

行政院國家科學委員會專題研究計畫 成果報告

探討外國銀行與本國銀行在技術差距比率之決定因素—全球銀行的實證分析 研究成果報告(精簡版)

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行政院國家科學委員會補助專題研究計畫 成果報告
 期中進度報告

探討外國銀行與本國銀行在技術差距比率之決定因素 — 全球銀行的實證分析

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一、緒論

(一)研究動機

過去數十年來，分析銀行效率的文獻研究正快速且蓬勃地增加中，此趨勢顯示隨著全球銀行市場的發展，跨國性的金融活動也愈趨頻繁，各國銀行應如何有效提升其經營績效及掌握其全球競爭優勢，持續受到全球學術界高度的重視。然而，當各國積極從事金融自由化的過程中，同時也大幅提升全球銀行的競爭程度，更直接促使金融機構的高階管理者積極研擬有效控制經營成本方案與進行最佳投資計畫，藉由有效整合組織內的資源配置，進而快速提升整體的經營績效。特別是外國銀行因受惠於各國解除進入障礙(entry barriers)之利，也積極進入各國金融產業中，以開展其海外事業的金融版圖，但此過程也進一步加劇跨國銀行間的競爭性。因此，是否外國銀行的經營效率表現較本國銀行為佳，近年來儼然已受到各國學者的高度關注，但目前多數的實證分析多以特定國家或單一區域為研究對象，以全球銀行的比較實證分析依然相對缺乏，無法提供更充分且完整的觀點與證據。

然而，過去探討影響本國銀行與外國銀行其經營績效的關鍵決定因素的部分研究結果仍缺乏一致性(consensus)的結論，有待藉由全球銀行的實證分析進行更完整的探討。再者，當外國銀行與本國銀行在管理技術上具有顯著的異質性時，若在相同的效率前緣下使用傳統效率估計方法評估個別的效率值，此估計結果可能存在相當程度的潛在偏誤(bias)，但過去多數研究銀行效率的文獻仍未強調此潛在的估計問題。有鑑於此，本研究應用「共同邊際法」(Meta-Frontier Method)進行全球銀行的實證分析，藉以分析本國銀行與外國銀行在經營效率的差異性，並探討影響兩者在技術差距比率(Technology Gap Ratio)的關鍵決定因素為何，特別是同時控制銀行特性(包括：財務績效、所有權結構、重要股東持股比例)，以及地主國家特性差異(包括：總體經濟環境、法規制度、監理結構、機構治理結構)等因素，更完整認定影響本國銀行與外國銀行在技術差距比率的決定因素。

過去探討影響銀行效率的跨國研究文獻中，主要針對銀行獲利性、重要相關財務比率與銀行業集中度等因素(Pastor et al., 1997; Dietsch and Lozano-Vivas, 2000; Lozano-Vivas et al., 2002; Carvallo and Kasman, 2005; Kasman and Yildirim, 2006)，也有部分研究考量各國在總體經濟因素上的差異性，例如：股票市場資本化、國內生產毛額的成長、銀行體系的總資產、以及資本適足比率等因素的影響(Dietsch and Lozano-Vivas, 2000; Lozano-Vivas et al., 2002; Grigorian and Manole, 2002)，尤其是跨國間機構特性的重要變數，例如：財產權的保護程度、

銀行分行家數及自動提款機 (ATM) 相對於總人口的比例、以及銀行所有權結構的差異(公營銀行與外國銀行)等因素對銀行技術效率的影響。最近, Pasiouras (2008)進行全球銀行的實證分析, 並發現從事低度放款活動的大規模銀行, 相對表現出較佳的純技術效率水準。再者, Sturm and Williams (2004)指出當澳洲政府持續採行金融開放政策時, 將鼓勵本國銀行與外國銀行更積極進行多角化的業務活動, 此為提升銀行自身經營效率與有效促進金融市場創新提供重要的誘因來源。儘管少數學者已指出金融政策對銀行效率具有重要的影響性, 但銀行經營效率的全球實證分析, 仍處於初步發展的階段中, 有待投入更多的研究貢獻。

前人關於外國銀行是否較本國銀行具經營效率的相關文獻中, 依舊獲得不一致的實證結果。Barros et al. (2007)雖指出外國銀行進入本國銀行市場會提高本國銀行業的競爭程度, 但卻有利於提升整體的經營績效水準。最近, Sturm and Williams (2008)也支持 Barros 等人的研究結果, 並發現隨著外國銀行進入本國銀行業可進一步提升全體潛在的福利水準。基於最近全球銀行的實證結果, Lensink et al. (2008)指出來自較佳機構特性國家的外國銀行相對於較差機構特性者其經營效率表現較好。此外, 總部設於美國並在世界各國經營的外國銀行, 其經營效率相較本國銀行則為佳(Berger et al. 2000; Miller and Parkhe, 2002)。但部分研究卻指出已開發國家並不利於外國銀行的經營效率, 相反地開發中國家則有利於外國銀行的經營效率(Peek et al., 1999; Hasan and Hunter, 1996; Demircuc-Kunt and Huizinga, 1999; Sathye, 2001; Claessens et al., 2001); 特別是在特定已開發國家中, 外國銀行的經營效率幾乎等同於本國銀行(Vennet, 1996; Hasan and Lozano-Vivas, 1998)或稍較本國銀行具經營效率(Sturm and Williams, 2004)。因此, 基於實證結果的不一致性, 實有必要藉由全球銀行的實證分析, 分別比較已開發國家與開發中國家中外國銀行的經營效率是否較本國銀行表現為佳, 進一步更清楚且完整的瞭解兩者在經營效率的差異性。

