Min She (2016, Jul). Endogenous Location and Spatial Price Discrimination with Public Infrastructure. PET 2016 (Association of Public Economics Theory)
8. Chih-Min She and Ya Po Yang (2016)，Uniform vs Discriminatory Pricing in Spatially Separate Market. 2016 International Conference on Business and Information.
9. Wu, Shih-Jye, Che-Wen Wu, and Hung-Yi Chen, (2015) Optimal import tariff rate toward a multinational firm with alternative channels of market entry, presented at the Bilateral International Meeting of WEAI, Wellington, New Zealand-.

(3)成員進行的works in progress(working paper共8篇)

1. Ya Po Yang, Nov 2019. "On the Certification of credence in an Oligopoly market," *Working Paper*.
2. Chih-Min She, Aug 2018. "Effects of Spatial Price Discrimination with an Input Source." *Working Paper*.
3. Shih-Min She and Leonard F.S. Wang, 2019 "Market Structure, Private Goods and Public Goods"。
4. Leonard F.S. Wang. Yang, Y. P., Qidi Zhang. (2019). Ad Valorem vs. Specific Tariff, Privatization and Global Welfare
5. Leonard F.S. Wang. Yang, Y. P., Qidi Zhang. (2019), Ad Valorem vs. Specific

Tax, Privatization with Social Cost of Public Funds

6. Yang, Y. P. Leonard F.S. Wang., (2019). Strategic CSR and Trade Policies.
7. Lee, Jen-yao; Tsai, Chien-shu; Wang, Leonard,(2018), Foreign Ownership, Strategic Export Policy and Optimal Discriminatory Tariffs,
8. Su-Ying Hsu, Lo, Chu-Ping and Shih-Jye Wu, (2018) “Foreign Intermediate Market and Downstream Privatization,”。

(4)研究群培育的博碩士論文(共碩士論文5篇)

1. 王瑞升, ”環保與出口政策”, 2020 國立高雄大學經營管理碩士, 論文指導教授楊雅博。
2. 郭柔廷, ”多產品廠商與出口政策”, 2020國立高雄大學經營管理碩士, 論文指導教授楊雅博。
3. 陳正融, ”污染減排與民營化”, 2020國立高雄大學經營管理碩士, 論文指導教授楊雅博。
4. 許峻瑋, ”網路外部性混合寡占與技術授權”, 2020國立高雄大學經營管理碩士, 論文指導教授楊雅博。
5. 洪子洋, ”廠商研發, 技術授權與分權管理”, 2020國立高雄大學經營管理碩士, 論文指導教授楊雅博。

(5)成員於研究群中發表的演講

研究群成員於研究群中發表的演講如下表4, 過程中大家討論熱烈, 也獲得許多有趣的研究題材。

表 4 研究群成員於研究群中發表的演講

項次	日期	報告人	篇名	出處
1	2019/10/07	楊雅博	Patent Licensing from a High-Cost Firm to a Low-Cost Firm	THE ECONOMIC RECORD, VOL. 86, NO. 274, SEPTEMBER, 2010, 384-395
2	2019/11/11	吳世傑	Internal Transfer	Working paper

項次	日期	報告人	篇名	出處
			Pricing, External Technology Licensing, and Market Performance	
3	2019/12/23	鄭義暉	Cost pass-through, bargains, and vertical contracts	Working paper
4	2019/12/30	蔡建樹	Privatization of state holding corporations	J Econ (2017) 120:171-188
5	2020/5/18	李仁耀	Optimum Discriminatory Tariffs under Oligopolistic Competition	Canadian Journal of Economics, 693-702.
6	2020/6/8	佘志民	Market structure and quality determination for complementary products: Alliances and service quality in the airline industry	International Journal of Industrial Organization 68 (2020) 102557 Contents lists
7	2020/6/15	蔡建樹	Privatization of a multi-product public firm	Asia-Pacific Journal of Accounting & Economics, 1-11.
8	2020/6/22	許淑嫻	Agriculture and aggregate productivity: A quantitative cross-country analysis	1. A quantitative cross-country analysis. Journal of monetary economics, 55(2), 234-250. The Journal of Industrial Economics, 59(3), 484-505.
9	2020/6/29	吳世傑	Friction in Related-Party Trade When a Rival Is Also a Customer	Management Science, 54(11), 1850-1860.

五 結 論

從本研究群成員在計畫執行期間，共報告 48 篇文章，五年內共有 31 篇文章刊登或接受刊登於經濟學專業期刊，其中 SSCI 期刊有 24 篇，包括一篇刊登於 Canadian Journal of Economics，經濟學門列為 A 的期刊，以及經濟學門列為 B+ 的期刊 6 篇。在微薄的經費補下，可謂研究成果豐碩，也達到初步達到提升南部學術水準的目的。

附件一：研究群歷次會議記錄

國立高雄大學貿易與產業經濟理論討論會 報告人：王瑞升

2019/7/08

篇名	Strategic product variety and quality choice
作者	Lluís M. Granero
出處	Economics Letters 182 (2019) 10–14
摘要	We examine the linkages between strategic product assortment, quality choice, and pricing by multiproduct firms as well as the welfare effects from those linkages. The analysis shows that strategic effects can lead to relevant inefficiencies. Specifically, the analysis identifies effects which can induce insufficient or excessive product quality relative to the socially optimal level of quality.
研究動機	The previous literature has identified conditions under which markets can provide too much or too little variety. Relatively less is known about linkages between product diversity and quality choice, and about the impact of those linkages on welfare, particularly in strategic contexts. However, an analysis of those linkages is potentially relevant, at least in view of the empirical evidence of significant effects of market power on variety and quality, where some contributions have explored whether there is too much or too little product variety and have documented are lative over-provision of quality (e.g., Berry and Waldfogel, 2001, and Berry et al., 2016). Our analysis attempts to contribute to a better understanding of this evidence in a setting with multi-product firms and strategic product assortment. We consider a framework with multi-product firms that decide on price, quality, and product diversity. Our analysis builds on the spokes model of imperfect competition proposed by Chen and Riordan (2007)
模型	The setting relies on the spokes model of imperfect competition with spatial product differentiation by Chen and Riordan (2007). In the product market there are N potential varieties, where each particular variety $i = 1, \dots, N$ may or may not be supplied. Supplying a variety involves a setup cost f and, for simplicity, a zero marginal production cost. There are N spokes of length $1/2$, which start from the same central point, and there is a continuum of consumers with mass $N/2$ uniformly distributed over the N spokes. In the spatial representation of the product market, spokes are indexed $i = 1, \dots, N$, and each variety i is located in the extreme end of spoke i . As is conventional, consumer location represents the relative valuation of product variants, and each consumer has use for one unit of the good. Consumers are uniformly distributed over the network of $N(N-1)/2$ Hotelling lines of length 1. Each consumer patronizes the variety with the highest net surplus between the two varieties at the ends of the Hotelling line to which the consumer belongs. Consumers' surplus increases with the quality of the brand that they buy.

研究 結果	<p>In deciding on product assortment, each multi-product firm anticipates that new varieties reduce the demand for other varieties it already produces. In general, several effects determine whether there will be under- or over-provision of product diversity and, respectively, over- or under-provision of quality. On the one hand, relatively high expected prices induce firms to expand their product range and thus to alter quality. On the other hand, a strategic multi-product firm anticipates that its product range affects price competition.</p>
研究 貢獻	<p>Our analysis attempts to contribute to a better understanding of this evidence in a setting with multi-product firms and strategic product assortment. We consider a framework with multi-product firms that decide on price, quality, and product diversity. In our setting, each multi-product firm takes into account that introducing new varieties reduces the demand for other varieties it produces, and this leads to an incentive to refrain from expanding product assortment. In those circumstances, there will be strategic under-provision of product diversity and over-provision of quality. Additionally, the introduction of new brands can affect price competition, which is anticipated by multi-product firms in choosing product diversity, and this can induce an excessive level of quality. In contrast, when business stealing becomes dominant, firms end up choosing an insufficient level of quality.</p>
未來 研究 方向	<p>This strategic price effect can also affect product variety and quality. In particular, when the strategic price effect dominates, for high intermediate values of f the two firms have incentives to refrain from expanding their product range in order to relax price competition and then product variety becomes insufficient and quality excessive. In contrast, when business stealing dominates, for low intermediate values of f each multi-product firm produces an excessive number of brands and chooses an insufficient level of quality. Below those low intermediate values of f, if f is sufficiently low ($f \leq f_D$) then</p> <p>Firms restrict product assortment considerably in order avoid very low prices, and this can lead to a sizable over-provision of quality in the future (particularly for $f \leq f^*$).</p>

篇名	Mergers of complements and entry in innovative industries
作者	Federico Etro
出處	<u>International Journal of Industrial Organization</u> Volume 65, July 2019, Pages 302-326
摘要	I study a merger between producers of complement inputs facing potential entry, with investment by the incumbents in deterministic cost reduction and by the entrants in probabilistic innovation, and then competition in prices. The merger solves Cournot complementarity problems in investment and pricing, which is what makes it profitable but also potentially anti-competitive. When the demand is inelastic the merger harms consumers by reducing R&D of the entrants if the incumbents are efficient enough (always when bundling is adopted). Instead, with a demand elastic enough, the merger increases consumer surplus (even with bundling).
研究動機	My main point can be presented with a simple example. Consider two suppliers of inputs A and B that are perfect complements in the production of a final good. They face a downward sloping demand $D(P)$ in the total price P and produce at marginal costs c_A and c_B , which can be reduced through R&D investment. The incumbents invest based on their (unilateral) incremental profit of a lower marginal cost, and underinvestment relative to the monopoly case occurs because the incumbents fail to internalize the effect of their investment on the profit of their rival. Therefore, a merger increases investments by the incumbents. Moreover (and abstracting from entry), such a merger is good for consumers for three reasons: first, it leads to direct price reductions because it fixes the traditional Cournot complementarity problem in pricing; second, it directly increases investment because it fixes the Cournot complementarity problem in R&D, which reduces prices further; and third, by increasing production and profits it generates an additional incentive to invest in R&D and reduce costs and prices compared to the pre-merger situation.
模型	Before analyzing the game, it is useful to establish the first best outcome for this market. Welfare can be expressed as the net surplus generated by the goods, and the social planner problem is its maximization: $\max_{c_A, c_B, z_A, z_B} 1 - \sum_{j=A, B} [c_j(1 - z_j) + F(z_j) + I(\bar{c} - c_j)]$ where the first term in the summation is the expected production cost of a component, the second term is the R&D cost for an entrant and the third one is

	<p>the R&D investment in cost reduction for an incumbent. When there is an interior solution, it equates the marginal revenues and costs of the investment of each incumbent according to $1 - z_j = I'(\bar{c} - c_j)$ and of each entrant according to $c_j = F'(z_j)$. The quadratic specification for the cost of the entrants provides a symmetric solution where $c_A = c_B = z_A = z_B = c^{FB}$ satisfies the optimality condition:</p> $1 - c^{FB} = I'(\bar{c} - c^{FB}) \quad (1)$ <p>The expected consumer surplus is:</p> $\mathbb{E}(CS) = z_A z_B (1 - c_A - c_B) \quad (2)$ <p>which corresponds to the probability of a joint innovation multiplied by the surplus of consumers in that state of the world. Moreover, I can express the expected profits of the incumbents producing component $i, j = A, B$ as:</p> $\mathbb{E}(\pi_i) = (1 - z_i)(1 - z_j) \frac{1 - c_i - c_j}{2} + (1 - z_i) z_j (1 - \lambda c_j - c_i) - I(\bar{c} - c_i) \quad (3)$
<p>研究 結果</p>	<p>Proposition 1. The merger is profitable, reduces the investment of the entrants and increases the investment of the merging parties, with a reduction of consumer surplus if the merging firms are efficient enough in the pre-merger situation.</p> <p>Proposition 2. When a commitment to pure bundling is feasible:</p> <p>(a) the merged entity adopts pure bundling when a single innovator appropriates a large enough fraction of the value of its innovation, and in such a case the merger reduces further the investment of the entrants and increases further the investment of the merging firms, always with a reduction in consumer surplus;</p> <p>(b) otherwise the merger occurs without bundling and delivers a reduction of consumer surplus if the merging firms are efficient enough in the pre-merger situation.</p> <p>Last, I note that total welfare after a merger with bundling is just given by the profits of the merged firm. It is then easy to verify that the adoption of bundling is compatible with an increase in welfare even if it always harms consumers.</p>
<p>研究 貢獻</p>	<p>In the first stage the incumbents invest in cost reduction and each entrant in probabilistic R&D and in the second stage price competition takes place. I start by considering the case of a fixed willingness to pay for the final good to show that consumer harm can indeed materialize. This is a benchmark where the merger would be completely neutral in the absence of Cournot effects on</p>

	<p>R&D of the merging firms. In such a case the merger always reduces the incentives of the entrants to invest in R&D and the expected price for the consumers increases post-merger as long as the incumbents are already efficient enough in the pre- merger situation. While I use a consumer welfare standard in the analysis, I show that the merger can also reduce total welfare. Finally, I extend the analysis to a downward sloping demand.</p>
<p>未來 研究 方向</p>	<p>One can consider precommitments to R&D by the same incumbents, as often realistic for firms with the leading technology (Czarnitzki et al. (2014)): also in this case the merger reduces further the investment of the entrants and increases further the investment of the merging parties due to a first mover strategic effect. A novel result for this case is that efficient incumbents reduce their investment when they can adopt bundling. In practice bundling and investment in cost reductions are substitute tools in reducing the probability of entry: once a commitment to bundling can be credibly adopted, the merged entity can reduce its investment in R&D without increasing the likelihood of entry by the rivals.</p>

篇名	Corporate social responsibility, vertical product differentiation and international competition
作者	Jie Li1 , Xingtang Wang , Baomin Dong , Eden S. H. Yu
出處	Review of International Economics. 2019; 00:1–18.
摘要	<p>Would a foreign firm’s consumer-oriented corporate social responsibility (CSR) activities be rewarded by an importing country’s voluntary tariff reduction? The current paper addresses this question in an import-competing duopoly model with vertical product differentiation. It is shown that the tariff will decrease if the foreign firm switches from a purely profit-driven firm to a CSR firm. A consumer-oriented CSR strategy will always hurt the domestic firm’s profit, whereas the relationship between the foreign firm’s profit and CSR sensitivity (the degree to which a firm cares about consumer welfare) is invertedly U-shaped. When firms’ decisions to switch to CSR are endogenized, only the foreign firm will become a CSR firm.</p>
研究動機	<p>Since Chang et al. (2014) discuss firms’ CSR strategy as well as endogenous tariff determination in an international trade context, it is worth some comparisons between their settings and ours. Specifically, we introduce vertical product differentiation into our theoretical model, whereas their paper only considers homogeneous product. Second, the domestic government’s optimal tariff determination is based on the consideration of the domestic firm’s profit only in Chang et al. (2014), whereas the equilibrium tariff is determined based on domestic welfare maximization in the current paper. Furthermore, in analyzing the equilibrium, Chang et al. (2014) compare the ex post objective (with the incorporation of CSR in the objective) and ex ante objective (profit only), whereas we only compare the ex post and ex ante profit levels. Finally, we analyze firms’ profit-maximizing endogenous choices over CSR initiatives, which is absent in Chang et al. (2014). We find that the foreign firm would choose to launch the CSR initiative, whereas the domestic firm would not.</p>

模型	<p>We consider a home market that consists of a domestic firm and a foreign firm, denoted by 1 and 2, who produce vertically differentiated products and engage in price competition. Denote the quality of products produced by producer $i(i = 1,2)$ by θ_i and the corresponding output by q_i. We assume that $\theta_1 < \theta_2$. Furthermore, qualities are not adjustable and each firm is endowed with only one fixed quality.</p> <p>Denote p_1 and p_2 as the prices of the products charged by firm 1 and firm 2, respectively. The market is characterized by a linear city, $l \in [0,1]$, where consumers are uniformly distributed. Each consumer is indexed by her location in the city $x \in [0,1]$ and buys at most one unit of the good, which generates her utility $u(x, \theta, p) = x\theta - p$, where p is the price. Without loss of generality and for notational simplicity, we assume in the following that $\theta_1 = 1$ and $\theta_2 = 1 + \delta$ with $\delta > 0$, where δ is a measure of quality difference for the consumers. We now derive the demand for each quality when both qualities are provided. Let y denote the consumer who is indifferent between buying quality θ_1 and quality θ_2. The location of this consumer is determined by $u(y, \theta_1, p_1) = y\theta_1 - p_1 = y\theta_2 - p_2 = u(y, \theta_2, p_2)$. Similarly, let z denote the consumer who is indifferent to buying quality θ_1 or buying nothing: $u(z, \theta_1, p_1) = z\theta_1 - p_1 = 0$.</p> <p>Without loss of generality, we frame the problem in a two-stage game with complete information. In the first stage, the home government determines its optimal tariff rate that maximizes social welfare, rationally foreseeing the decisions of the firms on CSR activities. In the second stage, having observed the tariff rate set in the first stage, the domestic and foreign firms independently and simultaneously set their prices that maximize their respective objectives.</p>
研究結果	<p>It is shown that when firms' CSR types are exogenous, the foreign firm's transformation from profit maximizer to a CSR firm would induce the home government to lower the tariff level. Furthermore, upon switching to a CSR firm, the foreign firm's profit will increase (decrease) when its CSR sensitivity is sufficiently low (high). This is in contrast with the domestic firm where the profit would always decrease upon transformation to a CSR firm. The social welfare is the highest when both firms are CSR firms. However, if CSR types are endogenously chosen by firms, the foreign firm is always a CSR firm, whereas the domestic firm is not.</p>
研究貢獻	<p>Despite the importance of CSR in an international context and the existence of a large literature on domestic economy CSR, few papers connect these two issues together. The current paper characterizes the equilibrium in an</p>

	international trade context when CSR is introduced.
未來 研究 方向	Aside from tariff, there are other forms of restricting imports, for example, quotas. It would be interesting to extend our discussion to cover the case of quantitative restrictions in future research.

篇名	The equivalence of emission tax with tax-revenue refund and emission intensity regulation
作者	Hiroaki Ino, Toshihiro Matsumura
出處	Economics Letters Volume 182, September 2019, Pages 126-128
摘要	This study examines policies balancing emissions reduction and promotion of consumption. We show the equivalence of emission intensity regulation coupled with tradable emission permits and the combination of an emission tax and refunding of the tax revenue to consumers.
研究動機	This study examines policies that balance emissions reduction and promotion of consumption in a market. Such balancing policies are desirable when society has some reason to weaken the incentive to reduce consumption/production. For instance, decarbonization of the electric power source and electrification are key factors for creating a low carbon society (Global Environment Committee, 2017). However, standard carbon-pricing policies raise the price of electricity, which can be an obstacle to electrification. To strike the aforementioned balance, governments can propose using the revenue from the emission tax levied on suppliers to reduce consumer prices, for instance, to reduce the specific tax on electricity consumption (the surcharge for renewable energy). This tax-revenue refund enhances consumption. On the other hand, environmental efficiency has traditionally often been regulated based on emissions-per-output level rather than the total amount of emissions. Such emission intensity regulation also has a weaker effect on the restriction of production levels than the regulation of total emissions or an emission tax has. Thus, this regulation may have a similar effect as that of an emission tax combined with refunding the tax revenue to consumers.

<p>模型</p>	<p>We consider the following partial-equilibrium model where n firms choose output and abatement levels. The model consists of a perfectly competitive market, and the demand function is $D(\cdot)$ with $D' < 0$. For $i = 1, \dots, n$, q_i is firm i's output, a_i is the level of firm i's abatement activity, and $C_i(q_i, a_i)$ is firm i's cost function. We assume $\partial C_i / \partial q_i > 0$ and $\partial C_i / \partial a_i > 0$ and that the function is strictly convex. $e_i(q_i, a_i)$ is firm i's emission function. We assume $\partial e_i / \partial q_i > 0$ and $\partial e_i / \partial a_i < 0$ and that the function is convex. Each consumer faces the effective price $p + f$, where p is the market price and f is the specific tax (surcharge) on consumption. We assume that the problem is well-defined (the equilibrium uniquely exists). We focus on the interior solution case (i.e., $q_i > 0, a_i > 0, \text{ and } e_i > 0$ at equilibrium). We consider an emission tax coupled with refunds to consumers. The government imposes an emission tax with a tax rate $t > 0$ and uses the tax revenue to reduce f. $f = F - s$, where F is the surcharge before refunding and s is the reduction in the surcharge. The government chooses s to meet the budget constraint $tE = sQ$, where E and Q are the total emissions and total demand, respectively. Firm i's profit is $\pi_i = pq_i - C_i - te_i$. Each firm maximizes π_i with respect to q_i and a_i, given p and t. Let $q_i^T(p; t)$ and $a_i^T(p; t)$ be the profit-maximizing outcome under the emission tax, given p and t. The supply function is given by $S(p; t) \equiv \sum_{i=1}^n q_i^T(p; t)$. The supply–demand equilibrium is given by the market-clearing condition $S(p; t) = D(p + f)$. From these conditions, we obtain the equilibrium price p^T and refund s^T, as well as the equilibrium output $q_i^T = q_i^T(p^T; t)$, and abatement $a_i^T = a_i^T(p^T; t)$. Let the aggregate equilibrium output be $Q^T = \sum_{i=1}^n q_i^T$ and emissions be $E^T = \sum_{i=1}^n e_i(q_i^T, a_i^T)$.</p> <p>Emission-intensity regulation :</p> <p>Firm i's profit is $\pi_i = pq_i - C_i - r(e_i - \theta q_i)$. Each firm maximizes π_i with respect to q_i and a_i, given p and r. Let $q_i^I(p, r)$ and $a_i^I(p, r)$ be the profit-maximizing outcomes under the emission intensity regulation, given p and r. The supply function is given by $S(p, r) \equiv \sum_{i=1}^n q_i^I(p, r)$. The supply–demand equilibrium of the product market is given by $S(p, r) = D(p + F)$. The supply–demand equilibrium of the permit is given by</p> $\sum_{i=1}^n e_i(p, r) = \sum_{i=1}^n \theta q_i^I(p, r) \quad (1)$
<p>研究 結果</p>	<p>Proposition 1. For any t, there exists θ, and conversely, for any θ, there exists t such that the two policies yield the same outputs and abatements (i.e., $(q_i^T, a_i^T) = (q_i^I, a_i^I)$ for all i) and thus the same emission levels (i.e., $e_i(q_i^T, a_i^T) = e_i(q_i^I, a_i^I)$ for all i).</p>

研究 貢獻	<p>In this study, we prove the equivalence of the two abovementioned policies. Our results show that emission intensity regulation is as reasonable as the tax-revenue refund policy for striking a balance between lowering the emission intensity and promoting the market's development.</p>
未來 研究 方向	<p>In the cap-and-trade system, the government must consider how it initially distributes the permits, with foresight regarding the future state of affairs: the government must design an auction to sell the permits or consider benchmark allocation based on grandfathering. However, emission intensity regulation resolves this problem: the government only needs to set a desired θ and the permits are traded based on the resulting q_i and e_i.</p>

篇名	Optimal production tax in a mixed market with an endogenous market structure
作者	Susumu Cato, & Toshihiro Matsumura (2019)
出處	Manchester School, 87(4), 578-590. doi: 10.1111/manc.12266
摘要	We investigate how the optimal production tax rate is affected by privatization policies in a mixed oligopoly in which a state-owned public firm competes against private firms in a free-entry market. First, we investigate the domestic private firm case. The optimal tax rate is strictly positive except for the full privatization and full nationalization cases, and the relationship between the optimal tax rate and degree of privatization is an inverted U-shape. Next, we investigate the foreign private firm case and find that the non-monotonic relationship disappears.
研究動機	Cato and Matsumura (2013) showed that the privatization neutrality theorem does not hold in free-entry markets. This is another type of non-neutrality result, because the presence of free entry is the key of their results. However, Cato and Matsumura (2013) did not consider the possibility of partial privatization. Given this context, this study analyses how a privatization policy affects the optimal tax-subsidy policy by allowing the possibility of partial privatization.
模型	<p>Firms produce homogeneous goods and engage in Cournot competition. The inverse demand function is assumed to be $f(X)=A-X$ (A is a positive real number and X is total output). Here, market demand A is assumed to be sufficiently large. We consider $N+1$ firms. Firm 0 is a partially state-owned public firm, while the other firms i ($i=1, 2, \dots, N$) are private. Let $\alpha \in [0, 1]$ be the degree of privatization of firm 0.</p> <p>All private firms have the same cost function $g(x_i) = \frac{cx_i^2}{2} + K$, where $x_i \geq 0$ is firm i's output level, c and K are positive real numbers, and K is the entry cost of each private firm. The cost function of firm 0 is given by $g_0(x_0, \alpha) = \frac{c_0(\alpha)x_0^2}{2} + K$, and thus, it depends on α (here, K is the sunk cost paid by the partially state-owned public firm). We assume that $c_0(0) \geq c$ and $c_0(1) = c$, and $c_0(\alpha)$ is non-increasing in α. In other words, we allow the possibility of cost difference between firm 0 and the others, and privatization can have a positive effect on the technology of the (semi-)public firm. The government levies a simple unit production tax t (if t is negative, the tax becomes a production subsidy). Each firm i's profit is given by</p>

	$\Pi_i = f(X)x_i - g(x_i) - tx_i \quad (i = 1, \dots, N),$ <p>where $X = \sum_{i=0}^N x_i$. We have $g_0(x_0, \alpha)$ instead of $g(x_i)$ in the case of firm 0. Tax revenue R is tX.</p> <p>Economic welfare E consists of the sum of the consumer surplus, firms' profits, and tax revenue, as follows:</p> $E = \int_0^X f(x)dx - g_0(x_0, \alpha) - \sum_{i=1}^N g(x_i) \quad (1)$ <p>Each private firm maximizes its profit. Firm 0's objective is the weighted average of Π_0 and E:</p> $\alpha\Pi_0 + (1 - \alpha)E.$
研究結果	<p>In this study, we investigate the relationship between privatization and industrial policy. We find that regardless of whether private firms are domestic or foreign, the optimal tax rate is zero in both the full nationalization and full privatization cases. However, the optimal tax rate is strictly positive except for these two cases if private firms are domestic. Our result suggests the possible risk of restricting the analysis to these two polar cases and highlights the importance of partial privatization. However, our non-monotone result does not hold if private firms are foreign and the optimal tax rate is zero for any degree of privatization.</p>
研究貢獻	<p>Such real-world examples lead us to derive the following policy implications of our results. Consider a transition from full nationalization to full privatization because of deregulation and liberalization. Our results suggest that the government should make the tax higher in the early stage of the privatizing process, and then make it lower in the late stage. Moreover, the presence of foreign firms matters. If foreign penetration occurs in the process, a lower tax rate can be optimal.</p> <p>This observation implies that privatization and industrial policies have strong interaction. Intuitively, industrial policies can change the strategic interaction among firms, and thus, privatization is affected by industrial policies.</p> <p>Furthermore, privatization can cause a change in a strategic interaction among firms, which leads to a change in industrial policies.</p>
未來研究方向	<p>In this study, we assume that the policies are implemented before the entry of private firms. However, as Lee et al. (2018) and Sato and Matsumura (2019) showed, the timing of such policies may affect policymaking in mixed oligopolies. Investigating this topic is left to future research.</p>

篇名	Optimal Licensing Contract: The Implications of Preference Function
作者	Arijit Mukherjee
出處	Arthaniti-Journal of Economic Theory and Practice 1-7
摘要	Our analysis provides a rationale for the existence of a positive fixed-fee and output royalty in the licensing contracts. In this article, we show that the preference functions play an important role in this respect. As the market expansion effect gets weaker, it reduces the possibility of a royalty-only contract, thus increasing the possibility of the co-existence of a positive fixed-fee and output royalty in the licensing contract. Our argument is different from the existing reasons based on imitation, number of firms, product differentiation and decreasing returns to scale.
研究動機	Mukherjee and Balasubramanian (2001), Mukherjee (2014) and Sen and Tauman (2007) show the implications of number of firms, product differentiation and decreasing returns to scale, in explaining the existence of positive fixed-fee and output royalty in the licensing contracts. Sen and Tauman (2007) show that the result of Rockett (1990) holds if the number of licensees is not more than two; however, if the number of licensees is at least three, the equilibrium contract can involve fixed-fee and output royalty. In a duopoly market with an inside innovator, fixed-fee and output royalty can occur in equilibrium if the firms produce differentiated products (Mukherjee & Balasubramanian, 2001). Mukherjee (2014) shows that fixed-fee and output royalty can occur in the presence of decreasing returns to scale technologies. We focus on a different aspect in this article. We show how the consumer's preference function affects the licensing contracts. We consider a duopoly market with horizontally differentiated products to show how the market expansion effect influences the licensing contract.
模型	Assume that there are two firms, firms 1 and 2, competing in a product market like Cournot duopolists with horizontally differentiated products. Assume that the technology of firm 1 is better than the technology of firm 2. The marginal cost corresponding to the technology of firm 1 is c_1 , which we normalise to 0 for simplicity, and the marginal cost corresponding to the technology of firm 2 is $c > 0$. This cost difference creates the possibility of technology licensing, which is the focus of this article. Our results do not depend on the simplifying assumption of $c_1 = 0$. The inverse market demand function for the i th goods, is $P_i = 1 - [1 + s(1 - g)]q_i - gq_j$, $i = 1, 2$, $i \neq j$, where P_i is the price, q_i and q_j are the

	<p>outputs and $g \in [0,1]$ is the degree of product differentiation. This demand function is generated from the utility function $U(q_1, q_2) = (q_1 + q_2) - [1 + s(1 - g)] \frac{1}{2}(q_1^2 + q_2^2) - gq_1q_2$. If $g = 0$, the goods are isolated and if $g = 1$, they are perfect substitutes. The parameter $s \in [0,1]$ measures the degree of market expansion, where $s = 1$ corresponds to no market expansion effect, as in Shubik and Levitan (1980), and $s = 0$ generates a preference function because of Bowley (1924), which shows that the market size significantly increases with higher product differentiation. It is worth noting that product differentiation is important for our analysis. Without product differentiation, that is, if $g = 1$, the market expansion effect, captured by s, has no effect, since the demand functions are independent of s for $g = 1$.</p> <p>If we aggregate the demand functions, we get $(q_1 + q_2) = [1 + g + s(1 - g)]^{-1}2(1 - \bar{P})$, where $\bar{P} = \frac{P_1 + P_2}{2}$ is the average price. As s reduces, the total demand increases, implying that the market size increases. If $s = 1$, we get $(q_1 + q_2) = (1 - \bar{P})$, suggesting that the total demand is independent of g, as in Shubik and Levitan (1980). If $s = 0$, we get $(q_1 + q_2) = [1 + g]^{-1}2(1 - \bar{P})$, suggesting that a lower g increases the total demand, that is, the market size increases with higher product differentiation, as in Bowley (1924).</p> <p>We consider the following game. At stage 1, firm 1 decides whether to license its technology to firm 2. In the case of licensing, firm 1 gives a take-it-or-leave-it licensing contract with a non-negative up-front fixed-fee (F) and a non-negative per-unit output royalty (r). At stage 2, Firm 2 accepts the licensing contract if it is not worse off by accepting it than rejecting it. At stage 3, conditional on the licensing decision, the firms compete like Cournot duopolists and the profits are realised. We solve the game through backward induction.</p>
研究結果	<p>We show in this article how the consumer's preference function, affecting the market size, influences the licensing contracts. As the market expansion effect gets stronger, the range of product differentiation over which the equilibrium licensing contract consists of output royalty only increases. Hence, the consumer's preference function affects the possibility of having positive fixed-fee and royalty in the licensing contracts.</p>
研究貢獻	<p>In an earlier work, Rockett (1990) considers a duopoly market with an inside innovator and homogeneous products and shows that the equilibrium licensing contract consists of a positive output royalty only if there is no imitation. In a duopoly market with homogeneous products, Wang (1998) shows that a</p>

	<p>licenser prefers royalty licensing to fixed-fee licensing if the licenser is an inside innovator.</p> <p>Although these articles provide new insights, they cannot explain an important fact, that is, the existence of positive fixed-fee and output royalty in the licensing contracts, in the absence of imitation, which may be the outcome of a strong patent system.</p>
<p>未來 研究 方向</p>	<p>It can be considered under diminishing marginal utility.</p>

篇名	Markets with technological progress: pricing, quality, and novelty
作者	Ludwig von Auer、Mark Trede
出處	J Econ (2018) 124:121–137
摘要	New and old products differ in two respects: quality and newness. Whereas a higher quality of a new product always benefits consumers, the newness itself benefits some consumers, but not others, and for some, it is even a disadvantage. We capture these features in a Hotelling model of Overlapping Innovators (HOLI model), entailing a sequence of static Hotelling games of horizontal product differentiation (newness), that we extend by vertical product differentiation (quality). In this model, the firms compete on quality and price.
研究動機	Our VEH model is a duopoly model in which the consumers can choose either an incumbent product or an entrant product. The incumbent product is an established commodity of basic quality and zero novelty that competes against the entirely novel entrant product. By definition, the basic quality of the incumbent product is given. However, the seller of the entrant product can choose a quality that differs from the basic quality of the incumbent product. The cost of the entrant product increases with its quality level. In our VEH model, the duopolists compete on price and quality. Quality can be interpreted in a broad sense. It captures all product features that influence the consumers' willingness to purchase the product (e.g, usefulness, design, emotional benefit, etc.). All consumers appreciate the difference in quality (the vertical characteristic) in the same way. However, the consumers differ in their preferences for novelty (the horizontal characteristic).
模型	The consumers are of mass 1 and uniformly distributed along the interval [0, 1]. The consumer's location is equivalent to her taste parameter $x \in [0, 1]$. Each consumer can buy either one unit of Product I or one unit of Product E or no unit at all. The established Product I exactly matches the taste of the consumer located at $x = 0$ and the novel Product E exactly matches the taste of the consumer located at $x = 1$ (horizontal product differentiation). More specifically, the consumer rents derived from the products I and E are defined $U_I(P_I) = Q - tx - P_I$ $U_E(P_E) = Q + \Delta - t(1 - x) - P_E,$ by where Q is consumer x 's willingness to pay for a product that conforms precisely to her own taste and has the same quality as Product I. The

	<p>difference in quality between products E and I is indicated by Δ (vertical product differentiation). The parameter $t > 0$ measures the intensity of preferences, that is, the sensitivity of consumer rent with respect to the distance between the consumer's location x and the product's location ($x_I = 0$ and $x_E = 1$). The larger the t, the greater the extent to which consumers dislike a given distance between their own and the product's location. Without loss of generality, the consumer rents can be expressed in units of $t \frac{[\Delta]}{SEP}$</p> $u_I(p_I) = q - x - p_I \quad (1)$ $u_E(p_E) = q + \delta - (1 - x) - p_E, \quad (2)$
研究結果	<p>The first component is Hotelling's (1929) spatial model, extended by vertical product differentiation. Though developed in the context of industrial organization, this Vertically Extended Hotelling (VEH) model is applicable to decision problems in various fields within and beyond that of economics (e.g., political science, medical science). In this paper, we were concerned with pricing in markets with regular product turnover and technical progress. Therefore, our VEH model combines different preferences for novelty (horizontal differentiation) with quality differences (vertical differentiation). We considered different equilibrium concepts leading to different interior solutions.</p> <p>The second component is the consistent application of our VEH model in a dynamic context. For this purpose, we assume that last period's entrant product is the incumbent product of the present period. This yields an infinite-horizon Hotelling model with Overlapping Innovators (HOLI).</p> <p>The HOLI model allows to analyze markets in which a product starts its life cycle as an entrant product, becomes the incumbent product and then exits the market. In such markets, two opposing pricing strategies appear sensible and rational: introducing the entering product at a premium price and selling the exiting product at a discount (skimming) or doing the reverse (penetration). Our HOLI model reveals that the pricing strategy depends on the underlying equilibrium framework. Penetration occurs when the seller of the entrant product acts as the Stackelberg follower.</p> <p>In the HOLI model, the equilibrium prices remain constant as the basic quality improves over time. Therefore, the beneficiaries of the firms' perpetual</p>

	innovations are not the firms, but the consumers.
研究 貢獻	The study of markets characterized by technical progress usually relies on rather complex analytical tools. In this paper, we introduced a much simpler alternative that we refer to as the Hotelling model of OverLapping Innovators (HOLI model). This model transforms an essentially dynamic market process into an overlapping sequence of static market situations. The model can be seen as a combination of two basic components.
未來 研究 方向	In the future , it could contain network externality, mixed oligopoly into considertation.

