

出國報告（出國類別：進修）

行政院選送優秀公務人員
100 年赴國外進修博士學位
-海運物流網商業關係結構及價值
之研究

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出國期間：100.10.1-104.10.7
報告日期：105.1.7

報告內容摘要

本出國報告以博士學位論文內容為主，尚包含進修緣起及目的、進修過程（包括攻讀學位過程介紹、進修期間參與之重要訪談及觀摩考察）、進修心得及建議。進修學校卡帝夫大學在海運領域是英國首屈一指的傳統名校，近期並結合供應鏈管理觀念發展新的研究領域。博士論文以海運物流網的關係結構為主題（An exploration of relationship structures, their integration and value in maritime logistics network），從網路觀點切入，在眾多的影響因素中，以服務複雜程度為主要考量因素，研析海運物流網中主要成員間的關係結構、所產生的價值，及其動態變化。

研究方法除了以網路觀點進行文獻回顧外，並採用混合研究法深入訪談來自 23 個不同公司或組織的 41 個高階經理人或相關專業技術人員，結合問卷調查有效樣本 248 份，取得來自業界（包括貨櫃航商、海運承攬運送業者、港口經營業者及貨主）豐富的第一手資料，並以網路方法進行分析。研究結果發現：1.海運物流網中不同主要成員間的商業關係強度及整合程度實務上並非相同也不需要相同；2.有 7 項會影響海運物流網中主要成員間的商業關係結構，包括：貿易條件、貨物型態、服務複雜程度、不同航線市場、港口型態、貨主形態、貨種市場；3.總體而言，海運物流網中主要成員間的關係強度的增加與服務複雜程度有正相關，但是在一些關係維度上則沒有顯現該趨勢；4.在創造價值部分，總體而言，服務複雜程度與衍生價值的增加有正相關，但是只有海運承攬運送業者所感知的價值創造與不同複雜程度的服務在統計上有顯著性差異的正向關係存在。5.掌握海運物流供應網中各成員間之關係結構應可作為分析海運服務中各種商業模式之基礎，亦可協助政府制定適當的航運政策。

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一、計畫緣起與進修目的

有鑑於人才培育為國家提升施政績效及國際競爭力之重點工作，行政院於民國 100 年恢復已停辦 18 年之選送中高階公務人員赴國外進修學位機制（前「行政院社會科學人員出國進修計畫」），配合國家重大政策發展需要，訂定新的國外進修實施計畫（行政院選送優秀公務人員國外進修實施計畫），選送優秀具發展潛力之中高階公務人員出國進修碩士、博士學位，以培育具國際視野之中高階公務人才，提升政府人員專業知能及整體國際競爭力，俾因應國家建設發展需要。經過兩階段甄審作業，該計畫第一屆錄取來自中央各部會計 13 名中高階公務人員，其中博士組 6 人，碩士組 7 人，並由行政院院長核定。進修者為博士組錄取人員之一，並奉行政院 100 年 8 月 19 日院授人培字第 1000047106 號函核定，赴英國威爾斯首府卡帝夫大學（Cardiff University，簡稱卡大）攻讀航港政策及國際物流博士學位。

進修者於民國 92 年進入交通部服務，由海運服務產業證照核發業務著手，嗣負責公股船運公司之監督，及海運相關重大專案之規劃及執行（例如海運噸位稅之規劃及實施），另因具備外語能力而處理海運涉外業務（WTO 及 FTA 海運服務業談判及諮商、APEC 海運工作小組、國際租稅協定海運部分、ECFA 海運服務業等）之談判及諮商。從參與多次國際會議的過程中，有感於海運國際涉外業務對於國家發展具有長遠的利益及重要性，加上我國貨櫃航商是我國少數具有國際競爭力的服務產業而且在全球供應鏈扮演著重要的角色，爰培養專人赴歐美先進國家深入學習其海運相關產業經濟與社會發展的思維邏輯，及國際場域的運作法則將有利於為國家及人民爭取更多利益。透過獲選參與本計畫，進修者得以赴海運先進國家英國攻讀並完成博士學業，未來在適當的培育制度下將有機會能貢獻所學，達成上述計畫目標。

二、進修過程及心得

進修過程除於英國卡帝夫大學參與物流與運籌學系研究團隊進行學術研究外，另規劃安排實地赴海運相關產業及政府機構進行訪問及考察以收集第一手研究資料充實研究深度與實用性，以下報告內容即按此順序說明。

（一）學校及課程介紹

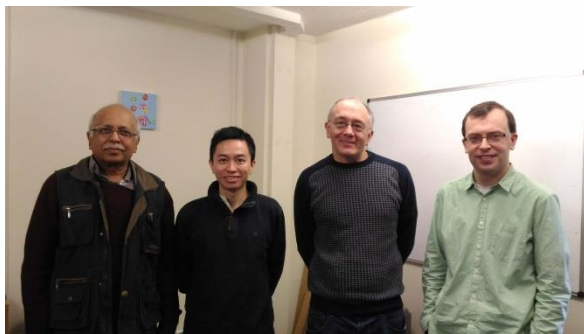
卡帝夫大學屬於英國頂尖研究型大學羅素大學集團之一員，在海運領域是英國首屈一指的傳統名校，近期並結合供應鏈管理觀念發展新的研究領域。其中商學院物流及運籌學系所開設的國際運輸碩士（MSc in International Transport）、物流與運籌管理碩士（MSc in Logistics & Operations Management），及博士班課程是該校非常熱門的課程。另外設立有海員國際研究中心（Seafarers International Research Centre）進行多樣化的海運相關研究，與重要的國際海事組織有密切的聯繫。

依據卡帝夫大學商學院規定，博士班第一學年必修研究方法學程（共計 10 門課，120 學分）其總平均需達 60 分以上，始能晉級正式博士生。進修者於第一年學期結束後順利達成晉級標準，其中 4 門課並達到 70 分以上傑出通過（卡大博士班成績評分標準係以 60-69 分為 High Pass; 70-79 分為 Excellent Pass），平均成績名列系上博士生第二名，並獲得卡大社會科學研究方法研究生文憑（Postgraduate Diploma in Social Science Research Methods）。

第二學年開始與指導教授正式展開研究工作，學校原來指派的第一指導老師因為首次指導學生經驗不足，經過從入學第一年開始一年半的時間雙方仍無法適當的合作，恐有影響攻讀博士學位計畫執行成功之虞，爰進修者向校方提出更換第一指導老師的申請，經多方努力後，校方依進修者的研究方向及需求重新指派適任的第一指導老師—Andrew Potter 教授（兼任英國皇家物流與運輸學會 CILT 威爾斯主席，專長為運輸、物流及供應鏈管理），第二及第三指導老師則為 Stephen Pettit 教授及 Rawindaran Nair 博士（二者專長分別為港口發展與人道救援研究，及海運政策與海運經濟研究，進修者與三位指導老師合影如圖一），進修者得以順利繼續開展研究工作，並完成第一階段的文獻回顧工作。

依據卡大商學院規定博士班第二學年起無必修課程，採自主學習，定期與指導教

授開會討論研究進度及論文內容，並依指導教授建議參加由卡大研究生學院 (University Graduate College) 所舉辦之相關研究能力發展訓練課程，或由系上等單位開辦之相關講座、研討會議及論壇。第三學年主要研析相關研究方法論及進行研究資料的收集，第四學年則進行論文撰寫及修改。每一學年間皆有研究進度審查 (Annual Review)，通過才得以晉級，以掌控博士生的研究進度及研究品質。進修者並善用學校提供的英文導師服務以提升論文寫作的品質。博士生於提送論文後，校方會安排在二到三個月後進行口試。博士論文口試進行方式由兩位口試委員 (外審委員及內審委員各一位) 就博士論文內容對博士候選人進行逐頁詢問，博士候選人不需進行簡報。進修者已於 105.1.13 參加博士論文口試並順利通過 (如圖二)，將獲頒博士學位。



圖一 進修者與博士班指導老師合影
(右起 Dr. Potter, Dr. Pettit, Dr. Nair)



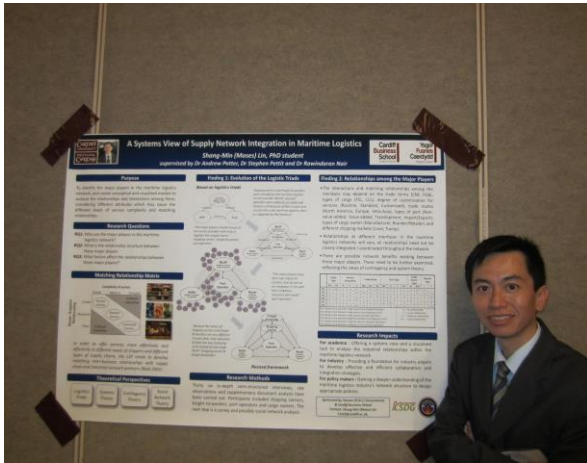
圖二 進修者與口試委員及指導教授

(二) 參加相關重要研討會

1. 參加國際海運經濟學人論壇(The International Association of Maritime Economists，簡稱 IAME) 2014 年年度研討會

- (1) 本論壇係目前規模最大之國際海運經濟學術論壇，本次年度研討會於美國維吉尼亞州 Norfolk 舉辦，除討論一般性海運經濟相關議題(包括海運物流、海運政策、港口績效及治理、船運金融、複合運輸、海運風險管理、海運環境等議題)外，針對年度主題「海運經濟於後巴拿馬運河拓寬時期之發展」，邀請包括美國及中南美區域相關港口、國際航商、美國貨主、巴拿馬運河及蘇伊士運河管理當局，從不同角度就「巴拿馬運河拓寬後對美東、美西港口及全球海運航路的影響」進行研討。

- (2) 進修者參加於本研討會舉辦之博士生論壇，展示當時階段博士研究成果海報(海運物流網關係結構之研究)，吸引到來自美國、加拿大、澳洲、荷蘭、香港等學者之關注、肯定及意見交換，並被公認為最佳研究海報（如圖三及附錄一）。
- (3) 進修者另於研討會中簡報與第二指導教授合作論文(內陸國哈薩克斯坦大宗物資跨國複合運輸之研究)，吸引各國參與者聆聽討論（如圖四）。簡報後，美國聯邦海事委員會(FMC)首席經濟學家 Dr. Pearson(兼任聯邦海事委員會 FMC 經濟及競爭分析處處長)趨前表示肯定並說明其與進修者所就讀之卡帝夫大學有深厚淵源，進修者則藉此請教其有關 FMC 如何管理國際航商運費報備及國際航運聯盟運作等問題，其因無法完整答覆爰主動邀請進修者赴華府拜訪 FMC 辦公室並協助安排與相關人員會談(註:美國聯邦海事委員會主管美國境內及國際往來美國水上航運產業之市場秩序維持)。
- (4) 心得：綜合國際海運經濟學人研討會各方意見及進修者與陽明、長榮海運美國公司之業界先進看法，巴拿馬運河擴寬後對該運河船舶通行量是否能大量增長多數方皆持保留態度，因為該區域既有之供應鏈路徑及主港一支港網路已經形成，使現行美東、美西港口及全球海運航路愈行固定而不致產生太大影響。但巴拿馬運河東端出口加勒比海及沿岸區域的港口因為更大型船舶可以通過巴拿馬運河而有機會形成新的區域轉運港。巴拿馬運河拓寬後之通行量是否增長，尚取決於未來其通行費及定價策略與蘇伊士運河的比較競爭，及美國境內強大鐵路公司的運作等。另外，興建中的尼加拉瓜運河因為可通行更大型船舶及地理上的緊臨，可能才是影響巴拿馬運河未來通行量的最大變數。另外，該議題值得我國持續關注，因為東南亞往東行經巴拿馬運河的貨量越多時，將可能提供更多在台灣港口轉運集貨的機會，對台灣港口的發展較為有利。