在管理技術層面上, 外國銀行與本國銀行具有明顯的異質性, 但過去傳統效率估計方法卻多使用在相同的效率前緣下估計其效率值, 此估計結果可能存在潛在的問題。為改善此問題, Battese and Rao (2002)首先提出「共同邊界法」(Meta-Frontier)的概念來計算並比較存在不同技術廠商的技術效率, 進一步估計在不同技術前緣下廠商與共同效率差距的缺口比率, 即「技術差距比率」(Technology Gap Ratio)。最近「共同邊界法」的概念已廣為被應用在不同的研究議題上, 特別是在銀行的效率分析上, Bos and Schmiedel (2007)則考慮歐洲金融市場整合下評估 1993 年至 2004 年歐洲銀行的相對效率值, 並發現混合邊際法(pooled frontier)相對在共同邊際法下較易低估銀行的效率值。此外, 基於銀行為多期理性決策者的觀點下, 長期而言銀行應存在技術效率調整的過程, 即銀行依據前期技術效率水準充分調整其投入與產出的差額。最近, Huang and Chen (2009)使用「動態追蹤資料模型」(Dynamic Panel Data Model, DPD), 並針對 1994 年至 2003 年共 112 家法國銀行採用「一般動差法」(Generalized Method of Moment, GMM)進行實證估計, 結果指出法國銀行間確實存在長期成本調整速度上的異質性。

(二)研究目的

有鑑於全球銀行實證研究仍相對地不足，且本國銀行與外國銀行存在異質的生產技術與效率。本研究採用 BankScope 資料庫中個別銀行財務報表資料進行實證分析，研究期間涵蓋 2002 年至 2006 年之間，銀行類型則包括商業銀行、儲蓄銀行、合作銀行以及金融控股公司等四種，以下三點為本研究之主要研究目的：

- (1)應用「共同邊際法」(Meta-Frontier approach)並使用「資料包絡法」(Data Envelope Analysis, DEA)針對外國銀行與本國銀行兩種不同共同邊界，分別評估其經營效率的優劣與比較兩者在技術差距比率(Technology Gap Ratio, TGR)的差異所在。
- (2)探討主要影響外國銀行與本國銀行在技術差距比率的關鍵決定因素，特別考慮「在地國」(host country)在總體經濟及機構治理品質等國家變數，分別對外國銀行與本國銀行在技術差距比率的影響，並使用非線性 Blinder-Oaxaca 拆解法針對 Tobit 模型估計，檢定決定外國銀行與本國銀行間其技術效率差距比率是否存在顯著的解釋變異。
- (3)實證研究結果將更清楚地瞭解外國銀行與本國銀行在經營效率的差異性，有助於、國內銀行、外國銀行、各國金融當局在調整其經營策略或金融政策執行方向上，作為重要的參考依據。

二、文獻回顧

回顧過去全球研究銀行效率的相關文獻中，主要可分成三個主要的研究主題(Berger, 2007)：(一)使用相同的效率前緣(common frontier)比較不同國家的銀行經營效率；(二)使用國家特定的效率前緣比較不同國家的銀行經營效率；(三)使用國家特定的效率前緣(nation-specific frontiers)在相同國家下比較本國銀行相對於外國銀行的經營效率。詳細內容說明如下：

(一)使用相同的效率前緣比較不同國家的銀行經營效率

多數研究文獻以在不同國家下評估所有銀行相對於最佳效率前緣的個別銀行效率為主，並比較不同國家在平均效率的差異性，例如 1990 年代早期的研究學者：Berger et al. (1993)、Fecher and Pestieau (1993)、Bergendahl (1995)、Bukh et al. (1995)、Allen and Rai (1996)、Ruthenberg and Elias (1996)、以及 Pastor et al. (1997)等人。其中，Berger et al. (1993)曾衡量過

挪威、瑞典以及芬蘭等三國中銀行經營效率的優劣，在共同效率邊界評估法下發現瑞典銀行的經營效率則位居三國之冠。再者，研究 11 個經濟合作發展組織國家(OECD)也發現挪威銀行的效率優於其他國家的銀行效率，相對比率分別為 90%與 76% (Fecher and Pestieau, 1993)；同時，相較 8 個已開發國家美國銀行的經營效率僅等同於第 2 低的排名(Pastor et al., 1997)。

最近一些研究以探討國家總體經濟環境的差異(例如每人所得水準、人口數、存款總額、銀行分行家數比例等)、銀行市場結構(例如銀行前三大市場佔有率)以及管制結構(存款保險、法規制度)對銀行經營績效的影響(例如：Dietsch and Lozano-Vivas, 2000; Lozano-Vivas et al., 2001; Lozano-Vivas et al., 2002; Maudos et al., 2002; Kwan, 2003)；也有些學者高度關注在歐洲銀行業的效率變化與發展(例如：Casu and Molyneux, 2003; Casu and Girardone, 2006; Barros et al., 2007; Carbo Valverde et al., 2007; Maudos and Fernandez de Guevara, 2007)，而部分學者則特別在意特定歷經政治轉變的東歐國家(例如：Fries and Taci, 2004; Bonin et al., 2005; Rossi et al., 2005; Yildirim and Philippatos, 2007)。此外，Hollo and Nagy (2006)則認為銀行在這些經濟轉變中的國家具有相似金融環境，例如多數都正歷經公營銀行私有化與外國銀行大舉入侵本國市場的過程。Williams and Nguyen (2005)使用共同效率前緣檢驗 1990 年到 2003 年間南亞五國(含印尼、南韓、馬來西亞、菲律賓、泰國等)中銀行治理的改變對其經營效率的影響，此實證結果顯示在這段期間這五國都經歷相似的金融危機與政策改變。