篇名	Emission reduction and profit-neutral permit allocations☆
作者	Jean-Philippe Nicolai
出處	Journal of Environmental Economics and Management 93 (2019) 239-253
摘要	<p>The present paper addresses two policy objectives: to implement a market for pollution permits and to make regulation acceptable for businesses. Profit-neutral permit allocations are defined as the number of permits that the regulator should give for free so that post-regulation profits (i.e. a firm's profits in the products market plus the value of the allowances granted for free) are equal to pre-regulation profits. The proposed model is developed by assuming that firms use polluting technologies and compete "à la Cournot". The paper demonstrates that a low number of free allowances is sufficient to meet these two goals. Moreover, the regulator can fully offset losses, even when the reduction in emissions is high, provided that the sectors concerned are not monopolies, both for isoelastic and linear demand functions.</p>
研究動機	<p>The present paper establishes that the conditions required to make environmental regulation acceptable are more stringent and suggests that if there are large numbers of domestic firms and few foreign firms, then offsetting losses in profits may be possible. We extend our analysis to a market for permits covering several sectors and assess the way different sectors are affected by the implementation of pollution permits.</p>
模型	<p>Firms. There are n symmetric firms competing in a market and producing a homogeneous good. The production technology is polluting. Let c be the marginal cost and assume that the emissions intensity is equal to f. In other words, one unit of production generates f units of pollution. Firms can only abate emissions by reducing production. The emission intensity indicates how polluting a sector is. Firms compete "à la Cournot", simultaneously choosing their production quantity in order to maximize profits. Consumers. Firms face an inverse demand function $P(Q)$, where Q is the total quantity produced. The inverse demand function is twice differentiable, positive or null, and strictly decreasing when positive, and $P(0) > 0$. Moreover, let us assume that $P(Q) + P'(Q)q_i$ for any firm i is decreasing in q_i and that $P(Q) + P'(Q)Q/n$ is decreasing in Q. Let $E = P''Q/P'$ be the elasticity of the demand slope. Moreover, two specific demand functions will be analyzed: an isoelastic demand function and a linear one.</p> <ul style="list-style-type: none"> • The linear demand function that we use is given by: $P(Q) = a - bQ$, (1) <p>When demand is linear, the elasticity of the demand slope is equal to 0.</p> <p>Regulation. In order to cut pollution, the regulator implements a market for</p>

	<p>permits. A firm must own a permit in order to pollute one unit. Assume that there are many identical oligopolistic markets, each producing a different product, although the market for permits is common to all of these industries. Firms are price-takers in the market for permits. The permit price is denoted by σ and clears when supply equals demand. When the permit price is equal to σ, total emissions are equal to $fQ(\sigma)$. The goal of the regulator is to reduce emissions such that: $fQ(\sigma) = (1-z)fQ(0)$, (3) where $0 < z < 1$. The emissions before regulation are denoted by $Q(0)$. In other words, the percentage reduction in emissions is given by $100z$. The number of permits put into circulation is equal to $(1 - z)fQ(0)$.</p>
研究結果	<p>Proposition 1. When demand is either isoelastic or linear, the ratio of free allowances to permits (γ_p) increases with the percentage reduction in emissions, $\partial\gamma_p/\partial z > 0$, and decreases with the number of firms, $\partial\gamma_p/\partial n < 0$.</p>
研究貢獻	<p>The present paper addresses two policy objectives: to implement a market for pollution permits and to make regulation acceptable for businesses. It shows that a low number of free allowances is sufficient to meet these two goals. Moreover, the regulator can fully offset losses, even when the reduction in emissions is high, provided that the sectors concerned are not monopolies.</p>
未來研究方向	<p>In light of these findings, we argue that the use of grandfathering coupled with a significant reduction in carbon emissions should be promoted instead of promoting capacity-based allocation and a weak percentage reduction in emissions. Under a profit-neutral allocation, the cost of environmental regulation is entirely borne by consumers and the state. Regulators should limit the number of free allowances to this upper bound.</p>

篇名	Multiproduct oligopoly and trade between asymmetric countries
作者	Yi-Ling Cheng, Takatoshi Tabuchi
出處	Review of International Economics Volume 26, 2018, Pages 524–538.
摘要	This paper develops a general equilibrium model of oligopolistic multiproduct firms conducting trade between asymmetric countries, in which heterogeneous entrants choose their product ranges and outputs. We show that there are fewer exporters in the larger country, and each produces a wider range of products but exports fewer varieties. We also show that while trade liberalization increases the total number of consumed varieties, it decreases the total number of firms and may reduce the product range of each firm.
研究動機	Multiproduct firms abound in the real world. Bernard, Redding and Schott (2010) show that about 39 percent of U.S. manufacturing firms produce more than one product, and their production accounts for 87 percent of total sales. According to international trade data, the majority of export sales originate from multiproduct firms. Bernard, Jensen and Schott (2009) indicate that over 10 percent of exporters and 20 percent of importers trade more than 10 products and that the sales of these firms account for about 90 percent of the export and import value in 2000. In spite of their dominant presence, multiproduct firms have received little attention in the theory of international trade and economic geography. Few studies analyze the production, product scope and export of multiproduct firms, which are affected by globalization and trade liberalization.
模型	<p>Consider an economy with L identical workers. The worker's preference is described by a quasilinear utility function defined over a continuum of differentiated product varieties and a homogeneous good chosen as the numeraire:</p> $U = \alpha \sum_{i=1}^m \sum_{j=1}^{n_i} q_i^c(j) - \frac{\beta}{2} \sum_{i=1}^m \sum_{j=1}^{n_i} [q_i^c(j)]^2 - \frac{\gamma}{2} \left[\sum_{i=1}^m \sum_{j=1}^{n_i} q_i^c(j) \right]^2 + q_0^c$ <p>where q_0^c denotes the numeraire good and $q_i^c(j)$ is the individual consumption of variety $j \in \{1, \dots, n_i\}$ of the differentiated product produced by multiproduct firm $i \in \{1, \dots, m\}$ where n_i is the number of varieties produced by firm i, and m is the number of firms in the economy. The total number of varieties of the differentiated product is given by $N = \sum_{i=1}^m n_i$. The parameters α, β, and γ are positive. A higher α means a stronger preference towards the differentiated varieties compared with the numeraire, a higher β implies more bias toward love for variety, and a higher γ means closer substitutes between</p>

	<p>varieties. Assume that each worker supplies one unit of labor inelastically. The budget constraint of the worker can be written as:</p> $\sum_i \sum_j p_i(j) q_i^c(j) + q_0^c = w \quad (2)$ <p>where w is the wage and $p_i(j)$ is the price of variety j produced by firm i. Solving (2) for the numeraire consumption, substituting the corresponding expression into (1), and solving the first-order conditions with respect to $q_i^c(j)$, we obtain the inverse demand of a worker for variety j of firm i:</p> $p_i(j) = \alpha - \beta q_i^c(j) - \gamma \sum_i \sum_j q_i^c(j) = \alpha - \beta \frac{q_i(j)}{L} - \gamma \frac{Q}{L} \quad (3)$ <p>where $q_i(j) \equiv q_i^c(j)L$ and $Q \equiv \sum_i \sum_j q_i^c(j)L$ denote the market demand for the product j of firm i, and the aggregate market demand over all varieties of all firms, respectively.</p> <p>Using (3), the profit of a firm with marginal cost c_i is given by</p> $\pi_i = \sum_{j=1}^{n_i} [p_i(j) - c_i] q_i(j) - n_i F = \sum_j \left[\alpha - \beta \frac{q_i(j)}{L} - \gamma \frac{Q}{L} - c_i \right] q_i(j) - n_i F. \quad (4)$
研究結果	<p>Proposition 1 Oligopoly with a limited number efficient firms is desirable when the demand a is large, whereas further entry of firms is preferred when the demand is small.</p> <p>Proposition 2 Consider two asymmetric countries with trade costs: (i) There are more firms $m_{22} > m_{11}$ but fewer exporters $m_{21} < m_{12}$ in the larger country. (ii) As the trade costs fall, the number m_{rs} of exporters increases while the total number m_{rr} of firms decreases.</p> <p>Proposition 3 The product ranges of a nonexporter and an exporter are wider in the larger country: $n_{22}(i) > n_{11}(i)$ and $n_{22}(i) + n_{21}(i) > n_{11}(i) + n_{12}(i)$.</p> <p>Proposition 4 The reverse home market effect holds: $p_{21} Q_{21} < p_{12} Q_{12}$.</p> <p>Proposition 5 Assume that the trade costs steadily fall. (i) For a given marginal cost, the product range $n_{rr}(i)$ of nonexporters always decreases. The product range $n_{rr}(i) + n_{rs}(i)$ of exporters is inverted U-shaped for large demand a while it always increases for small demand a. (ii) The total number $N_r^c = N_{rr} + N_{sr}$ of consumed varieties always increases.</p>
研究貢獻	<p>In an open economy with two asymmetric countries, we show that fewer exporters enter the larger country and produce fewer varieties for export to the foreign market although each of them offers a wider product range. Besides, the large country is a net importer, which shows the reverse home market effect. As trade costs fall, (i) the number of exporters increases but the total number of firms decreases, (ii) the product range and output of a nonexporter always decrease, whereas the product range and output of an exporter first increase and then decrease when the product demand is large, and (iii) the total number of</p>

	<p>varieties and outputs consumed always increase. Some of our results contrast sharply with those in the literature on new trade theory that assume single-product firms and/or monopolistic competition between multiproduct firms (see Melitz & Ottaviano, 2008; Bernard et al., 2011; Mayer et al., 2014). They consider behaviors of multiproduct firms conducting trade, but do not take the strategic effect into account. Furthermore, in order to examine how the market size affects the behaviors of multiproduct firms, we assume asymmetric country sizes with trade, whereas the literature such as Baldwin and Gu (2009) assumes symmetric countries.</p>
<p>未來 研究 方向</p>	<p>Discuss the social welfare of the domestic country under the implementation of export subsidies.</p>

篇名	Downstream Collusion under Asymmetric Costs with Network Externalities
作者	Leonard F.S. Wang ^a , Ya-ping Han ^b a. Wenlan School of Business Zhongnan University of Economics and Law Wuhan 430073, Wuhan, Hubei, China. b. Wenlan School of Business Zhongnan University of Economics and Law Wuhan 430073, Wuhan, Hubei, China.
出處	Working Paper
摘要	In a vertical structure with network externalities and cost asymmetry, we demonstrate larger network externalities lead to smaller collusion incentive for inefficient firm while for efficient firm it depends on the efficiency gap. When the profit distribution for side payment is narrowed to bargaining power, inefficient firm has larger incentive to deviate. While when the discount factor is minimized, cost differences stabilize the collusion, changing conventional wisdom. Moreover, network externalities always have negative effects except when they are large and the cost differences are relatively small. Besides, when the collusion is sustained, the social welfare is also dominant.
研究動機	In this paper, they study the sustainability of collusion in a vertical structure where there is cost asymmetry in the presence of network externalities, namely when the consumers utility increases as market gets larger, which extends Pal and Scrimatore (2016), and Song and Wang (2017). They demonstrate that the larger network externalities lead to smaller collusion incentive for inefficient firm while for efficient firm it depends on the efficiency gap. Because the input price (cost) can be changed as efficiency change, compared to unilateral structure like Pal and Scrimatore (2016). And similarly, they consider cost saving effect (market share effect) and the comprehensive effect of underutilized network externalities and side payment cost (revenue) for firm 2 (1). When the efficiency gap is small (large) and the former effect dominates (is dominated) the latter effect, stronger (weaker) motivation for firm 2. For firm 1, the latter effect is always large, and hence, there are always negative relationship among it.

模型

$$\frac{1}{2}(1-n)(q_1 + q_2)^2.$$

The profits of firms can be given by

$$\pi_U = \lambda w q_1 + w q_2 \quad (1)$$

$$\pi_1 = (p - \lambda w) q_1 \quad (2)$$

$$\pi_2 = (p - w) q_2 \quad (3)$$

where π_U is for upstream firm, π_i ($i = 1, 2$) are for downstream firm i .

Firms engage in an infinitely repeated game. Let δ denote the discount factor between periods. We examine the effect of cost asymmetry on the stability of the collusion in the vertical structure in the presence of network externalities. Along the punishment path, the firms are assumed to use the grim trigger strategy of Friedman (1971).

In the first-stage, upstream decides the input price; in the second-stage, each downstream firm simultaneously chooses the outputs. We solve the game through backward induction.

Consider a market where there is an upstream firm sells an input to its duopoly downstream firms for wholesale price w . Assume duopoly produces the final homogenous goods with positive consumption network externalities. For simplicity, upstream firm's cost is assumed to be normalized to zero and there are no other costs except for intermediates for downstream.

Firm 1 produces one unit of products with λ unit of inputs ($\lambda < 1$), while firm 2 produces one unit of products with one unit of inputs. This way of modelling firms' cost asymmetry allows us to capture firms' difference in capital capacity and its effect on production efficiency, i.e., firm 1 is more efficient than firm 2. And the direct demand function for product i can be derived as follows (see also Choi and Lee, 2017).

$$p = a - q_1 - q_2 + n(y_1 + y_2)$$

where p denotes the final price charged for products, and q_i ($i = 1, 2$) denotes the quantities, and y_i denotes consumers' expectations regarding firm i 's total sales, a is the market scale, $n \in (0, 1)$ measures the network effects. And we know that $CS =$

研究 結果	<p>Proposition 1. <i>With the larger network externalities, the collusion incentive for inefficient firm is always smaller. While, for efficient firm, the incentive is always smaller, if efficiency gap is large or small enough. If efficiency gap is moderate, there is an inverse U-shaped relationship between collusion motivation and network externality.</i></p> <p>Proposition 2. <i>If the efficiency difference between firms is larger, the collusion motivation of efficient firm is smaller, and the collusion motivation of inefficient firm is larger until the critical value and then the relationship reverses. Furthermore, the collusion likelihood is smaller.</i></p> <p>Proposition 3.</p> <p>(i) <i>When the cost differences are sufficiently large, an increase in network externalities would destabilize the collusion whenever the magnitude it is.</i></p> <p>(ii) <i>When the cost differences are not sufficiently large, an increase in network externalities would destabilize the collusion when they are small, and would stabilize it when they are large.</i></p>
研究 貢獻	<p>This paper has extended the literature on collusion by combining the network externalities and cost asymmetry in a vertical structure. They demonstrate that larger network externalities lead to smaller collusion incentive for inefficient firm while for efficient firm it depends on the efficiency gap for the changed input price (cost) as efficiency change. And inefficient firm has larger motivation to deviate from the collusion if the profit ratio is determined by the bargaining power, since it has larger gain from motivation with the advanced production tech and the lower input price. Besides, when the collusion is sustained, the social welfare in this case is also dominant. If the discount factor is minimized, it will be decreasing in cost differences but the relationship between network externalities and the sustainability depends on the cost differences.</p>

篇名	Input price discrimination in the presence of downstream vertical differentiation
作者	Duarte Brito, Markos Tselekounis, & Helder Vasconcelos (2019)
出處	Economics Letters, 184, 1-6. doi.org/10.1016/j.econlet.2019.108622
摘要	This paper investigates the competitive effects of input price discrimination (IPD) in a setting in which an upstream monopolist produces an essential input supplied to the downstream market where there is competition between two vertically differentiated retailers. Two different input pricing regimes are investigated: (i) the uniform pricing regime, in which third-degree input price discrimination is prohibited; and (ii) a discriminatory pricing regime, under which the upstream monopolist may charge different prices to the two downstream firms. We find that despite favoring the low-quality firm, IPD is welfare enhancing if and only if the quality gap is sufficiently high.
研究動機	We depart from previous literature (in which downstream firms differ in terms of cost efficiency) by examining the welfare effects of third-degree input price discrimination when downstream firms are vertically differentiated, but symmetric in terms of cost efficiency. A case in point is the pay TV industry, where competition concerns have been raised regarding the wholesale supply of premium content (e.g., live coverage of sports events and movies). In many countries there are competing distributors of premium content that make use of different technologies (e.g., cable and FTTx technologies that all differ in terms of quality). This implies that consumers perceive their quality of service as different (i.e., there is vertical differentiation in the downstream market).
模型	We consider a vertical industry in which an upstream monopolist, firm M produces an input that is supplied to a duopolistic downstream sector. Each downstream firm $i \in \{1, 2\}$ requires one unit of the input to produce each unit of the final product. Although the two downstream firms are symmetric in terms of costs, the quality of their final products is different. Denoting the quality of product i by v_i , we assume that $v_1 > v_2$. All production costs are normalized to zero except for the input price, $w_i \in [0, v_i]$, paid by firm i to the upstream monopolist. This market structure is assumed to be fixed. There is a mass of $N = 1$ consumers with unit demands, each of whom values product quality differently. Consumer valuation for quality is measured by s , which is uniformly distributed in $[0, 1]$. Net valuation of firm i 's product is then $U_i = sv_i - p_i$, where p_i denotes the retail price. Consumers choose between buying one unit from either firm or not purchasing at all, which results in zero utility.

研究 結果	<p>In this paper, we studied the impact of third-degree input price discrimination (IPD) when the downstream firms are vertically differentiated. Our main result is that, compared to uniform pricing, IPD increases total output and welfare if and only if the quality gap is significantly high. This finding contrasts with the result of the seminal papers that, assuming instead cost-asymmetric downstream firms, have found that IPD may be socially harmful because it benefits the less efficient firms.</p>
研究 貢獻	<p>In the present paper, we investigate the competitive effects of IPD when the two downstream firms differ solely in terms of quality. Moreover, we allow the upstream producer to set discriminatory input price(s) that may leave one firm with no sales.</p> <p>Within this structure, our main finding is that although an input monopolist sets lower input prices to the inefficient firm, this efficiency distortion is socially beneficial when the quality gap is significantly high, which contrasts with the conclusions of the literature focusing solely on cost differences. In our case, total output increases as well, contrasting with the result of Yoshida (2000).</p>
未來 研究 方向	<p>基於本文模型，可額外延伸廠商分權(decentralized)與集權(centralized)之間的議價(bargaining)關係，甚至考慮廠商的目標函數包含社會企業責任(CSR)。</p>

篇名	<i>Vertical integration and disruptive cross-market R&D</i>
作者	<i>Ping Lin , Tianle Zhang , Wen Zhou</i>
出處	Journal of Economics & Management Strategy 2019;1–23.
摘要	<p>We study how vertical market structure affects the incentives of suppliers and customers to develop a new input that will enable the innovator to replace the incumbent supplier. In a vertical setting with an incumbent monopoly upstream supplier and two downstream firms, we show that vertical integration reduces the R&D incentives of the integrated parties, but increases that of the nonintegrated downstream rival. Strategic vertical integration may occur whereby the upstream incumbent integrates with a downstream firm to discourage or even preempt downstream disruptive R&D. Depending on the R&D costs, vertical integration may lower the social rate of innovation.</p>
研究動機	<p>There are many real-life situations in which downstream producers in vertically related industries enter backward into the upstream market as a result of internal R&D or through the acquisition of independent innovating firms. For example, Apple Inc. once considered acquiring Imagination, a major supplier of the graphics processors used in iPhones, but eventually decided to develop the processors in-house to reduce its reliance on Imagination's technology. On the software side, Apple recently launched the mobile payment system Apple Pay, which is viewed by many analysts as posing a direct competitive threat to the incumbent PayPal, the dominant leader in online payment services. Similarly, in 2012, Dell created its own software division, Dell Software Group, after conducting a series of acquisitions in the software and service sectors.</p> <p>Motivated by these observations, we aim to address the following questions. How does market structure affect firms' incentives for developing innovations that may disrupt a vertically related industry? What are the effects of such crossmarket R&D on incumbent suppliers, downstream producers, and overall level of innovation? What competitive strategies might the affected firms use to fend off such threats?</p>

<p>模型</p>	<p>Consider a model of two vertically related industries: a downstream and an upstream industry. In the downstream industry, two firms, D_1 and D_2, compete with horizontally differentiated products. The demand function for D_i's product is $p_i(q_i, q_j)$, which satisfies the following properties: $(\partial p_i / \partial q_j) < 0$ for $i, j = 1, 2$, and $(\partial p_i / \partial q_i) > (\partial p_i / \partial q_j)$ for $j \neq i$. An example would be Cournot competition with a linear demand system $p_i = a - q_i - \beta q_j$, where $\beta \in (0, 1)$ represents the degree of product substitution. The production of the final products requires an input supplied initially by an upstream firm U with a constant marginal cost of production, $c > 0$. One unit of the final product requires exactly one unit of the input. The costs of transforming the input into the final product are normalized to zero.</p> <p>There are two alternative market structures: vertical separation (S), under which all three firms are independent entities, and vertical integration (I), under which U and D_1 are vertically integrated (into a firm which we denote as UD_1). The input is sold to each independent downstream firm via a two-part tariff contract, $T_i + \omega_i q_i$, where T_i is the lump-sum fee that D_i must pay and ω_i is the marginal cost of obtaining the input. Because the two downstream firms are symmetric, we use $q(y, z)$ to denote the equilibrium output of a downstream firm when its marginal cost of obtaining the input is y and that of its rival is z. Similarly, we use $p(y, z)$ to denote the resulting equilibrium price; that is, $p(y, z) = p_1(q(y, z), q(z, y)) = p_2(q(z, y), q(y, z))$, and use $\pi(y, z)$ to denote the standard duopoly profit (excluding the fixed cost) of a downstream firm.</p>
<p>研究 結果</p>	<p>We also abstracted away patent licensing in the current model. If licensing of the patented input is possible, a downstream innovator, e.g., D_1, may have an incentive to license its new innovation to the upstream supplier U, instead of entering backward into the upstream market directly and overthrowing U. Licensing enables the firms to realize the returns to R&D without having to integrate with one another and, hence, avoid the disadvantages associated with vertical integration as stated in Lemma 1. In other words, cross-market licensing of innovation may serve as a device against disruptive innovation. Future research along this line seems warranted.</p>

<p>研究 貢獻</p>	<p>In this paper, we have compared two scenarios in which the government chooses the optimal subsidy and privatization with or without the consideration of excess taxation burden in a mixed duopoly model with network effects. We show that in the case where there is no excess taxation burden, the privatization neutrality theorem (PNT) holds for all $\theta \in [0,1]$, and it yields the higher degree of optimal subsidy and the higher gross output and the higher profits. However, in the case in which excess taxation burden is taken into consideration, the optimal privatization policy may be full nationalization or partial privatization if the strength of network effects is not strong. The optimal output subsidy is positive if the shadow cost of public funds is small and the strength of network effects is strong, while the production tax may be used when the strength of network effects is weak, irrespective of the degree of the shadow cost of public funds.</p> <p>The most important result is that, the case in which excess taxation burden is taken into consideration is preferable from the social welfare standpoint. It is mainly because that an increase in the excess taxation burden may turn the production subsidy into production tax, and that in conjunction with the network effects will increase social welfare. Our results have important implications on subsidy/tax and privatization policies. The government may switch to use production tax coupled with full nationalization or partial privatization to improve the social welfare.</p>
<p>未來 研究 方向</p>	<p>We also abstracted away patent licensing in the current model. If licensing of the patented input is possible, a downstream innovator, e.g., D_1, may have an incentive to license its new innovation to the upstream supplier U, instead of entering backward into the upstream market directly and overthrowing U. Licensing enables the firms to realize the returns to R&D without having to integrate with one another and, hence, avoid the disadvantages associated with vertical integration as stated in Lemma 1. In other words, cross-market licensing of innovation may serve as a device against disruptive innovation. Future research along this line seems warranted.</p>

篇名	Technology licensing and innovation
作者	Arijit Mukherjee, Soma Mukherjee
出處	<u>Economics Letters</u> Volume 120, Issue 3, September 2013, Pages 499-502
摘要	We show that under a fixed-fee licensing contract if the licensor and the licensee bargain over the licensing fee, licensing decreases (increases) innovation by decreasing (increasing) the strategic (non-strategic) benefit from innovation. However, licensing increases innovation under a two-part tariff licensing contract. Licensing does not reduce social welfare.
研究動機	Gallini and Winter (1985) (henceforth GW) show that the availability of technology licensing encourages innovation if the firms' initial costs are close but it discourages innovation if the initial costs are sufficiently asymmetric. We show that the availability of licensing can discourage innovation even in industries with initially symmetric costs firms if the firms bargain over the licensing fee. With an innovating firm and n non-innovating firms, Chang et al. (2013) show that licensing may reduce marginal profits from innovation and the R&D investments. They also show that lower R&D investment in the presence of licensing may reduce welfare compared to no licensing. In contrast, we consider all innovating firms and show that bargaining powers of the licensor and the licensee play important role in affecting the total profits and the R&D investments of the firms.
模型	There are two firms, 1 and 2, competing like Cournot duopolists with homogeneous products. Assume that the inverse market demand function is $P = a - q$, where P is price and q is the total output. We assume that $c < \frac{a}{2}$, ensuring positive equilibrium outputs of the firms. We consider the following game. At stage 1, the firms decide simultaneously whether to invest in R&D or not. At stage 2, the firms determine their outputs simultaneously and the profits are realized. We solve the game through backward induction. If neither firm innovates, the equilibrium output and the profit of the i th firm, $i = 1, 2$, are $q_i^*(c, c) = \frac{(a-c)}{3}$ and $\pi_i(c, c) = \frac{(a-c)^2}{9}$ respectively. If both firms innovate, the equilibrium output and the net profit of the i th firm, $i = 1, 2$, are $q_i^*(0, 0) = \frac{a}{3}$ and $\pi_i(0, 0) = \frac{a^2}{9} - k$ respectively. If only firm 1 (firm 2) innovates, the equilibrium outputs of firms 1 and 2 are $q_1^*(0, c) = \frac{(a+c)}{3}$ and $q_2^*(0, c) = \frac{(a-2c)}{3}$

	<p>($q_1^*(c, 0) = \frac{(a-2c)}{3}$ and $q_2^*(c, 0) = \frac{(a+c)}{3}$) respectively, and the corresponding equilibrium net profits are $\pi_1(0, c) = \frac{(a+c)^2}{9} - k$ and $\pi_2(0, c) = \frac{(a-2c)^2}{9}$ ($\pi_1(c, 0) = \frac{(a-2c)^2}{9}$ and $\pi_2(c, 0) = \frac{(a+c)^2}{9} - k$).</p> <p>A fixed-fee licensing : $\max_F [\pi_1(0, 0) + F - \pi_1(0, c)]^\alpha \times [\pi_2(0, 0) - F - \pi_2(0, c)]^{(1-\alpha)}$</p> <p>Two-part tariff licensing contracts : $\max_{F,r} [\pi_1(0, r) + r q_2^*(0, r) + F - \pi_1(0, c)]^\alpha \times [\pi_2(0, r) - F - \pi_2(0, c)]^{(1-\alpha)}$</p>
研究結果	<p>Proposition 1. Both firms innovate if $k < X$. Only one firm innovates if $X < k < Y$. Neither firm innovates if $Y < k$.</p> <p>Proposition 2. If $k < F^*$, both firms innovate. If $F^* < k < Z + F^*$, only one firm innovates, where $\pi_1(0, 0) - \pi_1(c, c) = \pi_2(0, 0) - \pi_2(c, c) \equiv Z$. If $Z + F^* < k$, neither firm innovates.</p> <p>Proposition 3. (a) If $k \in (F^*, X)$, only one firm innovates in the presence of licensing but both firms innovate without licensing, thus licensing decreases innovation. (b) If $k \in (Y, Z + F^*)$, only one firm innovates in the presence of licensing but neither firm innovates without licensing, thus licensing increases innovation.</p> <p>Proposition 4. If there is a two-part tariff licensing contract, technology licensing increases innovation.</p>
研究貢獻	<p>A fixed-fee licensing contract decreases (increases) innovation by decreasing (increasing) the strategic (non-strategic) benefit from innovation in an industry with initially symmetric cost firms. A two-part tariff licensing contract always increases innovation. Licensing does not reduce social welfare.</p>
未來研究方向	<p>Compare to the social welfare under the fixed-fee licensing contract and two-part tariff licensing contract.</p> <p>Under vertical integration, the profits of the fixed-fee licensing contract and two-part tariff licensing contract.</p>

篇名	Patent Licensing from a High-Cost Firm to a Low-Cost Firm
作者	Sougata Pooddar, Uday Bhanu Sinha
出處	The Economic Record, Vol. 86, NO. 274, September, 2010, 384–395
摘要	<p>We depart from the standard framework and study optimal patent licensing under Cournot duopoly where the technology transfer takes place from an innovative firm, which is relatively inefficient in terms of cost of production, to its cost-efficient rival. Interestingly, we find even a drastic technology is licensed and the optimal licensing arrangement always involves a two-part tariff (i.e. a fixed-fee plus a linear per unit output royalty). Under nondrastic innovation, the two-part tariff is optimal when the cost difference between the firms is moderate. Our framework also helps to bridge the gap between optimal licensing schemes for ‘insider’ and ‘outsider’ patentees.</p>
研究動機	<p>When the patentee is an independent R&D organization and not a competitor of the licensee in the product market, it is an outsider patentee; whereas when it competes with the licensee it becomes an insider patentee. In the literature on insider patentees, the transfer of new technology is essentially studied in a framework where the competing firms are symmetric in terms of costs of production in the pre-innovation stage or when the patentee is more cost-efficient compared with the licensee. They depart from this standard framework to an environment where technology transfer takes place from a relatively cost-inefficient firm to its efficient counterpart.</p>

Consider a market with two firms: Firms 1 and 2, producing a homogenous good. The inverse demand function is given by $P = a - Q$, where p denotes price, Q represents aggregate output in the market and a is the positive demand intercept. We assume Firm 1 is the R&D-intensive firm that engages in process innovation. Firms are asymmetric; Firm 1's marginal cost of production is c_1 and Firm 2's marginal cost is c_2 . We assume $c_1 > c_2$, so that Firm 1 is actually inefficient compared with Firm 2 in terms of cost of production in the pre-innovation stage. We assume in the pre-innovation stage that both firms are active in production, and this would imply the condition $(a - 2c_1 + c_2) > 0$ is satisfied. We assume that Firm 1 comes up with a successful cost-reducing innovation. After the innovation its marginal cost becomes $c_1 - \varepsilon$, where $\varepsilon (> 0)$ is the amount of cost reduction. *Ex-post* innovation $c_1 - \varepsilon$ can be greater than or less than c_2 , depending on the size of the innovation, that is, ε . For a meaningful story of licensing by Firm 1, we also need to assume that the size of innovation is such that $c_2 - \varepsilon > 0$. We keep this assumption throughout the forthcoming analysis.