圖三 參加研究海報展



圖四 於研討會中進行簡報

2. 參加英國物流研究網路（Logistics Research Network，簡稱 LRN）2014 年年度研討會

- (1) 英國物流研究網路年度研討會係由英國皇家物流學會主辦的國際研討會，強調學術與實務的結合，每年吸引來自世界各地物流相關領域的頂尖學者及產業代表來參與。
- (2) 進修者於該研討會中簡報當時階段完成的博士論文研究內容（A systems view of supply chain integration in maritime networks，如附錄二，可於網路上下載取得），吸引各國參與者聆聽及討論並有熱烈迴響。

3. 參加卡帝夫大學商學院物流與運籌管理系 2015 年年度研討會（簡稱 LOMSEC）2015

- (1) LOMSEC 為卡大商學院物流與運籌管理系年度重頭戲，系上老師、研究人員及博士生會利用此機會作為試金石發表當時的研究成果，探詢相關意見及建議，以利正式發表於學術界及業界，或利用此場合分享已發表之研究成果。
- (2) 進修者於該研討會中簡報當時階段完成的博士論文研究內容，備受全體與會人員肯定並獲得許多正面回饋，研討會結束前經全體與會人員之票選後榮獲年輕學者及博士生組最佳報告獎（如圖五）。



圖五 最佳報告獎獎狀

(三) 赴歐美及中東訪問產業界之介紹及心得

1. 實地訪談英國 Felixstowe 港陽明海運貨櫃船

英國的港口在亞歐航線中屬於偏航港口，Felixstowe 港目前是英國第一大貨櫃港，陽明海運公司有定期航班停靠，進修人員為了博士研究需要，在陽明海運英國公司協助下前往該公司於是日停靠於 Felixstowe 港的貨櫃船（8000TEU），實際登船訪談船長及大副，以瞭解海運貨櫃運輸對於不同櫃型及運送物品所採取不同的作業方式。從訪談及觀察過程中發現，冷凍/冷藏櫃需要有專用的插座艙位，危險物品需要有特別的擺設位置及方式以利安全，相對之下，一般乾櫃則無需特別安排。

2. 考察德國漢堡港及訪談我國航商漢堡據點

(1) 觀摩考察德國漢堡港之建設及管理

漢堡港為德國第一大港、歐洲第二大港(2012 年貨櫃吞吐量達 882 萬 TEU)，每年約有 1 萬船次使用該港。相較於歐洲其它主要港口，漢堡港與位於德國、斯堪的納維亞、波羅的海地區、東歐、俄國、瑞士等市場更加接近。此地理優勢代表著更短的運輸時間、更環保的物流運輸鏈和更低的運輸成

本。除了整合駁船(feeder)外，另每天約有 200 班次貨運火車(分別由 80 家公司、私營鐵路公司提供)及 5000 趟次的卡車提供連結運輸，使其構成全歐第一大及全球第二大的鐵路貨運運輸網。目前有 1700 家運輸公司總部設於漢堡，全球前 25 大的定期貨櫃航商有 20 家在此設立歐洲總部或分公司。漢堡港為全球茶類、可可、咖啡及香料的重要轉運港，亦為歐洲最大的咖啡進口港及藥品原料之集散市場、全球最大地毯交易及儲存中心。漢堡港直接及間接提供了漢堡地區約 15 萬 6 千個工作機會。另外在漢堡地區，約有 5700 家物流公司提供增值服務包括從運輸、儲藏、加工、質量控制、包裝、測試、配送、貨運管理、運輸保險、報關、結賬開發票，及全球供應鏈管理等。Airbus, Still, H&M, Olympus 和 Beiersdorf 等知名企業多年來已將漢堡做為增值服務鏈中心，該等物流基地已間接支持漢堡港的持續發展。漢堡港務局(Hamburg Port Authority)隸屬漢堡市政府，負責行使公權力管理港口之業務，漢堡港行銷協會(The Marketing Organization for the Port of Hamburg)負責漢堡港的行銷事務，其由碼頭業者、貨運承攬業者、理貨公司、港口資訊公司等與該港相關之公司會員組成，營運經費一半來自漢堡市政府，一半來自會員繳納之會費。漢堡港的兩大碼頭經營業者為 Eurogate 和 HHLA (具有公股色彩)，未來皆繼續有拓展及升級碼頭的計畫。漢堡港港區主要位於易北河下游南岸，至於北岸則設置有多處交通船及觀光船碼頭，並有捷運(高架 U3 線)聯結通往市中心，該部分客船碼頭沿線有多處觀光景點並設有沿岸美食街，吸引許多遊客。

(2) 觀摩考察德國年度海運界人士傳統重要聚會活動(Traditional Eisbeinessen at Hamburg, 如圖六)

Eisbeinessen 是德國海運界人士傳統年度重要聚會活動，起源於 1948 年，因為二次世界大戰結束後，越來越多航運公司重新恢復在漢堡的業務，加上在 1948 年夏天時包括新造船隻及修船等多項有關海運的禁令紛紛解除，爰再次開啟漢堡的船舶經紀人與國外客戶進行生意的機會。為慶祝這對漢堡海運界來說特別的一年，當時的漢堡船舶經紀人協會總幹事 Bruno Jansen 於 1948 年 11 月 11 日邀請該協會各會員企業的總經理於一條名為 MS St.

Louis 的船上(在二戰期間具有特殊經歷，後停泊於漢堡並改裝成旅館及餐廳)進行了一場商務聚餐，當時共計有 110 名船舶經紀人參加，當天的餐點包括前菜為德北的雞肉奶油湯、主菜烤魚排及當地蔬菜等，餐會進行得非常成功，爰參加人員一致認為，該餐會應變成例行性的活動。隔年(1949 年)該餐會提早於 10 月 28 舉辦，菜單中的主菜開始提供德國北部傳統的美食 Eisbein(德國豬腳)，此後該餐會僅提供主菜 Eisbein 及相關佐料而未再改變，並因此演變成該餐會活動的名稱(Eisbeinessen)。該餐會活動沿習至今，已慣例於每年 11 月的第一個星期五於漢堡會議中心(CCH)舉辦，並已成為全球船舶經紀人、船舶代理商、船東、銀行家、貨運承攬業者、貨櫃集散站業者，及其他海運相關業者的國際聚會平台，每年參加人員已達到來自全球 50 個不同國家總數 5000 人以上之規模。

2013 年的 Eisbeinessen 餐會活動進入第 65 屆，於 2013 年 10 月 31 日下午 5 點半在市政廳舉辦開幕酒會，並於 2013 年 11 月 1 日(週五)下午 6 點半開始餐會活動，餐會後另有社交酒會至凌晨 2 點結束。餐會開始前由漢堡船舶經紀人協會主席、漢堡第一市長、德國聯邦議會官員及協辦國(今年為丹麥)領事致歡迎詞。本屆參加人數約 4500 人以上，參加人員除於聚會中交換意見及洽談新的生意機會外，許多由國外來參加的業者並利用此盛會機會提早抵達漢堡，拜訪新舊客戶。主辦單位製作大會手冊，並將所有參加人員名單列於手冊當中。進修者於此次活動受邀擔任陽明海運公司漢堡歐洲總部之來賓，活動期間並與陽明歐洲總部葉陳輝總經理、陽明台北總公司企劃部鄭正雄船長、陽明台北總公司船務部樂祖望輪機長、陽明海運瑞典代理 Leif Lund 總經理、陽明海運西班牙代理 Carlos Mestre 總經理、長榮海運漢堡代理 Roger Huang 總經理、長榮海運倫敦公司林順風經理，及萬海航運歐洲首席代表郭洸銘等交換意見。

(3) 參訪陽明海運歐洲總部

陽明海運公司歐洲總部設於德國漢堡，其代表目前為葉陳輝總經理，現行於德國當地雇用員工達 120 人，該總部轄管範圍為陽明海運公司於蘇伊士運河以北包括整個歐洲及北非之業務及作業範圍。總部地點設置於漢堡之

原因係考量漢堡港係全歐第二大港，德國龐大的內銷及外銷市場主要由漢堡港輸出及輸入，漢堡為德北區域台商最重要的聚集地區，亦為其他外商的重要投資地點，各國設立使館亦多，商業活動頻繁，人口也多(德國第二大城)。

經與葉陳輝總經理、朱介立副總經理、鄭正雄船長(陽明總部來訪人員)就進修者之博士論文研究及我國航商於歐洲區域之經營情形等相關議題進行訪談紀要如下:

- A. 海運物流鏈中除了貨主、航商、港口外，貨運承攬業者也很重要。對航商來說誰付運費誰就是貨主(Shipper)。航商現行未採行深度的垂直整合，而仍聚焦於核心業務(Port to port service)，寧可另行成立貨運承攬業公司主係基於分散及切割風險等考量。航商現行若只做海上業務利潤不佳，爰目前積極進行陸基活動(包括路上貨運及倉儲等)之擴展。有一些大型案件並需和貨運承攬業者組成團隊去投標。
- B. 能掌握重要資訊的貨運承攬業者(Freight forwarder)或足以擔任海運物流鏈中整合者角色，至於港口經營者(port operator)要發展則需投注龐大資金及漫長時間，但整合成大網路的能力仍屬有限，不過可作跨境投資。至於內陸運輸業者足以擔任整合者之案例較少，例如德國國鐵公司(DB)因為網路完整經營績效佳可以擔任相關區域的整合者。另依市場區域區分:美國市場貨源由幾大貨主掌握，貨量大且公司內部物流部門功能強大，足以擔任整合者。至於歐洲市場則因貨源分散於中小型貨主且貨物多需經跨國境運輸，所以傳統上由幾大熟悉歐洲市場物流運作的貨運承攬業者足以擔任整合者(例如: DB Schenker、DHL、Kuehne+Nagel 等)。
- C. 有關航商與其他海運物流鏈夥伴的關係，航商的貨源來自直客(直接接觸的貨主)及貨運承攬業者，航商會依其本身的經營策略決定貨源的比例，另為確保業績穩定，致力維持一定比例的熟客訂單(Repeated orders)，基於這些需求與其保持不同程度的關係。至於航商與碼頭的關係則在評估開闢航線的同時要定下來，基本上主要考量貨源及成本(包括港口當局給的優惠配套)等兩條件。海運物流鏈中水平及垂直層面各夥伴間存在既競爭又