部分研究則使用共同效率前緣更進一步衡量效率分數與環境變數的關連性，作為直接推論跨國金融整合可能造成的影響衝擊，即嘗試去預測當外國銀行進入本國金融市場所產生的潛在衝擊，以分析經濟環境表現的差異性。Lozano-Vivas et al. (2001)分析 10 個歐盟國家(包括：比利時、丹麥、法國、德國、義大利、盧森堡、荷蘭、葡萄牙、西班牙、以及英國等國家)的外商銀行在其他國家經營的相對效率表現為何，其實證發現母國來自西班牙、丹麥、葡萄牙的外國銀行其經營效率相對比現較本國銀行為佳。最近，Lensink, et al. (2008)探討外國所有權對銀行效率的影響，以及外國銀行其母國與在地國在機構品質的差異性及相似性(similarity)上是否會影響外國銀行的經營效率。實證結果發現若外商銀行其母國機構品質較高，且機構品質在母國與在地國之間的相似性愈高將降低其經營效率的表現。最後，部分學者則驗證共同效率前緣方法的假設問題，其中 Bos and Kolari (2005)針對歐洲銀行與美國銀行分別使用共同及個別效率前緣兩種方法，以檢驗是否兩者在相同的成本與獲利前緣下其經營效率的異同，實證結果發現共同獲利前緣則成立，但卻拒絕共同成本前緣。

另外，則有少數研究學者挑戰過去傳統使用相同效率前緣的研究，並嘗試提出不同的估計方法。Bos and Schmiedel (2007)則應用 Battese et al. (2004)所提出「共同邊際法」概念，在國家特定成本與獲利前緣下以「資料包絡法」(DEA)針對瑞士與 15 個歐盟國家銀行進行效率的估計，其結果則發現存在單一西歐金融市場前緣。此研究證實傳統以共同前緣法所得到的估計將會低估銀行的成本與獲利效率值，而且當進行跨國比較研究時，可能會導致嚴重的偏誤結果。

(二)使用國家特定的效率前緣比較不同國家的銀行經營效率

過去相當多數關於銀行效率的研究中，多採用在特定國家下評比所有銀行的相對效率值。Berger and Humphrey (1997)於 1997 年針對共 122 篇金融機構效率分析與共 8 篇探討保險機構效率的期刊文獻進行回顧與評析，發現其中 130 篇研究中僅 6 是以個別單一國家為效率前緣，其他的研究則以全體共同的效率前緣為主。再者，有 66 篇使用美國的資料，而 41 篇使用個別歐洲的國家，包括：比利時(2 篇)、賽普勒斯(1 篇)、丹麥(1 篇)、芬蘭(2 篇)、法國(2 篇)、德國(3 篇)、希臘(2 篇)、義大利(3 篇)、挪威(5 篇)、西班牙(11 篇)、瑞典(1 篇)、瑞士(1 篇)、英國(5 篇)，此結果顯示多數銀行效率文獻仍多以研究已發展中國家為主較，較缺乏開發中國家的效率分析。在 1997 年後較多以研究單一國家的銀行效率，但依舊多集中在研究美國與歐洲國家地區為主(約有 21 篇文獻)。之後，涵蓋已發展中國家的研究也迅速的增加，國家包括：澳洲(Otchere and Chan, 2003; Sturm and Williams, 2004)、葡萄牙(Barros and Borges, 2004)；近年來部分以的開發中國家的銀行效率研究為主的研究才陸續出現，國家包括：中國(Berger et al., 2008)、巴基斯坦(Bonaccorsi di Patti and Hardy, 2005)、南韓(Gilbert and Wilson, 1998)、波蘭(Havrylchyk, 2006)、克羅埃西亞(Kraft et al., 2006)、阿根廷(Delfino, 2003; Berger et al., 2005)、泰國(Leightner and Lovell, 1998; Chantapong, 2005)、匈牙利(Hasan and Marton, 2003)以及馬來西亞(Matthews and Ismail, 2006)等國。儘管多數研究仍以特定單一國家的研究為主卻不進行國際的跨國比較，但相當強調金融法規制度(DeYoung, 1998)、國內銀行合併活動(Vander Venet, 1996)、金融機構規模大小與組織結構(Hermalin and Wallace, 1994)、國內公營銀行相對於外國銀行的差異(Tulkens, 1993)、銀行市場力量(market power)(Berger and Hannan, 1998)、分行家數(Athanassopoulos, 1998)、生產力的改變(Berger and Mester, 2003; Kumbhakar and Sarkar, 2003)以及不同效率估計方法(Bauer et al., 1998)對銀行效率的影響層面。

部分研究則特別認定不同國家效率分配，是否存在顯著的差異性。例如，Berger and Humphrey (1997)比較美國與其他 14 個國家在年效率值的分配統計量差異，並發現從 50 家美國銀行共 188 筆年估計效率值中得知平均效率值為 79%且中位數則達到 83%；另外，從非美國銀行共 131 筆樣本估計年效率值中得知平均效率值為 75%且中位數則達到 81%，此結果意謂平均而言以美國為效率前緣所計算美國銀行效率值相當接近以其他國家為效率前緣所計算的銀行效率值。再者，在特定國家中銀行效率分配的國際比較，可作為強調分析政策實行的重要參考依據。例如，Berger et al. (2004)使用 21 個已開發中國家與 28 個開發中國家的銀行效率資料，評估經濟環境對社區銀行(community banks)相較於其他類型的銀行在相對效率的影響，結果發現同時在開發中國家與已開發中國家中社區銀行相對同一國家中的其他銀行其擁有較高的經營效率，此與快速成長的國內生產毛額、較高勞動雇用比率的中小企業、

較高的全體放款金額具高度正向的影響關係。然而，Bertu et al. (2008)針對在金融監理及法規管制因素方面，卻發現高度資本管制與金融監理對外國銀行所有權不具顯著的影響效果。此外，Pastor and Serrano (2006)比較 1992 年到 1998 年間歐洲跨國間，銀行專業化程度是否對其經營效率產生顯著的影響效果，其研究結果指出產出組成的差異確實會降低銀行效率在跨國差異性與在國家特定效率前緣下估計結果的偏離程度。