(i) No Licensing

When Firms 1 and 2 compete in quantities after innovation with costs $c_1 - \varepsilon$ and c_2 , respectively, the Nash equilibrium quantities are:

(ii) Licensing

In the following analysis we consider three licensing policies offered by Firm 1, namely: (i) (per unit) royalty; (ii) (lump-sum) fixed fee and (iii) a two-part tariff, that is a fixed fee plus royalty.

We consider the following three-stage licensing game. In the first stage, the patent-holding Firm 1 decides whether to license out the technology. Licensing reduces the marginal cost of the rival by ε .⁷ In case it offers to license out the technology, it charges a payment from the

$$q_1 = \frac{a - 2c_1 + c_2 + 2\varepsilon}{3}$$

and

$$q_2 = \frac{a - 2c_2 + c_1 - \varepsilon}{3}.$$

We follow the standard definition of drastic technology. A new technology is said to be ‘drastic’ when a firm with this new technology charges a monopoly price and the other firms with the older technology produce nothing (see Tirole, 1988). Thus, in our framework, the innovation is drastic when $q_2 = 0$, and the innovating Firm 1 behaves as a monopolist, that is, when $\varepsilon \geq a - 2c_2 + c_1$; otherwise, the innovation is non-drastic.

Profits under drastic innovation are:

$$\pi_1^{\text{NL}} = \frac{(a - c_1 + \varepsilon)^2}{4} \quad \text{and} \quad \pi_2^{\text{NL}} = 0. \quad (1)$$

Profits of firms under non-drastic innovation are:

$$\begin{aligned} \pi_1^{\text{NL}} &= \frac{(a - 2c_1 + c_2 + 2\varepsilon)^2}{9} \quad \text{and} \\ \pi_2^{\text{NL}} &= \frac{(a - 2c_2 + c_1 - \varepsilon)^2}{9}. \end{aligned} \quad (2)$$

(ii) Licensing

In the following analysis we consider three licensing policies offered by Firm 1, namely: (i) (per unit) royalty; (ii) (lump-sum) fixed fee and (iii) a two-part tariff, that is a fixed fee plus royalty.

We consider the following three-stage licensing game. In the first stage, the patent-holding Firm 1 decides whether to license out the technology. Licensing reduces the marginal cost of the rival by ε .⁷ In case it offers to license out the technology, it charges a payment from the

In case Firm 2 does not accept the licensing contract, it receives a payoff

$$\frac{(a - 2c_2 + c_1 - \varepsilon)^2}{9}.$$

Thus, for a given r , Firm 2 would accept the licensing contract if the fixed fee is not greater than

$$f = \frac{(a - 2c_2 + c_1 + \varepsilon - 2r)^2}{9} - \frac{(a - 2c_2 + c_1 - \varepsilon)^2}{9}.$$

Hence, Firm 1 can at the most charge this f as the fixed fee.

licensee (a fixed licensing fee or a royalty rate or a combination of both royalty and fixed fee). In the second stage, Firm 2 decides whether to accept or reject the offer made by Firm 1. Firm 2 accepts any offer if it receives a weakly greater payoff from acceptance than from rejection. In the last stage, both firms compete as Cournot duopolists.

First, we will consider the case of non-drastic innovation.

III Non-Drastic Innovation ($0 < \varepsilon < a - 2c_2 + c_1$)

Let us consider the general licensing scheme involving both a fixed fee and a linear royalty per unit of output (i.e. as two-part tariff). Note that fixed-fee only or royalty licensing are special cases of this generalised licensing scheme. Suppose that Firm 1 decides to license the innovation by offering a contract (f, r) , where f is the fixed fee charged upfront and r is the royalty rate per unit of output produced by the licensee. We assume both $f, r \geq 0$ and $r \leq \varepsilon$.⁸

Suppose that Firm 2 accepts the licensing contract (f, r) . Firm 2's profit would be

$$\frac{(a - 2c_2 + c_1 + \varepsilon - 2r)^2}{9} - f.$$

	<p style="text-align: center;"><i>IV Drastic Innovation ($\varepsilon \geq a - 2c_2 + c_1$)</i></p> <p>Note that when the pre-innovation costs of the two firms are symmetric, under the drastic innovation Wang (1998) establishes that no licensing is always better than a fixed fee, and it is always weakly better than a royalty. Now we first show that with the cost asymmetry in the pre-innovation stage, the drastic technology will be licensed either by a fixed fee or by a royalty. Thus, no licensing is never optimal for the patentee. Later we argue that the optimal licensing policy for a drastic technology is actually a two-part tariff.</p> <p>To clearly contrast our findings on licensing policy in the case of drastic innovation with that under the symmetric pre-innovation cost scenario, we perform a separate analysis for royalty and fixed-fee licensing before we move on to the two-part tariff analysis.</p>
研究結果	<p>Proposition 1. <i>Under non-drastic innovation, the optimal licensing policy is as given in the following.</i></p> <p>(a) For</p> $c_1 \geq \frac{a + 4c_2 + \varepsilon}{5},$ <p style="text-align: center;"><i>only a fixed fee is charged.</i></p> <p>(b) For</p> $\frac{a + 4c_2 + \varepsilon}{5} > c_1 > \frac{a + 4c_2 - \varepsilon}{5},$ <p style="text-align: center;"><i>a two-part tariff is charged.</i></p> <p>(c) For</p> $\frac{a + 4c_2 - \varepsilon}{5} \geq c_1,$ <p style="text-align: center;"><i>only a royalty is charged.</i></p>

	<p>Proposition 2. <i>For a given size of drastic innovation ε, in a Cournot duopoly model with asymmetric pre-innovation costs, fixed-fee licensing is superior to royalty licensing when δ is relatively high. Formally, $\pi^F > \pi^R$ when</i></p> $\delta \left[\frac{16\delta}{5} + 2(a - c_1 + \varepsilon) \right] > \frac{(a - c_1 + \varepsilon)^2}{4}$ <p><i>and vice versa.</i></p> <p>Proposition 3. <i>Under drastic innovation, the optimal licensing policy is always a two-part tariff licensing scheme.</i></p>
研究 貢獻	<p>This analysis also provides a platform to bridge the literature on external and internal patentees. Previous literature showed that a fixed fee is better than a royalty when the patentee is an outsider, whereas a royalty is better than a fixed fee when the patentee is an insider under symmetric initial costs. In their framework with asymmetric costs, they endogenise this feature of licensing arrangements. As the degree of cost asymmetry changes, they go from one type of licensing to another. At the same time, they show that when the cost asymmetry is moderate, a two-part tariff licensing scheme is optimal for non-drastic innovation. Also, quite interestingly, they find that the drastic innovation is always licensed and the optimal licensing contract for the drastic innovation involves a two-part tariff. Thus, their analysis also provides another theoretical rationale for the empirically observed two part tariff licensing practices in reality.</p>
未來 研究 方向	<p>Technology licensing in a vertically related is still not well developed, it is a new and interesting direction.</p>

篇名	The Nash bargaining solution in vertical relations with linear input prices
作者	Hamid Aghadadashli , Markus Dertwinkel-Kalt , Christian Wey
出處	Economics Letters 145 (2016) 291–294
摘要	We re-examine the Nash bargaining solution when an upstream and N downstream firms bargain over a linear input price with unobservable contracts. We show that the profit sharing rule is given by a simple and instructive formula which depends on the parties' disagreement payoffs, the profit weights in the Nash-product and the elasticity of derived demand. A downstream firm's profit share increases in the equilibrium derived demand elasticity which in turn depends on the final goods' demand elasticity.
研究動機	Our analysis of the bargaining frontier confirms this basic intuition and we derive a simple and instructive formula which combines all three determinants of parties' bargaining powers according to the Nash bargaining solution; namely, the disagreement pay-offs, the weights in the Nash product, and the slope of the bargaining frontier. The critical step in our analysis is to show that the slope of the bargaining frontier is equal to the total value of 1 plus the derived demand elasticity of the downstream firm for the input. The derived demand elasticity is the elasticity of the optimal input quantity with respect to the price of the input good. Its absolute value must be between zero and one to ensure the existence of a Nash bargaining solution in case of a linear transfer price.
模型	Suppose N downstream firms face a single upstream firm U . We normalize U's marginal production cost to zero and assume that all firms have the same production technology which transforms one unit of input to one unit of output. Firm $i \in \{1, \dots, N\}$ produces quantity x_i of a homogeneous product. Demand is given by the inverse demand function $p(x_1, \dots, x_N)$. We impose the standard assumption which guarantees the existence of a unique equilibrium $p''x_i + p' < 0, \tag{1}$ We solve the game via back-ward induction. If downstream firm i has negotiated input price w_i , it expects to get a profit of $\pi_i(w_i) = [p(x_1^*(\hat{w}_1), \dots, x_{i-1}^*(\hat{w}_{i-1}), x_i^*(w_i), x_{i+1}^*(\hat{w}_{i+1}), \dots, x_N^*(\hat{w}_N)) - w_i]x_i^*(w_i), \tag{2}$

	<p>while the upstream firm U expects to get</p> $L(w_i) = w_i x_i^*(w_i) + \sum_{i \neq j} \hat{w}_j x_j^*(\hat{w}_j). \quad (3)$ <p>The best-response function of firm i solves its first-order condition from which we get the condition</p> $p - w_i = -\frac{\partial p}{\partial x_i} x_i. \quad (4)$
研究結果	<p>We have established a link between the profit shares and the demand elasticity in vertical relations if up- and downstream firms bargain over linear input prices. Besides the disagreement payoffs and the weights of firms' profits in the Nash product, our formula singles out the slope of the bargaining frontier as an additional determinant of bargaining power. The slope of the bargaining frontier is equal to the total value of one plus the downstream firm's derived demand elasticity.</p>
研究貢獻	<p>This formula reflects the fact that the transferability of profit between the retailer and the supplier depends crucially on the derived demand elasticity.</p> <p>The more inelastic derived demand is in equilibrium the larger is the loss the retailer has to bear in order to shift one unit of utility to the supplier.</p> <p>We will speak of a bargaining frontier effect when a change in the economic environment changes the derived demand elasticity ε and thus the slope of the bargaining frontier.</p>
未來研究方向	<p>Our analysis can be important for empirical studies on bargaining power and on profit sharing in vertical markets as we provide a structural model which directly links up- and downstream profits with equilibrium (final and derived) demand elasticities, disagreement payoffs, and firms' exogenous Nash profit weights. Thus, our approach allows to estimate a party's Nash profit weight if profits are observed and if the derived demand elasticity (or the final good elasticity) is estimated.</p>

篇名	How to Compete? Cournot versus Bertrand in a Vertical Structure with an Integrated Input Supplier
作者	Luciano Fanti and Marcella Scrimatore
出處	Southern Economic Journal 2019, 85(3), 796–820
摘要	We study whether a quantity or a price contract is chosen at equilibrium by one integrated firm and its retail competitor in a differentiated duopoly. Using a similar vertical structure, Arya et al. (2008) show that Bertrand competition is more profitable than Cournot competition, which contrasts with conventional wisdom. In this article, we first demonstrate that such a result is robust to the endogenous determination of the type of contract. Second, by introducing managerial incentives in the model, we find that delegation to managers may lead each firm to choose a quantity contract and, as long as products are sufficiently differentiated, entails conflicting choices causing nonexistence of equilibrium in pure strategies. Significantly high product substitutability reconciles firms' objectives under delegation, leading unique or multiple equilibria with symmetric types of contracts to arise.
研究動機	The present study reconsiders the endogenous choice of price versus quantity in a vertical market in which an independent retailer outsources its input supply to an integrated rival. This type of market characterizes regulated industries such as telecommunications, energy, and transportations, where access to the network infrastructure is provided by a vertically integrated incumbent to retail competitors (see interesting examples of such sectors in Bourreau et al. 2011).
模型	Following Arya et al. (2008), we assume one vertical integrated producer (VIP) and one independent firm, respectively firm 1 and firm 2, offering differentiated products. Firm 1 operates as an unregulated monopolist on the upstream market, supplying a critical input to both its downstream affiliate and the downstream rival. Firm 2 is charged a per-unit wholesale price z for the input. Firms are endowed with a technology relying on perfect vertical complementarity (i.e., one unit of input is embodied in each unit of output). Thus, firm 1 and firm 2 produce the retail output at constant marginal costs c_1 and c_2 , respectively (with $c_1 \leq c_2$). Firm 1's costs to produce the input are normalized to 0, while no fixed costs and no capacity constraints are assumed. The demand side on the downstream market is a simplified version of Singh and Vives (1984), with the inverse demand function: $p_{i1} = a - \gamma q_j - q_i$, where p_i and q_i are, respectively, the retail price and the retail output of variety i ($i = 1, 2$). The variable $a > 0$ (with $a > c_2 \geq c_1$) is the reservation price and γ measures the degree of substitutability between the two varieties (i.e., goods are regarded as almost

	<p>unrelated, when $\gamma \rightarrow 0$ and almost homogeneous when $\gamma \rightarrow 1$). More precisely, we consider the interval of the product substitutability parameter that ensures the non-fore closure condition for firm 2 assumed throughout the article, that is, $\gamma \in (0, (a - c_2)/(a - c_1))$. This coincides with the unit-interval of imperfect product substitutability only in absence of cost differences between the two firms. Given the above assumptions, firm 1's profits, the sum of its upstream and retail profits, are: $\pi_1 = zq_2 + (p_1 - c_1) q_1$, (2) while firm 2's retail profits are: $\pi_2 = (p_2 - z - c_2) q_2$ (3)</p>
研究結果	<p>Indeed, the strategic choice of price allows the VIP to exploit its monopolistic position in the upstream market by inducing a higher demand of inputs by the rival. This lets the independent firm choose price in equilibrium to enjoy a market advantage by relaxing price competition. We have extended the baseline model to include managerial delegation. We find that delegation to a manager dramatically alters the results obtained in the no-delegation setting. The VIP now behaves more (less) aggressively downstream through the choice of quantity (price) as strategic variable. The independent firm also behaves more (less) aggressively downstream by choosing price (quantity) as its strategic variable. In the end, the VIP chooses the same strategy as the rival's, regardless of the degree of product differentiation. That is, the VIP gains from behaving less aggressively and choosing price as its strategy, provided that the independent firm competes aggressively and chooses price. Alternatively, the VIP finds optimal to behave more aggressively by choosing quantity, provided that the independent firm is less aggressive and chooses price. As long as product differentiation is high enough, the independent firm chooses the strategy that is opposite to the rival's, which causes nonexistence of an equilibrium in pure strategies. Indeed, the independent firm optimally exploits the advantages of competing more aggressively through a Bertrand strategy when the rival behaves more aggressively à la Cournot.</p>
研究貢獻	<p>We have shown that sufficiently high product substitutability aligns the objectives of the two competitors. It pushes the independent firm toward an output expansion through a price choice and a retail price increase through a quantity choice when the VIP chooses, respectively, price and quantity. This causes the existence of both a symmetric Bertrand and a symmetric Cournot equilibrium, with Bertrand arising as a unique equilibrium when products are not very close substitutes.</p>
未來研究	<ul style="list-style-type: none"> ▪ Future research could investigate the choice between price and quantity competition under nonlinear vertical pricing, which may provide new insights

方向	into vertical relationships and managerial incentives. Further analysis should be performed under a different timing regarding the design of 816 Luciano Fanti and Marcella Scrimatore managerial incentives, which could affect both retail competition and the wholesale price-setting stage.
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篇名	<i>Ad valorem versus per-unit royalty licensing in a Cournot duopoly model</i>
作者	<i>Hsu, J., Liu, L.-H., Wang, X. H., & Zhen, C.-H. (2019)</i>
出處	Manchester School, 87(6), 890-901. doi: 10.1111/manc.12280
摘要	Ad valorem royalty licensing is implemented when the licensor (i.e., patent-holding firm) obtains ownership shares in the licensee as payment once the new technology is transferred. In a Cournot duopoly model, we compare two licensing forms between competitors of different productivity, ad valorem and per-unit royalty licensing. This paper finds that ad valorem royalty licensing is superior to per-unit royalty licensing for the patent-holding firm when the cost-reducing innovation is non-drastic. The reason for this result is that cross ownership reduces output market competition and thus the patent-holding firm enjoys better profit margins by strategically setting the share ratio. Furthermore, we show that the relieved competition under ad valorem royalty licensing pulls down the industry output, and thus hurts consumer surplus and social welfare in comparison to per-unit royalty licensing.
研究動機	1. The theoretical research on licensing of cost-reducing innovations has studied extensively per-unit royalty licensing and fixed-fee licensing. But another commonly observed licensing method, which we call ad valorem royalty licensing, has been largely neglected thus far. Under ad valorem royalty licensing, the licensor obtains ownership shares in the licensee as payment once the new technology is transferred. As a result, the licensor receives a portion of the licensee's profit. Well-known real world examples include the technology-for-share deals between Motorola and Universal Display Corporation in 2000, CSIRO and PolyNovo in 2005, Microsoft and Skinkers in 2006, etc. This paper aims to study and compare ad valorem and per-unit royalty licensing between two Cournot competitors when one of them has a cost-reducing innovation.

模型	<p>Consider a homogeneous good market with two firms (firm 1 and firm 2) who compete in quantities (q_1 and q_2). The (inverse) market demand function is given by $p(Q)$, where p denotes price and $Q = q_1 + q_2$ represents industry output. Prior to innovation by firm 1, the firms have a common constant marginal cost, $c_1 = c_2 = c (c > 0)$. Suppose firm 1 has a patented cost-reducing innovation that lowers its unit cost to $c - \varepsilon$. The level of cost reduction ε is assumed to be non-drastic so that both firms are active under no licensing. Furthermore, the following assumption on market demand will be maintained throughout the paper.</p> <p>Given that the innovation (owned by firm 1) reduces the marginal cost of production, technology sharing via licensing may be mutually profitable. We consider two forms of licensing, ad valorem royalty licensing and per-unit royalty licensing. With ad valorem royalty licensing, firm 1 transfers its new technology to firm 2 and receives ownership shares of firm 2 as payment. In this way, firm 1 receives financial interests in firm 2's operating earnings. With per-unit royalty licensing, firm 1 transfers its new technology to firm 2 in exchange for a per unit royalty payment.</p>
研究結果	<p>In recent studies of licensing, little attention has been paid to the use of ad valorem royalty licensing, even though real firms have been shown to engage in it world-wide. In light of this, we attempt to study and compare ad valorem royalty and per-unit royalty in a Cournot duopoly model where one of the firms has a cost-reducing innovation. We find that ad valorem royalty licensing is better than per-unit royalty licensing for the patent-holding firm. This result is consistent with the empirical observation that most of the licensing contracts involve equity purchases. However, ad valorem royalty licensing reduces the industry output and thus hurts consumers, while perunit royalty licensing improves both consumer surplus and social welfare.</p>
研究貢獻	<p>Existing empirical evidence reveals that ad valorem royalty licensing is quite a common business practice in the real world in addition to per-unit royalty and fixed-fee licensing. In our model, the inside innovator indeed prefers to trade its new technology for ownership shares in the rival firm (Proposition 2), thus providing theoretical support for ad valorem royalty licensing. However, such a licensing method yields a lower social welfare in comparison to per-unit royalty licensing (Proposition 3). Moreover, the reduced industry output under ad valorem royalty licensing hurts consumers (Proposition 1). Accordingly, our analysis suggests that more</p>

	attention should be paid to ad valorem royalty licensing from an antitrust perspective.
未來 研究 方向	A number of areas are worthwhile directions for future research based on the present model. One direction is to compare the two licensing mechanisms in an oligopolistic industry to see which licensing method is optimal for the inside innovator. In the case that the innovator transfers the technology to one of its rivals, ad valorem royalty licensing might not be able to remain its superiority because that the well-known free-riders (i.e., all other rivals with the old technology) in the industry will extract some benefits of the market concentration. Another is to introduce product heterogeneity into the model. With imperfect substitutes/complements, we can examine how the incentive to license its innovation changes for the patent-holding firm. It is also very interesting to explore the optimal licensing mechanism in a differentiated duopoly under Bertrand Competition as in Wang and Yang (1999). Still a third avenue is to extend the analysis to a mixed duopoly. Either the public firm or the private firm can be the inside innovator. The optimal licensing mechanism is expected to be different in the two scenarios.

篇名	<i>On the Licensing of Innovations under Strategic Delegation</i>
作者	Judy Hsu , X. Henry Wang
出處	Working Paper
摘要	This paper uses a three-stage licensing-delegation-quantity game to study the licensing of a cost-reducing innovation by a patent-holding firm to its competitor. It is shown that licensing is less likely to occur under strategic delegation compared to no delegation.
研究動機	The goal of this paper is to point to another potentially important reason for the lack of licensing of innovations between competing firms.
模型	The impact of strategic delegation on licensing is most transparent in the context of a homogeneous good Cournot duopoly with a linear demand and constant unit cost of production. Assume the (inverse) market demand function is given by $p = a - Q$, where p denotes price and Q represents industry output. With the old technology, both firms produce at constant unit production cost c ($0 < c < a$). The cost-reducing innovation by firm 1 creates a new technology that lowers its unit cost and any licensee's unit cost by the amount of ε . For simplicity, our focus is on non-drastic innovations (i.e., $\varepsilon < a - c$). Our game takes place in three stages: delegation, licensing, and quantity competition, respectively. In the first stage, the firms' owners decide simultaneously their incentive contract for their managers. In the second stage, firm 1 (the patent-holder) chooses a licensing contract and firm 2 decides whether to accept firm 1's offer. In the third stage, the firms' managers simultaneously choose their output levels.
研究結果	Under strategic delegation, firms (managers) behave more aggressively than under standard quantity competition, reducing the incentive for the patent-holding firm to license its innovation to the other firm. This is the result of two forces. On the one hand, the cost-reducing innovation (if kept for own use) affords the patent-holding firm a bigger advantage over its competitor under strategic delegation than under no delegation. On the other hand, the potential licensing revenue is smaller due to a smaller potential for profit gain from licensing by the competitor under strategic delegation than under no delegation. Both forces work to reduce the likelihood of licensing under strategic delegation relative to no delegation. The discussion above also indicates that the main conclusion of this paper that

	licensing is less likely to occur under strategic delegation than under no delegation should survive extension of the simple homogenous good duopoly model with linear demand to more general settings.
研究 貢獻	It has to do with the widely recognized fact of separation of ownership and control in the modern corporation and the delegation of some decision making from owners to managers.
未來 研究 方向	It can be compared with production without licensing under Cournot competition.

篇名	Patent Licensing under Strategic Delegation
作者	Ana I. Saracho
出處	Journal of Economics & Management Strategy, Volume 11, Number 2, Summer 2002, 225–251
摘要	The modern corporation is characterized both by a separation of ownership from management and by managerial incentives that often include strategic elements in addition to the standard incentive elements. Despite the importance of these two features in the agency and corporate-governance literatures, they are absent in the treatment of the firm in the patent-licensing literature. The analysis in this paper shows how, by simply taking into account these two features of the modern corporation, it is possible to offer a new explanation for the use of royalties in licensing agreements.
研究動機	This paper provides a new justification for the superiority of the royalty mechanism over the fixed-fee mechanism within Kamien and Tauman's (1986) theoretical framework of analysis.
模型	<p>Consider, as in Kamien and Tauman (1986) and Kamien (1992), an oligopolistic industry with N identical firms that produce a homogeneous good. The inverse demand function for this good is of the form</p> $p = a - bQ \quad \text{with} \quad Q = \sum_{i=1}^N q_i$ <p>where q_i represents the quantity produced by firm $i = 1, \dots, N$. Entry into the industry is assumed to be unprofitable, i.e., the cost of entry exceeds the profits an entrant could realize. The average cost of production of each firm is independent of the level of production and equal to c, with $a > c > 0$. The oligopolistic firms are engaged in quantity competition and may choose to delegate production decisions to managers in order to improve their strategic position in the market. A given research laboratory owns a patent on a process innovation and sells licenses to the downstream firms in the oligopolistic industry. The innovation reduces their marginal cost of production from c to $c' = c - \varepsilon$, and is such that $\frac{a-c}{\varepsilon} \geq N$. The marginal cost of selling licenses is zero. Obviously, the value of the license to each firm depends upon the number of rival firms that also buy the license.</p>

研究 結果	The analysis in this paper suggests that firms' strategic incentives may play a fundamental role in generating the licensing practices observed in practice, and thus in explaining the forms and patterns of the diffusion of innovations. In consequence, the analysis indicates that it may be important to take account of some of the fundamental features that characterize the modern corporation, especially its separation of ownership from control and managerial incentives that may not be indexed only to profits.
研究 貢獻	The analysis will therefore maintain all the useful properties and features of their analysis and, in addition, deliver an explanation for the use of royalties. More precisely, it will be shown how, contrary to their result, royalty licensing may allow the patentee to obtain greater profits than fixed-fee licensing. In particular, the analysis in this paper draws attention to two important features of the modern corporation that have received no attention in the treatment of the firm in the patent-licensing literature: the actual objective function of the firm and its basic institutional structure of production.
未來 研究 方向	If the static analysis in the literature is extended to a dynamic framework by explicitly considering this intertemporal consistency problem as in Saracho (1997), then the implications of the analysis in this paper become notably stronger. The reason is that in such an intertemporal framework the time-consistency problem faced by the monopolist decreases the benefits that he may obtain under the auction and fixed-fee licensing mechanisms but does not affect those that may be obtained by means of royalty licensing.

篇名	Internal Transfer Pricing, External Technology Licensing, and Market Performance
作者	Chih-Min She, Shih-Jye Wu, Ya-Po Yang
出處	Working paper
摘要	This paper analyzes how a decentralized firm, facing the competition with a centralized firm in the downstream market, can manipulate both of an internal transfer price and an external license contract to achieve its preferred objective. We found that the transfer pricing as well as the technology licensing can be judiciously used by the decentralized firm as complementary tools to practice tacit collusion with its rival and to reshape the performance of the market to behave as the one in the monopoly situation. This novel finding is qualitatively robust under various directions of extension: heterogeneous products, alternative time structure, and bargaining power in signing a licensing contract.
研究動機	Despite firms in many industries have experiences in using transfer pricing as well as the technology licensing as two arms in raising their profits and promoting their advantage in competition, scholars in academic forum remain paying scant attentions to the issue about how a decentralized firm can maneuver both transfer pricing and technology licensing coordinately to affect the market performance and the ensuing welfare distribution among market participants. In light both of the prevalence of examples and the absence of due understanding about the usage of transfer pricing and technology licensing executed by decentralized firms, this paper is set to examine these firms' incentive to license advanced technology to their rivals in the downstream market, explore the effects of such business strategies affected on the markets, and discuss the regulatory concerns from the perspectives of fair market discipline and welfare.
模型	This paper presents a simple duopoly model, including a decentralized firm whose headquarter resides in the upstream division and owns intellectual property about advanced production technology applied to the downstream division, and a centralized firm who ultimate determines its output decision and may require the advanced technology transferred from the decentralized firm, a posited rival in the downstream market. The headquarter of the decentralized firm chooses the intra-firm transfer price and designs a licensing contract offered to the centralized firm. The transfer price and the resulting market performance with and without technology transfer are investigated.

研究 結果	<p>The main result of this paper is that a decentralized firm can simultaneously use transfer pricing and technology licensing to exploit more profits than that situation without the usage of licensing. Moreover, the decentralized firm can control the two tools as a way to facilitate tacit collusion with its market adversary and the market performance may even behave as the same as the situation in a monopoly case. That is, transfer pricing as well as technology licensing play complementary roles in making a decentralized firm to redirect the market equilibrium price and outputs from a duopoly market to the circumstance which is equivalent to those presented in a monopoly market.</p>
研究 貢獻	<p>This paper pioneers to explore the welfare implication of practicing technology licensing cum transfer-pricing by a decentralized corporation. This paper also provides alternative reason to explain why a cost-reducing licensing may worsen social welfare.</p>

篇名	Technology licensing in a differentiated oligopoly
作者	Aniruddha Bagchi , Arijit Mukherjee
出處	International Review of Economics and Finance 29 (2014) 455–465
摘要	We show the effects of product differentiation and product market competition on technology licensing by an outside innovator. For a certain range of product differentiation, both the innovator and the society prefer royalty licensing compared to auction (or fixed-fee), irrespective of Cournot and Bertrand competitions, if the number of potential licensees is sufficiently large. Hence, for such a range of product differentiation, neither the innovator nor the antitrust authority requires information about the type of product market competition in choosing the type of the licensing contract.
研究動機	In a simple model with an outside innovator, we show the implications of product differentiation and product market competition on fixed-fee and output royalty in the licensing contracts. In order to understand the implications of product differentiation and product market competition clearly on the different instruments of the licensing contracts, we consider licensing with auction where the fixed-fees are the winning bids of the licensees, and licensing with royalty separately. A simple extension of our analysis will be to consider a licensing contract combining fixed-fee and royalty, where all the effects shown in our analysis will interact.
模型	With this in mind, assume that the inverse market demand function for the i th licensee is $P_i = a - q_i - \gamma Q_{-i}$ First, we determine the product market equilibrium under royalty licensing. If I licenses the technology to n licensees and each of the n licensees pays a per-unit royalty r , where $r < a$, the i th licensee, $i = 1, 2, \dots, n$, chooses his output to maximize the following expression:

$$\text{Max}_{q_i} (a - q_i - \gamma Q_{-i} - r) q_i. \quad (2)$$

The equilibrium output of the i th licensee can be found as $q_{iC}^R = \frac{a-r}{2+\gamma(n-1)}$. Hence, I maximizes the following expression to determine the equilibrium royalty rate:

$$\text{Max}_r \frac{nr(a-r)}{2+\gamma(n-1)}. \quad (3)$$

The equilibrium royalty rate is $r_C^* = \frac{a}{2}$. The equilibrium output of the i th licensee is $q_{iC}^R = \frac{a}{4+2\gamma(n-1)}$, and the equilibrium payoff of I is

$$\Pi_C^R = \frac{na^2}{4[2+\gamma(n-1)]}. \quad (4)$$

Notice that the output of a licensee does not depend on the lump-sum amount paid in the auction. The reason is that, in the production stage, the fixed amount paid in the auction is a sunk cost, and hence is irrelevant in determining a firm's output. In contrast, under the royalty contract, the royalty rate affects a firm's output.