合作的關係，兩組織間是否能夠長久合作，端視各組織文化的相容性及長期合作的成效等。作業面良好的合作關係會帶來未來其他貨源的戰略面利益。

- D. 貨櫃航商本身所提供的差異化服務以不同櫃型來區分，包括 20 呎櫃、40 呎櫃、冷櫃、非冷櫃、危險物品櫃、非危險物品櫃，特殊尺寸櫃等，另處理特殊案件或專案時，可以提供不同程度客製化之服務以為因應。運送案件越複雜，貨主參與程度越高。

(4) 心得：

- A. 德國漢堡港和我國高雄港同樣面臨港口要和都市一起發展的問題，漢堡港的管理權屬於市政府，其將港區土地的使用進行調和，利用易北河北岸的狹窄空間及既有的觀光景點順勢發展交通船及觀光船碼頭，以兼顧市民娛樂及觀光事業的發展趨勢，該點值得借鏡。
- B. Eisbeinessen 這個以德國豬腳為餐會主軸的海運商務聚會，已成為德國甚至全球海運界人士傳統年度重要聚會活動，至今已發展成為來自全球 50 個不同國家總數 5000 人以上參加之規模，不但直接促進海運產業在漢堡地區的永續發展，亦間接帶動會展及周邊產業的商機。我國海運服務業已具有一定的競爭優勢（高雄港裝貨櫃卸量勝過漢堡港，總商船船隊規模名列全球前 10 大，並有 4 家貨櫃航商擠身全球前 30 大，航線遍佈各大洲，是仍深具發展潛力及可以帶動就業機會及其他商機並值得繼續深耕的產業。
- C. 了解並掌握海運供應鏈中重要成員及成員間之關係可作為分析海運供應鏈中各種商業模式之基礎。



圖六 與陽明海運歐洲總部葉陳輝總經理同仁於 Eisbeinessen 會場合照

3. 訪談陽明海運及長榮海運美國（紐澤西）公司

- (1) 進修者於訪談航商時先行分享進修者參與國際海運經濟學人研討會之心得，並針對博士論文研究相關議題—北美航線市場的海運物流網中主要成員(包括貨主、航商、承攬業者、港口及陸上運輸業者等)間之關係結構進行請益，以了解我國航商於北美地區之經營情形，及與其他航線市場(如歐洲線及亞洲區間航線)進行比較。另詢問有關北美地區航運相關法令包括：對運價及航運聯盟的管理規定、對 NVOCC 的管理規定、對港口的管理規定等。
- (2) 陽明海運美國公司由李文進總經理會同相關同仁計 9 人與進修者進行會談(如圖七)，長榮海運部份則由蔡(Benjamin Tsai)執行副總經理率同相關同仁計 4 人與進修者進行會談(如圖八)。
- (3) 心得：美國的買家及賣家相對都具有較高的市場力而主控供應鏈的規劃，趨勢上其亦分別採用 FOB 及 CNF 之貿易條件以主導船運及其他運輸的安排。另外，透過鐵路運輸將卸載在美西港口的貨櫃貨送達美東市場的運輸安排仍佔很大的部分，及美國法規中對航運產業的分類方式(如設有 NVOCC 行業別)等，使其不同於其他航線的市場，因為這些特性造成不同地理區域海運物流供應網中各成員間不同的關係結構。掌握海運物流供應網中各成員間之關係結構應可作為分析海運服務中各種商業模式之基礎，亦可協助政府制定適當的航運政策。



圖七 與陽明海運美國公司李總經理及訪談同仁合影



圖八 與長榮海運美國公司蔡執行副總合影

4. 拜訪陽明海運公司比利時安特衛普及西班牙巴塞隆納據點

(1) 進修者分別拜訪陽明海運公司駐比利時(安特衛普港)宋政杰總經理(如圖九)，及陽明海運駐西班牙(巴塞隆納)據點駐西班牙謝志宏代表，以了解我國航商於該等港口及國家區域之經營情形及該等港口的運作模式(如圖十)。另考察巴塞隆納國際郵輪港相關設施及港市發展情形(於後面國際郵輪部分一併說明)。

(2) 心得：

A. 安特衛普港港區內有多家世界級化學產品大廠設置儲存槽及加工設施，化學品產業鏈所產生的相關貨量對該港貢獻很大。另外，該港因為多為歐洲出口貨較不趕時效，所以在歐洲北陸相較其他進口貨量較多港口之靠港順位一般被船公司排在較後面，重要性也相對會被排擠，所以該港目前努力的方向包括鼓勵航商改變靠泊該港的順序，可為參考。

B. 以貨量來說西班牙的第一大港為距離馬德里較近的瓦倫西亞港，但陽明海運主要經營第二大港巴塞隆納港，因為瓦倫西亞港貨源已被少數大型貨運承攬業者所把持，亞州航商不易切入，陽明之前以代理行的型態在巴塞隆納港已經營多時，有一定的貨源及網路，長期經營仍有穩定利基，此點說明緊密的海運供應鏈關係及網路之重要性對船公司來說更勝於靠泊港口的排名。另西班牙政府目前也透過致力發展成為以歐洲為目標市場的汽車組裝產業鏈之據點，以間接增加該國港口的貨量，亦值得參考。



圖九 與陽明駐比利時宋政杰總經理



圖十 與陽明海運駐西班牙謝志宏代表

5. 拜訪我國航商阿聯（杜拜）據點

- (1) 進修者於訪談我國航商時分享進修者於英國進行的相關研究心得，並針對地理航線別，及航商所提供不同客製化程度的服務為考量因素向我國航商請益有關中東航線市場的海運物流鏈中主要成員(包括貨主、航商、承攬業者、港口及陸上運輸業者等)間之關係結構及所衍生的價值，並與其他航線市場(如歐洲線及北美航線)進行比較。另詢問有關杜拜地區航運相關法令，包括：對運價及航運聯盟的管理規定、對港口的管理方式，及杜拜港口物流發展模式等。
- (2) 拜訪陽明海運阿聯公司及長榮海運駐中東辦事處：陽明海運阿拉伯聯合大公國公司由周總經理(Managing Director)、P.Vijayagopal 總經理(General manager)、薛代表、劉代表計 4 人與進修者進行會談（如圖十一）。長榮海運由邱進福代表、蘇代表、沈代表、駐埠船長暨船務作業部主管 Yaser、行銷經理 Vijay、協力貨運承攬業者中東區域主管 Sidharth 計 6 人與進修者進行會談（如圖十二）。
- (3) 綜合陽明、長榮海運阿聯公司意見及其於中東地區之經營情形心得如下：
 - A. 中東航線屬於獨立的航線，中東地區即為航線起訖點，該航線目前裝卸量最大的港口及杜拜的傑貝阿里港(Jebel Ali Port)。在杜拜港口裝卸的貨物絕大部分為進口貨，進口貨內容主要包括來自中國大陸製造的日常生活用品及歐美生產的較高價貨品，出口貨品部分主要為石化產業的衍生品(例如塑膠粒等)及鋁業製品等。
 - B. 進口貨的部分大都由國外的賣家採用 CNF 等貿易條件來主導船運的安排，例如來自中國大陸及東南亞的進口貨 90%已由賣家預付運費決定船運。所以我國航商於杜拜據點主要負責船務部分的業務及開發中東當地的新市場。
 - C. 外國船公司在杜拜設立公司需採合資方式經營。另外，中東市場由於阿拉伯文化、文字及語言等障礙，內陸運輸的部分(door to door)是我國航商較無法經營的業務，主要只能作港到港(port to port)的生意，然而中東地區當地的貨運承攬業者規模較小無法與歐洲大型物流業者相比。為降低風險，

進入中東戰亂區域的貨櫃，船公司也會收取高額的押金(高過運費)，以迫使貨主能夠將空櫃送回。

- D. 以往中東航線多由小 TUE 數貨櫃船航行，因為運價較高每年都能獲利，但近年因為全球主航線船舶大型將原本中型 TUE 數的貨櫃船舶排擠到該航線行駛，造成艙位供過於求運價下跌，也導致中東航線開始有虧損情形。
- (4) 進修者與長榮海運中東辦事處當地的經理人行銷經理 Vijay、協力貨運承攬業者中東區域主管 Sidharth 及我國航商其他先進深入談論有關杜拜推動港口物流商業模式的心得如下：
- A. 杜拜目前能成功成為中東的轉運中心主要是地理位置的優勢，他界於亞洲與歐洲的中間點，加上杜拜政府當局在硬體建設及政策上的大力支持，例如便捷的通關、提供貨物於港區免費存放等優惠措施，近期更努力發展海空聯運模式，以利於擴大操作轉運中心的商業模式。也因為杜拜時區介於亞歐中間，恰可彌補因時差所造成的在上班時間工作聯繫不便的問題。
- B. 東非區域及印度因為港口心關軟硬體設施不足需藉由杜拜轉運，沙烏地阿拉伯其實係中東地區最大的進口國，但並不熱衷於發展區域成為轉運中心，所以進口貨物多由杜拜的港口進入，因此讓杜拜有發展的機會。
- C. 杜拜在阿拉伯國家中是最開放的國家，海關效率也最高，相較之下，沙烏地阿拉伯的通關效率非常不佳，所以也造成沙烏地阿拉伯的進口貨寧可由杜拜的港口進出。
- D. 杜拜對運價及航運聯盟的並無相關管制規定。
- (5) 杜拜看似成功發展的現狀也面臨許多挑戰，他的鄰近酋長國阿布達比一直是他的主要競爭對手且擁有更多的油源等資源，鄰國沙烏地阿拉伯擁有比杜拜雄厚多倍的經濟規模及經濟發展潛力，在波灣對岸擔任中亞門戶國的伊朗也是潛力無窮，但目前因為遭美國禁運而限制其港口的發展，未來這些國家都將是杜拜是否能永續作為中東地區轉運中心的重要影響因素。
- (6) 目前長榮海運駐中東辦事處及其他多家國際航商辦公室所在的 shipping tower 辦公大樓僅隔一條馬路面對舊(貨櫃)港區拉希德港 Port Rashid，原來目地係方便就近管理各公司靠泊的貨櫃船，但是因為近年港區腹地不足以