(三)使用國家特定的效率前緣在相同國家下比較本國銀行相對於外國銀行的經營效率

最近有許多的研究藉由使用國家特定的效率前緣，在同一國家下比較外國銀行相對於本國銀行效率的差異性，以延伸過去銀行效率的研究文獻。雖然此議題直接強調銀行如何進行跨國的經營，但是藉由比較在同一國家下比較外國銀行相對於本國銀行效率的差異性可能存在一些衡量問題(measurement problems)。

1.外國銀行相對於本國銀行較具效率優勢

相對於本國銀行，外國銀行可能因多國籍的企業活動，藉由分行的組織結構在不同的國家來服務其企業客戶而具效率優勢。部分學者提出提出「跟隨客戶」(follow-your-customer)的觀點，以解釋為何外國銀行會積極進入各國的銀行市場的現象(Goldberg and Saunders, 1981; Grosse and Goldberg, 1991; Ter Wengel, 1995; Brealey and Kaplanis, 1996)。然而，也有少數學者提出不同的意見，並指出外國銀行並非以跟隨其母國客戶而進入在地國的金融市場為導向，而是積極從事於借款給在地國的新企業客戶，以建立新的事業版圖與網路(Stanley et al., 1993; Seth et al., 1998)。

外國銀行另一個潛在的效率優勢，則為因可藉由國際業務多角化而降低其業務風險。Berger et al. (2000)指出在歐洲國家金融市場間存在相對較低的關連性，特別是在某些國家中可能存在跨國長期負向的相關性，例如在 1979 年至 1996 年間德國銀行的權益報酬率被發現與西班牙、法國、盧森堡與葡萄牙等國之間存在負向的相關性。Hartmann et al. (2005)也發現 12 個歐洲國家中銀行在跨國間所存在極端風險外溢效果相對低於在個別國家中各自銀行極端風險外溢效果，此結果也顯示國際業務多角化活動可降低銀行的經營風險，有利於外國銀行的跨國經營優勢。對發展中國家而言，外國銀行的穩定性高度受限於發生金融危機的機率，例如，Goldberg et al. (2000)發現當美國與墨西哥發生金融危機的時期，境內的外國銀行可提供重要的信用援助，並同時有助於維持金融的穩定性。

在 2000 年至 2005 年期間銀行獲益自金融產品組合的伸縮性(flexibility)大幅提高，特別是大銀行受惠於金融創新與解除管制遠大於社區銀行(Asaftei, 2008)的效益。Sturm and Williams (2008)分析在澳洲的外國銀行經營效率並指出母國獲利性並不會進一步提升在地國

的外國銀行其經營效率，但若母國金融體系完整性愈高對在地國的外國銀行其效率影響則愈高，此意謂母國的銀行監理與金融制度可高度解釋外商銀行的效率表現。儘管過去文獻較少論及多角化對跨國金融組織的益處，但國際多角化活動已被證實可大幅改善保險公司其預期風險報酬的抵換關係與獲利效率(Hughes et al., 1996; Demsetz and Strahan, 1997; Hughes and Mester, 1998)。同時，研究美國國內銀行併購活動的研究也指出銀行可藉由併購活動顯著提升其自身的經營效率，而此改善效益與多角化降低風險的因素有關(Akhavein et al., 1997; Berger, 1998)。

特別是將總部設於已開發國家中的外國銀行，可能較將總部設於開發中國家者相對具有更高的競爭優勢，而多數研究此議題的學者均認為此結果與公營銀行所有權高度集中在特定國中易受到不利經濟情勢所致有關(Barth et al., 1999; La Porta et al., 2002; Berger et al., 2004)。來自已開發國家中的外國銀行可能因善用獨特新金融技術，得以迅速在發展中國家建立高度的競爭優勢，其中更以大型跨國金融組織可能因具備重要有利的機構資訊，例如：高知名度的信用評等、較透明化的財務報表資訊或易評價的固定資產作為擔保品或租賃，因而可大幅提高其於在地國的競爭優勢(Berger and Udell, 2006)。最近一些研究發展中國家銀行借貸的文獻，也發現外國銀行因掌握重要有利的機構資訊使其更具放款的優勢。其中，Clarke et al. (2006)研究 28 個發展中國家的外國銀發現當外國銀行於在地國有較高的參與率時，一般規模的企業較不易認定高利率及提供長期放款作為企業成長款的障礙。同時，Berger et al. (2004)也得到類似的結果，並指出在 28 個發展中國家中，當外國銀行擁有較高放款市場佔有率時，將有利於中小企業提高其雇用比重。但是，Berger et al. (2001)卻提到在阿根廷的外國銀行似乎存在無法有效提供信用貸款給資訊較透明化的中小企業的問題。然而，外國銀行可能因具備重要有利的機構資訊，較偏好集中提供中小企業大額放款，特別是資訊較透明化的大型、公開上市且為外國所有權的企業為主。

過去文獻相對較少分析跨國整合過程中對銀行效率的影響，但是現有實證結果多支持跨國的併購活動不利於銀行的經營效率的論點。例如，Beitel and Schiereck (2001)發現歐洲銀行的跨國併購活動對併購效益與合併價值改變一般多為負效益，相對於國內銀行併購活動的併購效益與合併價值則為正效益。然而，DeLong (2001)與 Amihud et al. (2002)則認為美國銀行的併購活動相較於歐洲，特別是跨國的併購活動可大幅創造銀行的價值，主因為受惠於地域優勢與業務專業之利而實質提高其市場價值。

2.外國銀行相對於本國銀行較不具效率優勢

然而，外國銀行相對於本國銀行可能的劣勢，則因外國銀行地處遙遠而不利於母國總部在對國外分行組織的控管。特別是此相對距離的不利控制，卻可能隨著時間的技術提升的過程而降低，例如在美國境外的外國銀行(Berger and DeYoung, 2001 and 2006)。此外，儘管