Using the expression for the output of each licensee, we can determine that the profit

of the i th licensee is $\frac{a^2}{[2+\gamma(k-1)]^2}$.

Hence, each licensee's maximum willingness to pay for the technology is $\frac{a^2}{[2+\gamma(k-1)]^2}$.

Therefore, in the Nash equilibrium of the bidding

game, each potential licensee bids $\frac{a^2}{[2+\gamma(k-1)]^2}$.

The reason is as follows. Given that a licensee bids $\frac{a^2}{[2+\gamma(k-1)]^2}$, other licensees will

not get the technology if they bid less than $\frac{a^2}{[2+\gamma(k-1)]^2}$.

Hence, to get the technology, each licensee needs to bid $\frac{a^2}{[2+\gamma(k-1)]^2}$.

As mentioned in Kamien et al. (1992), if $k = n$, I can guarantee this equilibrium bid by specifying a minimum bid. However, for $k < n$, the potential licensees bid these amounts even if I does not specify a minimum bid.

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We consider technology licensing by an outside innovator, and show the effects of product differentiation and competition (given by the number of licensees producing in the market) on the innovator's profit and social welfare. We show that both the innovator and the society can be better off under royalty licensing compared to auction if the number of potential licensees is sufficiently large. We find that the relation between product differentiation and the minimum number of potential licensees that is required to make the royalty licensing profitable to the innovator is non-monotonic under Cournot competition, while it is positive under Bertrand competition.

研究貢獻	Our analysis suggests that if the number of potential licensees is large, there is a wide range of the product differentiation parameter in which the innovator and the antitrust authority both prefer the royalty contract, regardless of the type of the product market competition.
未來研究方向	Like previous works such as Muto (1993), we have assumed that product differentiation is not the outcome of technological factors but it is due to non-technological factors. Hence, natural extensions of this paper are to consider situations where (i) product differentiation is due to technological factors, and (ii) product differentiation is a choice variable of the producers. We intend to consider these issues in our future research.

篇名	Environmental Regulation and Horizontal Mergers in the Eco-industry
作者	Joan Canton, Maia David and Bernard Sinclair-Desgagné
出處	Nota di lavoro // Fondazione Eni Enrico Mattei: ETA, Economic theory and applications, No.2008,46
摘要	This paper considers the environmental policy and welfare implications of a merger between environment firms (i.e., firms managing environmental resources or supplying pollution abatement goods and services). The traditional analysis of mergers in Cournot oligopolies is extended in two ways. First, we show how environmental policy affects the incentives of environment firms to merge. Second, we stress that mergers in the eco-industry impact welfare beyond what is observed in other sectors, due to an extra effect on pollution abatement efforts; this might lead to disagreements between an anti-trust agency seeking to limit market concentration which can be detrimental to consumer surplus and a benevolent regulator who maximizes total welfare.
研究動機	Over the past decades, the provision of goods and services to abate pollution or manage environmental resources has by and large become the core business of specialized private firms. This so-called eco-industry is now approaching the aerospace and pharmaceutical sectors in size, with an estimated 2005 global market of US \$653 billion that is expected to reach US \$776 billion by 2010.1 Unsurprisingly, government agencies and policy makers are paying extra attention to this sector: not only does it account for a significant number of jobs (1.5 million jobs, or 3.8% of total employment, in the European Union alone in 2002, according to These articles, however, did not study how environmental regulation affects concentration and mergers in the eco-industry. Investigating such aspects of industry structure seems nevertheless crucial for an understanding of the supply of environmental resources and abatement technologies. In a first attempt to do so, The present paper, on the other hand, will now consider the relationship between emission taxes and mergers of environment firms.

模型	<p>Consider a representative price-taking polluting firm that produces one consumption good and sells it on a competitive market at unit price P. The marginal production cost for this good is assumed to be constant and is referred to as c. For an output level x, the firm generates polluting emissions $e(x, A)$, where A represents the firm's abatement effort. Without loss of generality, we take the emission function to be $e(x, A) = \frac{1}{2}(x - A)^2$. This means that $e_x(x, A) > 0$ (more production entails more pollution), $e_A(x, A) < 0$ (more abatement decreases total emissions), $e_{xx}(x, A) > 0$ (emissions from the last unit produced increase with the production level), and $e_{AA}(x, A) > 0$ (abatement effort is subject to diseconomies of scale). Last, we have $e_{xA}(x, A) < 0$ (the higher the abatement, the less the last unit produced generates pollution). The representative polluting firm is subject to a constant tax t per-unit of emission. However, it can purchase abatement goods and services from a specialized environment industry at a unit price p. It then sets production and abatement efforts in order to maximize the following profits:</p> <p>$\max_{x,A} \phi = P x - cx - pA - te(x, A)$. Let $p(A)$ denote the inverse demand function faced by the environment firms. It is given by the polluters' decision to abate, as captured by equation (3). Rearranging this equation, the inverse demand is then $p(A) = \alpha_1 - \alpha_2 A$, where $\alpha_1 = \frac{(1-c)t}{1+t}$ and $\alpha_2 = \frac{t}{1+t}$. The eco-industry is initially composed of n identical firms competing à la Cournot. Following McAfee & Williams (1992), the total cost of an environment firm i is assumed to be equal to $\frac{a_i^2}{2k_i}$, where a_i is the firm's output and k_i its capital investment</p>
研究結果	<p>A more stringent tax will decrease the price-elasticity of demand for environmental goods and services, thereby allowing outsiders to a merger to benefit even more from the larger residual demand. To be sure, the proposed policy would now have to internalize its effect on the structure of the eco-industry.</p>
研究貢獻	<p>Following a merger in the eco-industry, polluting firms produce less and the price of the final good increases. Consumer surplus then shrinks. a merger of environment firms has opposite effects on welfare: it decreases environmental quality and consumer surplus but increases the eco-industry and the polluting sector's profits.</p>

未來 研究 方向	Environmental costs should supplement conventional welfare analyses of mergers when dealing with horizontal mergers in the ecoindustry. Some possible extensions of the present work might be worth mentioning at this point. Other (more realistic) market structures should certainly be considered, such as asymmetric oligopolies and oligopolies with a competitive fringe. It would also be instructive and useful, moreover, to study the optimal emission tax in this context; to be sure, the proposed policy would now have to internalize its effect on the structure of the eco-industry.
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篇名	自費醫療與醫院的品質競爭
作者	王光正 ^a ，胡家瑜 ^b a. 長庚大學工商管理學系教授 b. 林口長庚醫院神經內科研究員、，長庚大學醫學系
出處	Working paper
摘要	在考慮自費醫療市場下，我們討論醫療市場競爭程度與醫院醫療品質投入的關係。我們得到三項主要結果。第一、當醫療市場同時存在自費與保險市場時，醫療市場越競爭，醫院的醫療品質投入可能上升，也可能下降。影響醫療品質上升或下降的因素在於，如何衡量醫療市場競爭，與保險公司對診療與低品質醫材的價格給付。第二、當醫材市場完全為自費市場時，醫療市場越競爭，醫療品質投入不會上升。第三、當醫療市場完全為保險市場時，醫療市場越競爭，醫療品質投入不會下降。我們的研究結果顯示，考慮自費市場時，醫療競爭不一定存在。
研究動機	<p>世界各國的健康醫療體系有很大的差異，有的傾向全部由政府提供醫療服務；有的則傾向由市場提供。然而，不論採用何種制度，除了政府或市場中的保險公司所提供的醫療服務外，病患就醫時，仍有相當多的醫療商品或服務屬於自費支出(out-of-pocket payments)。整體來看，根據世界銀行(World Bank) 2000 至 2015 年的資料，無論國家平均收入高低，全球各國醫療費用的自付額皆有上升趨勢。</p> <p>無論醫療服務主要是由政府或市場提供，自費醫療在醫療市場上都佔有相當的重要性。但在醫療品質相關的理論研究上，卻還未將自費醫療考慮進去。本文的主要目的就是在考慮自費醫療支出下，討論醫院間的品質競爭行為</p>
模型	<p>考慮一圓形市場，病患平均分布在圓周長為 1 的圓圈上，圓上每一點病患密度為 1。此市場中有 n 家醫院，我們假設此 n 家醫院平均分佈在此圓形市場上，因此醫院 i 的位置 $z_i = i/n, i = 1, 2, \dots, n$。一個完整的醫療服務分成兩部分，一部分為門診與手術(以下稱為診療服務)，一部分為診療所需醫材。在我們的模型中，除了醫院可以改變診療品質外，醫材也有高低品質的差異。我們設定市場中的病患有兩種類型，第一型病患(type I)對於醫材的品質相當重視，較願意付出高代價使用高品質醫材，在病患群中比例為 λ；相較之下，第二型病患(type II)對於醫材品質的要求較不敏感，在病患群中比例為 $1-\lambda$。¹第一型與第二型病患之效用函數分別如下：</p>

¹我們的設定與 Brekke, Siciliani and Straume (2008)與 Brekke, Siciliani and Straume (2011)類似，他們將市場區分為高低需求市場。

$$U_i^I(z_i, q_i^c) = v + q_i^c + \delta q_k^m - P_i - |z - z_i|t \quad ;$$

$$U_i^{II}(z_i, q_i^c) = v + q_i^c + q_k^m - P_i - |z - z_i|t \quad .$$

(1)

(1)式中， v 為病患接受醫療服務之保留效用， q_i^c 為醫院 i 診療服務之品質水準， q_k^m 為醫材之品質水準，為了方便分析，我們假設醫材只有兩種品質 q_k^m ($k = H$ 或 L)，高(低)品質醫材的品質水準標準化為 $q_{H(L)}^m = 2(1)$ 。 P_i 為病患接受醫院 i 提供醫療服務時其所需付的價格，此價格為診療服務價格加上醫材價格。 t 則為單位距離之交通成本。第一型與第二型病患效用函數之差異在於 δ ，我們假設 δ 大於 1，這表示第一型病患對醫材品質較為敏感且較為重視。

一單位的醫療服務需要一單位的診療配合上一單位的醫材(高品質或低品質醫材皆可)。假設醫院 i 提供單位診療的邊際成本為 c ，高品質與低品質醫材每單位的邊際成本分別為 c_H 與 c_L ， $c_H > c_L$ 。有相當多的診療服務符合這樣的設定，舉例來說對白內障的診療有醫師的診療服務成本以及醫材成本。白內障手術的醫材主要為人工水晶體，而人工水晶體有高低品質的差異，高(低)品質的人工水晶體單位成本較高(低)。由於 c 的大小不影響本文的結果，為求簡化令 $c = 0$ 。另外，我們假設醫院 i 提升診療品質的成本函數為 $K(q_i^c)$ ， $K(q_i^c) = \beta(q_i^c)^2/2$ ， $\beta > 0$ 。這表示品質提升投資為一次性之投資。對於醫院的醫療服務而言，品質提升有外部性，醫院醫療品質提升後不會影響每單位醫療服務的邊際成本。這種品質研發在實務上如引進新醫療資訊系統，與醫療硬體設備(核磁共振機、電腦斷層機)的購買等。假設醫院 i 對第一型與第二型病患的供給量分別為 λx_i^I 與 $(1 - \lambda)x_i^{II}$ 時，醫院 i 的成本函數可以(2)式表示。

$$TC(q_i^c) = \frac{\beta}{2}(q_i^c)^2 + \lambda x_i^I c_H + (1 - \lambda)x_i^{II} c_L \quad .$$

(2)

為凸顯醫療市場中醫療價格被管制(regulated)的特性，我們假設有一個醫療保險公司，所有的病患皆向此保險公司投保。當醫療服務發生時，保險公司只向醫院支付診療費用 r^c 與低品質醫材費用 r^m 。這意思是說，若民眾使用低品質醫材，保險公司負擔診療與醫材的全部費用；但若民眾選擇高品質醫材，那保險公司只負擔診療費用 r^c ，其中的高品質醫材費用將由病患完全負擔。我們假設高品質醫院可對高品質醫材價格 p_{iH} 定價。²換句話

² 另一種設定是病患選擇高品質醫材時，病患負擔差價 $p_{iH} - r^c$ 。這樣的設定不影響本文的結果。

	<p>說，病患若選擇低品質醫材，(1)式中的醫療費用$P_i = 0$，醫院提供每單位醫療服務可得$(r^c + r^m)$；若病患選擇高品質醫材，(1)式中的醫療費用$P_i = p_{iH}$，醫院提供每單位醫療服務可得$(r^c + p_{iH})$。由於高品質醫材為自費項目，為方便討論，之後高品質醫材市場稱為自費市場，低品質醫材市場稱為保險市場。本文為兩階段賽局。在給定保險公司給付r^c與r^m下，第一階段醫院們決定診療品質水準q_i^c。在給定q_i^c下，第二階段醫院們決定高品質醫材價格p_{iH}。以下利用倒推解法(Backward Induction)求解。</p>
研究結果	<p>命題 1：若以醫院家數來刻畫市場競爭，當市場中醫院家數越來越多(少)，醫院的品質投資越低(高)。這表示市場越競爭，醫院的品質競爭越低。</p> <p>命題 2：若以運輸成本來描述市場競爭。當$r^c + r^m > (<)c_L$，市場競爭越激烈，醫院的品質投資越高(低)。</p> <p>命題 3：若以自費醫療病患比例來描述市場競爭。當$r^c + r^m < c_L$，市場競爭越激烈，醫院的品質投資越高。當$r^c + r^m > c_L$，市場競爭越激烈，醫院的品質投資則不確定，取決於保險市場與自費醫療市場之邊際收益的相對大小。</p> <p>命題 4：若醫療市場競爭以醫院家數或運輸成本來衡量：</p> <p>(1).當醫療市場為完全自費市場時，市場變的越競爭，均衡醫療品質不會上升；</p> <p>(2).當醫療市場為完全保險市場時，市場變的越競爭，均衡醫療品質不會下降。</p>
研究貢獻	<p>本文的理論分析也為目前實證文獻結果間的矛盾提出了一個可能的解釋。Robinson and Luft (1985, 1987), Noether (1988), Dranove, Shanley and Simon (1992)與 Sari (2002)等的研究支持醫療競武。Zwanziger and Melnick (1988)得到與醫療競武相反的結果。Kessler and McClellan (2000) , Gowrinsankaran and Town (2003)與 Mutter, Wong and Goldfarb (2008)等則得到市場競爭可能促使醫院品質競爭上升，也可能促使醫院品質競爭下降。這些實證研究使用的資料來自 Medicare, Health Maintain Organization 或是 Preferred Provider Organization，但統一的特徵是這些研究沒有考慮自費醫療市場。然而，無論是 Medicare, Health Maintain Organization 或是 Preferred Provider Organization 都有相當比例的自費市場。此文的理論研究顯示，未將自費市場與保險市場分離，是實證文獻結果分歧的可能原因。</p>

未來 研究 方向	醫療制度與醫療競爭的型態對於醫療品質投入的影響是有趣的問題，值得再做多元的探討。
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篇名	Foreign direct investment, unionised labour markets and welfare
作者	Jiyun Cao, Arijit Mukherjee
出處	International Review of Economics and Finance Volume 58, November 2018, Pages 330-339
摘要	Although empirical evidence on the relationship between labour union and foreign direct investment (FDI) is mixed, the theoretical literature mainly explains the negative relationship between labour union and FDI. We show that a multinational firm may prefer FDI in the presence of labour unions if it is sufficiently technologically superior to its domestic counterpart. FDI (compared to export) makes the domestic labour union better off but it makes the consumers, the domestic firm, the foreign labour union and the foreign country worse off, and may reduce domestic welfare. We show the implications of industry-wide and firm-specific labour unions.
研究動機	This paper provides a new rationale for undertaking foreign direct investment (FDI), which dominates international trade in recent years (UNCTAD, 2006) and has generated a vast theoretical and empirical literature. The evidence showing the relationship between labour union and FDI is mixed. While Cooke (1997) and Cooke and Noble (1998) show a negative relationship between high labour union density and FDIs by US multinationals, Traxler and Woitech (2000) show that the level of labour union density can have a positive influence on the investments by US multinationals. Coughlin, Terza, and Arromdee (1991) and Friedman, Gerlowski, and Silberman (1992) also show a positive relationship between the degree of labour union and FDI. While the theoretical papers by Naylor (2003) and Naylor and Santoni (2003) explain the negative relationship between labour union and FDI, the theoretical literature did not pay much attention to explain their positive relationship. Our paper fills this gap and provides an explanation for the positive relationship between labour union and FDI.

<p>模型</p>	<p>Assume that there are two countries, called foreign and domestic. There is a firm in each country. The foreign firm is called firm 1 and the domestic firm is called firm 2. The firms compete in the domestic country with homogeneous products. Firm 1 can serve the domestic country either through export or through FDI. We assume that production requires only workers and the firms differ in technologies. Assume that firm 1 requires λ ($0 < \lambda < 1$) workers to produce one unit of output and firm 2 requires one labour to produce one unit of output. The labour market in each country is unionised and the reservation wage of labour is z, which is assumed to be zero, for simplicity. The utility of each labour union is $U = wL$, where w is wage and L is the number of workers employed. If firm 1 exports to the domestic country, firms 1 and 2 hire workers from the labour unions in the foreign and the domestic countries respectively. However, if firm 1 undertakes FDI, both firms hire workers from a single (or an industry-wide) labour union in the domestic country. We assume that the inverse market demand is</p> $P = a - Q$ <p>where P is the price and Q is the total output.</p> <p>We consider the following game. At stage 1, firm 1 decides whether to export or to undertake FDI. At stage 2, the labour union in each country determines wage. At stage 3, the firms hire workers according to their requirement and compete like Cournot duopolists, and the profits are realised. We solve the game through backward induction.</p> $\pi_1^{x,d} = (\alpha - q_1^{x,d} - q_2^{x,d} - \lambda w_1^{x,d}) q_1^{x,d} \quad \text{and} \quad \pi_2^{x,d} = (\alpha - q_1^{x,d} - q_2^{x,d} - \lambda w_2^{x,d}) q_2^{x,d}$ $\max_{w_1^{x,d}} U_1^{x,d} = \max_{w_1^{x,d}} w_1^{x,d} \left[\frac{\lambda(\alpha - 2\lambda w_1^{x,d} + w_2^{x,d})}{3} \right] \quad \text{and} \quad \max_{w_2^{x,d}} U_2^{x,d} = \max_{w_2^{x,d}} w_2^{x,d} \left(\frac{\alpha + \lambda w_1^{x,d} - 2w_2^{x,d}}{3} \right)$
	<p>Proposition 1. If the labour markets in both countries are unionised, the foreign firm (i.e., firm 1) undertakes FDI (export) for $0 < \lambda < \frac{\sqrt{105}-7}{4}$ ($\frac{\sqrt{105}-7}{4} \leq \lambda < 1$).</p> <p>Under FDI, the domestic labour union sets the wage $w^{l,m} = \frac{\alpha}{2\lambda}$ as for $0 < \lambda \leq \frac{1}{2}$, so as to make the foreign firm a monopolist, but it sets the wage as $w^{l,d} = \frac{(1+\lambda)\alpha}{4(1-\lambda+\lambda^2)}$ for $\frac{1}{2} < \lambda < \frac{\sqrt{105}-7}{4}$, so that the firms compete like Cournot duopolists.</p> <p>Proposition 2. If the labour markets in both countries are unionised, FDI benefits the domestic labour union, but it makes the foreign labour union, the domestic firm and the consumers worse off.</p>

	<p>Proposition 3. If the labour markets in both countries are unionised, FDI decreases (increases) domestic welfare for $0 < \lambda < \bar{\lambda}(\bar{\lambda} < \lambda < \frac{\sqrt{105}-7}{4})$, while it always decreases foreign welfare compared to export.</p> <p>Proposition 4. If the labour markets in both countries are unionised, in our analysis, the domestic country prefers a uniform wage compared to discriminatory wages charged by the industry-wide domestic labour union if $\bar{\lambda} < \lambda < \frac{\sqrt{105}-7}{4}$.</p> <p>Proposition 5. If the labour markets in both countries are unionised and $0 < \lambda < \frac{\sqrt{105}-7}{4}$, an industry-wide domestic labour union with a uniform wage setting behaviour is preferable compared to firm-specific domestic labour unions for attracting FDI and making the domestic labour union better off. An industry-wide domestic labour union with a uniform wage setting behaviour is also preferable compared to firm-specific domestic labour unions for domestic welfare if $\bar{\lambda} < \lambda < \frac{\sqrt{105}-7}{4}$.</p>
研究結果	<p>We provide an explanation for the positive relationship between labour union and FDI, thus providing a new rationale for undertaking FDI. We show that the raising rival's cost motive may create the incentive for FDI in industries with unionised labour markets. FDI (compared to export) reduces the consumer surplus and foreign welfare, and it reduces domestic welfare if the multinational firm is sufficiently technologically superior to the domestic firm. FDI also makes the domestic firm and the foreign labour union worse off but it makes the domestic labour union better off compared to export. We further show that an industry-wide domestic labour union charging a uniform wage may create higher incentive for FDI and higher domestic welfare compared to both the industry-wide domestic labour union charging discriminatory wages and firm-specific domestic labour unions.</p>
研究貢獻	<p>We consider green-field FDI and show the effects of labour unions on the incentive for FDI.</p>
未來研究方向	<p>可考慮利用 Barbell model 解此一問題。</p>

篇名	Labour unionisation structure and product innovation
作者	Debasmita Basak , Arijit Mukherjee
出處	International Review of Economics and Finance
摘要	<p>This paper contributes to the recently growing literature by examining the effects of different labour unionisation structures on innovation. Using a Cournot duopoly setup, we investigate the effects of centralised and decentralised labour unions on product innovation. We show that if the products are symmetrically differentiated, the incentive for innovation is higher under decentralized labour unions, whereas the innovation incentive can be higher under a centralised labour union if the products are asymmetrically differentiated. Our results show that social welfare is strictly higher under decentralised unions compared to a centralised union.</p>
研究動機	<p>The purpose of this paper is to analyse the effects of different labour unionisation structures on the firms' incentives to innovate new products.</p> <p>Labour unions differ substantially between countries with respect to the degree of wage setting centralisation (Calmfors and Driffill, 1988; Moene & Wallerstein, 1997; Flanagan, 1999; Wallerstein, 1999). Decentralised wage setting is often contrasted with centralised wage setting. Under a decentralised wage setting, wages are set between employers and firm-specific unions, while under a centralised wage setting, an industry-wide union negotiates wages with all firms (Haucap & Wey, 2004). While the centralized argument is egalitarian in nature and generally makes the sufficiently substitutable workers better off (Horn & Wolinsky, 1988; Davidson, 1988), the rigidity associated with this system is generally bad for overall economic performance (Nickell, 1997;; Siebert, 1997).</p> <p>Given the diversity of unionised labour market, there is a growing literature (Calabuig & Gonzalez-Maestre, 2002; Haucap & Wey, 2004; Manasakis & Petrakis, 2009; Mukherjee & Pennings, 2011) that investigates the effects of different labour unionisation structures on innovation. Although the existing literature provides several important insights, their focus remained only on process innovation.</p> <p>Investment in process innovation is certainly a major part of firms' R&D expenditure, however, the firms in to a significant amount of their R&D budget towards product innovation. For example, as mentioned in Imai (1992), the Japanese firms R&D budget in process innovation relative to product innovation at a ratio of 60:40. It is argued in Mansfield (1988) that American firms have traditionally spent more in product innovation than Japanese firms. Our paper aims at closing the gap between product innovation and the structures of labour unions.</p> <p>It is intuitive that process and product innovations create different effects on labour demand and unionised wage. While product innovation increases the number</p>

	<p>of products in the market, by creating new demand for workers; process innovation, on the other hand, reduces the number of workers required in the production process by lowering the demand for workers. Hence, the effects of unionisation structures on product innovation demand new analysis. We take up this issue in this paper. Following the existing literature alluded earlier, we compare the incentives for innovation under a centralised union and decentralised unions respectively.</p>
<p>模型</p>	<p>We start by considering the output game. At this stage, the firms take the number of products and the wages as given.</p> <p>First, consider the case where neither firm innovates. If firm 1 and 2 produce goods g and h respectively and if the wages paid by firm 1 and 2 are w_1 and w_2, the respective equilibrium outputs are:</p> $\tilde{q}_g^o = \frac{(2-\gamma)a - 2w_1^o + \gamma w_2^o}{4-\gamma^2}$ $\tilde{q}_h^o = \frac{(2-\gamma)a + \gamma w_1^o - 2w_2^o}{4-\gamma^2}$ <p>Now consider the case where only firm 1 innovates the new product. In this situation, firm 1 produces g and y and firm 2 produces h. We get the resulting equilibrium outputs as:</p> $\tilde{q}_g^i = \tilde{q}_y^i = \frac{(2-\gamma)a - 2w_1^i + \gamma w_2^i}{2(2+2\gamma-\gamma^2)}$ $\tilde{q}_h^i = \frac{a + \gamma w_1^i + (1-\gamma)w_2^i}{2(2+2\gamma-\gamma^2)}$ <p>Similarly, if only firm 2 invests in innovating the new product, firm 1 produces g and firm 2 produces h and z. The resulting equilibrium outputs become:</p> $\tilde{q}_g^i = \frac{a + \gamma w_1^i + (1-\gamma)w_2^i}{2(2+2\gamma-\gamma^2)}$ $\tilde{q}_h^i = \tilde{q}_z^i = \frac{(2-\gamma)a - 2w_1^i + \gamma w_2^i}{(2+2\gamma-\gamma^2)}$ <p>Finally, consider the case where both firms innovate new products. In this situation, firm 1 produces g and y and firm 2 produces h and z. We get the outputs as:</p> $\tilde{q}_g^i = \tilde{q}_y^i = \frac{a - (1+\gamma)w_1^i + \gamma w_2^i}{(1+2\gamma)}$ $\tilde{q}_h^i = \tilde{q}_z^i = \frac{a + \gamma w_1^i - (1+\gamma)w_2^i}{2(1+2\gamma)}$ <p>Now, consider the scenario where the wages are set by the decentralised unions. The firm-specific union maximises the utility function $U_k = (w_k - c)L_k$ with respect to w_k where $k = 1, 2$.</p> <p>We summarise the equilibrium wages under four different constellations. If neither firm innovates, the equilibrium wages ex-post R&D are:</p> $\tilde{w}_1^d = \tilde{w}_2^d = \frac{a(2-\gamma) + 2c}{4-\gamma}$ <p>Next, we consider the case where only one firm innovates. For notational ease, we denote the innovating firm by 'iv' and the non-innovating firm by 'nv'. In this case, the equilibrium wages give:</p> $\tilde{w}_{iv}^d = \frac{a(4+3\gamma-2\gamma^2) + c(1+\gamma)(4+\gamma)}{(8+8\gamma-\gamma^2)}$ $\tilde{w}_{nv}^d = \frac{a(4+2\gamma-\gamma^2) + 2c(2+3\gamma)}{8+8\gamma-\gamma^2}$ <p>Finally, if both firms innovate, the equilibrium wages yield:</p> $\tilde{w}_1^d = \tilde{w}_2^d = \frac{a + c(1+\gamma)}{2+\gamma}$ <p>The following lemma is immediate from the above discussion.</p> <p>Lemma 1. <i>Assume that the labour unions are decentralised in nature. We get the following wage rankings:</i></p> <p>(a) <i>Compared to the case with no innovation, innovation reduces the wage paid by the innovating firm when both firms innovate, i.e., $\tilde{w}_k^i - \tilde{w}_k^d < 0$, and when only one firm innovates, i.e., $\tilde{w}_{iv}^d - \tilde{w}_k^d < 0$.</i></p> <p>(b) <i>The wage paid by the innovating firm is lower when both firms innovate compared to the case where only one firm innovates, i.e., $\tilde{w}_k^d - \tilde{w}_{iv}^d < 0$.</i></p> <p>Proof. See that $\tilde{w}_k^i - \tilde{w}_k^d = \frac{\gamma(a-c)(1-\gamma)}{(4-\gamma)(2+\gamma)} < 0$, $\tilde{w}_k^d - \tilde{w}_{iv}^d = -\frac{\gamma^2(a-c)(1-\gamma)}{(4-\gamma)(8+8\gamma-\gamma^2)} < 0$ and $\tilde{w}_k^d - \tilde{w}_k^d = -\frac{2\gamma(a-c)(1-\gamma^2)}{(2+\gamma)(8+8\gamma-\gamma^2)} < 0$.</p>

The model specific assumptions made in Section 2 also hold in this section with the exception that we consider the existing products of the firms, i.e., g and h , are perfectly substitutable. To economise on notations let's define the existing products as product x . This modification gives us the inverse market demand functions for x , y and z respectively, as:

$$\begin{aligned} P_x &= a - q_x - \gamma q_y - \gamma q_z \\ P_y &= a - q_y - \gamma q_x - \gamma q_z \\ P_z &= a - q_z - \gamma q_x - \gamma q_y \end{aligned}$$

We consider the game structure similar to Section 2.