處理貨櫃物流的需求，目前貨櫃碼頭已移至新港區的傑貝阿里港(Jebel Ali Port)，舊港區部分則發展成為郵輪碼頭等其他用途。

- (7) 心得：掌握海運物流供應網中各成員間之關係結構可作為分析海運服務中各種商業模式之基礎，亦可協助政府制定適當的航運政策。



圖十一 與陽明阿聯公司訪談同仁合影



圖十二 與長榮中東辦事處同仁合影

(三) 訪問重要航運產業相關政府機構與人員介紹及心得

1. 赴美國聯邦海事委員會 (FMC) 進行訪談

- (1) 進修者受 FMC 首席經濟學家 Dr. Pearson (如圖十三) 之邀請訪問 FMC 位於華府的總部，計與 FMC 發照局 Kusumoto 局長及所屬相關執照發放及保證金管理處等處長、貿易分析局所屬海運服務契約及費率處處長進行訪談。發照局局長表示 FMC 曾與進修者母校 Cardiff University 的教授有良好合作關係，渠等並分別向進修者說明 FMC 的發照審查程序、保證金訂定及管理方式、後續監管海運服務合約及運價等作法及未來發展方針等。
- (2) 進修者經安排另與現任 FMC 主席 Mario Cordero (由美國總統指派) 進行會談 (如圖十四)，席間並由 FMC 執行長、法律顧問室副主任、首席經濟學家參與會談。進修者請教有關 FMC 對航運產業管理的政策面思維等議題，主席則探詢有關進修者對 P3(全球運能前 3 大貨櫃航商組成海運聯盟)的看法。
- (3) 心得：美國 FMC 管理航運產業的政策思維包括「確保公平競爭及有效率的海運服務以保護美國國內進口商、出口商及消費者之利益」、「在航運產業間的競爭與合作中取得平衡」、「提供航運產業一個公平及良好的經

營環境」、「兼顧大型及中小型航運企業的生存空間」等。美國目前對國際定期貨櫃航運產業仍維持可豁免反托拉斯法的政策，但運價或海運服務合約及航運聯盟的組成仍需向 FMC 報備，俾其監督有無人為操控漲價或降低服務水準之情事，FMC 雖監管眾多航運產業家數及龐大的運價及海運服務合約等資訊，但主要在有接到檢舉不法之情況下才會進行調查。綜觀我國航業法相關規定及目前主管機關在核照、監督運價及航運同盟之作法與美方並無太大差異，唯在立法意旨上，似需依據我國國情需求的演進，動態思考如何調合我國進出口商、消費者與航運產業間的利益。另外，美國 FMC 屬美國聯邦政府的獨立機構，其用人唯才具有彈性值得一提，例如其現任主席曾為長灘港(全美第二大港)管理委員會主委，首席經濟學家曾為英國大學教授，海運服務合約及費率管理處處長曾為國際航商主管等。另美國及歐盟仍為世界主要之海運市場，我國為該兩方之重要貿易夥伴，我國航運產業於此亦有龐大商機，爰應把握與該兩方之海運相關主管機關建立對話及交流管道之機會。



圖十三 與美國聯邦海事委員會首席經濟學家 Dr. Pearson 合影



圖十四 與美國聯邦海事委員會現任主席 Mario Cordero 合影

2. 拜訪歐盟執委會海運相關兩總署

(1) 拜會我國駐歐盟兼駐比利時代表處：

進修者針對擬訪談之歐盟執委會海運相關單位透過我國駐歐盟兼駐比利時代表處安排訪談相關對口官員，同時並與該處經濟組陳正祺組長、韓嘉駿秘書，及溫士淳秘書進行會談，以瞭解歐盟機構之組織概況及經濟組與國

內相關工作之連繫情形，另分享進修者於英國進行的海運物流鏈相關研究，另與陳組長交流我國參與國際服務業談判之心得（如圖十五）。

(2) **與歐盟執委會競爭總署(DG Competition, European Commission)政策官 Nora BEDNARSKI 及 Filomena CHIRICO 進行會談及心得：**

首先簡介我國海運產業發展情形及有關該產業在公平競爭方面之相關法令架構，俟針對歐盟海運產業中有關核照、違反公平競爭(Anti-trust)及海運相關產業與貨主間利益調和之政策、評估、管理方式、執行等事項進行瞭解及意見交流（如圖十六）。

歐盟執委會競爭總署權管海運產業中若有涉及跨不同會員國且可能發生違反公平競爭(Anti-trust)之情勢進行調查，對於船公司之間的非運價合作或安排的協議(non-price agreement)採取從寬態度。對於貨櫃航商策略聯盟或聯營等措施訂有市場佔有率 30%的競爭法適用豁免門檻，若低於 30%則適用豁免，若高於 30%則須依據競爭法進行自我評估(self-assessment)，兩種情形都不需正式主動向執委會提出(與美國聯邦海事委員會(FMC)之逐案申報管理方式不同)，但有策略聯盟或聯營等措施致市占率超過 30%而未遵守競爭法相關規定之航商，一旦經競爭總處調查屬實將予以重罰。

競爭總署管理海運產業公平競爭之原則在於只要對貨主(或消費者)有利皆可接受，所以海運服務業者之間的各種合作方式及定價方式，只要不涉及統一定價，原則上皆可接受。競爭委員會除監督貨櫃航商的聯營等行為外，還關注貨櫃航商與港口間的垂直整合是否會影響公平競爭。另外歐盟執委會競爭總署會與美國 FMC 等世界其他主管海運公平競爭之機關進行合作及定期對話。

(3) **與歐盟執委會移動與運輸總署 DG Mobility and Transport)主管國際海運運輸及物流之政策官 Lola Fadina 進行會談及心得：**

首先簡介我國海運產業發展情形及發展政策，俟針對歐盟於海運產業之政策及發展方向、權宜船因應政策、海運跨部門整合政策與航運產業發展之連動性等事項進行瞭解及意見交流（如圖十七）。

歐盟鼓勵船舶掛旗於歐盟各會員國並無關動員及徵用之考量(該部分另有

安排)，強調歐盟會員國之旗幟代表為「安全及品質的海運(safety and quality shipping)」把關，也鼓勵歐盟人民上船工作以培養未來具有海上經驗人員從事岸基方面航運管理階層的工作，以利未來整體海運產業的長遠發展，鼓勵懸掛歐盟會員國旗幟。但目前歐盟亦面臨同樣具有「安全及品質的海運(safety and quality shipping)」的新加坡旗及其優惠措施的強勁競爭。歐盟執委會移動與運輸總署會定期與海運相關利害關係團體進行對談及諮詢，追求兼顧及調和各方利益(例如調和貨主，航商及港口等之利益)，相關政策形成前會公布於歐盟執委會網站徵詢各方意見。

3. 與英國上議院議員及陽明海運英國公司許世芳總經理餐敘交流海運產業發展之看法 (如圖十八)



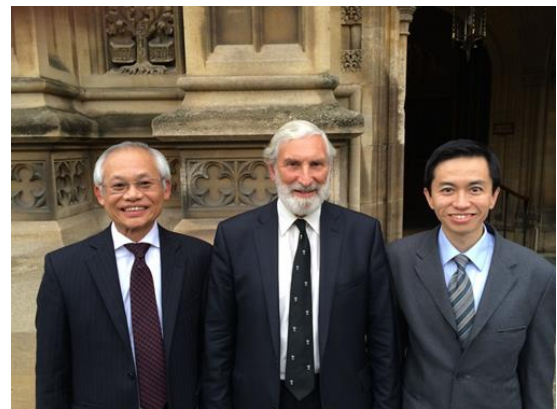
圖十五 與駐歐盟兼駐比代表處經濟組陳正祺組長、韓嘉駿秘書、溫士淳秘書合影



圖十六 與歐盟執委會競爭總署政策官 Nora BEDNARSKI 及 Filomena CHIRICO 合影



圖十七 與歐盟執委會移動與運輸總署主管國際海運運輸及物流政策官 Fadina



圖十八 與英國上議會議員及陽明海運英國公司許世芳總經理合影

(四) 歐洲國際郵輪考察及心得

1. 巴塞隆納（西班牙）國際郵輪港考察：

(1) 依據英國國際郵輪旅遊資訊顯示，巴塞隆納是多家歐洲郵輪公司於規劃地中海區域航程中非常受歡迎的靠泊港口，其原因包括：

- A. 該城市市區具有對觀光客的吸引力，擁有許多世界級的觀光資源，如高第建築群等，加上周圍一日內可火車來回的周邊景點，是一個即使郵輪沒有到也會有很多觀光客透過其他方式到訪的城市，加上西班牙氣候、交通、物價、飲食等因素皆優於地中海其它各港，先天的觀光條件較優。
- B. 主要景點離郵輪停靠的碼頭不遠節省交通接駁時間亦是一大優勢。此外，巴塞隆納港對港區遊輪碼頭區域的開放程度也是他們自豪的，去年為了興建(外租)一座 ferry 碼頭，把港區入口的 Security booth 內推近 100 公尺，以增加旅客進出方便性。另外據該港表示因為其為 city port，所以其發展與定位可更有效地與市政相關業管單位配合，在業務方面也能整合資源，對郵輪業者進行招商，爭取做為郵輪港的起點或終點港 (embarking/disembarking port)，以賺取最大的消費財。

(2) 有關歐盟之國際郵輪一般管理方式部分，其主要權責單位並非歐盟執委會競爭總署及運輸移動總署(當郵輪涉及跨會員國之間且不公平競爭時，競爭總署才介入；運輸移動總署則僅規範國際郵輪的安全標準)。郵輪營運主體理應向靠泊國相關單位進行登記(因為多數郵輪行程還會涉及旅客入境及簽證問題)，在登船前若發生問題應由旅行社負責處理，若旅客碼頭上候船、郵輪航行途中、或上岸時有發現問題造成糾紛時，應由郵輪公司的票務或船上客務經理處理。一般如果有發生公共意外，造成人身損傷，公部門才會有一定的介入與調查。

2. 北部歐洲國際郵輪考察：

(1) 英國之國際郵輪市場概況：

英國之國際郵輪市場發展成熟，有多家國際郵輪公司經營英國市場，市面上較常見的郵輪品牌包括 P&O Cruises, Royal Caribbean, Celebrity Cruises, MSC Cruises, Princess Cruises, Norwegian Cruise Line, Hurtigruten 及英國前兩大

旅行社自營的品牌 Thomson Cruises，行銷分布於世界各航線的郵輪行程，在歐洲區域最熱門之郵輪航線包括北歐俄羅斯航線(包括挪威-冰島航線及波羅地海週邊海域航線)、歐洲北陸航線、地中海航線等。英國旅客可從英國港口搭乘郵輪往返或從英國自行搭機前往他國至啟航港接駁郵輪。另外歐洲地區尚流行河流郵輪(River Cruise)藉由延伸至內陸的河流進行郵輪式的旅行，但不在本次觀摩考察的主題中。旅客可向旅行社訂購郵輪行程，亦可直接在郵輪官網訂購行程。