比利時的外商銀行則非如此(Degryse and Ongena, 2002)，但美國銀行也隨著時間的改變，提高放款給距離較遠的中小企業(Petersen and Rajan, 2002; Hannan, 2003; Brevoort and Hannan, 2006)。

部分研究則指出外國銀行所面對進入國內市場障礙程度，不僅受到高度金融管制、地域距離、以及文化差異等因素所致，而這些因素也相當不利於跨國合併活動，尤其是當規模不經濟仍難以有效地被改善時(Buch, 2003 and 2005; Buch and DeLong, 2004; Choi et al., 2006)。外國銀行因地域性不利其母公司進行的組織協調，因而表現相對不具技術效率(Berger and Udell, 2002; Stein, 2002)。此外，Berger et al. (2003)研究過多國籍外國銀行分行在歐洲國家的經營模式，發現這些外國分行通常選擇與在地的國內銀行進行現金管理服務，即所謂「櫃檯效果」(“conciierge” effect)。然而，相對少數的實證研究針對外國銀行放款給中小企業貸款，但當想較已發展中國家的大規模與小規模的本國銀行的放款行為時，卻得到與大銀行組織的關係放款一致的不利條件。大銀行傾向於放款給大規模且更具財務安全性的企業(Haynes et al., 1999)，但是期間較短且較無管理上的往來關係(Berger et al., 2005)，以及主要基於企業的財務表現而非先前的往來關係來進行放款的決策(Cole et al., 2004)。

3.在同一個國家以共同效率前緣比較外國銀行與本國銀行的效率值

過去許多文獻在基於同一個國家效率前緣(nation-specific frontier)下，對同一個國家中的本國銀行與外國銀行同時進行經營效率的比較分析。美國的研究一般都發現平均而言外國銀行的效率較本國銀行為差(DeYoung and Nolle, 1996; Hasan and Hunter, 1996; Mahajan et al., 1996; Chang et al., 1998)，但此研究證據並不足以單獨認定是否來自於定國家的外國銀行相對美國境內的本國銀行更具經營效率。然而，也有一些實證發現在其他已發展國家的外國銀行其經營效率的表現幾乎與本國銀行一樣好(VanderVennet, 1996; Hasan and Lozano-Vivas, 1998)或是更具效率(Sturm and Williams, 2004)，但這些研究結果並無直接認定是否外國銀行其母國特性會影響其在地國的經營效率。

最近一些針對外國銀行效率的研究，則考量涵蓋較多已發展國家並認定國家特性對其經營的影響性。這些研究發現指出平均而言外國銀行的效率較本國銀行為低，但是母國總部設在美國的外國銀行在許多國家的經營效率則較本國銀行為佳(Berger et al., 2000; Miller and Parkhe, 2002)。Berger et al. (2004)格外指出可能的原因為美國藉由併購的國外直接投資(foreign direct investment)方式，直接輸出其金融機構管理的核心技術能力。再者，基於美國競爭市場的條件下，其金融市場開放與競爭激烈也會提高其母國銀行的經營效率，更有效影響其在國外分行的外國銀行效率。然而，探究發展中國家外國銀行效率的研究結果，往往與已開發中國家的結果大不相同。例如，Claessens et al. (2001)探討超過 80 個國家的外商銀行的研究發現，在開發中國家的外國銀行其效率與獲利性則相對較於已開發者為佳。

此外，部分探討單一國家的研究也指出外國銀行的經營效率相較於本國銀行為佳，例如：克羅埃西亞 (Kraft et al., 2006)、中國 (Berger et al, 2008)、巴基斯坦 (Bonaccorsi di Patti and Hardy, 2005)、匈牙利 (Hasan and Marton)、以及馬來西亞 (Matthews and Ismail, 2006)等國。但是，也有部分學者認為在開發中國家的外國銀行僅比較或稍微較本國銀行為差，例如：東歐國家(Yildirim and Philippatos, 2007)、阿根廷(Delfino, 2003; Berger et al., 2005)、波蘭(Havrylchyk, 2006)、以及泰國(Chantapong, 2005)，特別是外商銀行通常較本國公營銀行較具效率。此外，外國銀行可能傾向於收購在地國公營銀行，尤其是具不易解決的經營問題(Peek et al., 1999)以及具嚴重呆帳問題(Berger et al., 2005)。

三、研究方法

(一)資料包絡分析法(DEA)

「資料包絡法」(DEA)主要依據「個別決策單位」(Decision Management Unit, DMU)(如銀行)與整體效率前緣的相對距離，以計算其個別效率的指標，銀行技術可假定為「固定規模報酬」(Constant Returns to Scale, CRS)或「變動規模報酬」(Variable Returns to Scale, VRS)等兩種類型。Charnes et al. (1978)建議假定廠商生產技術為「投入導向」(input orientation)且具「固定規模報酬」的特性，因而可估計出廠商的「總技術效率」(Overall Technical Efficiency, OTE)。假定 K 個投入與 M 個產出對應 N 家銀行，如第 i 家銀行的投入與產出向量(vector)分別為 x_i 和 y_i 。因此，投入 X 為 $K \times N$ 的矩陣，產出 Y 為 $M \times N$ 的矩陣，則以投入導向為主且在固定規模生產技術架設下，銀行的效率計算如下：

$$\begin{aligned} & \text{Min}_{\theta, \delta} \theta \\ & \text{s.t.} \quad -y_i + Y\delta \geq 0 \\ & \quad \quad \theta x_i - X\delta \geq 0 \\ & \quad \quad \delta \geq 0 \end{aligned}$$