3.1. The equilibrium outputs

If there is no innovation by any firm, only product x will be produced, and the inverse demand function becomes $P_x = a - q_x$. Given the wages w_1 and w_2 for firm 1 and 2 respectively, the equilibrium outputs of firm 1 and firm 2 yield:

$$\begin{aligned} \tilde{q}_{x_1}^0 &= \frac{1}{3}(a - 2w_1^0 + w_2^0) \\ \tilde{q}_{x_2}^0 &= \frac{1}{3}(a + w_1^0 - 2w_2^0) \end{aligned}$$

Now, consider the situation where only firm 1 innovates a new product and firm 2 does not innovate. This corresponds to $q_z = 0$. Straightforward calculations show that the equilibrium outputs of firms 1 and 2 are respectively:

$$\begin{aligned} \tilde{q}_{x_1}^1 &= \frac{a(2 - \gamma) - (4 + \gamma)w_1^1 + 2(1 + \gamma)w_2^1}{6(1 + \gamma)} \\ \tilde{q}_{x_2}^1 &= \frac{1}{3}(a + w_1^1 - 2w_2^1) \\ \tilde{q}_y^1 &= \frac{1}{2} \left(\frac{a - w_1^1}{1 + \gamma} \right). \end{aligned}$$

If only firm 2 innovates, it implies that $q_y = 0$. In this situation, we get the equilibrium outputs as:

$$\begin{aligned} \tilde{q}_{x_1}^2 &= \frac{1}{3}(a - 2w_1^2 + w_2^2) \\ \tilde{q}_{x_2}^2 &= \frac{a(2 - \gamma) + 2(1 + \gamma)w_1^2 - (4 + \gamma)w_2^2}{6(1 + \gamma)} \\ \tilde{q}_z^2 &= \frac{1}{2} \left(\frac{a - w_2^2}{1 + \gamma} \right). \end{aligned}$$

Finally, consider the case where both firms innovate. In this situation, the equilibrium outputs give:

$$\begin{aligned} \bar{q}_{x_1} &= \frac{2}{3} \left(\frac{a(2 + \gamma) - (4 + 5\gamma)w_1^0 + 2(1 + 2\gamma)w_2^0}{(2 + 3\gamma)(2 + \gamma)} \right) \\ \bar{q}_{x_2} &= \frac{2}{3} \left(\frac{a(2 + \gamma) + 2(1 + 2\gamma)w_1^0 - (4 + 5\gamma)w_2^0}{(2 + 3\gamma)(2 + \gamma)} \right) \\ \bar{q}_y &= \frac{a(2 + \gamma) - 2(1 + \gamma)w_1^0 + \gamma w_2^0}{(2 + 3\gamma)(2 + \gamma)} \\ \bar{q}_z &= \frac{a(2 + \gamma) + \gamma w_1^0 - 2(1 + \gamma)w_2^0}{(2 + 3\gamma)(2 + \gamma)}. \end{aligned}$$

研究
結果

Appendix A. The case of symmetric product differentiation

Table A.1
Firms' payoffs under a Centralized Union

Neither firm innovates	$\bar{\pi}_1^c(g; h) - \bar{\pi}_2^c(g; h) = \frac{1}{4} \left(\frac{a-c}{2+\gamma} \right)^2$
One firm innovates	$\bar{\pi}_1^c((g, y); h) - \bar{\pi}_2^c(g; (h, x)) = \frac{(a-c)^2(1+\gamma)(2-\gamma)^2}{8(2+2\gamma-\gamma^2)^2} - I$
Both firms innovate	$\bar{\pi}_1^c(g; (h, x)) - \bar{\pi}_2^c((g, y); h) = \frac{(a-c)^2}{4(2+2\gamma-\gamma^2)^2}$
Both firms innovate	$\bar{\pi}_1^c((g, y); (h, x)) - \bar{\pi}_2^c((g, y); (h, x)) = \frac{(a-c)^2(1+\gamma)}{8(1+2\gamma)^2} - I$

Table A.2
Firms' payoffs under Decentralized Union

Neither firm innovates	$\bar{\pi}_1^d(g; h) - \bar{\pi}_2^d(g; h) = \frac{4(a-c)^2}{(2+\gamma)^2(4-\gamma)^2}$
One firm innovates	$\bar{\pi}_1^d((g, y); h) - \bar{\pi}_2^d(g; (h, x)) = \frac{2(a-c)^2(1+\gamma)(4+3\gamma-2\gamma^2)^2}{(2+2\gamma-\gamma^2)^2(8+8\gamma-\gamma^2)^2} - I$
Both firms innovate	$\bar{\pi}_1^d(g; (h, x)) - \bar{\pi}_2^d((g, y); h) = \frac{(a-c)^2(1+\gamma)^2(4+2\gamma-\gamma^2)^2}{(2+2\gamma-\gamma^2)^2(8+8\gamma-\gamma^2)^2}$
Both firms innovate	$\bar{\pi}_1^d((g, y); (h, x)) - \bar{\pi}_2^d((g, y); (h, x)) = \frac{(a-c)^2(1+\gamma)^2}{2(2+\gamma)^2(1+2\gamma)^2} - I$

Appendix B. The case of asymmetric product differentiation

Table B.1
Firms' payoffs under a Centralized Union

Neither firm innovates	$\bar{\pi}_1^c(g; h) - \bar{\pi}_2^c(g; h) = \left(\frac{a-c}{6} \right)^2$
One firm innovates	$\bar{\pi}_1^c((g, y); h) - \bar{\pi}_2^c(g; (h, x)) = \frac{(a-c)^2(13-5\gamma)}{144(1+\gamma)} - I$
Both firms innovate	$\bar{\pi}_1^c(g; (h, x)) - \bar{\pi}_2^c((g, y); h) = \left(\frac{a-c}{6} \right)^2$
Both firms innovate	$\bar{\pi}_1^c((g, y); (h, x)) - \bar{\pi}_2^c((g, y); (h, x)) = \frac{(a-c)^2(13+12\gamma)}{36(2+3\gamma)^2} - I$

Table B.2
Firms' payoffs under Decentralized Union

Neither firm innovates	$\bar{\pi}_1^d(g; h) - \bar{\pi}_2^d(g; h) = \frac{4(a-c)^2}{81}$
One firm innovates	$\bar{\pi}_1^d((g, y); h) - \bar{\pi}_2^d(g; (h, x)) = \frac{4(a-c)^2(4+\gamma)(7+\gamma)(7-2\gamma)}{8(1+\gamma)(9+\gamma)^2} - I$
Both firms innovate	$\bar{\pi}_1^d(g; (h, x)) - \bar{\pi}_2^d((g, y); h) = \frac{5(a-c)^2(7+\gamma)(19+\gamma)}{162(9+\gamma)^2}$
Both firms innovate	$\bar{\pi}_1^d((g, y); (h, x)) - \bar{\pi}_2^d((g, y); (h, x)) = \frac{4(a-c)^2(7+8\gamma)^2(13+12\gamma)}{81(2+3\gamma)^2(8+7\gamma)^2} - I$

研究
貢獻

This paper explains how unionisation structures, viz., centralised and decentralised labour unions, affect the incentive for product innovation. While few recent papers studied the effects of different unionisation structures on process innovation, our paper provides a new perspective to the literature by focusing on new product development. While process innovation is an important aspect of R&D, empirical observations suggest that the firms allocate a significant amount of their budget towards product R&D. We take up this issue in our paper and investigate how the type and degree of product differentiation affect the incentives for product innovation in a unionized labour market. We show that if the products are

	<p>symmetrically differentiated, the incentive for innovation is higher under decentralized labour unions compared to a centralised labour union. However, considering a particular type of asymmetric product differentiation, we show that the incentive for innovation may be higher under a centralised labour union than decentralised unions.</p>
<p>未來 研究 方向</p>	<p>While the novelty of this paper lies in new product development and how the incentive for innovating a brand new product is influenced by different union structures, viz., centralised and decentralised unions, it would be equally intriguing to investigate how the results would differ if the products are differentiated vertically, if the firms compete in prices or act as a market leader, if the innovating firms invest both in product and process R&D, if the wage and employment negotiation between labour unions and firms take the form of efficient bargaining. As each of these questions would require a thorough analysis, we leave them for future work.</p>

篇名	Competitive persuasive advertising under consumer loss aversion
作者	Oliver März
出處	Economics Letters, 185, 108690.
摘要	I present a model to describe the effects of persuasive advertising targeted at consumers with expectation-based reference-dependent preferences. Persuasive advertising is competitive and increases the salience of advertised products while decreasing the salience of competing products. Consumers' gain-loss utility associated with the expectation to buy the most salient product is inflated, while gain-loss utility associated with the expectation to buy the least salient product is deflated. I show that under moderate levels of loss aversion and product differentiation persuasive advertising has strictly anti-competitive effects, whenever consumers are aware of prices but uncertain about their individual match value from a purchase.
研究動機	I present a model of competitive persuasive advertising when consumers are expectation-based loss averse, according to the notion of Köszegi and Rabin (2006). Current models exploring the effects of firm advertising to consumers with expectation-based reference-dependent preferences have focused on the informative view of advertising (Karle and Schumacher, 2017; Karle and Peitz, 2017) showing that it could be optimal for a monopolist to establish uncertainty about prices or product characteristics by advertising incomplete or superfluous information. This strategy creates an expectation to possess the advertised product at low prices or because of favorable product characteristics, and thereby increases consumers' willingness-to-pay because they want to avoid the loss from unsatisfied expectations of ultimately not owning the product. When consumers are expectation-based loss averse, informative advertising could therefore have a persuasive effect .

模型

The position of the indifferent consumer $\hat{x}(p_1, p_2, A_1, A_2)$ will depend on equilibrium prices and advertising expenditures. Advertising costs are assumed to follow a quadratic function. Firm profits are then given by,

$$\begin{aligned} \pi^1(b^1, b^2, \varphi^1, \varphi^2) &= (b^1 - c) \cdot (1 - \chi(b^1, b^2, \varphi^1, \varphi^2)) - \frac{\Sigma}{1} \varphi_1^2 \\ \pi^2(b^1, b^2, \varphi^1, \varphi^2) &= (b^2 - c) \cdot \chi(b^1, b^2, \varphi^1, \varphi^2) - \frac{\Sigma}{1} \varphi_2^2 \end{aligned} \quad (1)$$

The game will be solved by backward induction. Firms foresee that consumers play a personal equilibrium, according to the notion of Kőszegi and Rabin (2006), which implies that expectations are always confirmed in equilibrium.

Advertising is modeled as persuasive. It could comprise any form of salience-enhancing marketing activities that do not provide information about match values. Formally, I define the salience weighting function

$$\omega_i = 2 \cdot \frac{(1 + A_i)}{\sum_{k=1}^2 (1 + A_k)} \quad i \in \{1, 2\}, \quad (2)$$

where $A_i \geq 0$ measures the amount of advertising by firm i .

The salience weighting function specifies that firms advertise to compete for the attention of prospective consumers. In particular, consumers' gain-loss utility associated with the expectation to buy from firm i will be weighted by factor ω_i . Advertising expenditures A_i and A_{-i} get transformed into salience weights ω_i and ω_{-i} , depending on firms' relative advertising levels. Total salience is given by 2 (i.e. $\omega_i + \omega_{-i} = 2$). Firm i that advertises relatively more captures a share $1 < \omega_i < 2$, while firm $-i$ that advertises less captures a share $0 < \omega_{-i} < 1$.

The weight on gains is normalized to 1. For $p_2 \geq p_1$, the utility of a consumer $x \in (1 - \hat{x}, 1]$ buying from firm 1 is given by

$$\begin{aligned} u_1(x, p_1, p_2, A_1, A_2) &= (v - tx - p_1) - \omega_1 \cdot \lambda \cdot \hat{x} \cdot (p_1 - p_1) \\ &\quad + \omega_2 \cdot (1 - \hat{x}) \cdot (p_2 - p_1) \\ &\quad - (\omega_1 + \omega_2) \cdot \lambda \cdot t \int_0^{1-\hat{x}} (x-s)dG(s) \\ &\quad - \omega_1 \cdot \lambda \cdot t \int_{1-\hat{x}}^x (x-s)dG(s) \\ &\quad + \omega_1 \cdot t \int_x^{\hat{x}} (s-x)dG(s), \end{aligned} \quad (3)$$

Given consumer demand, it is possible to solve for the price equilibrium. For technical reasons, it is assumed that firms choose prices from a common finite grid $\Gamma = \{0, m, 2m, \dots, vm\}$, where $m > 0$ and $v \in \mathbb{N}$. The only condition required is that equilibrium prices p^* belong to this grid. Proposition 1. Under moderate levels of loss aversion and product differentiation ($\lambda \in (1, 2]$ and $t \in (0, 1.47m]$), there exist two pure strategy price equilibria. The equilibrium

	<p>markup is symmetric and either given by</p> <p>Proposition 1 highlights that the equilibrium markup is affected by firms' advertising decisions in the first stage. If both firms advertise the same amount (i.e. $\omega_i = \omega_{-i} = 1$), markups are given by $p^* - c = (2(\lambda+1))/(\lambda+3)$ and are equivalent to a game without advertising, as presented in Karle and Peitz (2014).</p> $p^* - c = \frac{2t(\lambda + 1)}{\lambda\omega_2 + \omega_1 + 2},$ <p style="text-align: right;">(4)</p> <p>or $p^* - c = \frac{2t(\lambda + 1)}{\lambda\omega_1 + \omega_2 + 2}.$</p> <p>Without loss aversion (i.e. $\lambda = 1$), there are also no effects of advertising because I modeled advertising to affect consumers only through their gain–loss utility. In this case, the equilibrium markup is equivalent to the standard Hotelling model $p^* - c = t$. Whenever consumers are expectation-based loss averse (i.e. $\lambda > 1$), asymmetric advertising affects the markup and has anticompetitive consequences whenever $p^* - c = (2t(\lambda+1))/(\lambda\omega_{-i} + \omega_i + 2) > (2t(\lambda+1))/(\lambda+3)$, which holds if $\omega_i > 1 > \omega_{-i}$.</p> $\pi_1(A_1, A_2) = \frac{2t(\lambda + 1)}{\frac{4\lambda(1+A_1)+4(1+A_2)}{(1+A_1)+(1+A_2)} + 4} - \frac{1}{2}A_1^2$ $\pi_2(A_1, A_2) = \frac{2t(\lambda + 1)}{\frac{4\lambda(1+A_1)+4(1+A_2)}{(1+A_1)+(1+A_2)} + 4} - \frac{1}{2}A_2^2.$ <p style="text-align: right;">(5)</p> <p>Solving for optimal advertising expenditures results in the described equilibrium, $A_1^* = 0$ and $A_2^* > 0$. Because only firm 2 advertises, the product sold by firm 2 is more salient, which implies that $\omega_2 > 1 > \omega_1$. Compared to a game without advertising, which is equivalent to setting $\omega_1 = \omega_2 = 1$, the asymmetric effects of salience allow for strictly higher markups in equilibrium; thus, firms' ability to use advertising has strictly anticompetitive consequences.</p>
研究結果	<p>My main result is that allowing firms to invest in persuasive advertising when competing for expectation-based loss averse consumers has strictly anticompetitive effects under moderate levels of loss aversion and product differentiation, whenever consumers are aware of prices but uncertain about their individual match value from the purchase. The intuition for this finding is that firms' ability to use persuasive advertising acts as an instrument to mitigate consumers' losses from higher prices, which reduces competitive pressure. Formally, it turns out that loss aversion in the price dimension has a procompetitive effect, whereas it has an anticompetitive effect in the match value dimension; persuasive advertising weakens the procompetitive effect in</p>

	the price dimension, such that the anticompetitive consequences of loss aversion become more pronounced.
研究 貢獻	My model provides a novel explanation for persuasive advertising based on consumer loss aversion. By attracting consumers' attention through persuasive advertising, firms can mitigate consumers' sensation of losses from paying higher prices, which allows them to set higher prices and realize higher markups
未來 研究 方向	Increased attention inflates the weight that is put on the gain–loss utility associated with the expectation to buy the advertised product, and deflates the weight that is put on the gain–loss utility associated with the expectation to buy competing products. This concept of advertising to expectation-based loss averse consumers is embedded into the standard Hotelling model of differentiated product competition in which consumers are aware of prices but uncertain about match values from the purchase.

篇名	Cost pass-through, bargains, and vertical contracts
作者	鄭義暉 (I-Hui Cheng)
出處	進行中論文
摘要	We consider a non-cooperative two-stage game in a vertically related market in which downstream firms bargain with a upstream firm via linear pricing contracts in the first stage, and in the second stage downstream firms engage in Cournot competition with each other in the final goods market. By examining the cases of two and three downstream firms, we find that under symmetric case the input price is the same, and cost pass-through rate remains the same with perfect substitution no matter the contract is in centralized or decentralized bargaining structures.
研究動機	We are interested in the cost pass-through problem addressed in the earlier literature. For example, Bresnahan & Reiss (1985,RJE): the relationship between retail and wholesale markups. Bulow & Pfleiderer (1983,JPE): the case of a monopolist facing linear costs; manufacturer sets linear prices the ratio of the retailer’s markup to that of the manufacturer is equal to the retail pass-through rate. Weyl & Fabinger (2013,JPE): extend to a chain of imperfectly competitive markets as an application of their main findings to vertically-related markets. Adachi and Ebina (2014a,EL) show that the total chain pass-through rate is greater than the wholesale one if and only if demand is log-concave. Adachi and Ebina (2014b,EL) derive related results in the case of two-tier Cournot oligopoly markets. Gaudin (2016,EL) generalize the result of Bresnahan & Reiss (1985,RJE) to Nash-bargaining: analyze the vertical determinants of cost pass-through, vertical contracts and relative bargaining power impact pass-through rates.
模型	<p>Consider a vertical market structure where an upstream monopoly supplier provides a critical input to n downstream firms of final goods for producing differentiated products. The monopoly supplier, denoted by M, produces the inputs at a constant marginal cost c, $c \geq 0$. Each downstream firm i, denoted by D_i, convert s one unit of inputs to one unit of the final goods without incurring any further cost. The input price is determined through a linear pricing contract based on the bargaining powers of the upstream and downstream firms.</p> <p>By extending the Singh and Vives (1984) model, we assume that the utility function is given by:</p> $U(q_1, \dots, q_n) = a \sum_{i=1}^n q_i - \frac{1}{2} \sum_{i=1}^n (q_i^2 + \gamma_{ij} q_i q_j) + B,$ <p>where q_i represents the output of the downstream firm D_i ($i, j = 1, \dots, n, i \neq j$), $a > 0$, B is the numeraire good, and the parameter $\gamma_{ij} \in [0,1)$ measures the degree of the product substitutability between goods i and</p>

	<p>j, letting $\gamma_{ij} = \gamma_{ji}$, for simplicity.</p> <p>We consider an upstream supplier and downstream firms interact in a non-cooperative two-stage game. In stage one, downstream firms bargain with the upstream input supplier, acting as an independent supplier rather than as a monopolist supplier, over the terms of contracts involving a uniform input price ω_i ($i = 1, \dots, n$). In stage two, there is a one-shot game where downstream firms engage in Cournot competition with each other in the final goods market. Using equation (1) and solving the utility maximization problem gets the inverse demand function for downstream firm i : $P_i = a - q_i - \sum_{j=1}^n \gamma_{ij} q_j$ ($i, j = 1, \dots, n, i \neq j$). The downstream firm i chooses its output to maximize its profit then as follows:</p> $\max \pi_i = (a - q_i - \sum_{j=1}^n \gamma_{ij} q_j - \omega_i) q_i, \quad (i, j = 1, \dots, n, i \neq j).$ <p>At stage 1, the upstream supplier (M) and downstream firm i (D_i) bargain over the terms of a linear pricing contract. At stage 2, two downstream firms maximize their profits and choose optimal production quantities, taking the other's quantity as given. We solve the subgame perfect Nash equilibrium of this two-stage game through backward induction.</p>
研究結果	<ul style="list-style-type: none"> ● When there exists bargaining over the terms of a linear pricing contract between one upstream and two downstream firms, an increase in downstream firms' bargaining power (i) reduces downstream firms' input prices, and (ii) increases the cost pass-through rate. ● When upstream and n downstream firms engage in centralized bargaining, and the degree of substitutability between any pair of two goods is symmetric, the cost pass-through rate is $(1+(n-1)\gamma)(2-\beta)/2(2+(n-1)\gamma)$, which increases in the number of downstream firms and their bargaining power. <p>When downstream firms with relative higher product substitution engage in centralized bargaining, and the degree of substitutability between their products is higher than any pair of the other goods, the cost pass-through rate is higher than that of identical-product-substitution case. The research has derived a general form of the rate of cost pass-through in the vertically-related markets.</p>
未來研究方向	<ol style="list-style-type: none"> 1. Refine the model and re-examine the results. 2. Attempt to link with the findings in Gaudin (2016, EL) and other literature. 3. May find role to compare with the results of other cases, namely two-part tariffs and revenue sharing agreements. <p>Re-examine possible related issues, namely demand curve curvature.</p>

篇名	Privatization of state holding corporations
作者	Juan Carlos Bárcena-Ruiz and María Begoña Garzón
出處	Journal of Economics (2017) 120: 171-188.
摘要	This paper considers a state holding corporation with two plants that may produce complement or substitute goods. Assuming that private firms are more efficient than the state holding corporation we find the following: If the marginal cost of the state corporation is low, it is not privatized either if goods are substitutes or if they are complements. However, if the marginal cost of the state corporation is high the two plants of the state holding corporation are sold to a single private investor if goods are complements, and to different investors if goods are substitutes. If goods are close substitutes and the marginal cost of the state corporation takes an intermediate value only one plant is privatized. We extend the model to consider that firms are equally efficient, that they face quadratic cost functions and that there are n uniplant private firms producing each good. We find two differences with the previous result: The government never privatizes just one plant of the state corporation, and when goods are complements the two plants of the state corporation are sold to different investors if n is high.
研究動機	Many countries have privatized part of their state holding corporations in recent years. However, the literature on this issue has analyzed mainly the privatization of uniproduct public firms. State corporations are usually made up of several production plants producing different products that may be substitutes or complements. As a result, corporations are indeed multiproduct firms.
模型	We consider an economy that comprises a public sector and a private sector. Firms produce differentiated goods, denoted by 1 and 2, that may be substitutes or complements. In the public sector there is a state holding corporation, denoted as firm A, whose objective function is social welfare. It owns two production plants, denoted by 1A and 2A, which produce goods 1 and 2 respectively. In the private sector there are two private uniplant firms that produce differentiated goods, denoted by 1B and 2B respectively. On the consumption side, there is a continuum of consumers of the same type. The representative consumer maximizes $U(q_i, q_j) - p_i q_i - p_j q_j$, where p_i is the price of good i , $q_i = q_{iA} + q_{iB}$ is the amount of good i and q_{ik} is the output level by firm or plant ik , $i \neq j$; $i, j = 1, 2$; $k = A, B$. The function $U(q_1, q_2)$ is assumed to be quadratic, strictly concave and symmetric in q_1 and q_2 : $U(q_1, q_2) = (q_1 + q_2) - ((q_1)^2 + 2bq_1q_2 + (q_2)^2)/2, \quad -1 < b < 1.$

	<p>Private firms have a constant marginal cost of production which is normalized to zero. The state corporation is less efficient than the private firms, so if it is privatized there is an improvement in efficiency. Therefore, the profit function of plant iA of the state corporation is:</p> $\pi_{iA} = (p_i - c)q_{iA}, \quad i = 1, 2,$ <p>where $c = 0$ if plant iA is privatized. The profit of public firm A is the joint profit of its two plants: $\pi_A = \pi_{1A} + \pi_{2A}$. The profit function of private uniplant firm iB is:</p> $\pi_{iB} = p_i q_{iB}, \quad i = 1, 2,$ <p>As usual, the producer surplus is given by $PS = \pi_{1A} + \pi_{2A} + \pi_{1B} + \pi_{2B}$. The social welfare function considered by the government when it decides whether to privatize the state corporation or not comprises the consumer surplus and the producer surplus. Specifically, this function can be expressed as: $W = CS + PS$.</p>
<p>研究 結果</p>	<p>Proposition 1. In equilibrium, the government does not privatize the state corporation in zones II and III. The government sells the state corporation to a single private investor in zone I, and to different private investors in zone IV. Finally, the government privatizes only one plant of the state corporation in zone V.</p> <p>Proposition 2. (Equally efficient firms with quadratic cost functions) In equilibrium, the government does not privatize the state corporation in zones II and III. The government sells the state corporation to a single private investor in zone I, and to different private investors in zones IV and V.</p>

<p>研究 貢獻</p>	<p>1. To fill this gap in the literature we consider a state corporation that owns two production plants producing differentiated goods, which may be substitutes or complements.</p> <p>The result obtained in the paper helps to understand the different types of privatization of state holding corporations that governments have carried out in practice depending on whether the goods produced by state corporations in their different plants are substitutes or complements and on the efficiency of those state corporations.</p>
<p>未來 研究 方向</p>	<p>The analysis of privatizations when there are economies of scale arising when the state corporations have several production plants for further research.</p>

篇名	<i>Technology Licensing in a Network Product Market: Fixed-Fee versus Royalty Licensing</i>
作者	<i>HUAIGE ZHANG and XUEJUN WANG · XIANPEI HONG · QIANG (STEVEN) LU</i>
出處	ECONOMIC RECORD, VOL. 94, NO. 305, JUNE, 2018, 168–185
摘要	<p>This study investigates pricing and technology licensing decisions in a two-echelon supply chain with one upstream firm that provides a key input to two downstream firms. We assume that one of the downstream firms owns a licensable innovation that exhibits network effects and that the other can either accept the licence from the innovator or develop a substitutable innovation. We analyse the effects of the producer-innovator's two alternative licensing strategies (i.e. fixed-fee and royalty licensing) on the members of the supply chain and the supply chain's efficiency. We find that royalty licensing is optimal with low network effects. For high network effects, the innovating firm's optimal licensing strategy depends on the market size and the potential licensee's cost of developing a substitutable innovation. We also find that royalty licensing can achieve better coordination of the supply chain than fixed-fee licensing.</p>
研究動機	<p>With the rapid development of technology, technology licensing has become a standard practice in high-tech industries. From a social welfare perspective, technology licensing is conducive to technology proliferation and innovation for the entire industry. For firms with great innovation capacity, technology licensing contributes to recovering research inputs and increases the economic benefit. Therefore, a detailed and in-depth study of the technology licensing of firms in high-tech industries is of great theoretical and practical significance. With the development of supply chains, particularly the prevalence of out-sourcing, firms depend increasingly on suppliers. Because suppliers significantly affect the price of and demand for the final product, firms must analyse supplier behavior when choosing their technology licensing strategy. In other words, firms can use their technology licensing strategy to influence suppliers' behavior and improve the efficiency of the supply chain. Our study analyses supply chain coordination in the context of resource outsourcing and technology licensing. To the best of our knowledge, no prior study has examined the impact of outsourcing and technology licensing on supply chain coordination.</p>

模型	<p>We develop a model in which one upstream firm provides an intermediate product and two downstream firms (firm 1 and firm 2) conduct Cournot competition. We assume that the two competing downstream firms are able to develop a new product or service that exhibits a network effect. Suppose that firm 1 has developed a new product or service and that firm 2 is temporarily lagging behind.³ However, firm 2 may develop a substitute innovation by investing K through R&D. Firm 1 may monopolise the innovation or license it to firm 2, which will decide to either accept the licence or develop a new innovation. We assume that the linear inverse demand function for normal goods is $p(q,a) = a - q$, where q is the demand quantity of the good and a is the market scale or the potential maximum market demand. To obtain the demand function for the network good, we adopt for a representative user the utility function $U = [a + v(q^e)] q - \frac{1}{2}q^2 + b$, where a now denotes the maximum market demand when the network good does not possess additional network value; q^e represents users' expectation regarding the scale of the network and $v(q^e)$ denotes a single user's willingness to pay for the network value of the good, which is an increasing function of q^e; and b is a constant. The value of a network good for a user is defined as $v(q) = \beta q$, where β denotes the intensity of network effects. Specifically, when $\beta = 0$ and $v(q) = 0$, the network goods become normal goods. To ensure a downward-sloping linear demand function, we restrict $\beta < 1$ (i.e. $\beta \in [0,1]$). The paper builds a four-stage game model for the fixed-fee licensing strategy. In the first stage, the supplier decides the unit wholesale price w for the intermediate good. In the second stage, firm 1 determines a fixed licensing fee F. In the third stage, firm 2 decides whether to pay the fee requested by firm 1. In the fourth stage, the two firms simultaneously and non-cooperatively determine their outputs.</p>
研究結果	<p>When downstream firms rely on the supplier to provide an intermediate good, it is generally optimal for the innovator to license its technology by means of royalty licensing, and we find that royalty licensing convinces the supplier to set a lower wholesale price and thereby improve the supply chain coordination by reducing double marginalisation. We also demonstrate that royalty licensing dominates fixed-fee licensing when network effects are less intense. In contrast, when network effects are intense, the innovator's optimal licensing strategy depends on the demand level and the potential licensee's investment to develop a substitutable innovation. Another notable result of this study is that fixed-fee licensing is superior to royalty licensing from the supplier's perspective.</p>

研究 貢獻	<p>This study contributes to and differs from the previous literature in the following three respects. First, we investigate two alternative licensing forms (fixed-fee and royalty licensing) in a network product market and consider the supplier's pricing decisions. Second, we analyse supply chain coordination in the context of resource outsourcing and technology licensing. To our knowledge, this study is the first to examine the impact of supplier's pricing decisions and technology licensing on supply chain coordination. Finally, we find that royalty licensing can reduce the double marginalization problem of the supply chain, but fixed-fee licensing cannot.</p>
未來 研究 方向	<p>We assume that there is only one supplier who provides one type of intermediate good to downstream firms. However, there may be more than one supplier who competitively provides key inputs to downstream firms. It is thus important to analyse the impact of suppliers' different competitive behaviors on innovator's licensing decisions. For example, one can investigate the effects of the oligopolistic suppliers' competitive behaviors in different situations such as Stackelberg, Bertrand and Cournot competition on the optimal decisions of the downstream firms and the suppliers. Second, we assume that the information between the two downstream firms is symmetric. However, information asymmetry may also generate inefficiencies and risk-sharing issues, which can affect the supply chain coordination. Therefore, future research should analyse asymmetric information in the licensing process. Another limitation of this study is that only one firm is able to license its innovation to another firm; thus, future research may investigate cross-licensing between two firms.</p>

篇名	<i>Optimality of Emission Pricing Policies Based on Emission Intensity Targets under Imperfect Competition</i>
作者	<i>Hiroaki Ino and Toshihiro Matsumura (2019)</i>
出處	Discussion Paper Series 199, School of Economics, Kwansai Gakuin University
摘要	This study shows the first-best optimality of an emission tax based on emission intensity targets. Emissions are taxed when a firm's emission intensity exceeds the targeted level. The literature on environmental tax shows that Pigovian tax, which internalizes negative externality, yields the first-best optimum under perfect competition, whereas the same is not true under imperfect competition. We show that even under imperfect competition, the combination of uniform emission tax and nonuniform emission intensity targets leads to the first best. The first-best uniform tax rate is always equal to the Pigovian tax. This principle can also apply to the policy combination of tradable emission permits and emission intensity targets.
研究動機	<p>It is well known that in perfectly competitive markets, the optimal emission tax rate on a harmful emission is equal to the marginal environmental damage caused by the emission, and that this tax policy leads to the first-best optimality. The tax that internalizes the negative externality of emission is known as "Pigovian tax." In imperfectly competitive markets, however, this Pigovian tax is not optimal. Whether the optimal tax rate is higher or lower than the Pigovian, the first best is not achieved by the emission tax policy. This low tax rate distorts the incentive for the monopolists' emission abatement activities, and thus reduces welfare. Therefore, the first-best optimality is not achieved by the emission tax.</p> <p>In this study, we propose a new emission pricing policy based on emission intensity targets. The government imposes an emission intensity (emission per output) target on each firm. In other words, we show the optimality of the policy combination of emission tax and emission intensity regulation.</p>
模型	Consider an oligopoly market wherein n firms choose their outputs (Cournot competition) and abatement levels. For $i = 1, \dots, n$, $q_i \geq 0$ is firm i 's output, and $a_i \geq 0$ is the level of firm i 's abatement activity. The firms' products are homogeneous, and the inverse demand function is $p(Q)$, where $Q = \sum_{i=1}^n q_i$. We assume that $p(Q)$ is twice continuously differentiable and $p'(Q) < 0$ for all Q as long as $p > 0$. Firm i 's cost function is $c_i(q_i, a_i)$. We assume that $c_i(q_i, a_i)$ is