(2) 英國之國際郵輪市場行程規劃：

國際郵輪旅客並非皆為頂級旅客，亦有分級，同一船最低價之內艙房（無窗戶）與附窗或有陽台的艙房價差很大。郵輪公司規劃每一航線會有一個主題或重點以吸引旅客選購，郵輪公司行銷的目標市場不限英國或歐洲，招攬來自全世界的顧客。一般國際郵輪夏天（四月到九月）的期間集中在北半球營運，冬天則移至南半球。靠港選擇鄰近具有對觀光客高度吸引力的城市或景點為主。

(3) 心得:

A. 靠港的關鍵因素：依據各大郵輪公司在英國銷售的東北亞行程，從國際郵輪公司的角度來看，其同一行程中多規劃停留數港，同一港口多數僅停留一天(六至十小時)，觀光點範圍較大較多的點則停留兩天，停靠這些港口的考量因素除了各港口連結的內陸城市對郵輪旅客的吸引力外，也考量該個別城市在整個行程中的異質性，例如兩個城市吸引旅客的條件相當，但當航行天數縮短時，同質性高、知名度較低、方便性較差的港口就會被跳過。所以在標榜”東北亞洲文化之旅”的郵輪行程中，若在行程天數有限的情況下，郵輪停靠日韓後可能會跳過我國港口而選擇停靠上海，所以如何向郵輪公司及向郵輪公司的潛在顧客包裝行銷台灣城市或特定風景名勝非常有別於中國大陸(例如故宮是全世界收藏中華文物最完整及最精隨獨一無二的頂級博物館，只有來台灣才能看到)。是我們可以努力的方向。爭取郵輪母港也僅非港口業務，應該要有 city port 的概念，才能使發展與定位可更有效地與

市政相關業管單位配合，在業務方面也能整合資源，對郵輪業者進行招商。

- B. 郵輪停靠港及母港：以歐洲地區為例，不同郵輪公司在類似的航線可能會選擇不同的母港，例如 Royal Caribbean 在波羅地海航線就選擇以瑞典斯德哥爾摩為母港，Celebrity Cruises 在歐洲北陸航線就以荷蘭阿姆斯特丹為母港，值得一提的是英國南安普敦是 P&O Cruises(英國船公司)、Princess Cruises 等多家郵輪公司的母港，該港主要應該是服務英國旅客可以不必搭機前往他國登船，而可直接在該港上下船。這些國際郵輪航商選擇停靠不同母港可能是和各港間已談好雙方可以接受的條件。
- C. 母港效益：在國際郵輪的停靠港中，若能爭取做為郵輪港的起迄港 (embarking/disembarking port)，乘客會在郵輪旅程開始前或結束後在港口城市停留較長時間，所產生的效益較為可觀，才能賺到過境旅客真正觀光的消費財，及較多的外溢經濟效益，包括：郵輪旅客（及郵輪本身船員）可能購買的國籍航空機票、增加機場相關收入、上船前及下船後所需的住宿旅館支出、交通費用包括機場及郵輪碼頭間的公共運輸或計程車的支出、餐廳及購物的消費等等，還有郵輪船上乘客所需物料及郵輪船舶本身航行及正常運作所需的補給及相關支援服務，另外若能成功行銷台灣，郵輪旅客還會有興趣在上船前或下船後在台灣作往前或往後的延伸停留。若是只是中途港的停靠，有時甚至連物料補給都不做，而旅客也都是早出早歸，除非參加自費行程，不然在岸期間只吃個午餐或消磨時間消費有限，一些距離觀光市區或景點較遠的郵輪碼頭，只能付費搭乘郵輪公司獨佔提供的接駁巴士，連接駁的運輸收益當地都無法取得太多。
- D. 郵輪碼頭設施：以進修者本次自費觀摩考察的歐洲北部海域波羅的海航線停靠港口為例，除俄羅斯的聖彼得堡需要有過關們通關的手續而有較具永久性及視覺上較高級的通關建築外(惟通關等候時間長)，其他港口（瑞典斯德哥爾摩、芬蘭赫爾辛基、愛沙尼亞塔林、拉脫維亞

里加) 因皆屬歐盟會員旅客無需通關，所以皆僅設置簡易的鐵皮外牆旅客中心，建築裡面並無太多設施，多數以販售紀念品的攤位為主（以瑞典郵輪旅客中心為例如附圖十九及二十），所以郵輪旅客中心不一定要豪華，旅客上下船的區域及動線規劃可能比硬體等級重要。



圖十九 瑞典斯德哥爾摩國際郵輪旅客中心外觀



圖二十 瑞典斯德哥爾摩國際郵輪旅客中心內觀

三、博士學位論文研究成果

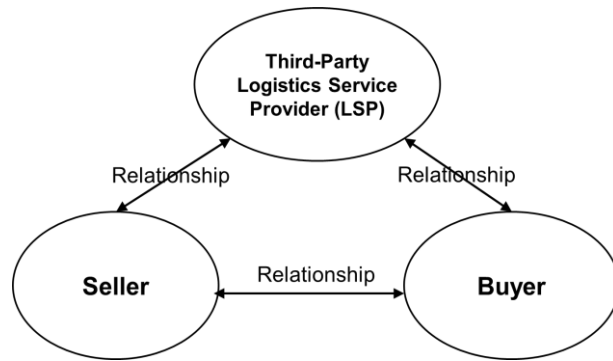
(一) 研究目的

海運物流在全球供應鏈扮演重要的角色亦是我國少數且具有國際競爭力的服務產業，依據聯合國資料顯示，我國貨櫃航商所掌控的船噸規模近年來皆名列全球前十大(UN, 2014)。另外，供應鏈中的各成員彼此間錯綜複雜關係的釐清及管理是成功供應鏈管理的關鍵因素，探討海運物流網(maritime logistics network)中各主要成員間的關係結構因此有其必要性。以往文獻在探討海運物流此相關議題時大多以一元或二元(例如航商與港口間的關係、航商與貨主間的關係、港口與貨主間的關係等)的角度考量，欠缺較全面及超越二元的網路思維，我國公部門以往在業務推廣及政策研擬的上也有類似的情形存在。然而供應鏈網路中各成員彼此關聯，二成員間的關係可能亦會受到第三方的影響，一元及二元的觀點容易導致次優化(sub-optimization)。基於上述理由，本研究將從網路觀點切入，在眾多的影響因素中，以服務複雜程度為主要考量因素，研析海運物流網中主要成員間的關係結構、所產生的價值，及動態變化（博士論文題目：An exploration of relationship structures, their integration and value in maritime logistics network）。

(二) 研究方法

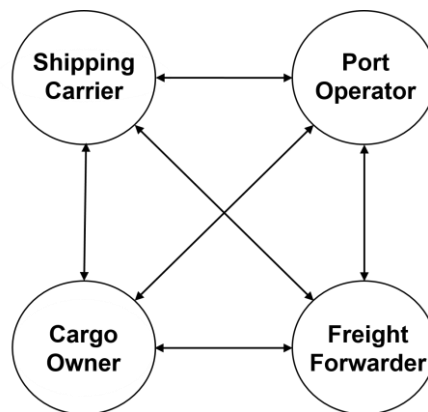
基於前開研究目的所述，本研究之文獻回顧以海運物流網中重要成員其一元及二元的觀點出發，逐步擴大為二元以上的網路觀點。鑑於二元以上網路觀點的海運物流網相關現有研究文獻有限，爰需以海運相關產業從業人員意見為基礎，採取結合訪談及問卷調查的混合研究方法（mixed method）進一步收集第一手資料，以利研究目的的達成。

透過文獻回顧，獲得海運物流網中重要成員、其敘述性的關係結構、發展本研究的理論基礎（物流三元關係（Logistics Triad，Bier 1987; Bask 2001，如圖二十一）、測量關係強度的維度（包括 soft and hard）、測量不同複雜度（客製化程度）服務的方式（如一般乾櫃、冷凍/冷藏櫃，及專案項目貨的分類），及測量不同複雜程度服務所創造的價值。



圖二十一 物流三元關係圖 (Beier 1989, Bask 2001)

在產業界第一手資料收集方面，第一階段進行深入訪談，並以半結構式訪談 (semi-structured interview) 方式進行 (除預設問答題外另提供受訪者提供其他相關意見之空間以提供研究進一步發展之空間)，採訪包括以我國業者為主的貨櫃航商、海運承攬運送業者、港口經營者及貨主，另包括英國及韓國的受訪對象。訪談對象總計包括來自 23 個不同公司或組織的 41 個高階經理人或相關專業技術人員，每次訪談時間平均約一至三小時。透過深入訪談階段之研究，擴展物流三元關係結構而建立海運物流網中四個主要成員及六條關係線的研究及分析模式 (如圖二十二，林上閔 2015)，及影響該網路中關係結構的因素。



圖二十二 本研究建立之分析框架 (資料來源:進修者)

第二階段問卷調查的有效樣本總計 248 份，以滾雪球法 (snow-balling) 收集來自台灣海運業者及其上下游相關業者之資料，樣本來源亦包括貨櫃航商、海運承攬運送業者、港口經營者及貨主。回收的問卷資料以三層次分析法 (整體平均觀點、二元相關成員平均觀點、單一類型成員平均觀點)、敘述統計分析 (評估比較不同關係線的關係強度、不同服務複雜度於不同關係維度的強度與關聯性、不同服

務複雜度產生的價值，及該等價值的來源）及社會網路分析法（Social Network Analysis，簡稱 SNA）進行分析。

（三）研究發現

1. 雖然文獻仍強調供應鏈中各成員必須密切整合的重要性（Nassirnia and Robinson, 2013），但是本研究結果發現海運物流網中不同主要成員間的商業關係強度及整合程度實務上並非相同也不需要相同，呼應其他學者的看法（Cooper et al. 1997）。
2. 依據文獻回顧及深入訪談，貨櫃航商、海運承攬運送業者、港口經營者及貨主為海運物流網中最重要的成員，主要係因為其於實務上掌握較多關鍵資源或資訊而較具有整合者（integrator）的條件，陸上運輸業者未被考慮納入主要成員係根據深入訪談結果，在台灣其並未具備上述條件。
3. 港口與航商間的關係最常被文獻及政府部門提及，但是實際上此連結僅著重於作業面的關係，一般而言，對航商來說，其與客戶即貨主或大型海運承攬運送業者的關係更為重要，港口擔心航商出走，航商更擔心其客戶會流失。另外航商與海運承攬運送業者的關係於不同的貨物型態又會有不同的關係，在散裝貨（LCL）時，海運承攬運送業者是航商的客戶，因為航商並無興趣經營散裝貨，但在整櫃貨（FCL）時，航商與海運承攬業者則有微妙的競合關係存在。港口除了與航商間有較收入互動的關係外，與海運承攬運送業者及貨主相對之下則較無商業往來。大型貨主有需要海運運送時不一定會透過海運承攬運送業者代為處理，有時會直接與航商聯繫取得較優惠的價格。
4. 本研究找出七項會影響海運物流網中主要成員間的商業關係結構的因素及其影響關係強度的情形（其中六項如表一，林上閔 et al. 2014），包括：貿易條件（FOB/CNF）、貨物型態（整櫃貨 FCL/散裝貨 LCL）、服務複雜程度（標準化服務/輕度客制化服務/客製化服務）、不同航線市場（北美航線/歐洲航線/亞洲區間航線）、港口型態（無提供附加價值服務港/有提供附加價值服務港；轉運港/進(出)口港）、貨主形態（製造商/品牌商或通路商）、海運市場型態（貨櫃貨/散裝貨）。貿易條件主要會影響買家或賣家與海運服務業者及港口經營者的