利用線性規劃(linear programming)求解 θ 值。基本上， $\theta \leq 1$ 表示為效率分數小於等於 1，而 k 為常數 $N \times 1$ 向量。若 $\theta = 1$ 時，表示此銀行相對整體銀行最具效率；反之，若 $\theta < 1$ 則表示銀行愈不具效率。然而，Banker et al. (1984)卻建議應假定銀行生產技術為變動規模效率，則銀行總效率可拆解成「純技術效率」(Pure Technical Efficiency, PTE)與「規模效率」(Scale Efficiency, SE)兩種類型。其中，「純技術效率」表示銀行管理其使用既定的能力，而「規模效率」則表示運用生產資源以延展其經營規模。依據 Canhoto and Dermine (2003)、Drake and Hall (2003)、Havrylchyk (2006)、Das and Ghosh (2006)等學者的建議，本研究假定銀行生產

技術為「變動規模報酬」，以計算外國銀行與本國銀行的效率分數。

同時本研究以 O'Donnell et al. (2008) 的共同邊界法估計全球銀行的效率值，並分別在固定規模報酬(constant return of scale)與變動規模報酬(variable return of scale)的不同假設下，以投入導分別估計兩種銀行的效率值。依據 Pasiouras (2007) 對投入與產出變數的設定，本研究使用三個投入與三個產出設定：在投入變數方面，本研究使用以下三個投入變數：(存款＋短期資金)、固定資產、人事費用，以及兩個產出變數，包括總貸款與其他營利資產。所有投入與產出變數均使用物價指數調整過，藉以降低通貨膨脹的估計問題。在「共同邊際」方法下使用 DEAP 視窗版軟體，分別估計個別國家中單一年度的外國銀行與本國的效率分數值。表 1 中分別將投入變數與產出變數以變異數分析檢定是否不同區域別(北美洲、亞洲、南美洲、非洲、歐洲等四個區域)下是否具差異性，結果顯示所有投入變數(存款與短期資金、固定資產、人事費用)及產出變數(總貸款與其他營利資產)在五大區域下具統計的顯著性。

(二)共同邊界前緣法(Meta-Frontier Approach)

本研究依據 O'Donnell et al. (2008) 提出的共同邊界法，適用在當 DMU 具有不同的生產技術時，可正確的加以評估經營效率。

1.共同邊際前緣(Meta-Frontier)

若 y 與 x 為非負數且為 $M \times 1$ 產出向量與 $N \times 1$ 投入向量，銀行利用目前所具備多種可行技術方法，產生許多的投入產出組合，這項組合稱為「共同技術集合」(Meta-Technology Set)。以數學式表示如下： $T = \{(x, y) : x \geq 0; y \geq 0; x \text{ 足以生產 } y\}$ 。其中產出組合為投入向量 x 與產出向量 y 所組成，亦即 $P(x) = \{y : (x, y) \in T\}$ 。所以，此產出集合所形成的邊界則稱為「共同邊界」(Meta-Frontier)。

2.群組邊界(Group Frontiers)

各種技術的組合，隱含表示不同類別的銀行其可能的生產組合。將銀行分成 k 組不同的類型(其中 $k > 1$)，並假設銀行經營效率受限於資源配置、政策法規或金融環境等因素的影響，而無法採用共同技術組合中之技術進行產出。此時，技術水準的範圍剛好等於所投入與產出所形成的共同邊界，第 k 組銀行受限於特定技術的組合，所得到的投入產出組合為： $T^k = \{(x, y) : x \geq 0; y \geq 0; x \text{ 可被特定 } k \text{ 群組的銀行使用來生產 } y\}$ 。在特定類別技術下，銀行所產生的產出組合及產出距離函數，也可以寫成： $P^k(x) = [y : (x, y) \in T^k]$ ，其中 $k=1, 2, \dots, s$ 且 $D^k(x, y) = \inf_{\theta} [y > 0 : (y/\theta) \in P^k(x)]$ ，其中 $k=1, 2, \dots, s$ 。

表 1、不同區域別之投入與產出變數之敘述統計

項目		區域別	樣本數	平均數	標準差	最小值	最大值	變異數分析 (F 檢定)
投入變數	(存款+短期資金)/物價指數	全體	16,292	3,066.948	8,241.224	0.109	99,565.220	147.40***
		北美	3,780	4,459.269	10,370.580	3.224	96,365.330	
		亞洲	1,874	6,184.764	9,595.893	17.878	99,565.220	
		非洲	282	1,880.429	5,182.845	3.750	31,116.460	
		南美	934	1,271.696	3,712.482	0.109	52,012.700	
		歐洲	9,422	2,101.718	7,058.793	0.892	97,919.220	
	固定資產/物價指數	全體	16,292	48.399	146.768	0.102	5,201.895	136.02***
		北美	3,780	66.242	150.685	0.103	1,532.772	
		亞洲	1,874	109.242	171.523	0.106	1,516.584	
		非洲	282	30.366	59.889	0.102	375.807	
		南美	934	41.603	107.188	0.102	1,087.302	
		歐洲	9,422	30.353	140.865	0.109	5,201.895	
	人事費用/物價指數	全體	16,292	46.712	153.609	0.103	5,237.880	86.67***
		北美	3,780	85.057	208.118	0.103	1,907.729	
		亞洲	1,874	51.921	90.663	0.292	1,209.798	
		非洲	282	44.230	116.525	0.111	799.153	
		南美	934	42.235	153.344	0.106	2,007.044	
		歐洲	9,422	30.811	134.945	0.104	5,237.880	
產出變數	總貸款/物價指數	全體	16,292	2,216.983	6,142.561	0.109	93,098.980	159.29***
		北美	3,780	3,638.108	8,695.879	0.279	90,236.250	
		亞洲	1,874	4,193.422	6,800.171	0.696	79,130.300	
		非洲	282	1,594.615	4,547.008	4.780	24,179.830	
		南美	934	711.005	2,022.242	0.109	27,334.870	
		歐洲	9,422	1,421.652	4,716.076	0.117	93,098.980	
	其他營利資產/物價指數	全體	16,292	1,421.955	5,107.180	0.121	92,545.000	30.73***
		北美	3,780	1,551.838	4,193.587	0.126	42,578.430	
		亞洲	1,874	2,525.138	5,553.717	3.214	90,518.900	
		非洲	282	657.089	2,022.926	2.446	19,739.330	
		南美	934	821.869	2,862.946	0.163	33,356.250	
		歐洲	9,422	1,232.808	5,535.866	0.121	92,545.000	