	<p>twice continuously differentiable, $\frac{\partial c_i}{\partial q_i} > 0$, $\frac{\partial c_i}{\partial a_i} > 0$, and that the function is convex. Firm i's emission function is $e_i(q_i, a_i)$. We assume that $e_i(q_i, a_i)$ is twice continuously differentiable, $\frac{\partial e_i}{\partial q_i} > 0$ and $\frac{\partial e_i}{\partial a_i} < 0$, and that the function is convex. The social welfare is defined by</p> $W = \int_0^Q p(q) dq - \sum_{i=1}^n c_i(q_i, a_i) - D \left[\sum_{i=1}^n e_i(q_i, a_i) \right].$ <p>where $D(\cdot)$ is the environmental damage function, which is twice continuously differentiable and convex, and $D' > 0$. We assume a unique interior social optimum and market equilibrium.</p> <p>We denote the outcomes at the social optimal by the superscript o. Assuming the interior solution (i.e., $q_i^o > 0$ and $a_i^o > 0$), the first-order conditions for the welfare maximizing problem are $p(Q^o) = \frac{\partial c_i}{\partial q_i}(q_i^o, a_i^o) + D'(E^o) \frac{\partial e_i}{\partial q_i}(q_i^o, a_i^o)$,</p> $-D'(E^o) \frac{\partial e_i}{\partial a_i}(q_i^o, a_i^o) = \frac{\partial c_i}{\partial a_i}(q_i^o, a_i^o)$ <p>Where $E^o = \sum_{i=1}^n e_i(q_i^o, a_i^o)$. The second-order condition is satisfied.</p>
研究結果	<p>Emission intensity regulation gives producers an incentive to expand their production to relieve the regulatory constraint. Adjusting for this production expansion effect, the firm-specific emission intensity target can cancel out the effect of each firm's market power. Thus, the emission tax uniformly corrects the negative externality at the Pigovian level.</p> <p>In this study, we showed that the first-best optimality is achieved by the combination of two traditional and standard policy tools, emission tax (or tradable permit) and emission intensity targets. In other words, emission pricing policies based on emission intensity targets yield the first-best outcomes. The literature on environmental tax shows that Pigovian tax internalizing the negative externality yields the first best under perfect competition, whereas it does not under imperfect competition. We showed that the optimality is achieved by the combination of uniform emission tax and non-uniform emission intensity targets, leading to the first best. We also showed that the first-best uniform tax rate is always equal to the Pigovian tax rate.</p>
研究貢獻	<p>Emission taxes and tradable permits were intensively discussed in the context of carbon pricing, and many countries have introduced one of the two to mitigate global warming. Emission intensity regulations are also widely observed. Emission taxes raise the marginal cost of production and increase</p>

	<p>the distortion of suboptimal production under imperfect competition. Emission intensity regulation serves to stimulate production and mitigates the problem of insufficient production. Thus, the policy combination of two standard and widespread environmental policies is ideal.</p>
<p>未來 研究 方向</p>	<p>In this study, we assumed that the number of firms is exogenous. If we consider the free-entry market, the first best will not be achieved by the combination of emission tax and emission intensity targets. However, if we introduce the appropriate level of entry license tax, the first-best optimality will be achieved by the policy discussed in this study. We also did not consider any kind of uncertainty in this study. However, in the context of global warming, uncertainties with regard to the supply side, demand side, and social costs of emissions are quite important. Our analysis will be extended in this direction in future research.</p>

篇名	Content provision and compatibility in a platform market
作者	Alexander Rasch , Tobias Wenzela (2014)
出處	Economics Letters, 124(3), 478-481.
摘要	This paper studies the ambiguous welfare effects of compatibility in a platform market with endogenous content provision. Compatibility can be particularly harmful if it leads to reduced content but can be beneficial if content is sufficiently increased.
研究動機	This article considers compatibility in a platform (or two-sided) market which is characterized by the interaction of three distinct parties: a platform (or intermediary) tries to attract two different groups of customers that use the platform only if the other side does so too (e.g., Rochet and Tirole, 2003; Armstrong, 2006). Such demand interdependencies are, for instance, relevant in the software industry where platforms (e.g., game consoles, media players, operating systems) bring together users (gamers, etc.) and application developers (content providers, etc.). In this context, compatibility (that is, the search for a common standard) is an important aspect reflected in so-called standard wars (e.g., VHS/Betamax, Blu-ray/ HD DVD). However, it has only received relatively little attention in the literature so far.
模型	<p>The model we use is a competitive-bottleneck model with single-homing users and multi-homing content developers (Armstrong, 2006; Choi, 2010). Two symmetric platforms offering differentiated services to users are located at opposite ends of a line of unit length (Hotelling, 1929). Platforms compete for users by setting a user price p_i and for content providers by setting a license fee l_i (where $i \in \{1, 2\}$). Marginal costs and fixed costs are normalized to zero. Introducing a common standard making platforms compatible leads to fixed costs F per platform. Users are uniformly distributed along the line. The utility of a user who is located at x and who buys access to platforms 1 or 2, respectively, is given by</p> $u_1 = v + \theta n_1 - p_1 - \tau x \quad \text{and} \quad u_2 = v + \theta n_2 - p_2 - \tau(1-x).$ <p>Users derive an intrinsic utility of v from connecting to a platform. Moreover, the utility increases with the amount of content n_i that is available on a platform. Users value each additional unit of content with θ and incur transportation costs of τ if the platform's location differs from the user's preferred location.</p>

研究 結果	We show that the amount of content does not necessarily increase with compatibility but may also decrease. Our key assumption is that participation of content providers is endogenous. We identify two effects of compatibility on content creation: a market-size effect and a price effect. Due to the market-size effect, content providers have access to a larger number of users which increases the incentives to develop content. The price effect is novel: compatible platforms may have lower incentives to subsidize the creation of content. If this effect is sufficiently strong, content provision may be lower when platforms become compatible. However, we also characterize situations where compatibility results in lower license fees and thereby increases the amount of available content.
研究 貢獻	We analyze platforms' compatibility choices in a competitive bottleneck setup with single-homing users and multi-homing content developers. The main difference with existing duopoly models (Doganoglu and Wright, 2006; Alexandrov, forthcoming) is that we allow for endogenous content both under incompatibility and compatibility. In existing models, it is assumed that compatibility means that a larger number of customers on each market side.
未來 研究 方向	The model can be changed to a competitive-bottleneck model with multi-homing users and multi-homing content developers.

篇名	Strategic environmental policy; eco-dumping or a green strategy?
作者	Mads Greaker
出處	Journal of Environmental Economics and Management 45 (2003) 692–707
摘要	<p>The Porter hypothesis claims that a strong environmental policy best serves the interests of a nation's export industry. While this hypothesis seems to be based on some form of bounded rationality, this paper argues that governments may have good reasons for setting an especially strong environmental policy even though firms are fully rational. If the available abatement technology turns the environment into an "inferior input", competitiveness is spurred by a strong environmental policy. The government should take advantage of this, and set an especially strict emission quota or an especially high emission tax. The findings in the paper also has consequences for the desirability of international cooperation with respect to national environmental policy. If a strict environmental policy spurs competitiveness, the environment is better protected without cooperation.</p>
研究動機	<p>Export firms are frequently given various kinds of subsidies, either openly as production subsidies or, more difficult to discover, as cheap government provided inputs or as tax reductions. One rationale for this line of thought can be found in the strategic trade theory literature. This literature explores how governments can help their national firms to steal profits from foreign competitors by making it possible for their firms to commit to a more aggressive strategy, see for instance. While the literature on this subject dealt primarily with traditional industrial policy tools such as the ones mentioned above, it has during the 90s been extended to the field of environmental policy. The question has been to what extent a government should provide its export industry with a weak environmental policy as a sort of hidden subsidy.</p>
模型	<p>The model includes two countries; one domestic and one foreign. There is one nationally owned firm in each of the countries. Both firms pollute, and the governments use an emission tax to regulate emissions. The firms export to a third market, compete by choosing output levels, and take the emission taxes in the two countries as given. It is assumed that environmental damage is national, and that the environmental performance of the industries has no effect on demand.</p> <p>Denote the domestic firm's output by q; the domestic emission tax rate by t and let $c(q, t)$ the domestic firm's cost function. Emissions can be interpreted as an input, and the tax rate as the price of this input. It then follows from standard production theory that costs are increasing in the tax rate. Denoting</p>

	<p>derivatives by subscripts, we have $c_1 > 0$ and $c_2 > 0$. Uppercase letters denote corresponding magnitudes for the foreign firm, with $C_1 > 0$ and $C_2 > 0$ °</p>
研究 結果	<p>This paper shows that if emissions are an inferior input, the government should use a green strategy when abatement and output are decided simultaneously. This is also very likely to hold when abatement effort is decided separately from output. Cases where emissions can be both an inferior and a normal input are explored through a numerical example. In these cases the resulting strategy is sensitive to market size. Since it is scale economics in abatement which leads to the inferior input case, environmental policy will be stronger and emissions smaller the bigger the market.</p>
研究 貢獻	<p>The policy implication of the paper is that governments should not distort their environmental policy for strategic reasons. However, given that emissions may be an inferior factor, politicians should a priori be less afraid of introducing a sufficiently stringent environmental policy.</p>
未來 研究 方向	<p>This paper has not treated other forms of competition. The introduction of Bertrand competition would turn all the conclusions around in the simple two-stage model where emissions are either inferior or normal. However, we would argue that the two-stage version of the game is less appropriate for Bertrand competition. Clearly, prices can be changed a lot easier than abatement technology. An emission cap could therefore work as a capacity constraint. This could yield the Cournot outcome of the Bertrand game as in Kreps and Scheinkman. For a discussion of this case, see the working paper version of this paper.</p>

篇名	Network Effects and Technology Licensing with Fixed Fee, Royalty, and Hybrid Contracts
作者	Lihui Lin and Nalin Kulatilaka
出處	Journal of Management Information Systems · October 2006
摘要	Technology innovators are faced with the question of whether to license an innovation to other firms, and if so, what type of license it should use. This question takes on paramount importance with information technology innovations that lead to new products and services that exhibit network effects. This paper explores the impact of network effects on the licensing choice. The literature suggests that without network effects, a royalty license is preferred by producer-innovators. We find that a fixed-fee license is optimal with strong network effects. For less intense network effects, the optimal license uses a royalty rate, either alone or in combination with a fee. We further derive the terms of the optimal license and discuss the impact of the investment needed to replicate the innovation and the size of the potential market. Our results provide insights for licensing decisions in industries that exhibit network effects.
研究動機	In addition to the introduction of network effects, the licensing game in our model also has two important points of departure from the standard setup of the licensing literature. First, we consider drastic innovations that lead to new products and services, while the literature focuses on incremental innovations that reduce costs. Second, we grant a competing firm an option to develop its own technology standard, which has not been considered in previous research. Kulatilaka and Lin study the licensing of drastic innovations in an uncertain environment without network effects. They find that a royalty license is optimal in absence of uncertainty, whereas a royalty cap contract can be used as a financing vehicle in face of uncertainty.
模型	Suppose Firm 1 does not offer a license to Firm 2. If Firm 2 invests K , the two firms will have incompatible standards. Therefore, each firm's customers form their own network. Because the two firms' products are perfect substitutes in their stand-alone value, the prices for the products are given by (we use subscripts 1 and 2 to represent Firms 1 and 2): $p_i = \theta + v(q_i^e) - q_1 - q_2, i = 1, 2.$ The profits are given by $\pi_i = q_i[\theta + v(q_i^e) - q_1 - q_2], i = 1, 2.$

	<p>To determine the firms' optimal production decisions, we solve the firms' profitmaximization problems and impose a fulfilled expectation equilibrium (FEE) condition [15]. Leibenstein [21] shows how to derive the demand curve in presence of network effects under FEE. Each firm chooses the optimal quantity of the network good by maximizing its profits and setting the quantity equal to corresponding expected quantities. We use the functional form $v(q) = \beta q$.</p> $q_1^* = q_2^* = \frac{\theta}{3 - \beta}, \pi_1^* = \pi_2^* = \left(\frac{\theta}{3 - \beta} \right)^2$
研究結果	<p>Our results have implications for firms that are trying to establish a standard and to reach agreements with other parties. First, to successfully license a technology, the leading firm should choose the licensing mechanism and terms of the contract based on relevant information of the market. When parties fail to reach a licensing agreement, often the innovating firm charges too high a fee or royalty, not offering other parties enough incentive to adopt its technology. Second, parties may fail to reach an agreement due to different estimates of parameters. Each party may have its own estimate of the intensity of the network effect and expectations about the size of the market, leading to different opinions of a fair contract. Such discrepancies may lead to either failure of negotiation, or agreements that significantly benefit or cost some of the parties. For example, if the leading firm's estimate of the network intensity is higher than that of the other party, no agreement can be reached, whereas in the opposite situation, the parties will agree on a contract that benefits the other party more.</p>
研究貢獻	<p>Our model can be further extended in several ways. Here, we assume that the parameters are common knowledge. While the intensity of network effects and market size are parameters that can be estimated based on publicly available information, the investment required to achieve a comparable innovation is often private information known only to firms capable of such an innovation. Therefore, asymmetric information may play an important role in making licensing agreements. Our results show that the lower the required investment, the lower the fee or the royalty rate. The information asymmetry may lead to the well-known adverse selection problem, where a potential competitor accepts a licensing contract only when its technology development is not promising and more threatening competitors will decline an offer.</p>
未來研究	None

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篇名	Wholesale price discrimination: Innovation incentives and upstream competition
作者	Uğur Akgün, Ioana Chioveanu
出處	J Econ Manage Strat. 2019;28:510–519
摘要	In intermediate good markets where there are alternative supply sources, wholesale price discrimination may enhance innovation incentives downstream. We consider a vertical chain where a dominant firm and a competitive fringe supply imperfect substitutes to duopoly retailers which carry both varieties. We show that a ban on price discrimination by the dominant supplier makes uniform pricing credible and reduces retailers' incentives to decrease the cost of acquiring the competitively supplied variety, leading to higher upstream profits and lower downstream welfare. Our analysis complements existing results by identifying a novel channel through which wholesale price discrimination can improve dynamic market efficiency.
研究動機	Price discrimination in intermediate good markets has focused mainly on situations where an upstream supplier is unconstrained or where downstream firms single source. However, downstream firms often have access to different suppliers, rather than being locked into a single upstream supplier. They also frequently multisource and do not allocate all of their volume to a single supplier on the basis of price alone even when upstream firms produce a relatively homogenous input for their product. Moreover, if there is differentiation between the products of the upstream firms, then downstream firms may be purchasing from different suppliers to produce different varieties of their own products.
模型	Consider a vertically related industry. An upstream dominant firm (M) and a competitive fringe supply differentiated (intermediate) products U and S, respectively, to a downstream market. The upstream marginal costs of production are constant and normalized to zero. Downstream, two independent retailers A and B both resell the two differentiated varieties and compete in quantities for final consumers. One unit of the wholesale product corresponds to one unit of the retail good. We consider downstream retailers, but the model could be interpreted alternatively as a production chain where each downstream firm produces the same two differentiated products. One of the downstream goods is produced from one unit of the dominant upstream supplier's product, while the other from one unit of competitively supplied input. In the retail product market, inverse demand functions for the two varieties, U

	<p>and S, are</p> $P^U(q^U, q^S) = \alpha - \beta q^U - \gamma q^S \quad \text{and} \quad P^S(q^U, q^S) = \alpha - \beta q^S - \gamma q^U,$
研究 結果	<p>Proposition 1 Suppose Condition 1 holds. Compared to uniform pricing, wholesale price discrimination results in (a) a larger reduction in the cost of acquiring the competitively supplied product, (b) lower wholesale prices, (c) a smaller quantity of dominant supplier's product, (d) a larger quantity of the competitively supplied product, and (e) lower retail prices for both varieties.</p> <p>Proposition 2 Suppose Condition 1 holds. Total welfare and the dominant supplier's profit are lower, while downstream welfare, calculated as the sum of downstream profits and consumer surplus, is higher under wholesale price discrimination than under uniform pricing.</p>
研究 貢獻	<p>This paper studies wholesale price discrimination in a setting where an upstream dominant supplier and a competitive fringe supply differentiated varieties to two multiproduct downstream retailers. It focuses on the impact of price discrimination by the dominant supplier on the dynamic efficiency of the market and shows that the practice improves multiproduct retailers' incentives to reduce the cost of acquiring the competitively supplied product.</p>
未來 研究 方向	<p>None.</p>

篇名	Trade liberalization, absorptive capacity and the protection of intellectual property rights
作者	Arghya Ghosh, Jota Ishikawa
出處	Review of International Economics, 26(5), 997-1020.
摘要	We examine how trade liberalization affects South's incentive to protect intellectual property rights (IPR) in a North–South duopoly model where a low-cost North firm competes with a high-cost South firm in the South market. The North firm serves the South market through either exports or foreign direct investment (FDI). The extent of effective cost difference between North and South depends on South's imitation, which in turn depends on South's IPR protection and absorptive capacity and North firm's location choice, all of which are endogenously determined in our model. For a given level of IPR protection, South's absorptive capacity under exports may be greater than under FDI. Even though innovation is exogenous to the model (and hence unaffected by South's IPR policy), strengthening IPR protection in South can improve its welfare. The relationship between trade costs and the degree of IPR protection that maximizes South welfare is non-monotone. In particular, South has an incentive to protect IPR only when trade costs are moderate. When masking technology or licensing is incorporated into the model, however, some protection of IPR may be optimal for South even if the trade costs are not moderate.
研究動機	Globalization leads to technology transfers/spillovers from developed countries (North) to developing countries (South). A typical channel of technology transfers/spillovers is trade and foreign direct investment (FDI), which make it easier for South firms to imitate superior production technologies in North. However, such imitation is neither automatic nor costless. The extent of imitation depends crucially on South's absorptive capacity, that is South's ability to effectively copy the superior technologies of North. South's imitation activities are also importantly affected by South government's policies and North firms' strategic decisions (e.g., location). If IPR protection is perfect and fully enforced, patented technologies cannot freely be copied. When IPR protection is imperfect, North firms may mask their technologies to deter South firms from copying them unless masking is too costly. Furthermore, North firm's location choice affects South's imitation, because geographical proximity plays an important role in technology spillovers.
模型	There are two countries, North and South, each with one firm denoted by firm N and firm S respectively. These firms sell a homogenous product in the South. As we are primarily interested in the incentives and welfare consequences of

	<p>strengthening IPR protection in South, we assume that all consumers are located in South. The inverse demand for the product in the South is $P = b - Q = b - (q_N + q_S)$, where q_i ($i = N, S$), $Q \equiv q_N + q_S$ and P respectively denote output of firm i, aggregate output and market price. Firm N's marginal cost of production is assumed to be zero. Firm N can either locate in North and export to South, incurring a trade cost of $t > 0$ per unit of q_N. Otherwise, it can opt for FDI in South. That is, firm N can build a plant in South and serve the South market from that plant. In that case, firm N does not incur the trade costs. For simplicity, we assume that there are no fixed costs for setting up a plant in South. Firm S is located in South. The initial unit cost of production for firm S is a constant $c > 0$. However, the effective unit cost for firm S is $C_s = c(1 - \alpha z)$; $\alpha \in [0,1]$, $z \in [0,1]$, where z denotes the absorptive capacity (or, the imitation ability) of firm S and α captures the degree of IPR protection in South. If $\alpha = 0$, intellectual property rights are fully protected while if $\alpha = 1$, there is no protection of IPR. As α increases from zero to unity the protection becomes weaker. Weakening of the IPR protection in South reduces the cost advantage of firm N. However, even with no IPR protection (i.e., $\alpha = 1$) firm N enjoys some cost advantage as long as $z < 1$. Firm S has to make an effort to develop absorptive capacity. To attain the capacity level z, firm S has to incur costs, $C(z)$. In the following, we refer to this effort as investment in absorptive capacity. We assume that $C(0) = 0$, $C'(z) > 0$ and $C''(z) > 0$ for all $z > 0$. Furthermore, to obtain closed-form solutions, we consider $C(z) = kz^2$, where $k = k^E$ if firm N opts for exports and $k = k^F$ if firm N opts for FDI. We assume that $k^E > k^F$.</p>
研究結果	<p>Proposition 1 Absorptive capacity, given by $z(\alpha, e)$, (i) increases as the degree of IPR protection weakens; (ii) decreases as (a) the cost of investment ($k(e)$) rises, and (b) the trade cost (t) falls.</p> <p>Proposition 2 For any given degree of IPR protection, absorptive capacity is strictly higher under FDI than under exports if and only if trade costs are sufficiently low. More formally, for all $\alpha \in [0,1]$, there exists a threshold value $\tilde{t}(\alpha) \equiv \min \left\{ \frac{9(k^E - k^F)(b - 2c)}{9k^F - 4\alpha^2 c^2}, \frac{b}{2} \right\}$ such that $z^F > z^E$ holds if and only if $\tilde{t}(\alpha) < t(\alpha)$. Furthermore, $\tilde{t}(\alpha)$ is weakly increasing in α.</p> <p>Proposition 3 (i) Absorptive capacity under FDI, z^F, is inverted U-shaped in firm S's initial unit cost of production c. For all $\alpha \in (0,1]$ there exists $c^F(\alpha) > 0$ such that $\frac{dz^F}{dc} \gtrless 0 \Leftrightarrow c \gtrless c^F(\alpha)$.</p>

	<p>Proposition 5 For a given trade cost $t \geq 0$, let $\alpha^*(t)$ denote the level of IPR protection that maximizes South welfare. The relationship between t and $\alpha^*(t)$ is nonmonotone. More formally, there exists t_1 and t_2 satisfying $0 < t_1 \leq t_2 < \bar{t} < \frac{b}{2}$ such that $\alpha^*(t) = 1$ for $t < t_1$ and $t \geq \bar{t}$ while $\alpha^*(t) = \alpha(t) < 1$ for $t \in (t_2, \bar{t})$. Furthermore, $\alpha^*(t)$ is strictly increasing in t for all $t \in (t_2, \bar{t})$.</p> <p>Proposition 4 The North firm prefers FDI to exports if IPR protection is strong enough. The minimum degree of IPR protection that induces FDI increases as trade costs decline. More formally, for all $t > 0$, there exists $\alpha(t) \in [0, 1]$ such that firm N opts for FDI in stage 1 if and only if $\alpha \leq \alpha(t)$. There exists $\bar{t} \equiv \min\left\{\frac{9c^2(k^E - k^F)(b - 2c)}{(9k^F - 4c^2)(9k^E - 3c^2)}, \frac{b}{2}\right\}$ such that $\alpha(0) = 0$, $\alpha(t) < 1$ for $t < \bar{t}$ and $\alpha(t) = 1$ for $t \geq \bar{t}$. Furthermore, $\alpha(t)$ is continuous (in t) and $\alpha'(t) > (=) 0$ for all $t < (>) \bar{t}$.</p>
研究 貢獻	<p>In the presence of (i) endogenous absorptive capacity and (ii) North firm's location choice—both endogenously determined in our framework—we found that South can benefit from having strict IPR protection depending on the level of trade costs. We also found that the relationship between the optimal strength of IPR protection in South and trade costs is non-monotone. If the trade costs are too high or too low, there is no incentive to protect IPR in South. For moderate values of trade costs, however, it is optimal for South to protect IPR to some extent. In this range of values for trade costs, the IPR protection becomes stronger as the trade costs decline. We showed that in the presence of masking or licensing, some protection of IPR might be optimal for South even if the trade costs are zero or prohibitive. Our analysis also offers an explanation for the ambiguous relationship between FDI and spillovers which is often observed in the data. Absorptive capacity/spillovers can be higher or lower under FDI.</p>

篇名	<i>Multi-product bargaining, bundling, and buyer power</i>
作者	<i>Markus Dertwinkel-Kalt, Christian Wey (2020)</i>
出處	<i>Economics Letters, 188</i>
摘要	We re-consider the bilateral bargaining problem of a multi-product, manufacturer–retailer trading relationship. O’Brien and Shaffer (2005) have shown that the unbundling of contracts leads to downward distorted production levels if seller power is strong, while otherwise the joint profit maximizing quantities are contracted (which is also always the case when bundling contracts are feasible). We show that the unbundling of contracts also leads to downward distorted output levels when the buyer firm has sufficient (Nash) bargaining power (i.e., buyer power). Our result is driven by cost substitutability (diseconomies of scope).
研究動機	In this paper we make the following simple point in favor of bundling practices: In negotiations between a multi-product upstream firm and a single downstream firm, efficiency requires that the multiple products are bundled when the products are substitutable in both demand and cost. Forcing the firms to unbundle the products leads to inefficiencies such that quantities are distorted downward below the monopoly levels, which results in higher consumer prices and reduced social as well as consumer welfare. In short, unbundling creates a “pick-and-choose” option on the weak bargaining party’s side, which is countered by downward distorted quantities in the negotiation process.
模型	An upstream monopolist (manufacturer) produces two imperfectly substitutable products, 1 and 2, to be sold to a downstream firm serving final consumers. We take the downstream firm as a retailer that resells the manufacturer’s products to final consumers on a one-to-one basis. We abstract from any retailing costs except the cost of buying the products from the manufacturer. The retailer acts as a monopolist in the final product market. The manufacturer’s production costs $C(q_1, q_2)$ strictly increase in each product’s quantity, that is, $\frac{\partial C(q_1, q_2)}{\partial q_i} > 0, \text{ for } i = 1, 2 \text{ and all } q_1, q_2 > 0,$ while we abstract from fixed costs. In addition, the cost function exhibits diseconomies of scope, so that marginal costs of product i increase in the other products quantity; i.e., $\frac{\partial^2 C(q_1, q_2)}{\partial q_1 \partial q_2} > 0$

研究 結果	<p>We extend the analysis of OBS who show that imposing unbundling restrictions on multi-product negotiations can lead to inefficiencies in the presence of large seller power. We show that a similar reasoning applies to large buyer power and that inefficiencies from unbundling restrictions can then emerge because of cost substitutability. The reason is that large buyer power in association with cost substitutability gives rise to a binding incentive constraint for the manufacturer to accept all contracts and not less. Taking this constraint into account in the Nash bargaining problem then leads to insufficient output levels.</p>
研究 貢獻	<p>Our contribution is, therefore, to show that the sub-optimality of unbundled contracts also holds in the presence of buyer power (which critically depends on cost substitutability, but not on product substitutability). Retailer buyer power has become a focus area of competition policy in recent decades (see, e.g., EC, 1999, FTC 2001, CC, 2008). Several competition reports have expressed the concern that powerful buyers are able to extract rents from sellers. Our analysis suggests that imposing unbundling restrictions on vertical contracts can become the source of inefficient bargaining outcomes when retailers have strong bargaining positions.</p>
未來 研究 方向	<p>Following OBS, we can extend our analysis by considering N single-product upstreams firms (assuming all products are imperfect substitutes). In this case, the revenue function has to be interpreted as a residual revenue function (given the quantities of the other suppliers). It is then straightforward to show that our analysis and all of our results extend to the case where the downstream retailer bargains with $N + 1$ upstream firms over contracts, where each of the additional N firms offers one product. This directly follows from the fact that the retailer is a monopolist in the downstream market and is thus a common agent from the suppliers' perspective. It then follows that the negative social welfare effects of unbundling under significant buyer power remain valid because rival firms' products are imperfect substitutes; i.e., even though rival firms respond by increasing their quantities this increase does not offset the negative welfare effect of the reduction of the quantities of the multiproduct firm under unbundling (see OBS, p. 583 for a similar conclusion within their framework).</p>

篇名	Apportioning indivisible damage and strategic diffusion of pollution abatement technology
作者	Yi Li
出處	Journal of Economics (2019) 126:19–42
摘要	I examine the problem of apportioning liability among competing firms in an industry where the environmental damage is a joint product of the actions taken by all firms. In particular, I analyze the effect of alternative apportionment rules on adoption and strategic diffusion of pollution abatement technology. In a duopoly where industry wide technological diffusion is welfare enhancing, I characterize the second best optimal apportionment rules. Inducing technology transfer requires placing a larger burden of the liability on the ex ante cleaner firm i.e., the one with a more efficient abatement technology.
研究動機	<p>From a purely economic perspective, liability apportionment rules affect the expected cost of damaging actions taken by a firm and an appropriately designed apportionment rule should strive to provide adequate incentives for firms to choose their actions so as to attain efficiency in emissions and damage.</p> <p>However, in many situations, firms that are jointly liable for an environmental damage are also competitors in the product market. This is often observed in situations where an industry is spatially agglomerated. In such situations, apportionment rules also affect the competitive position of various firms in the industry. More importantly, they may affect the incentives of firms with better abatement or cleaner technology to transfer this technology to rival firms in order to reduce the damage and liability. Appropriate design of joint liability apportionment rules ought to take into account the economic consequence of such rules for technology diffusion and the eventual market outcome. This paper is a first attempt to analyze this issue.</p>

模型	<p>Consider a Cournot duopoly where the inverse market demand function $P(Q)$ is:</p> $P(Q) = a - Q, 0 \leq Q \leq a.$ <p>Firms are indexed by $i \in \{1, 2\}$. Each firm i produces output with a common unit cost normalized to 0 and generates pollution as a by-product. Firm i's emission level e_i is determined by its emission per unit output x_i and output quantity q_i:</p> $e_i = x_i q_i$ <p>Firm 1 has an abatement technology which allows it to reduce its emission per unit output x_1 to x^*, where $0 < x^* < 1$. x^* serves as a measure for the abatement technology efficiency in the sense that a smaller x^* indicates a higher technology efficiency. Firm 2 does not have access to such abatement technology initially, and as a result, $x_2 = 1$.</p>
研究結果	<p>I find that the emission intensity of the cleaner firm may affect the design of the optimal apportionment rules. In particular, if the emission intensity is small then the optimal apportionment rule will allocate a relatively large (more than $\frac{1}{2}$) portion of the compensation payment to the firm originally owning the technology. Such an apportionment rule ensures a competitive market structure and encourages the diffusion of the abatement technology. If instead the emission intensity is large then diffusion never occurs and the ex-ante cleaner firm will be responsible for less than half of the liability under the optimal apportionment rule.</p>
研究貢獻	<p>This paper contributes to the current body of literature by investigating the role of apportionment rules in inducing technological change. In particular, I propose an apportionment rule that does create incentives for diffusion of an advanced care technology among jointly liable actors in the context of market competition, and I show that such diffusion is welfare improving.</p> <p>Lastly, this paper is related to the licensing literature, which examines the conditions and in particular the conditions on the fee and royalty structure for it to be beneficial for a firm to transfer its superior technology to a less efficient rival (see for example, Wang 1998; Sen and Tauman 2007). In this paper, I show that because of joint liability for the consequence of production process, it may be possible to induce certain kinds of technology transfer even if the firm with superior technology does not receive any payment from its competitor.</p>
未來研究	<p>I make the special assumption that the emission function is linear in output and firms produce at constant marginal cost. In a more general model, the</p>

方向	<p>production cost may be an increasing and convex function of output (so that the marginal cost is increasing). At the same time, as some of the literature in environmental economics has emphasized, the state of the technology (whether clean or dirty) used by a firm may affect its marginal cost of production. If the marginal cost of production is increasing in output and technology then it is possible that the negative strategic cost effect will not exist, as technology diffusion may now increase the cost gap between the two firms and advantageously affect the position of the firm that initially owns the technology in product market competition. The story, however, will be completely different if the marginal cost of production is decreasing in technology. Thus, for more general cost functions, the net effect of the damage reduction and strategic cost effects may vary in complex ways and, moreover, it is difficult to match a specific industry to a specific functional form. Addressing these issues would require the introduction of considerable complexity into the present model, and I leave exploration of these issues for future work.</p>
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篇名	Price competition in the presence of a web aggregator
作者	Oksana Loginoval · Andrea Mantovani2
出處	J Econ (2019) 126:43–73
摘要	<p>In this paper we examine the impact of a web aggregator on firms and consumers in a horizontally differentiated market. When a firm pays a fee to be listed on the aggregator’s website, its location and price become observable to e-users (consumers who visit the website). We consider two settings, depending on the possibility for online firms to offer discounts to e-users. In equilibrium, not all firms will go online—some will choose to remain offline. Online firms attract more customers due to the higher level of information, but face a tougher price competition. When the proportion of e-users is relatively low, price discrimination may hurt the firms. Therefore, less of them can afford to go online. The opposite holds when e-users predominate; price discrimination yields a higher number of online firms than uniform pricing. Finally, we evaluate the aggregator’s optimal policy regarding the fee and whether to impose uniform pricing or to allow price discrimination. We discover that, unless the proportion of e-users is relatively low, the aggregator induces only a few firms to go online.</p>
研究動機	<p>In this paper we examine the impact of a web aggregator on firms and consumers in a horizontally differentiated market. When a firm pays a fee to be listed on the aggregator’s website, its location and price become observable to e-users (consumers who visit the website). We consider two settings, depending on the possibility for online firms to offer discounts to e-users. In equilibrium, not all firms will go online—some will choose to remain offline. Online firms attract more customers due to the higher level of information, but face a tougher price competition. When the proportion of e-users is relatively low, price discrimination may hurt the firms. Therefore, less of them can afford to go online. The opposite holds when e-users predominate; price discrimination yields a higher number of online firms than uniform pricing.</p> <p>Finally, we evaluate the aggregator’s optimal policy regarding the fee and whether to impose uniform pricing or to allow price discrimination. We discover that, unless the proportion of e-users is relatively low, the aggregator induces only a few firms to go online.</p>