關係；貨物型態主要會影響貨櫃航商與海運承攬運送業者的關係；不同複雜程度的服務會影響整體的關係結構中的強度；不同航線市場因地理特性、傳統及法令之不同等，會對不同主要成員間的關係造成影響。不同港口型態會使港口與航商，或港口與貨主間的關係強度產生變化；不同貨主形態會因採取不同的物流外包策略而與貨櫃航商及海運承攬運送業者產生不同的商業互動；不同海運市場中的貨主對海運航商及對港口經營者會有不同整合程度的關係。

4. 總體而言，海運物流網中主要成員間的關係強度的增加與服務複雜程度有正相關，但是在一些關係維度上則沒有顯現該趨勢（例如：成員間的承諾程度、商業關係合約長度），北歐學派學者所持的理論僅適用於作業面的解釋（如圖二十四），需要依據本研究的結果擴展補足無法解釋的部分。
5. 在創造的價值部分，總體而言，服務複雜程度與衍生價值的增加有正相關，但是在海運物流網主要成員中只有海運承攬運送業者所感知的價值創造與不同複雜程度的服務在統計上有顯著性差異的正向關係存在。貨主甚至對複雜程度高的服務產生負向的價值感知，但此點在統計上並無顯著差異的負向關係，其原因可能係基於不同類型成員的特性，例如貨櫃航商相對海運承攬業者僅能提供較標準化的服務，所以對客製化服務感知的價值較低，這部分有助於釐清實務中對價值產生的迷思。

表一 海運物流網中主要成員間的商業關係結構之影響因素及其影響關係強度的情形
(來源:進修者)

	Cargo Type		Service Complexity			Trade Route			Port Type				Cargo Owner Type		Market Type	
	FCL	LCL	R	S	C	NA	EU	IA	NV	V	T	I/E	M	B/R	L	T
R1	++	+++	+	++	+++	+	+++	+++	+	++	+	+	++	+++	++	+
R2	++	0	+	++	+++	+++	++	++	+	+	+	+	+	++	++	+++
R3	0	0	0	0	+	+	++	++	0	++	0	++	0	+	0	+++
R4	++	+++	+	++	+++	+	+	+	+	+	+	+	++	+	+	++
R5	0	++	0	+	+	0	+	+	0	+++	+	++	0	0	0	0
R6	+	+	+	++	+++	++	+	+	+	++	+++	++	+	+	+	+++

R1: Relationship between cargo owners and freight forwarders
R2: Relationship between cargo owners and shipping carriers
R3: Relationship between cargo owners and port operators
R4: Relationship between freight forwarders and shipping carriers
R5: Relationship between freight forwarders and port operators
R6: Relationship between shipping carriers and port operators

0 = No relationship
+ = Loose relationship
++ = Medium relationship
+++ = Close relationship

四、結論與建議

(一) 研究結論與建議

1. 從供應鏈管理的網路觀點切入，海運物流網中各成員間的關係錯綜複雜，掌握海運物流網中各成員間之關係結構可作為分析海運服務中各種商業模式之基礎，亦可協助政府制定適當的航運政策。海運物流網中不同成員會依據自身利益而有不同感知、期望及需求，所以從政府立場應先依據國家特性及需求，在客觀學理的基礎上去建立政策管理的哲學觀，再站在中立的立場去訂定即推行平衡性的政策，同時考慮海運物流網中重要成員包括貨主及海運服務提供者的利益。以美國 FMC 管理航運產業的政策思維為例，其包括「確保公平競爭及有效率的海運服務以保護美國國內進口商、出口商及消費者之利益」、「在航運產業間的競爭與合作中取得平衡」、「提供航運產業一個公平及良好的經營環境」、「兼顧大型及中小型航運企業的生存空間」等。而歐盟執委會競爭總署管理海運產業公平競爭之原則在於只要對貨主(或消費者)有利皆可接受，所以海運服務業者之間的各種合作方式及定價方式，只要不涉及統一定價，原則上皆可接受亦是一例。
2. 有關我國長期所關注的港口發展議題，經本研究證實海運服務仍是衍生性需求，而港口服務更是雙重衍生性需求(double-derived demand)，產生貨物運送需求的產業才是關鍵，爰訂定我國港口相關發展政策時，應先認清其戰略位置再發展合適的策略。另外具有全球移動性的貨櫃航商及海運承攬運送業者，基於其業態特性及經營靈活性，未來在全球市場的擴展部分具有更大的發展潛力，亦是政策擬定及資源配置時可以考量的地方。

(二) 針對本計畫之建議

本計畫選送中高階公務人員出國進修學位利益非常良善，並提供進修者自行擬定進修計畫、申請學校、執行計畫、取得學位之發揮空間，期間充滿挑戰及風險，形同於相關領域吸取先進國家知識經驗的開路先鋒，相信能夠順利完成學業的進修人員在本職學能、國際視野及膽識上皆有所精進。鑒於透過該計畫之人才養成實屬不易，建議應善用本計畫進修人員，透過例如舉辦完成進修人員

座談會進行交流以傳承寶貴經驗與意見及整合人才資源，另外建立可被運用的人才資料庫，以落實人才培育及運用。

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附錄一 進修者參加海運經濟學人論壇 2014 年研討會海報競賽展作品



A Systems View of Supply Network Integration in Maritime Logistics

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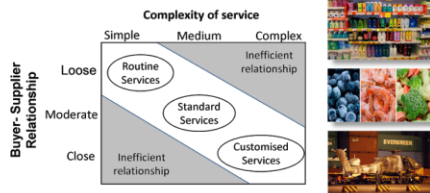
Purpose

To identify the major players in the maritime logistics network, and create conceptual and visualized models to analyse the relationships and interactions among them, considering different attributes which may cause the different levels of service complexity and matching relationships.

Research Questions

- RQ1:** Who are the major players in the maritime logistics network?
- RQ2:** What is the relationship structure between these major players
- RQ3:** What factors affect the relationships between these major players?

Matching Relationship Matrix



In order to offer services more effectively and efficiently to different needs of shippers and different types of supply chains, the LSP needs to develop matching inter-business relationships with supply chain and industrial network partners (Bask 2001).

Theoretical Perspectives



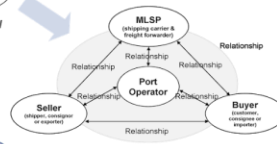
Finding 1: Evolution of the Logistic Triads

Based on logistics triads

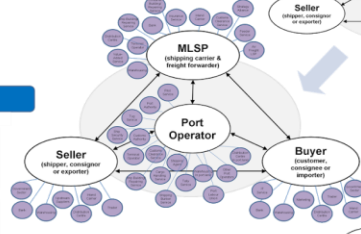


"The major players should include all the service providers who help or regulate the cargoes move." (shipping carrier, freight forwarder, port operator)

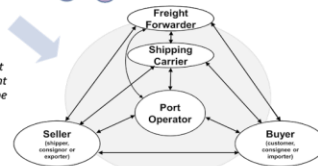
Shipping carriers and freight forwarders were included as the maritime logistics service provider (MLSP), and port operators were added as an additional analysis unit because of their unique and crucial role in the maritime logistics chain as suggested by the literature.



"The major players have their own industrial clusters, and can act as an integrator in line with their ambitions, resources and needs." (port operator)



"Because the nature of shipping carriers and freight forwarders are very different to each other, they should be divided into two analysing units instead of only single MLSP" (shipping carrier & freight forwarder)



Revised framework

Research Methods

Thirty six in-depth semi-structured interviews, site observations and supplementary document analysis have been carried out. Participants included shipping carriers, freight forwarders, port operators and cargo owners. The next step is a survey and possibly social network analysis.

Finding 2: Relationships among the Major Players

- The interactions and matching relationships among the members may depend on the trade terms (CNF, FOB), types of cargo (FCL, LCL), degree of customization for services (Routine, Standard, Customized), trade routes (North America, Europe, Intra-Asia), types of port (Non-value-added, Value-added, Transshipment, Import/Export), types of cargo owner (Manufacturer, Brander/Retailer) and different shipping markets (Liner, Tramp).
- Relationships at different interfaces in the maritime logistics networks will vary, all relationships need not be closely integrated / coordinated throughout the network.
- There are possible network benefits existing between these major players. These need to be further examined, reflecting the views of contingency and system theory.

Cargo Type	Service Complexity			Trade Route			Port Type			Cargo Owner Type			Market Type			
	FCL	LCL	R	S	C	NA	EU	IA	NV	V	T	I/E	M	B/R	L	T
R1	++	+++	+	++	+++	+	+++	+	++	+	+	+	++	+++	++	+
R2	++	0	+	++	+++	+++	++	++	+	+	+	+	+	++	++	+++
R3	0	0	0	0	+	+	++	+++	0	++	0	++	0	++	0	+++
R4	++	+++	+	++	+++	+	+	+	+	+	+	+	+	++	+	++
R5	0	++	0	+	+	+	0	+	+	0	+++	+	++	0	0	0
R6	+	+	+	++	+++	++	+	+	+	++	+++	++	+	+	+	+++

0 = No relationship
 + = Loose relationship
 ++ = Medium relationship
 +++ = Close relationship

Research Impacts

- For academia :** Offering a systems view and a visualized tool to analyse the industrial relationships within the maritime logistics network.
- For industry :** Providing a foundation for industry players to develop effective and efficient collaboration and integration strategies.
- For policy makers :** Gaining a deeper understanding of the maritime logistics industry's network structure to design appropriate policies.

Sponsored by Taiwan (R.O.C.) Government & Cardiff Business School
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A SYSTEMS VIEW OF SUPPLY NETWORK INTEGRATION IN MARITIME LOGISTICS

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Introduction

Supply chain integration (SCI) is an emerging fashion where manufacturers strategically collaborate with their supply chain partners to manage intra- and inter-organizational processes, in order to achieve effective as well as efficient flows of products and services, and to provide maximum value to the customer. As shipping is a vital component in global supply chains, it is important for maritime logistics service providers to be embedded well in this system. The dominant consideration of research about SCI in maritime logistics has been focused on dyadic relationships between two of the major players in the chain. There has been little research that has looked at this issue from a systems view, and identified the network benefits among all the major players both theoretically and empirically.