資料來源：本研究整理而成。

註：***表示在 1%信賴水準下具統計顯著性。

3.技術效率(Technical efficiency, TE)與技術缺口比率(Technology gap ratio, TGR)

不同銀行群組的邊界均被包含在共同邊界之內。在共同技術之下，銀行產出導向的技術效率為： $TE(x, y) = D(x, y)$ ，其中第 k 類群組個別邊界的產出導向技術效率為：

$TE^k(x, y) = D^k(x, y)$ ，且 $D^k(x, y) \geq D(x, y)$ ，且第 k 類群組中評估單位的產出導向的技術缺口

比率計算如下：

$$TGR^k(x, y) = \frac{D(x, y)}{D^k(x, y)} = \frac{TE(x, y)}{TE^k(x, y)}$$

假設一組特定投入與產出下在共同技術下所估計的技術效率值為 0.6，此共同邊際所對應第 k 群組的技術效率為 0.8，因此技術缺口比率(TGR)為 $0.75(=0.6/0.8)$ 。此比例意謂在既定投入組合下，第 k 群組銀行使用共同技術所產生的最大產出為 75%。

如圖 1 所示，假設在特定一國家中，在共同邊際前緣(M-M')下外國銀行與本國銀行使用不同生產技術，分別為外國銀行群組前緣曲線(1-1')與本國銀行群組前緣曲線(2-2')。因此，外商銀行的技術效率為 $TE(\text{外國銀行})=OC/OE$ ，技術缺口比率(外國銀行)= OD/OE 。若外國銀行群組前緣曲線(1-1')愈呈現凸性(convexity)，則表示外國銀行整體技術缺口比率愈大，即與外國效率的效率較全體共同邊際效率為差；反之，則外國銀行的效率表現愈佳。

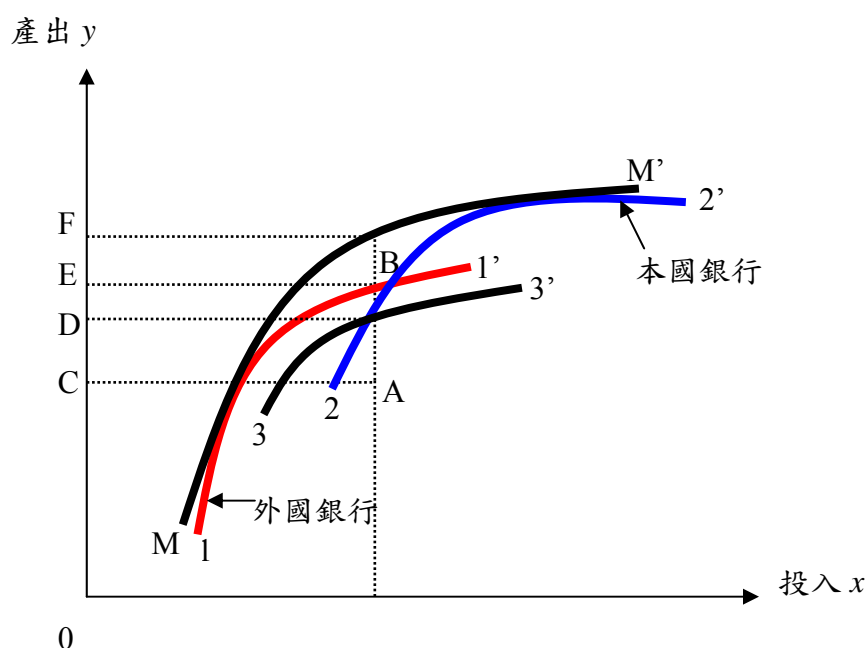


圖 1、技術效率與共同技術比率

表 2 為不同銀行別(外國銀行)與區域差異(非洲、歐洲、亞洲、北美洲、南美洲)下銀行技術差距比率(TGR)之平均數與變異數分析結果，整體而言外國銀行與本國銀行以及不同區域間在不同技術效率型態下皆具顯著的差異性。首先，就固定規模報酬技術效率來看，全體銀行的平均值為 0.836，而外國銀行的平均值為 0.856，略高於全體銀行的平均數，顯著高於本國銀行的平均值 0.834；歐洲整體平均效率值最高達到 0.952，最低則為非洲其平均值僅達 0.487。其次，就變動規模報酬技術效率來看，整體全球銀行的平均值為 0.871，略高於固定規模報酬技術效率的平均數，而外國銀行整體平均效率值仍略高於本國銀行，但差距較小；歐洲與非洲仍分別維持最高與最低的平均效率值。最後，就規模效率而言，整體全球銀行的平均值高達 0.963，外國銀行的平均規模效率仍高本國銀行，分別為 0.981 及 0.960；南美洲銀行的平均效率為 1.026 居全體最高，相對而言最低平均規模效率則為北美的銀行為 0.888。

再者，表 3 為全體銀行、本國銀行與外國銀行分別在所屬地主國的敘述統計，全體樣本數為 16,292，其中樣本數最多出現在德國為 4,722，但具有最多外國銀行樣本數的國家為 228，其次為美國的 161 個樣本數，但仍有孟加拉、日本、墨西哥、哈薩克、奈及利亞、巴基斯坦、巴拿馬、新加坡、斯里蘭卡、瑞典、越南等 11 國中，因資料不完備而沒有收錄外國銀行的樣本。