<p>模型</p>	<p>The players in our model are uninformed consumers, restaurants and a web aggregator. (Think of tourists visiting Paris and looking for a place to have a nice dinner.) Consumers differ in their preferences for cuisine and dining atmosphere. For example, some customers prefer a more authentic food experience, while others enjoy more mainstream dining. For some customers, presentation is important, whereas for others it is the size of a meal that matters. Depending on the occasion, customers may prefer a more intimate ambience, or a more vibrant one where patrons can engage in dynamic conversation. Families may want to avoid student hangouts, and vice versa. We use Salop circular city to model consumer heterogeneity. Consumers of total mass one are uniformly distributed on a circle of circumference one. N restaurants are located equidistantly around the circle; each produces a meal at the constant marginal cost c.</p> <p>When a consumer dines in a restaurant located at distance x from her, her utility from consuming a meal (her valuation) is</p> $v - tx,$ <p>where t represents the intensity of consumer tastes.</p> <p>We assume that consumers do not know the locations of the restaurants on the Salop circle nor their prices. Only when a consumer enters a restaurant, she observes its price, and only after the consumer has a meal there, she learns its location on the circle. Since the expected distance between the consumer and a randomly chosen restaurant is $1/4$, the consumer's expected utility equals $v - t/4$. We also assume that, as long as the restaurant's price does not exceed the consumer's expected utility, the consumer dines at that restaurant. Thus, in equilibrium each restaurant will set its price equal to leaving all consumers with zero expected payoffs.</p> $v - \frac{t}{4},$
<p>研究 結果</p>	<p>The analysis carried out in this paper relied on many simplifying assumptions. First of all, we considered the presence of only one aggregator, and supposed that it conveys reliable information at almost zero cost for consumers. This can be justified by the fact that consumers tend to resort to just a few trusted sources of information, those who successfully win the race to become the reference points for consumers unfamiliar with certain product characteristics. For this reason, aggregators usually do not charge final users, but compete for rents coming from the firms that want to get online visibility.</p>

研究 貢獻	We also acknowledge that our analysis has been performed under some specific parametric conditions. However, such conditions have been always justified not only for algebraic tractability, but also for being well suited to the specific market case that we wanted to study. All in all, we are also convinced that the basic model that we provided allows to capture the impact of web aggregators in a simple but significant way.
未來 研究 方向	none

篇名	Consumer surplus bias and the welfare effects of price discrimination
作者	Francisco Galera, Pedro Garcia-del-Barrio, Pedro Mendi
出處	Journal of Regulatory Economics (2019) 55:33–45
摘要	<p>A well-known result with important policy implications is that an output increase is a necessary condition for social welfare to increase with third-degree price discrimination. In this paper, we explore the robustness of this result to the introduction of an assumption that is different than the conventional approach, namely preferences not being quasilinear. We show that in the presence of income differences among consumers, the aggregate utility of consumers may increase with price discrimination while total output remains constant. This result questions the general policy recommendation that third-degree price discrimination should be disapproved because it reduces welfare unless output increases. Our result highlights the crucial role of the assumption of quasilinear preferences in standard welfare calculations. In the presence of income differences, consumer surplus may be a biased welfare measure, thus potentially leading to incorrect conclusions when assessing the impact of specific policies.</p>
研究動機	<p>A central question in Economics is the welfare consequences of government intervention. In fact, competition authorities and regulators are typically concerned about the welfare of consumers and of society as a whole. This calls for the need of a measure of welfare that may be used to evaluate whether or not society is better off after a given policy is adopted. According to Economic Theory, consumer surplus is an accurate measure of welfare, as it reflects consumers' willingness-to-pay. However, the validity of this measurement, especially when dealing with aggregate consumer surplus, relies on the assumption of a constant utility of income, typically associated with the assumption of quasilinear preferences. This consideration may have important effects on the evaluation of government policies. Since standard welfare calculations that rely on the concept of consumer surplus may be giving a greater weight to individuals or markets where income levels are higher, these calculations may be distorted, potentially leading to incorrect conclusions. This is precisely the issue that we address in this paper, for the specific case of third-degree price discrimination.</p>

模型	<p>We consider the existence of two markets, 1 and 2. There is a representative consumer in each market. Both consumers have the same preferences on goods x and y. Specifically, we assume that the utility function of any individual is given by</p> $U(x, y) = u(x) + v(y).$ <p>In particular, assume that with $0 \leq z \leq 1$. Notice that this function attains a maximum at $z = 1$, implying that</p> $u(z) = v(z) = z - \frac{z^2}{2},$ <p>the individual's utility function exhibits satiation at $x = 1$ or $y = 1$.</p>
研究結果	<p>Proposition 1 Under Assumption 1, the welfare of consumers is greater with price discrimination than with a single uniform price, while total consumption of good x is constant.</p>
研究貢獻	<p>The main contribution of this paper is to highlight the crucial role of assuming that consumers have quasilinear preferences when evaluating the impact of a given policy on the welfare of society. In particular, we focus on third-degree price discrimination. We assume that consumers in two different markets, with income levels being different across markets, have preferences on two goods, x and y, that are not quasilinear, hence potentially giving rise to differences in the marginal utility of money, arising from differences in income levels across consumers.</p>
未來研究方向	None

篇名	Partial privatization policy and the R&D risk choice in a mixed duopoly market.
作者	Mingqing Xing(2019)
出處	The Manchester School, 87(1), 60-80.
摘要	This study investigates how the partial privatization on the public firm affects the R&D risk choice in a mixed duopoly market. It mainly finds that: (i) the partial privatization of the public firm leads to a decline in the optimal level of R&D risk chosen by the private (or public) firm, and the higher the degree of privatization the lower the optimal level of R&D risk; (ii) for the public firm, the partial privatization policy always causes the private optimum to be lower than the social optimum; (iii) for the private firm, whether the private optimum is higher or lower than the social optimum depends on the partial privatization level of the public firm. When the degree of privatization is small (large), the private optimum is higher (lower) than the social optimum.
研究動機	In facing of R&D uncertainty, the optimal choice of the risk associated with R&D programs is a variable of interest. Thus it is interesting and important to investigate how the partial privatization on the public firm affects the R&D risk choice of the firms in a mixed market. Based on the framework of Hotelling (1929), we examine the impact of partial privatization of the public firm on both private and public firms optimal R&D risk choice among R&D programs with different degrees of risk but a same expected outcome in a mixed duopoly.
模型	Consider a linear market denoted by $[0, 1]$. Consumers are evenly distributed over the market according to their subjective taste preferences. The mass of consumers is normalized to one. There are two firms, denoted by firm 0 and firm 1, in the market. They provide consumers with product 0 and product 1, respectively. Firm 0 is a public firm (or a partially privatized firm) and firm 1 is a private firm. Each firm is exogenously located at one endpoint of the interval, so that firm 0 (firm 1) is located at 0 (1). The net utility of a consumer located at x is defined as: $u_0 = v - p_0 - tx, \text{ if he/ she buys from firm 0,}$ $u_1 = v - p_1 - t(1-x), \text{ if he/ she buys from firm 1}$ In equation (1), v is a positive constant and sufficiently large, p_i denotes the price of product i , tx and $t(1-x)$ stand for the disutility caused by using a product not consisting with his/her own preference and t ($t > 0$) captures the degree of differentiation as perceived by consumers (or can be interpreted as the transportation cost per unit distance). We assume that the market is

	completely covered and consumers have unit demand.
研究 結果	This paper relates the risk-taken behavior of the private (public) firm to the partial privatization of the public firm in a mixed duopoly market. Both private and public firms are more willing to take risks when the public firm is not privatized than when it is partially privatized. This result implies that the effect of partial privatization on the private (or public) firm's R&D behavior strongly depends on the market environment. From a welfare perspective, (i) the public firm is always too conservative when it is partially privatized, and (ii) the private firm is too risky when the public firm is not privatized, while it is too conservative when the public firm is partially privatized and the level of privatization is sufficiently large.
研究 貢獻	We note that several studies have attempted to examine the relationship between the privatization (or partial privatization) and the R&D expenditure in mixed oligopoly. Cato (2011) investigates the effect of privatization on the cost-reducing investment by the private firm. He finds that the privatization increases (reduces) the cost-reducing investment if the market demand is sufficiently large (small). Heywood and Ye (2009) examine the incentive for partial privatization in a mixed duopoly with R&D rivalry. They show that, the optimal extent of privatization is reduced because the mixed duopolies engage in more R&D. Zhang (2015) considers a mixed triopoly market competition, and shows that the R&D investment of the public firm (the private firm or the joint venture) will decrease (increase) along with the increasing degree of privatization. However, these studies ignore the effect of partial privatization on the optimal R&D risk choice of the private (or public) firms, which is the focus of the present paper.
未來 研究 方向	This study uses a simplest framework to examine the optimal R&D risk choice in a mixed duopoly. Thus several extensions of this analysis are possible. One is that we can consider the spillovers in R&D activity. When the technological spillovers occur in an industry, successful firms are not able to appropriate all of the gains from the outcomes of their R&D activities (see d'Aspremont and Jacquemin, 1988). This inability to appropriate all the rents of R&D success may weaken the firms' incentives to invest in R&D (see Silipo and Weiss, 2005). It is interesting to study whether the spillovers change the impact of privatization on the optimal R&D risk choice. Given the static nature of our model, we cannot address the relative R&D incentives of leader and follower. Thus the other extension is that we can consider a finite-stage model of entry into a new market. However, these extensions require much effort and are task that remains for future research.

篇名	Direct Welfare Analysis of Relative Price Regulation
作者	John Vickers
出處	The Journal of Industrial Economics, 68(1), 40-51.
摘要	The paper synthesizes and develops the welfare analysis of regulating relative prices, for example price differences, of which banning price discrimination is a special case. Welfare results are derived directly by convexity arguments using functions of welfare levels. The method is also used to obtain results about effects on consumer surplus.
研究動機	How do constraints on the relative prices charged by a profit-maximizing monopolist affect social welfare and consumer surplus? The literature on price discrimination addresses this question by comparing laissez-faire with the case where no price differences are allowed – see, for example, Varian [1985], Aguirre, Cowan and Vickers [2010] (henceforth ‘ACV’), and the subsequent contributions by Cowan [2012, 2016]. The present paper introduces a method for comparing outcomes by defining market variables directly as functions of welfare or consumer surplus. The method not only yields results from the literature on monopoly price discrimination; it generalises them and adds some new findings. Moreover, the method can be applied to forms of relative price regulation other than banning price differences altogether.
模型	<p>A product with constant unit cost $c > 0$ is supplied in n markets by a profit-maximizing monopolist. Demand in market i is $x_i(p_i)$, which is assumed to be a smooth, strictly decreasing function of price p_i, and inverse demand is $p_i(x_i)$. Profit from that market is $\pi_i(x_i) = (p_i(x_i) - c)x_i$. The firm's total profit is $\Pi = \sum_i \pi_i$. The firm chooses the vector of quantities $x = (x_1, \dots, x_n)$ to maximize Π subject to price difference constraints except in the case of laissez-faire. The prime question is how the constraints affect total welfare $W = \sum_i w_i$, where w_i is welfare in market i. Consider the welfare comparison between laissez-faire, which yields welfare level w_i^* in market i, and a requirement of uniform pricing, which yields welfare w_i^0. (Superscripts $*$ and 0 generally denote outcomes with laissez-faire and uniform pricing respectively, which are assumed to differ.) To see where the analysis is headed, imagine that there is a strictly convex function $\gamma_i(w_i)$ for each market such that $\sum_i \gamma_i(w_i^0) = \sum_i \gamma_i(w_i^*) = 0$.</p> <p>With $w_i^0 \neq w_i^*$ strict convexity implies that $(w_i^0 - w_i^*)\gamma_i'(w_i^*) < \gamma_i(w_i^0) - \gamma_i(w_i^*) < (w_i^0 - w_i^*)\gamma_i'(w_i^0)$ and therefore by summing $\sum_i (w_i^0 - w_i^*)\gamma_i'(w_i^*) < \sum_i [\gamma_i(w_i^0) - \gamma_i(w_i^*)] < \sum_i (w_i^0 -$</p>

	<p>$w_i^*)\gamma'_i (w_i^0)$.</p> <p>The middle term in this chain is zero, and so $\sum_i(w_i^0 - w_i^*)\gamma'_i (w_i^*) < 0 < \sum_i(w_i^0 - w_i^*)\gamma'_i (w_i^0)$.</p> <p>If, moreover, all $\gamma'_i (w_i^0)$ and were the same, we would immediately have from (2) that total welfare w^0 with uniform pricing was greater than welfare w^* with laissez-faire. If, on the other hand, all $\gamma'_i (w_i^*) > 0$ and were the same, the opposite would be true. More generally, let $E[\cdot]$ denote the average of a variable across the n markets, and write $\sum_i(w_i^0 - w_i^*)\gamma'_i (w_i^0) = (w^0 - w^*)E[\gamma'_i (w_i^0)] + \sum_i(w_i^0 - w_i^*)\gamma'_i (w_i^0) - E[\gamma'_i (w_i^0)] = (w^0 - w^*)E[\gamma'_i (w_i^0)] + nCov[(w_i^0 - w_i^*), \gamma'_i (w_i^0)]$.</p>
研究結果	<p>Proposition 1. If all markets are regular, among difference-compatible outcomes total welfare (i) is maximized by uniform pricing if $\sigma_i^0 \eta_i^0$ is higher in H-markets in the sense that $Cov[\sigma_i^0 \eta_i^0, (w_i^0 - w_i)] \geq 0$, but (ii) is maximized by laissez-faire if $(2 - \sigma_i^*)(\eta_i^* - 1)$ is higher in H-markets in the sense that $Cov[(2 - \sigma_i^*)(\eta_i^* - 1), (w_i - w_i^*)] \geq 0$.</p> <p>Proposition 2. (i) With constant elasticities of demand η_i, uniform pricing is better for welfare than laissez-faire if all $\eta_i - 1 \leq \eta^0$. (ii) With constant curvatures of inverse demand σ_i, uniform pricing is (a) better for welfare than laissez-faire if σ_i is higher in H-markets in the sense that $Cov[\sigma_i, (w_i^0 - w_i)] \geq 0$, all $\sigma_i \leq 1$ and $\sigma_i \frac{\eta_i^0}{\eta^0} \leq 1$ for all $l \in L$, but (b) worse for welfare than laissez-faire if σ_i is lower in H-markets in the sense that $Cov[\sigma_i, (w_i^0 - w_i^*)] \leq 0$, all $\sigma_i \geq 1$ and $\sigma_h \frac{\eta_h^0}{\eta^0} \geq 1$ for all $h \in H$.</p> <p>Proposition 3. (i) With constant σ_i uniform pricing is (a) better for consumer surplus than laissez-faire if σ_i is higher in H-markets in the sense that $Cov[\sigma_i, (s_i^0 - s_i^*)] \geq 0$, all $\sigma_i \leq 1$ and $\sigma_l \frac{\eta_l^0}{\eta^0} \leq \frac{2}{3}$ for all $l \in L$, but (b) worse for consumer's surplus than laissez-faire if σ_i is lower in H-markets in the sense that $Cov[\sigma_i, (s_i^0 - s_i^*)] \leq 0$, all $\sigma_i \geq 1$, $\frac{\eta_l^0}{\eta^0} \leq \frac{1}{\sigma_i - 1}$ for all $l \in L$ and $\sigma_h \frac{\eta_h^0}{\eta^0} \geq \frac{2}{3}$ for all $h \in H$. (ii) With constant η_i uniform pricing is better for consumer surplus than laissez-faire if all $\eta_i \leq 2\eta^0$.</p>
研究貢獻	<p>The analytical method used in this paper has been based on the observations that (i) in standard single-product monopoly settings there is equivalence between choosing price and choosing the level of consumer surplus (or</p>

	<p>welfare), and (ii) at its optimum the incentives of a multi-market monopolist to raise prices in parallel sum to zero across markets whether or not there are binding price difference constraints, for example a requirement of uniform pricing. Using convexity properties, the method directly delivers known welfare results on third-degree monopoly price discrimination, such as those in ACV, and somewhat generalises them by relaxing the concavity of $\pi_i(p_i)$, by extending beyond the two-market case, and by applying to price difference constraints more broadly than a ban on price discrimination. The method also yields some new results, for example that monopolistic price discrimination is bad for consumers with constant elasticities that differ by no more than a factor of two.</p>
<p>未來 研究 方向</p>	<p>Whether the approach can be applied to other contexts involving welfare comparison between constrained and unconstrained optima, and whether its economic interpretation can be strengthened.</p>

篇名	Overlapping ownership, endogenous quality, and welfare
作者	Duarte Brito, Ricardo Ribeiro, Helder Vasconcelos
出處	Economics Letters 190 (2020) 109074
摘要	This paper investigates how overlapping ownership affects quality levels, consumer surplus, firms' profits and welfare when the industry is a vertically differentiated duopoly and quality choice is endogenous. This issue is particularly relevant since recent empirical evidence suggests that overlapping ownership constitutes an important feature of a multitude of vertically differentiated industries. We show that overlapping ownership, while detrimental for welfare, may increase or decrease the quality gap, consumer surplus and firms' profits. In particular, when the overlapping ownership structure is such that the high quality firm places a positive weight on the low quality firm's profits, the incentives of the high quality firm to compete aggressively reduce. This may increase the equilibrium quality of the low quality firm, which in turn may lead to higher consumer surplus, despite higher prices.
研究動機	This issue is particularly relevant since recent empirical evidence suggests that overlapping ownership constitutes an important feature of a multitude of vertically differentiated industries.
模型	<p>We follow Wauthy (1996)'s approach and notation. Two duopolists, firm 1 and firm 2, sell products of different quality to a continuum of consumers of measure 1 that have different valuations for quality. We assume that each consumer is identified by a parameter θ that characterizes the utility when purchasing from firm $i = L, H$, as follows: $u_{\theta i} = \theta s_i - p_i$, where s_i and p_i denote the quality and price of firm i. θ is uniformly distributed over the support $[\theta^-, \theta^+]$, and θ^+/θ^- is assumed to be sufficiently large so that the market is not covered in equilibrium. We focus on the non-trivial case in which $s_H > s_L$, with s_H and s_L denoting the quality level of the high (H) and low (L) quality firm, respectively. The utility of not purchasing any product (outside option $i = 0$) is normalized to zero: $u_{\theta 0} = 0$.</p> <p>We assume constant unit production costs and, without loss of generality, we take these costs to be zero. We also assume that quality is costless and can take values in interval $[0, s^+]$ in the lines of Choi and Shin (1992) and Wauthy (1996). This simplifies the analysis considerably. The introduction of costs of quality improvement, as in Motta (1993), constitutes a very interesting potential area for future research.</p> <p>Finally, we assume that, due to overlapping ownership, firm i's objective</p>

	function places a weight $w_i < 1$ on firm j 's profit (with the weight on own profit normalized to 1). These assumptions imply that the objective function of firm $i = L, H$ is $\hat{\pi}_i = \pi_i + w_i\pi_j = p_iD_i + w_ip_jD_j$, where π_i and D_i denote the profit and demand of firm i .
研究 結果	We have shown that overlapping ownership, while detrimental for welfare, may increase or decrease the quality gap, consumer surplus and firms' profits. In particular, when overlapping ownership leads the manager of the high quality firm to place some weight on the low quality firm's profits, the low quality level increases and consumers will benefit from this. The reason being that when the rival prices less aggressively, quality differentiation is not as relevant and the low quality firm narrows the quality gap.
研究 貢獻	Overlapping ownership – in the form of cross-ownership by competitors (internal shareholders) or common ownership by (external) shareholders – can induce managers to internalize the externalities that their actions inflict on rival firms (Rubinstein and Yaari, 1983; Rotemberg, 1984; Gordon, 1990; Hansen and Lott, 1996). This internalization can naturally lessen product market competition since it reduces the incentive of firms with ownership links to compete aggressively, leading (i) to higher product prices and lower output levels (Bresnahan and Salop, 1986; Reynolds and Snapp, 1986; Flath, 1992; Dietzenbacher and Smid, 2000; Shelegia and Spiegel, 2012; Brito et al., 2019b); and (ii) to a lower likelihood of entry (Newham et al., 2018). However, this internalization can also have a bright side by (i) promoting cost-reducing investments (Shelegia and Spiegel, 2015; Anton et al., 2018; López and Vives, 2019); (ii) facilitating the transfer of tacit knowledge and product innovation (Ghosh and Morita, 2017; Papadopoulos et al., 2019); and (iii) reducing intra-industry portfolio risks (Shy and Stenbacka, 2019). We contribute to this strand of the literature by studying the effects of overlapping ownership on the quality choices, consumer surplus, profits and welfare of a vertically differentiated duopoly.
未來 研究 方向	可嘗試內生化交叉股權權重，藉以比較福利效果。

篇名	Two Rationales for Insufficient Entry
作者	Linfeng Chen ¹ / Tan Li ² / Bing Qian ³ 1.School of Economics and Management, Changzhou Institute of Technology, 2 School of Economics and Management, Changzhou Institute of Technology, 3School of Economics and Management, Changzhou Institute of Technology,
出處	The B.E. Journal of Theoretical Economics. 2019; 20180054
摘要	This study offers two new rationales for insufficient entry in a given industry. The first is the presence of complementary industries. Suppose there is free entry in an industry and the complementary industries are monopolistic. If the number of complementary industries is sufficiently high, then there is insufficient entry. However, if these industries are substitutes, then there is always excessive entry. The second rationale is that there is cost-reducing R&D investment and spillover. When the spillover rate is sufficiently high, there is insufficient entry. Further, we consider the general model and obtain similar results.
研究動機	To extend this literature, we offer two new rationales for insufficient entry. Our logic is fundamentally different to the approaches considered in the existing studies. The first rationale is the presence of complementary industries. The so-called business-stealing effect is present in the model without complementary markets, which states that the marginal entrant's incentive for entering the market is socially excessive, as the post-entry profit is larger than the incremental social surplus associated with the marginal entry.
模型	To extend this literature, we offer two new rationales for insufficient entry. Our logic is fundamentally different to the approaches considered in the existing studies. The first rationale is the presence of complementary industries. The so-called business-stealing effect is present in the model without complementary markets, which states that the marginal entrant's incentive for entering the market is socially excessive, as the post-entry profit is larger than the incremental social surplus associated with the marginal entry. Demand for firms can be summarized by the following inverse $p_0 = a - b\left(\sum_{j=1}^{j=n} q_j\right) - r\left(\sum_{j=1}^{j=m} Q_j\right),$ $p_i = a - bQ_i - r \sum_{j=1, j \neq i}^{j=m} Q_j - r \sum_{j=1}^{j=n} q_j,$ where q_j and Q_j are the supply of firm j in industry 0 and the supply of firm j in industry j , respectively; while p_0 and p_i are prices of product 0 and product i ,

	<p>respectively. a, b, and r are constants. The common marginal cost for all firms is c. Firms in industry 0 are homogeneous substitutes, while firms in other industries are complements (substitutes) if $r < 0$ ($r > 0$). This demand system comes from the following utility function.</p> $a \sum_{j=1}^{j=n} q_j + a \sum_{j=1}^{j=m} Q_j - \frac{1}{2} (b (\sum_{j=1}^{j=n} q_j)^2 + b \sum_{j=1}^{j=m} Q_j^2 + 2r (\sum_{j=1}^{j=n} q_j) (\sum_{j=1}^{j=m} Q_j) + r \sum_{i,j=1, i \neq j}^{i,j=m} Q_i Q_j) - p_0 \sum_{j=1}^{j=n} q_j - \sum_{j=1}^{j=m} p_j Q_j.$ <p>Given n firms in industry 0 and m firms in the other m industries, we have profit</p> $\pi_i = (p_i - c)Q_i = (a - bQ_i - r \sum_{j=1, j \neq i}^{j=m} Q_j - r \sum_{j=1}^{j=n} q_j - c)Q_i,$ $\pi_l = (p_0 - c)q_l = (a - b(\sum_{i=1}^{j=n} q_j) - r(\sum_{i=1}^{j=m} Q_j) - c)q_l,$ <p>where π_i and π_l are profits for firm i in industry i and firm l in industry 0, respectively.</p>
研究結果	<p>This study offers two new rationales for insufficient entry: the presence of complementary industries and investment in cost-reducing R&D and spillover. The first is the presence of complementary industries. Suppose there is free entry in one industry, and the complementary industries are monopolistic, then there could be insufficient entry. As entry in the industry leads to higher output in other complementary industries, it improves social welfare. If the number of complementary industries is sufficiently high, then there is insufficient entry. However, if these industries are substitutes, then there is always excessive entry. The second rationale is that there is cost-reducing R&D investment and spillover. When the spillover rate is sufficiently high, there is insufficient entry. This is because every additional entry under a high spillover rate leads to lower marginal cost, and improves social welfare. Under this situation, there is insufficient entry.</p>
研究貢獻	<p>The two rationales we identify in this study are based on the externality of the entry of the firm. By assuming away the strategic externality among firms, we focus on the externality on social welfare alone and extend the model to consider nonlinear demand. Due to the trade-off between the business-stealing effect and the externality, there will be insufficient entry if and only if the externality is sufficiently large. By modeling the strategic externality among firms directly, we extend the model to consider the general model. Although we fail to obtain the closed-form solution for the general model due to the strategic interaction between firms, our logic and intuition applies for the general framework as well. For details, please see the online appendix. We provide a general framework in the online appendix and obtain similar results. For future research, we could consider the case with oligopolistic complementary industries. Although the results are similar, the model will be more</p>

	realistic. Further, we could consider heterogeneous industries instead of homogeneous industries. Further, we could consider asymmetric competition among industries.
未來研究方向	None

篇名	On the firstmover advantage in Stackelberg quantity games
作者	Kurt Annen
出處	Journal of Economics (2019) 126:249–258
摘要	In economic models, “sales equals production” is typically treated as an identity and not as an equilibrium outcome. This distinction, however, matters when production is sequential because of off-equilibrium path behavior. This paper shows that the first mover advantage in the standard Stackelberg oligopoly game in quantities may be reduced when “sales equals production” is no longer treated as an identity. Moving first does not per se produce a strategic advantage. It is only first moves that are sufficiently costly that produce this advantage. With costless production, the advantage disappears completely and the Cournot–Nash outcome is obtained.
研究動機	Do firms sell what they produce or produce what they sell? To answer this question seems extraneous because when ever production is costly, production will equal sales in equilibrium. Maybe for that reason the variable y in economic models typically is used for both, production and sales. The output y affects revenues—i.e. y refers to what a firm sells—and costs—i.e. y refers to what a firm produces. The firm’s optimization problem is to choose y such that profits are maximized.
模型	We start by analyzing the standard setting. Consider a duopoly between two firms. Inverse demand is given by $p(y_1, y_2)$, thereby assuming a market-clearing auctioneer or process. Firm $i = 1, 2$ produces its output y_i at a cost $c_i(y_i)$. Assume that firm 1 chooses its output, y_1 , first. After observing y_1 , firm 2 chooses its output, y_2 , next. The demand function p and cost functions $c_i, i = 1, 2$, are assumed to have properties that assures a unique SPE (i.e. concavity of p , convexity of c , etc.) Firm 2 solves $\max_{y_2} p(y_1, y_2)y_2 - c_2(y_2).$ Firm 1, the Stackelberg leader, solves $\max_{y_1} p(y_1, y_2^*(y_1))y_1 - c_1(y_1).$
研究貢獻	Proposition 1 For sales of total output to be credible, the first mover revenue effect, $\frac{\partial p}{\partial y_2} \frac{\partial y_2}{\partial y_1} y_1$, cannot be larger than marginal cost evaluated at equilibrium quantities. The analysis of this paper suggests that as marginal production costs go to zero, the Stackelberg equilibrium becomes the Cournot–Nash equilibrium in an oligopoly game with sequential production when production and sales are no longer treated

	as an identity. We conclude that the first mover advantage in the Stackelberg game effectively arises only then when production is sufficiently costly: It is costly first moves that produce the advantage and for costless firstmoves, the firstmover advantage disappears.
未來 研究 方向	None

篇名	技術授權下之專利保護與歧視性貿易政策 s
作者	國立高雄科技大學 國際企業系 李仁耀
出處	Working paper
摘要	<p>本研究利用Hwang and Mai(1991)的理論架構，在兩國同時出口至第三國市場的貿易競爭模型下，同時結合進口國專利權人「技術授權」與出口國政府「專利權保護程度」等因素，探討進口國如何透過貿易政策來提高自身的福利水準。</p> <p>不同於Hwang and Mai(1991)的結論，進口國採取歧視性關稅下，將存在「高成本、低關稅」的課徵原則；本研究發現進口國採取差別關稅時，若專利權人採取單位權利金授權，且高成本出口國對專利權完全不保護，低成本國家對專利權完全保護，則進口國政府將對高成本國家的廠商給予進口關稅，低成本國家的廠商給予低進口補貼。本研究與Hwang and Mai(1991)具有重要的互補性，同時，本研究也可以解釋為何美中貿易戰下，美國利用關稅來報復中國的智慧財產權竊取。</p>
研究動機	<p>近期，美中貿易戰(China-United States trade war)為國際經貿中最重要之議題之一。2018年3月22日美國川普總統宣稱「中國偷竊美國智慧財產權和商業秘密」，並根據1974年貿易法第301條要求美國貿易代表署對從中國進口的商品徵收關稅，並於6月16日公布第一批針對500億美元中國輸美商品的徵稅清單。2019年5月5日，川普宣布對另外價值約2000億美元，合計共2500億美元的中國輸美商品於6月1日起徵收25%的關稅。2019年8月1日，因川普政府不滿中國政府對美國農產品的購買進程，川普在推特宣布將在2019年9月1日起，對餘下價值3000億美元的所有中國輸美商品徵收10%的關稅。相關的貿易報復措施，也對於全球經濟產生一系列的震盪。</p> <p>在此，我們感興趣的是，智慧財產權保護(Intellectual Property Rights Protection)與貿易政策(trade policy)所存在的相互影響關係為何？特別是在智慧財產權中，具有成本節約效果的製程創新(process innovation)與其技術授權策略，如何影響到最適貿易政策？如果專利權被完全保護、不完全保護或完全不保護，對於進口國的貿易政策是否有所差異？技術授權策略如果不同，對於貿易政策的選擇是否會有影響？同時，貿易三方的福利分布變化如何？</p>

模型

壹、無技術授權

在此，首先設立一個簡單的BS模型，來進行說明與作為比較基準。考慮兩個出口國(i, j)，各存在一家出口廠商，在第三國市場的進行數量競爭，進口國市場的(逆)需求曲線為 $P = a - Q$ ，市場供給量為 $Q = q_i + q_j$ 。其中 a 為市場規模參數， P 為價格， q_i 與 q_j 為 i 國廠商與 j 國廠商的產量，同時，消費者剩餘為 $CS = \int P(Q)dQ - PQ = Q^2 / 2$ 。另外，假設其生產成本分別為 $C(q_i) = c_i q_i$ 與 $C(q_j) = c_j q_j$ ， c_i 與 c_j 為固定的邊際成本，且 $c_i > c_j$ ，表示 i 國廠商的邊際成本較高。假設進口國政府對出口國廠商課徵 t_i 與 t_j 單位的從量稅(specific tariff)，關稅收入為 $T = t_i q_i + t_j q_j$ 。據此，可寫下出口國廠商的利潤函數分別為

$$\pi_i = (P - c_i - t_i)q_i, \quad (1)$$

$$\pi_j = (P - c_j - t_j)q_j. \quad (2)$$

假設出口國廠商的目標為利潤極大化，進口國政府的目標為社會福利(W)的極大化。同時，進口國的社會福利為消費者剩餘與關稅收入的加總，可表示為：

$$W = CS + T. \quad (3)$$

其決策時序如圖1所示，首先政府選取關稅稅率來極大化其目標函數；其次，出口國廠商進行Cournot(數量)競爭。

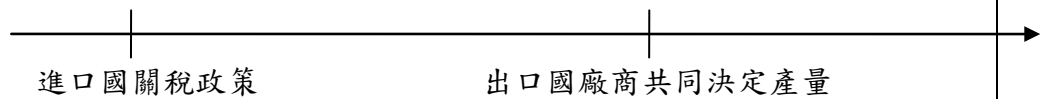


圖1 賽局決策時序

貳、技術授權

在此，考慮進口國存在一家研發公司，本身擁有成本節約之專利權，該專利權的技術，所能發揮節約成本的幅度為 ϵ ，此時，取得此一技術之廠商，其邊際成本降為 $c_k - \epsilon$ ， $k = i, j$ ，且 $0 \leq \epsilon \leq c_j$ 。