Secondly, even though the number of publications considering managing maritime logistics as an integrated chain is increasing, few of them distinguish the different relationship structures that exist between the main players in different situations. According to the view of contingency theory, relationships between relevant firms do not need to be integrated closely through the supply network. The most appropriate supply network relationships should depend on different products or services.

Therefore, this research aims to identify the major players in the maritime logistics network and create conceptual as well as visualized models to analyse the relationships and interactions among them, considering different attributes which may create the different levels of service complexity and matching relationships. In doing so, empirical research obtained through 36 interviews is presented.

Supply chain integration research in maritime logistics area

Previous studies have shown that there are a number of benefits to integration strategies in the maritime transport industry. Notteboom (2004) indicates that competition within container transport industries has not only been reliant on the single player, but on the whole chain. Song and Panayides (2008) and Woo et al. (2012) argue that the integration of ports into supply chains will have a positive impact on port performance, while Carbone and De Martino (2003) and Lam (2013) point out that SCI in the maritime industry will contribute to total supply chain value. However, knowledge of the effective and efficient extent and forms of integration relationships between major players within the maritime logistics chain remains scarce in the literature.

On the other hand, SCI research in the maritime logistics field is largely dominated by analyses on the basis of the dyadic relationship between two of the major members in the chain (limited either to shipping carriers and shippers, or shipping carriers and port operators, or freight forwarders and shippers, or port operators and shippers), which might lead to sub-optimisation bias. The number of

publications in managing maritime transport and logistics as an integrated chain are increasing but limited to date (e.g. Heaver, 2002, Panayides, 2006).

A similar trend exists in logistics research, which is gradually moving from the dyadic view to triadic and network perspectives. Since Beier (1989) launched the concept of logistics triads, which involves consignor, consignee and logistics service provider (LSP), a number of studies (Bask, 2001, Larson and Gammelgaard, 2001, Naim et al., 2010) have argued that this logistics triad should succeed the dyad and be seen as a fundamental building block of logistics provision and supply chain practice (see Figure 1a). Further, as Borgatti and Li (2009) point out, supply chain management research is beginning to see the supply network supplant simple chain and dyadic relationships.

However, it is important to recognise that relationships at different interfaces in the supply chain will vary, all relationships need not be closely integrated and coordinated throughout the supply chain (Cooper et al., 1997). In terms of matching relationships, the contingency approach to logistics, through identifying the most appropriate supply chain for different products with different market characteristics, is widely accepted in the supply chain literature. Bask (2001) indicates that in order to offer services more effectively and efficiently to different needs of shippers and different types of supply chains, that the LSP needs to develop matching inter-business relationships with supply chain and industrial network partners. She distinguishes three types of efficient service relationships: routine service, standard service and customized. While a loose customer relationship and a simple type of service characterise routine services, a close relationship and a complex type of service characterise customised services. The intermediate type of service is entitled standard services.

Such an approach has been applied successfully in general transport and logistics. Naim et al. (2006) developed three logistics service types in terms of their flexibility, and highlight the contingency of collaboration approaches to relationships between carrier, supplier and customer. They also argue that the degree of collaboration is actually dependent on the type of supply chain (efficient versus responsive) and the type of competitive outcome sought. Lagoudis et al. (2010) extend the conceptual work of Naim et al. (2006) through its application to ocean freight transport, in which four secondary-data case studies (liquid market, dry market, container market, ferry market) are conducted. They conclude that shipping companies have to be responsive to a range of different customer demands.

Based on the above, three questions emerge which are tackled through the research below:

- RQ1: Who are the major players in the maritime logistics network?
- RQ2: What is the relationship structure between these major players?
- RQ3: What factors affect the relationships between these major players?

Research method

Starting with a literature review, a conceptual framework was developed by which to visualise the various relationships. Exploratory in-depth interviews were conducted to refine this model and gain industrial insights into the factors affecting the relationships. Semi-structured interviews with 36 interviewees from 21 different companies/organizations/authorities, three site observations and supplementary document analysis were conducted during autumn 2013. The participants included 14 professionals from leading shipping carriers, nine from freight forwarders, eight from port operators and five from cargo owners, from managerial level to operational level in order to provide a wide range of perspectives and verify the initial model in accordance with industry practice. The participants were mainly based in Taiwan, which has well-developed manufacturing and maritime

sectors, and the majority of these participants' companies/organizations are involved in global scale business. Most of the participants are senior managers including company owners, chairmen, presidents as well as chief operators, and 67% of them have over 20-years work experience. The site observations include the handling of a container ship in a port, and advanced warehouses which provide vendor-managed inventory, multi-temperature storage and value-added services. Confidentiality of the participant firms was assured according to the Association of Business Schools ethics guide.

The interview questions were asked mainly in line with the concepts of the Bask (2001) and Lambert (2001) models, and consist of three inter-related elements of the supply chain: (1) the structure, e.g. the member firms and their links (relationships); (2) the business processes, e.g. the activities (supplied services) that provide value to the customer; (3) the management components, e.g. the variables by which the integration can be realized, information and communication technologies (ICTs), and performance measurement. The data were analysed by discourse analysis and an attribute-relationship table.

Framework development

Based on the Bask (2001) model (see Figure 1a), shipping carriers and freight forwarders were included as the maritime logistics service provider (MLSP), and port operators were added as an additional analysis unit within the logistics triad because of their unique and crucial role in the maritime logistics chain suggested by the literature (see Figure 1b). The majority of interviewees agreed with this research setting, but many suggested that there should be other important players who can also significantly influence the freight flow within this chain:

"The major players should include all the service providers who help the cargoes move."

These players include the customs agents, inland transport operators, cargo warehouse operators and government authorities which deal with customs and port governing.

When interviewees were asked who can be the integrator in the maritime logistics chain, some of them indicated that the shipping carriers are more competent than port operators as they are mobile, while others claim freight forwarders could be the integrator as they provide a wider range of services. Some interviewees pointed out that the government sector has public authority and more resources to be the integrator. It is worth noting that interviewees suggested that each major player has their strength to integrate other resources in their own specific area. For instance, shipping carriers could integrate the container transport and terminal operation, freight forwarders could integrate cargo flows, and port operators could integrate inland resources as well as the government authorities:

"The major players have their own industrial clusters, and can act as an integrator in line with their ambitions, resources and needs."

In addition, when interviewees were asked about their vertical integration strategies, most of them stated that they only integrate the most relevant and easier aspects into their in-house operation. In other cases, they intend to take advantage of the resources (or buy the other players' services) in the chain. For example, leading shipping carriers would often invest in their terminal operators to obtain long-term benefits; freight forwarders are interested in owning and managing their own warehouses if needed, but tend not to own land transport fleets as they are harder to manage.

Although there are many relevant players within the maritime logistics chain, the interviewees suggested that only some are capable of coordinating the resources, and willing to do so. From the

interviews, the consignor, consignee, MLSP and port operator were confirmed as being able to act as integrators coordinating the other players in the maritime logistics chain. The government sectors are not considered in this study given their role as a regulator rather than dealing with cargo transport (see Figure 1c).

Because the nature of shipping carriers and freight forwarders are very different to each other from the perspectives of assets ownership, expertise of core business and range of services offered, many interviewees strongly suggested they should be divided into two analysing units instead of only single MLSP. In order to keep the balance between convenience of data collection and practical reality, we decided to limit the focus on the network made by the aforementioned integrators, which includes consignor, consignee, shipping carriers, freight forwarders and port operators as the major players (see Figure 1d). Consequently the initial triadic conceptual model has been revised as a more complicated network framework in the maritime logistics context, and the evolved diagram could be a useful visual tool to describe and discuss the relationships structure within this network.

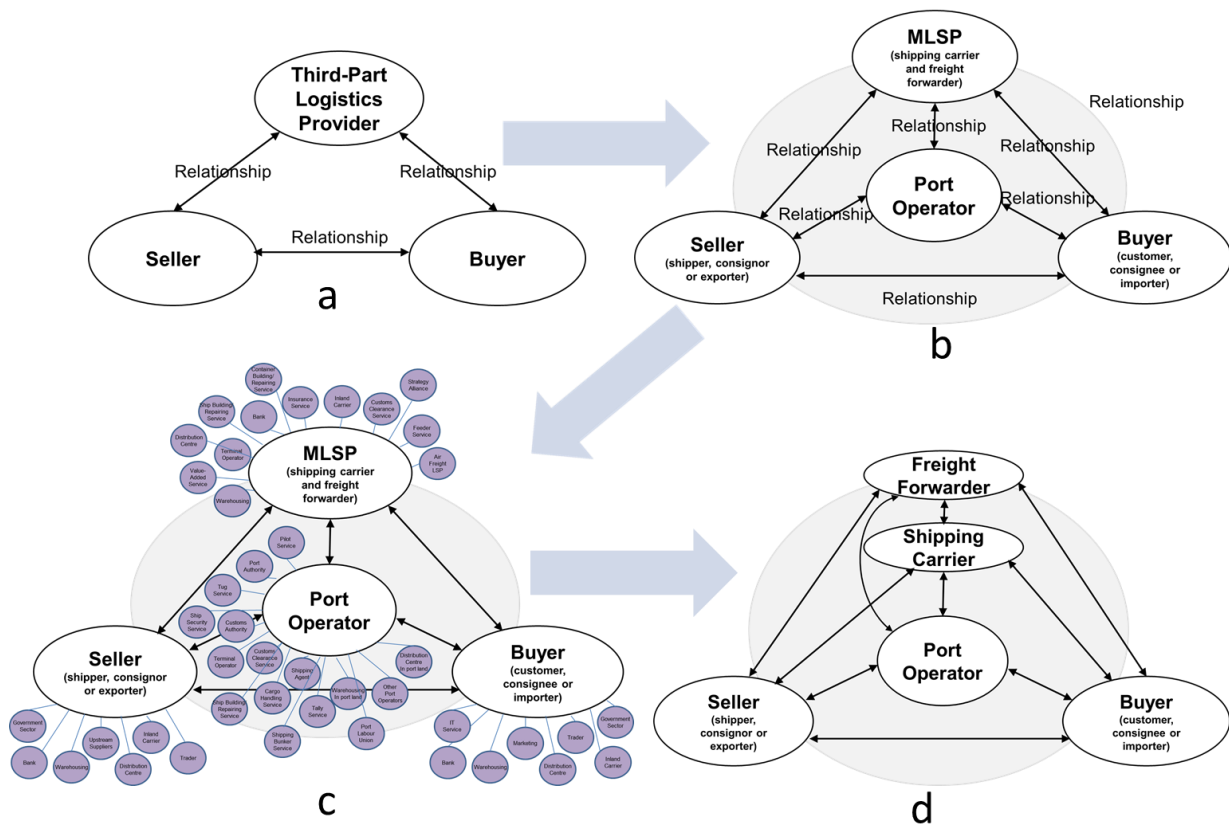


Figure 1: Evolution of the maritime logistics network (source: authors developed from Bask 2001)

Strengths of relationship

The interviewees highlighted that a wide range of attributes, and not only service complexity, influence the relationships between the major players within the maritime logistics network. These different existing relationship structures caused by different attributes found in the interviews are detailed below, with a summary in Table 1.

By trade terms (CNF, FOB)

The Incoterms (International Commercial Terms) rules published by the International Chamber of Commerce (ICC) that are widely used in international commercial transactions or procurement processes, are intended primarily to clearly communicate the tasks, costs, and risks associated with the transportation and delivery of goods. Theoretically, sellers (consignors) and buyers (consignees) are different players sitting at the two ends of the maritime supply chain. However, in practice, logistics service providers only have a direct relationship with one of them, depending on the trade term pre-defined in the Incoterms. For example, if the trade term is CNF (Cost and Freight), by which the sellers must pay the costs and freight to bring the goods to the port of destination, the interactions will occur between the MLSPs and the sellers. In contrast, if the trade term is FOB (Free on Board), by which the buyers arrange for the vessel and pay the cost of marine freight transportation, insurance, unloading and transportation cost from the arrival port to destination, the MLSP will have more interactions with the buyers. In Table 1, we simplify the number of relationships by only referring to the cargo owner.

“The consignor and consignee should be summarized as the cargo owner who is responsible for paying the freight, can ultimately decide on the shipping, and easier to be recognized.”

	Cargo Type		Service Complexity			Trade Route			Port Type				Cargo Owner Type		Market Type	
	FCL	LCL	R	S	C	NA	EU	IA	NV	V	T	I/E	M	B/R	L	T
R1	++	+++	+	++	+++	+	+++	+++	+	++	+	+	++	+++	++	+
R2	++	0	+	++	+++	+++	++	++	+	+	+	+	+	++	++	+++
R3	0	0	0	0	+	+	++	++	0	++	0	++	0	+	0	+++
R4	++	+++	+	++	+++	+	+	+	+	+	+	+	++	+	+	++
R5	0	++	0	+	+	0	+	+	0	+++	+	++	0	0	0	0
R6	+	+	+	++	+++	++	+	+	+	++	+++	++	+	+	+	+++
R1: Relationship between cargo owners and freight forwarders R2: Relationship between cargo owners and shipping carriers R3: Relationship between cargo owners and port operators R4: Relationship between freight forwarders and shipping carriers R5: Relationship between freight forwarders and port operators R6: Relationship between shipping carriers and port operators											0 = No relationship + = Loose relationship ++ = Medium relationship +++ = Close relationship					

Table 1: Relationship structures between major players in maritime logistics chain (source: authors)

By cargo type: Full container load [FCL in Table 1], Less-than-container load [LCL]

There are two cargo types, which are distinguished by whether they can fill a container. They are the full-container-load (also known as container yard cargo) and the less-than-container-load (also known as container freight station cargo). Shipping carriers are more interested in and mainly deal with FCL cargoes in container yards located at shipside. These are usually booked by large cargo owners and freight forwarders. LCL cargos usually come from many small cargo owners, and need to be consolidated in the container freight station by freight forwarders before they are delivered to container yards and then passed to shipping carriers. Freight forwarders can also receive FCL cargoes from cargo owners. Therefore, in the case of FCL cargo, both shipping carriers and freight forwarders will have business relationships with cargo owners. In the case of LCL cargo, freight forwarders will have more opportunities to build close relationships with the cargo owners, and freight forwarders become the shipping carriers' main customers.

By service complexity: Routine [R], Standard [S], Customized [C]

Many participants pointed out that from the perspective of containerised transport, the degree of complexity/customization for services could be categorised by the different types of container or operation which can deal with three types of cargo including general purpose cargo (by dry cargo container), reefer cargo (by reefer container) and out of gauge (OOG)/project cargo.

The dry cargo containers provide the simplest services for general purpose cargo (e.g. commodities, recycling waste) that do not contain any specific arrangements. These services are volume-based, and the most important factors in decision making are competitive price and ease of service procurement. The reefer container services provide some degree of customised operations for temperature-sensitive cargoes (e.g. fruit, sea food, meat, flowers, high-tech parts and chemicals), which include air ventilation, temperature setting, controlling and monitoring. Not all of the MLSPs have equivalent facilities and specialists to offer such services.

The OOG/project cargo services are the most complicated and highly customised services, and could include transportation of large, heavy, high value, critical pieces of equipment. The items made of various components need to be disassembled for shipment and reassembled after delivery. Some participants shared their experiences for delivering yachts, helicopters, sensitive equipment, turnkeys, exhibiting antiquities and project cargo management for their customers. These highly specialist shipments require individual transport planning from origin to destination, and all players work as a team to deal with these tasks. The rationales behind such services are economies of scope, basing on long-term contracts, and the requirements of special knowledge, facilities and marketing channels. There are often only a few providers which can offer such services.

It was found that the more complexity/customisation of the services, the closer the relationship should be kept between the MLSPs and cargo owners. For instance, an increasing level of complexity or customization increases the possibilities that customers have to influence services output and services flexibility, and calls for more joint work between the cargo owners and MLSPs, from planning to operations. In addition, more communication, information sharing and application of IT technology are needed. This type of service often causes high transaction costs because of dedicated investment, but can also develop strong loyalty from the customers. Many interviewees noted that highly complex or customised services imply gaining higher financial revenues but also higher risk.

By trade route: North America [NA], Europe [EU], Intra-Asia [IA]

According to the literature, maritime trade is dominated by three economic centres, namely North America, Europe and Asia Pacific. MLSPs in such different regions have seen different trends in service offering, which has significantly influenced the relationships among cargo owners, shipping carriers, freight forwarders and port operators. The reasons for such different trends include historical evolution, the power of freight forwarders, geographical difference and the length of shipping routes. Interviewees highlighted that freight forwarders in western Europe and Asia Pacific tend to offer more integrated services than those in North America. In North America, shipping carriers usually need to provide shipping and inland rail or truck services to cargo owners' depots, but they only need to provide shipping services in western Europe, as traditionally, inland transports in this area are mainly managed by freight forwarders. In terms of intra-Asia routes, which are shorter shipping routes, shipping carriers and freight forwarders need to spend more time in communicating with cargo owners, dealing with relevant documents and making quick responses. In such cases, both need to keep closer relationships with cargo owners.

By port type: Non-value-added [NV], Value-added [V]; Transshipment [T], Import/Export [IE]

Many participants mentioned that port operators usually have no direct relationships with cargo owners (and freight forwarders), but if port operators could provide the value-added services or spaces to operate these activities for cargoes (e.g. multi-national container consolidation, re-export, distribution centre or free trade zone), they may have more opportunities to establish direct relationships with these two players. This could reflect the point suggested by some interviewees, that is landlord ports will have more possibilities than public ports to establish relationships with other players. In the case of service ports, port authorities own the land and all available assets, and perform all regulatory and port functions. In the case of landlord ports, the port authorities maintain ownership of the ports and the infrastructures are leased to private operating companies. These initiatives should lead to more traffic and value-added services and more interactions with other players.

Some interviewees also pointed out that relationship structures can be influenced by whether the ports mainly operate transshipment or import/export cargoes. The shipping carriers could only decide which transshipment ports they call at, while import/export ports usually are decided by cargo owners. Therefore, transshipment ports have closer relationships with shipping carriers, and import/export ports should keep closer relationship with cargo owners. One example was mentioned that the Port of Rotterdam encourages local buyers (cargo owners) to apply the FOB trade term to indirectly arrange shipping carriers to call at this port.

By cargo owner type: Manufacturer [M], Brander/retailer [B/R]

The previous literature often emphasizes that many manufacturers have adopted global logistics strategies rather than simply relying on conventionally segregated shipping or forwarding activities (Notteboom and Merckx 2006). However, it was found that different types of cargo owner have different logistics outsourcing strategies. Compared with manufacturers, branders (e.g. ASUS, Acer) and large retailers (e.g. Wal-mart) usually dominate the logistics process. The branders and retailers, with their strong bargaining power, tend to contract with freight forwarders and shipping carriers separately, while manufacturers tend to accommodate their customer's logistics arrangement or contract with freight forwarders to make them deal with all the logistics processes.

By shipping market: Liner shipping [L], tramp shipping [T]

Although this research mainly looks at the liner containerised cargo transport, some participants mentioned that tramp shipping which carries bulk cargo is based on very different supply chains and has very different relationship structures within the maritime logistics network. In practice, the buyers of tramp cargoes tend to choose destination ports, allocate proper storage areas at the quayside, manage the ocean transport and terminal operation at the port on their own, which will cause them to be closer to port operators directly, rather than through ocean carriers:

“Most of the state-owned and large tramp cargo buyers act as the cargo owner, shipping carrier and terminal operator in the port area at the same time.”

Discussion and conclusion

For RQ1, cargo owners, shipping carriers, freight forwarders and port operators are the major players in the maritime logistics network. For RQ2, referring to the Figure 1d which evolved from the logistics triad, these major players have more complicated network relationships, and need to be looked at from a systems view. For RQ3, a wide range of attributes including industrial practice and service complexity, influence the relationships between the major players within this network.

The originality in this study is using a systems view to analyse supply network integration in maritime logistics empirically, which reflects the emerging appeals by maritime researchers (e.g. Carbone and De Martino, 2003, Song and Panayides, 2008, Woo et al., 2012, Lam, 2013), while also taking into account the contingency of different circumstances. This paper adds evidence in identifying the interactions between the major players in the maritime logistics chain based on a network consideration rather than simple dyads. This verifies Magala and Sammons' (2008) statement which the choice of a port made by the shipping carrier could be interrelated to the choice made by the cargo owner, and both choices are only one part of the supply chain selection process. Likewise, the choice of a maritime transport chain by shipping carriers, ports and cargo owners is considered to be jointly rather than independently determined (Talley and Ng, 2013).

On the other hand, while the contingency method is widely applied in SCM research, maritime research still overemphasises the close integration through all the maritime logistics chain (e.g. Nassirnia and Robinson, 2013). This paper has successfully verified the different relationship structures within the maritime logistics network by different cargo attributes, which could move maritime research forward. In addition, three types of transport service for containerised cargo and the matching relationships by the degree of complexity/customisation have been identified. These are in line with the logistics strategies for routine, standard and customized services (Bask, 2001).

This research contributes to academia by offering a systems view and a visualized tool to analyse the industrial relationships within the maritime logistics network. The research framework could also apply to other modes in international transport. For industry and policy makers, this study will provide a foundation for the above major players to develop effective and efficient collaborative and integration strategies in the industry, and help policy makers to gain a deeper understanding of the maritime logistics industry's network structure in order to design policies fit for purpose. Future research could also consider the network benefits from different relationship structures. In terms of limitations, the framework and findings in this study were developed mainly based on qualitative interviews conducted with participants in Taiwanese industry. More participants and further quantitative methods could be involved to overcome this.

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