假設，此專利權人分別對於兩個外國廠商進行技術授權，其權利金收入分為 R_k ， $k = i, j$ ，其總權利金收入為

$$V = R_i + R_j \quad (13)$$

此時，進口國的社會福利可改寫為消費者剩餘、權利金收入與關稅收入的加總，可表示為：

$$W = CS + V + T. \quad (14)$$

假設，出口國政府對於專利權給予完全的保護，廠商獲得授權後，其邊際成本降為 $c_k - \epsilon$ ， $k = i, j$ ，同時，必須支付 R_k 的權利金，此時，出口國廠商的利潤可表示為

$$\pi_i = (P - c_i + \epsilon - t_i)q_i - R_i, \quad (15)$$

$$\pi_j = (P - c_j + \epsilon - t_j)q_j - R_j \quad (16)$$

在此，專利權人可選擇定額權利金授權(Fixed fee licensing)或單位權利金授權(Royalty licensing)，若專利權人採取定額權利金授權，則將收取一筆固定權利金分別為 $R_i = F_i$ 及 $R_j = F_j$ ；若專利權人採取單位權利金授權，則將依據被授權人的產量，每單位產量收取 r_i 及 r_j 的權利金，其權利金收入分別為 $R_i = r_i q_i$ 及 $R_j = r_j q_j$ 。當然，專利權人也可以採用混合權利金的授權方式，進行授權。為簡化分析起見，在此針對單位權利金授權的情況進行分析。

其決策時序如圖2所示，首先政府選取關稅稅率來極大化其目標函數；其次，專利權人訂定技術權利金；最後，出口國廠商進行Cournot(數量)競爭。

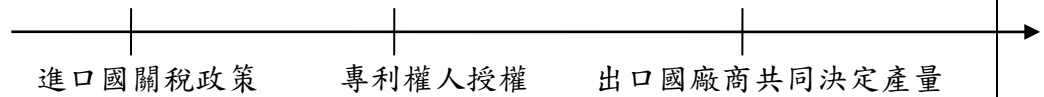


圖2 賽局決策時序

此一賽局的參與者有進口國政府、兩個出口國及其廠商，並在完全訊息的角度下建立動態賽局，藉以分析政府在不同模型環境設定下，對於社會福利、關稅(補貼)政策選擇的影響。本研究模型之決策時序為：首先，政府決定其關稅政策；其次，專利權人決定其權利金；第三，出口國廠商進行市場的數量競爭決策。

由於此一關稅決策架構可定義為一個訊息完全的動態賽局(dynamic game of complete information)，本研究將利用倒解法(backward induction)來求解此一賽局的子賽局完美那許均衡。

研究 結果	<p>Proposition 1. 進口國採取差別關稅時，若專利權人採取統一訂價的單位權利金授權，進口國政府將對高成本廠商給予高進口補貼，低成本廠商給予低進口補貼。</p> <p>Proposition 2. 進口國採取差別關稅時，若專利權人採取差別訂價的單位權利金授權，進口國政府將對高/低成本廠商給予相同的進口補貼。</p> <p>Proposition 3. 進口國採取差別關稅時，若專利權人採取單位權利金授權，且高成本出口國對專利權完全不保護，低成本國家對專利權完全保護，則進口國政府將對高成本國家的廠商給予進口關稅，低成本國家的廠商給予低進口補貼。</p>
研究 貢獻	<p>本研究主要可以解釋，在美中貿易戰下，美國為何會對專利權不給予保護國家，進行關稅報復，具有實務上的應用意義。</p>
未來 研究 方向	<p>在前述的「專利權保護」、「技術授權策略」與「差別成本」下，本研究探討進口國的「差別化貿易政策」制定。然而，在上述架構下，若進口國政府採取單一貿易政策下，其最適貿易政策是採取進口關稅或進口補貼，仍然需要加以討論，同時，可進行「差別化貿易政策」與「單一</p>

<p>貿易政策」的福利比較，以求得進口國的最適貿易政策與社會福利。同時，也可以比較「差別化貿易政策」與「單一貿易政策」下，出口國是否有意願進行「專利權保護」。</p>

篇名	Vertical integration without intrafirm trade
作者	Chrysovalantou Milliou(2020)
出處	Economics Letters 192 (2020) 109180
摘要	This paper shows that a vertically integrated firm has incentives to outsource input production to an equally efficient nonintegrated upstream firm that serves its downstream rival. By outsourcing, it raises both its own and its rivals' cost and generates softer price competition in the final product market. Both the positive implications of vertical integration on the integrated firm's profits and its negative implications on consumers and welfare are stronger with outsourcing than with the commonly presumed insourcing.
研究動機	Revisit the incentives and implications of vertical integration without the presumption of intrafirm trade. To do so, develop a model that gives a downstream firm, which integrates backwards, the option to source an input from a nonintegrated upstream firm rather than to source it internally from its upstream partner. Prior to integration there are two symmetric firms in both the upstream and downstream segments of the market, non-linear contracts are used, and downstream competition is in prices. This paper show that, in equilibrium, the integrated firm opts for outsourcing and raises rivals' cost more than it would if it insourced, while it also raises its own cost. As a result, the absence of intrafirm trade generates a less competitive outcome in the final product market, and renders vertical integration more profitable for firms and more harmful for consumers and welfare.
模型	<p>There is a vertically related market with two upstream firms, U_1 and U_2, and two downstream firms, D_1 and D_2. Downstream firms manufacture differentiated final products using, in an one-to-one proportion, an input that they obtain from either U_1 or U_2. Demand faced by D_i, with $i=1, 2$, is given by the standard linear demand function: $q_i(p_i, p_j) = \frac{(a-p_i) - \gamma(a-p_j)}{1-\gamma^2}$, where p_i is the price of its product, p_j is the price of its rival's product, and γ, with $\gamma \in (0, 1)$, is the degree of product substitutability. Each U_m, with $m = 1, 2$, produces the input at constant marginal cost, s, with $a > s \geq 0$, and sells it to D_i through a two-part tariff contract that includes a wholesale price per unit of input, w_{im}, and a fixed fee, f_{im}.</p> <p>U_1 and D_1 decide whether or not to integrate. Their decision is made in the first stage of the game. If they integrate, the downstream subsidiary of the newly formed integrated firm, U_1D_1, either insources the input, i.e., obtains it from its upstream partner at marginal cost s, or outsources it, i.e., buys it from</p>

	<p>U_2 at (w_{12}, f_{12}). U_1D_1's input sourcing decision occurs in the second stage, after U_2 simultaneously and separately offers (w_{12}, f_{12}) and (w_{22}, f_{22}) to U_1D_1 and D_2 respectively. If, instead, firms remain separated, both U_1 and U_2 make simultaneously offers to D_1 and D_2. Lastly, firms observe all the contract terms and set the prices of the final products.</p>
研究結果	<p>Vertical integration raises rivals' cost more without than with intrafirm trade. Although with outsourcing, vertical integration causes a larger raise in rivals' cost, it does not, in contrast to vertical integration with insourcing, cause full or partial market foreclosure. A larger pie is generated under vertical integration with outsourcing than under either vertical integration with insourcing or no vertical integration. The integrated downstream firm uses its outside option of in-house input sourcing to extract a sufficiently large piece of the pie.</p> <p>Vertical integration more beneficial for producers without intrafirm trade, namely, the softer competition in both upstream and downstream markets, makes it more harmful for consumers and welfare. It follows that the anticompetitive implications of vertical integration can be more severe when the merged firm outsources to the same upstream supplier as its downstream rival. Stated differently, vertical integration can raise more serious anticompetitive concerns when it does not cause the foreclosure of nonintegrated upstream firms than when it does.</p>
研究貢獻	<p>This paper have provided a strategic explanation for vertical integration without intrafirm trade. The integrated firm may outsource input production to an equally efficient nonintegrated upstream firm to further raise the cost of its downstream rival as well as to raise its own cost, thereby generating a less competitive final products market. And point out that it is crucial to treat a firm's input source as endogenous to better account for the potential implications of vertical integration. The anticompetitive effects of vertical integration could be more severe when integration is not accompanied by intrafirm trade and, therefore, it could take greater efficiencies to justify it.</p>
未來研究方向	<p>Extension for future research is the study of vertical integration when downstream firms choose both their merging partners and their input suppliers when upstream firms differ in efficiency.</p>

篇名	On competition and welfare enhancing policies in a mixed oligopoly
作者	Marc Escrihuela-Villar Carlos Gutiérrez-Hita
出處	Journal of Economics volume 126, pages259–274(2019)
摘要	In a mixed quantity-setting oligopoly with an inefficient public firm, we investigate the optimal government intervention contrasting two different regulatory measures; (possibly partial) privatization and an output subsidy. We find that the effects of the policy implemented crucially depend on the decision timing. Using an interdependent payoff structure in the fashion of a delegation contract to model imperfect competition, we show that privatization incentives are generally larger if it takes place before private firms determine the degree of competition since, in this case, the private firms' output is higher. On the contrary, if the regulator incorporates a production subsidy after the degree of competition is set, the private sector benefits from a high subsidy and achieves perfect collusion.
研究動機	Despite the trend toward economic liberalization and privatization of public firms, we can observe that some governments still hold a large share in public firms and that privatization has often occurred gradually over recent decades (see, for instance, Lee 2006). Consequently, studying how the timing of the policies affects the market outcomes may provide new insight into the optimality of privatization and output subsidization.
模型	<p>We consider an industry with $N + 1$ firms simultaneously producing a homogeneous product. N firms ($N \geq 2$) indexed by $i = 2, 3, \dots, N + 1$, are profit-maximizing private firms that produce a quantity q_i with a quadratic cost function given by $c_i(q_i) = \frac{1}{2}q_i^2$. A welfare-maximizing public firm indexed by 1 produces a quantity q_1 with a quadratic cost function given by $c_1(q_1) = \frac{c}{2}q_1^2$, with $c \geq 1$.</p> <p>Therefore, c accounts for the cost asymmetry between public and private firms. Welfare (W) accounts for cumulative firm's profits $\sum_{i=1}^{N+1} \pi_i$ plus consumer surplus CS, where π_i denotes profit of firm i.</p> <p>Industry inverse demand is piecewise linear $p(Q) = \max(0, a - Q)$, where $Q = \sum_{i=1}^{N+1} q_i$ is the industry output, p is the output price, and $a > 0$.</p> <p>Throughout the paper, we focus on the short-run equilibrium in which entry and exit in the market are not possible.</p> <p>the unique semi-public firm maximizes the weighted sum of</p>

	own profit and welfare: $\beta(\sum_{i=1}^{N+1} \pi_i + CS) + (1 - \beta) \pi_1$ where $\beta \in [0, 1]$.
研究 結果	N private firms maximize the sum of their own profits and a fraction of the other private firms' profits, $\pi_i + \alpha(\sum_{j \neq i}^{N+1} \pi_j)$ where $\alpha \in [-\frac{1}{N-1}, 1]$ is assumed to be symmetric and constant. Section 2 describes the imperfectly collusive market in the presence of a public firm. Section 3 presents two different policy measures in order to enhance the welfare and compares two different timings. Section 4 presents an extension of the model showing that, if we allow for multiple public firms, a sufficiently high number of public firms makes collusion among private firms unprofitable.
研究 貢獻	Two different policy measures are considered in our welfare analysis. Regarding privatization, we obtain that, especially when its deterring effects on cooperation among private firms are considered, the existence of a (at least to some extent) public firm seems a more appropriate policy unless a public firm is very inefficient compared to private firms. Full privatization is only advisable if the public firm is markedly inefficient. On the other hand, we also showed that, through a larger production subsidy, the degree of competition is smaller when the regulator is not able to correctly anticipate that private firms' cooperation depends on the subsidy. Our results might have an important implication in mixed oligopolies. As mentioned earlier, the optimal degree of privatization and production subsidies are popular in the literature on mixed oligopolies. However, our results suggest that, when the degree of competition is considered, these policies can yield contrasting results according to the timing chosen for the policy. Therefore, it is necessary to accurately predict the competitive response from private firms when discussing the implications of a privatization policy or a subsidy in a mixed oligopoly.
未來 研究 方向	The framework we have worked with is only a particular approach to a more general issue. To analyze real-world mixed oligopolies with collusive private firms, further research is required. Possible extensions include a repeated non-cooperative game where private firms tacitly collude. Additionally, incorporating price or supply function competition, spillovers in the case of a privatization policy affecting the production cost, foreign ownership or free entry of private firms would probably enrich our analysis. We believe that those are subjects for future research.

篇名	Market structure and quality determination for complementary products: Alliances and service quality in the airline industry
作者	Jan K. Brueckner and Ricardo Flores-Fillol
出處	International Journal of Industrial Organization, 68, 2020
摘要	This paper explores the effect of market structure on quality determination for complementary products. The focus is on the airline industry and the effect of airline alliances on flight frequency, an important element of service quality. With zero layover cost, the choice of flight frequencies has the same double-marginalization structure as in the usual alliance model, leading to a higher frequency in the alliance case as double marginalization is eliminated, along with a lower full trip price and higher traffic. The surprising result of the paper emerges with high-cost layover time, where double marginalization in frequencies is absent and where an alliance reduces service quality via a lower frequency, with the full price potentially rising (in which case traffic falls).
研究動機	The purpose of the paper is to analyze the effect of this market-structure change (international airline alliance) on the choice of airline <i>service quality</i> , as captured by the <i>flight frequencies</i> offered by the collaborating carriers.
模型	Consider a model where consumers purchase two goods, z_1 and z_2 , that must be used in fixed proportions, here assumed to be 1:1. The goods can be sold either by two separate firms or a single firm. Each good is produced with a particular quality denoted by q_i , with $i=1,2$. Effective consumption is equal to $q_1 z_1 + q_2 z_2 = (q_1 + q_2)z$, where z is the common quantity purchased. Letting y denote income and p_1 and p_2 the prices charged by the two firms, consumer utility is $U(x, (q_1 + q_2)z) = U(y - (p_1 + p_2)z, (q_1 + q_2)z)$, where x is a third good. Maximizing utility yields a demand function for z given by $D(p_1 + p_2, q_1 + q_2)$, with D_p (the derivative with respect to the first argument) negative and D_q ambiguous in sign but assumed positive. Production cost for z_i is given by $c(q_i)z_i$, where $c', c'' > 0$, so that higher quality is more costly.
研究結果	With zero-cost layover time, an alliance raises flight frequency relative to the no-alliance case, in line with the predicted double marginalization story. Interestingly, however, the same conclusion need not apply to fares, with the overall fare being either higher or lower than in the non-alliance case. However, an alliance does beneficially reduce the full trip price (fare plus schedule-delay cost), thus yielding the same increase in traffic as in the standard model.

	<p>With high-cost layover time, an alliance reduces the overall fare, as in the standard model. But since the high-cost case does not exhibit the double-marginalization structure of the low-cost case with respect to frequencies, the opposite frequency impact occurs, with an alliance leading to a reduction in flight frequency. Because of lower frequency, the full trip price can either rise or fall, so that an alliance could lead to a reduction in traffic, in a surprising reversal of the standard result. The upshot is that, when a service-quality dimension involving flight frequencies is added to an alliance model, the conclusions it generates may be unfamiliar. More generally, these results show that, when the quality of only one of two complementary goods matters to consumers, single-firm production may lead to unexpected effects.</p>
研究 貢獻	<p>The analysis fills a gap in the literature on airline alliances while providing a needed extension to the product-quality literature, which has mostly ignored the case of complementary products.</p> <p>The paper offers a decidedly mixed message on the service-quality effects of alliances. Although the zero-cost layover case offers a welcome confirmation of existing results establishing the benefits of alliances, the possibility of an adverse effect remains.</p>
未來 研究 方向	<p>This paper opens new avenues for research on airline alliances, while pointing to the need for more study of product-quality determination in the provision of complementary goods. Further study of the service-quality impacts of alliances, both theoretical and empirical, can increase our understanding of the impacts of these important airline linkages and perhaps better inform the actions of the regulators who oversee them. Study of quality determination in contexts outside the airline industry where product complementary matters is also likely to be worthwhile.</p>

篇名	Privatization of a multi-product public firm
作者	Akio Kawasaki and Shunichi Matsuzaki
出處	Asia-Pacific Journal of Accounting & Economics, DOI: 10.1080/16081625.2020.1726776
摘要	This study considers a public firm that provides a profitable service and an unprofitable service. In our model, only the public firm supplies the unprofitable service, while both the public firm and multiple private firms supply the profitable service. The two services may be substitutes, complements, or independent in demand, and the public firm has inferior technology. We examine whether the public firm should privatize either the profitable service or the service that faces competition from private firms. We obtain the following results. When the two services are complementary, the critical cost of the public firm such that privatizing the profitable service is socially preferable increases with the degree of complementarity. When the two services are substitutes, the critical cost decreases (increases) with the degree of substitution for a low (high) degree of substitution. For a sufficiently high degree of substitution, the critical cost becomes small.
研究動機	Many studies argue the need to privatize public firms. The studies on privatization assume that the public firm produces only one good and faces competition from private firms. However, as we already find in real world, a public firm sometimes supplies multiple services and one or more public firms face competition from private firms. Nonetheless, few studies address multi-product public firms' privatization.
模型	In this paper, assume there exist two types of differentiated services: one is provided by the public firm only, and the other is provided by both the public firm and multiple private firms. Assume that the government cannot privatize the former service because it operates in the non-profit sector, while it can privatize the latter service. To account for these two differentiated services, using a quasi-linear utility function following Dixit (1979). The public firm's technology is inferior to that of the private firm. Therefore, the marginal cost of the public firm is higher than that of the private firm. To consider an economy with two differentiated services, which we refer to hereafter as services A and B. The economy has one public firm and multiple private firms. Here, we express the number of private firms as n . The public firm provides both services A and B, while the private firms provide service B only. We assume that although the supply of service B can be privatized, the supply of service A cannot, due to the high maintenance costs (which result in

	<p>a negative profit). Thereby, we consider whether the government should privatize the supply of service B. If privatization does occur, only the public firm provides service A and one privatized firm and multiple private firms provide service B.</p> <p>We denote the quantity of service A supplied by the public firm as q_{A0} and the quantity of service B supplied by the public (or privatized) firm as q_{B0}. The quantity of service B supplied by the private firms is q_{Bi} ($i = 1, 2, \dots, n$). Then, the total quantity of service A is $Q_A (=q_{A0})$ and the total quantity of service B is $Q_B (=q_{B0} + \sum_{i=1}^n q_{Bi})$. Finally, we denote the price of service A as p_A and that of service B as p_B.</p> <p>This economy contains one representative consumer. Following Dixit (1979), we assume the following quasi-linear utility function:</p> $u = a(Q_A + Q_B) - \frac{1}{2}(Q_A^2 + 2\gamma Q_A Q_B + Q_B^2)$ <p>Here, γ ($\in[-1,1]$) expresses the degree of product differentiation. When γ is negative, services A and B are complementary; when γ is positive, the two services are substitutes. We assume that the value of parameter a is sufficiently large.</p> <p>We further assume that the marginal cost of the public firm is c and that of a private firm is zero. Therefore, the private firm's profit function is</p> $\pi_i = p_B q_{Bi}$ <p>Before privatization, the public firm's profit function is</p> $\pi_0 = p_A q_{A0} + p_B q_{B0} - c(q_{A0} + q_{B0})$ <p>When the supply of service B is privatized, the public firm's profit function becomes</p> $\pi_{A0} = p_A q_{A0} - c q_{A0}$ <p>and the privatized firm's profit function becomes</p> $\pi_{B0} = p_B q_{B0}$
研究結果	<p>Proposition 1. <i>The quantity of service A decreases with γ for $c \geq \max\{0, \underline{c}\}$. For $c < \underline{c}$, the quantity of service A increases with γ.</i></p> <p>Proposition 2. (1) When $c \leq (>) \frac{a}{2+n+\gamma(1+n)}$, $q_{B0}^G \geq (<) q_{B0}^P$ and $q_{Bi}^G \leq (>) q_{Bi}^P$ hold. (2) When $c \leq \frac{a}{2+n+\gamma(1+n)}$, $q_{B0}^G \leq (>) q_{B0}^P$ holds for $\gamma \geq (<) 0$;</p> <p>When $c > \frac{a}{2+n+\gamma(1+n)}$, $q_{B0}^G \geq (<) q_{B0}^P$ holds for $\gamma \geq (<) 0$.</p>

	<p>Proposition 3. (1) Assume that services A and B have independent demand. When the marginal cost of the public firm is (not) large, the supply of service B should (not) be privatized. (2) Assume that the two services are complementary. As the degree of complementarity increases, even when its marginal cost is large, privatization does not become socially preferable. (3) Assume that the two services are substitutes. For a small substitution degree, as the degree of substitution increases, even when the marginal cost is small, privatization becomes socially preferable; for a large degree of substitution, as the degree of substitution increases, when the marginal cost is large, privatization becomes socially preferable; for a sufficiently large degree of substitution, even when the marginal cost is small, privatization becomes socially preferable.</p> <p>Proposition 4. When the number of private firms increases, the privatization of the supply of service B is more socially preferable.</p>
研究 貢獻	<p>The results above suggest several policy implications. Suppose that two services are complementary. The government can privatize the supply of service B only when the public firm's technology is sufficiently inferior. By contrast, assume that the two services are substitutes. Under a low degree of substitution, the government can privatize the supply of service B even when the public firm's technology is not sufficiently inferior. However, if the degree of substitution is high, the government can privatize the supply of service B when the public firm's technology is inferior. If the degree of substitution is high and the government privatizes the supply of service B, then the total supply of service B decreases considerably, and the public firm must thus increase its supply of service A sufficiently, which largely increases total costs. To avoid this situation, even when the public firm's technology is inferior, the supply of service B should not be privatized. In other words, the government should not easily privatize the supply of service B. However, when the two services are nearly homogeneous, to allow the more efficient firms to provide the services, the government should privatize the supply of service B.</p>
未來 研究 方向	<ol style="list-style-type: none"> 1. To relax the assumption about service A's entry and analyze the privatization problem. 2. To consider the free-entry problem for service B's market. May address the case of partial privatization.

篇名	Agriculture and aggregate productivity: A quantitative cross-country analysis\$
作者	Diego Restuccia, Dennis Tao Yang, Xiaodong Zhu
出處	Journal of Monetary Economics 55,2008, 234-250
摘要	A decomposition of aggregate labor productivity based on internationally comparable data reveals that a high share of employment and low labor productivity in agriculture are mainly responsible for low aggregate productivity in poor countries. Using a two-sector general-equilibrium model, we show that differences in economy-wide productivity, barriers to modern intermediate inputs in agriculture, and barriers in the labor market generate large cross-country differences in the share of employment and labor productivity in agriculture. The model implies a factor difference of 10.8 in aggregate labor productivity between the richest and the poorest 5% of the countries in the world, leaving the unexplained factor at 3.2.
研究動機	To see why agriculture is important, consider the following facts. In 1985, the average gross domestic product (GDP) per worker in the richest 5% of the countries in the world is 34 times that of the poorest 5%. This is an enormous difference in aggregate productivity. However, the labor productivity difference in agriculture is even larger: GDP per worker of the richest countries is 78 times that of the poorest countries. In contrast, the difference in GDP per worker in non-agriculture is a factor of 5. Despite very low productivity in agriculture, the poorest countries allocate 86% of their employment to this sector, as compared to only 4% in the richest countries.
模型	<p>The joint importance of employment share and sectoral productivity in accounting for cross-country productivity differences can be shown by the decomposition of aggregate GDP per worker.</p> <p><i>2.1. Production technologies</i></p> <p>We posit the following production function for agriculture:</p> $Y_a = X^\alpha (Z^{1-\sigma} (\kappa A L_a)^\sigma)^{1-\alpha}, \quad 0 < \sigma < 1, \quad 0 < \alpha < 1, \quad \kappa > 0, \quad (1)$ <p>where the subscript a denotes agriculture (whereas n denotes non-agriculture).¹⁰ Y_a, Z, L_a, and X are agricultural output, land, labor, and the intermediate input provided by non-agricultural production. This intermediate input may consist of chemical fertilizers, pesticides, hybrid seeds, fuel, energy and other purchased factors. As a labor augmenting factor, A is an economy-wide productivity parameter that is influenced by factors such as the state of scientific knowledge, market institutions, property rights, public infrastructure, and government policies. Efficiency in agricultural production is linked to economy-wide productivity through parameter κ, which can be interpreted as measuring the integration of agriculture to the aggregate economy. For instance, institutions and policies affecting agricultural development may obstruct applications of general knowledge for the advancement of farming techniques, thus reducing the value of κ; in contrast, good transport infrastructure connecting rural and urban regions would raise the value of κ. We assume land is in fixed supply; hence, labor in agriculture exhibits decreasing returns.</p> <p>The production function for non-agriculture is</p> $Y_n = A L_n,$ <p>where Y_n and L_n denote output and labor input, respectively. Note that the input of capital services is omitted</p>

	<p>The representative household derives utility from consuming the agricultural good (c_a) and non-agricultural good (c_n). We do not consider leisure in our analysis, so that N is associated with aggregate employment in the cross-country data. Preferences for the representative household are summarized by a Stone-Geary utility function, which incorporates the impact of income growth on the secular decline in agriculture's share of economic activity,</p> $U = a \log(c_a - \bar{a}) + (1 - a) \log(c_n), \quad 0 \leq a < 1,$ <p>where \bar{a} is subsistence level of consumption of agricultural good and a is a utility weight over the two goods. This specification implies that the representative household first allocates $p_a \bar{a}$ amounts of income to \bar{a} units of agricultural good, and then allocates remaining income to the two goods proportional to their weights in the utility function. More specifically,</p> $c_a = \bar{a} + a p_a^{-1} (y - p_a \bar{a}), \quad (2)$ $c_n = (1 - a)(y - p_a \bar{a}), \quad (3)$ <p>where y is the income of the household.</p>
研究結果	<p>In this paper, we show that a simple two-sector general-equilibrium model with subsistence food requirements and decreasing returns to labor in agriculture can generate large differences in agricultural and aggregate labor productivity across rich and poor countries. These differences in productivity arise from differences in economy-wide productivity and barriers to the use of modern intermediate inputs in agriculture. Our emphasis on the role of agriculture in development has a long tradition in the development economics literature. We contribute to this literature by quantifying the role of agriculture in the aggregate economy and analyzing the importance of economy-wide productivity and barriers to intermediate inputs in generating differences in the use of modern inputs and the shares of employment and labor productivity in agriculture across countries. By generating substantial cross-country differences in agricultural productivity and employment, this paper provides a better understanding of aggregate productivity differences between rich and poor countries.</p>
研究貢獻	<p>Overall, this two-sector framework performs much better than a single-sector growth model in explaining observed differences in international productivity.</p>
未來研究方向	<p>Our analysis also highlights the role of barriers and the cost of government policies that impact systematically against agriculture. These barriers reduce the incentives of farmers in poor countries to use modern inputs that are crucial for improving agricultural productivity. These are the same problems that Schultz (1964) analyzed more than 40 years ago in his influential work “Transforming Traditional Agriculture.” Unfortunately, our quantitative analysis shows that for many poor countries in the world, barriers to transforming traditional agriculture are still pervasive. These barriers need to be removed in order to achieve substantial improvements in agricultural and aggregate productivity.</p>

篇名	Friction in Related-Party Trade When a Rival Is Also a Customer
作者	Anil Arya, Brian Mittendorf and Dae-Hee Yoon
出處	Management Science, Vol. 54, No. 11 (Nov., 2008), pp. 1850-1860
摘要	<p>There are many circumstances in which manufacturers provide inputs to wholesale customers only to subsequently compete with these wholesale customers in the retail realm. Such dual distribution arrangements commonly suffer from excessive encroachment in that the manufacturer's ex post retail aggression is harmful ex ante because it undercuts potential wholesale profits. This paper demonstrates that with dual distribution, a manufacturer can benefit from decentralized control and the use of transfer prices above marginal cost. Although these arrangements often create coordination concerns, a moderate presence of such concerns permits the manufacturer to credibly convey to its wholesale customer that it will not excessively encroach on its retail territory. This, in turn, permits the manufacturer to reap greater wholesale profits. We also note that this force can point to a silver lining in arm's-length (parity) requirements on transfer pricing in that they can solidify commitments to a particular retail posture</p>
研究動機	<p>This paper reexamines the effects of related-party frictions in light of the prevalence of input sales to rivals. This paper demonstrates that moderate frictions in decentralized entities can actually prove helpful. In particular, we show that when a vertically integrated producer (VIP) sells inputs to its rival, it cannot resist the ex post temptation to encroach excessively on its wholesale customer's retail business. With such behavior imminent, the wholesale customer requires substantial concessions ex ante to purchase inputs</p>
模型	<p>A VIP consists of two entities, an upstream subsidiary and a downstream subsidiary. The upstream subsidiary (U) is the sole supplier key input to the downstream subsidiary (D) as an independent downstream rival (R). The two downstream parties engage in Cournot competition retail market. The inverse demand function for the retail product of firm i is $P_i = a - q_i - kq_j$, $i, j = D, R$; $i \neq j$, where P_i denotes the retail price for firm i's good, and q_i and q_j denote the product quantities of firms i and j, respectively. The parameter $k \in (0, 1)$ represents the degree of substitution among the competing products, where the limiting values of $k = 0$ and $k = 1$ correspond to the cases of independent products and perfect substitutes, respectively.</p> <p>We normalize U's production cost to zero, and let c denote each firm's per-unit selling cost, $a > c$; the resulting demand intercept net of downstream cost is α, $\alpha = a - c$. With this basic setting, we seek to compare the outcomes under</p>

	<p>decentralization and centralization, as well as investigate the role of transfer pricing and effects of arm's-length restrictions in decentralized arrangements. The ensuing analysis employs backward induction to identify the subgame perfection equilibria.</p>
研究結果	<ol style="list-style-type: none"> 1. With related-party transfer prices above marginal cost, the parent firm is able to credibly commit to less aggressive retail encroachment which, in turn, engenders higher wholesale prices: the affiliated retail arm's market share is depressed and the unaffiliated rival's market share is expanded. However, the boost in wholesale profitability brought by decentralization can outweigh the costs due to ceding retail market share. 2. The analysis is also extended to consider the case in which the upstream and downstream entities themselves determine the appropriate pricing. The results indicate that as long as neither of the affiliated parties is too influential in setting prices, a decentralized structure is preferred. 3. Furthermore, when power is doled out to the parties in a judicious manner, ceding control of all decisions to the separate entities can replicate the parent's preferred arrangement. Not only can such decentralization achieve the desired outcome, but it can do so without the parent knowing the precise details of the retail market or the relative efficiency of the two retail operators. <p>While arm's-length parity requirements on input pricing can potentially reduce the attractiveness of decentralization, this paper demonstrates that decentralization and the attendant transfer pricing distortions can still be preferred. Furthermore, if the parent finds it difficult to credibly convey related-party prices to external parties, such restrictions can further solidify the implicit commitments to limited encroachment that are the source of decentralization benefits.</p>
研究貢獻	<p>This paper posits that the concerns of dual distribution can be minimized by a degree of related-party conflict associated with decentralization and transfer pricing</p>