(三)實證模型設定

本研究依據過去文獻結果設定以下的實證模型：

$$\begin{aligned} \text{技術差距比率}_{i,j,t} = & \alpha_1 \times \text{外國銀行所有權}_{i,j,t-1} + \sum_{k=1}^{15} \delta_k \times \text{銀行財務特性}_{i,j,t} \\ & + \sum_{p=1}^3 \beta_p^{\text{地主國}} \times (\text{總體經濟})_{j,t}^{\text{地主國}} + \sum_{s=1}^6 \gamma_s^{\text{地主國}} \times (\text{機構治理品質})_{j,t}^{\text{地主國}} \\ & + \lambda_t + \pi_j + \varepsilon_{i,j,t} \end{aligned}$$

其中， i 表示銀行、 j 表示為國家、 t 表示為時間； λ_t 與 π_j 則分別表示為「時間效果」(time effect) 與「國家特定效果」(country-specific effects)， $\varepsilon_{i,j,t}$ 表示為誤差項(random error)。基於銀行技術效率比率介於 0 到 1 之間的數值，且資料結構為 unbalanced panel 型態，因此本研究採用具隨機效果的 Panel Tobit Model 方法估計以上之實證模型。

表 2、不同銀行與區域差異下技術差距比率(TGR)之平均數與變異數分析

項目		固定規模報酬技術效率	變動規模報酬技術效率	規模效率
銀行別差異	全體銀行	0.836	0.871	0.963
	外國銀行	0.856	0.878	0.981
	本國銀行	0.834	0.870	0.960
	變異數分析 (P 值)	35.62*** (0.000)	5.90** (0.015)	60.38*** (0.000)
區域別差異	全體銀行	0.836	0.871	0.963
	非洲	0.487	0.549	0.913
	歐洲	0.952	0.952	1.001
	亞洲	0.774	0.878	0.894
	南美	0.745	0.739	1.026
	北美	0.628	0.722	0.888
	變異數分析 (P 值)	22,888*** (0.000)	6,331*** (0.000)	1,332*** (0.000)

資料來源：本研究整理而成。

註：**、***分別表示在 5%與 1%信賴水準下具統計顯著性。

應變數(dependent variable)為銀行技術差距比率(TGR)，自變數(independent variables)則包括：「外國銀行所有權」，本研究將外國銀行定義為母國之外人大股東持股比率超過 50%以上者。在「銀行財務特性」變數方面，本研究則分別使用(總權益/總資產)、(總營運資金/總資產)、(總營運資金/總負債)、總資產取自然對數、(呆帳準備/淨利息收益)、(總貸款/總資產)、(流動資產/總存款與借款)、(資產負債表外金額/總資產)、(淨貸款/總存款與借款)、(淨貸款/總存款融資)、(股東權益報酬率)、(非利息支出/平均資產)、(成本收益比率)、(其他營運收益/平均資產)、(非營運項目/淨收益)等財務變數。在「國家總體經濟」變數方面，分別使用「每人國內生產毛額成長率」(Growth Rate of GDP per capita)、「通貨膨脹率」與「實質利率」等。

再者，因為樣本銀行中跨國機構治理品質存在相當大的差異性，對本國銀行及外國銀行具重要的直接影響。因此，本研究採用 Kaufman et al. (2008)年針對全球所建立的「全球治理指標」(Global Governance Index)，進一步認定在地國在機構治理品質對本國銀行與外國銀行在技術差距比率上的影響是否存在實質的差異性。「全球治理指標」可細成六種指標：(1)「言論與表達」(Voice and Accountability, VC)，即表示一國人民可以充分自由表達民意的通暢程度；(2)「政治穩定度」(Political Instability and Violence, PIV)，即表示政府對遏止暴力與恐怖活動的認知程度；(3)「政府效能」(Government Effectiveness, GE)，即政府政策執行的有效程度、獨立性以及執行力等；(4)「管制品質」(Regulatory Quality, RG)，即表示政府制訂與執行健全政策的能力；(5)「法律規範」(Rule of Law, RL)，即表示衡量機構對社會法治的遵守與信心程度，特別是契約、政策、司法審判、以及犯罪與暴力的可能性方面的執行品質；(6)「貪污控制」(Control of Corruption, CR)，表示政府對公權力的維護程度。

表 3、不同國家下銀行差異之技術差距比率(TGR)

國家	技術差距比率(TGR)	全體銀行					外國銀行					本國銀行				
		樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值
ARGENTINA	固定規模報酬技術效率	146	0.777	0.076	0.505	0.992	35	0.784	0.077	0.626	0.946	111	0.775	0.076	0.505	0.992
	變動規模報酬技術效率	146	0.778	0.121	0.506	1.000	35	0.775	0.140	0.506	1.000	111	0.778	0.115	0.557	1.000
	規模效率	146	1.021	0.178	0.644	1.599	35	1.041	0.205	0.668	1.599	111	1.015	0.169	0.644	1.448
AUSTRIA	固定規模報酬技術效率	249	0.950	0.058	0.493	1.000	25	0.940	0.071	0.756	0.990	224	0.951	0.056	0.493	1.000
	變動規模報酬技術效率	249	0.947	0.058	0.519	1.000	25	0.941	0.067	0.766	0.993	224	0.948	0.057	0.519	1.000
	規模效率	249	1.004	0.032	0.902	1.112	25	0.999	0.011	0.964	1.017	224	1.004	0.033	0.902	1.112
BANGLADESH	固定規模報酬技術效率	95	0.771	0.046	0.696	0.948	0	—	—	—	—	95	0.771	0.046	0.696	0.948
	變動規模報酬技術效率	95	0.790	0.056	0.706	0.949	0	—	—	—	—	95	0.790	0.056	0.706	0.949
	規模效率	95	0.978	0.053	0.775	1.028	0	—	—	—	—	95	0.978	0.053	0.775	1.028
BELGIUM	固定規模報酬技術效率	148	0.946	0.041	0.787	0.997	58	0.948	0.040	0.787	0.997	90	0.946	0.042	0.795	0.995
	變動規模報酬技術效率	148	0.944	0.051	0.776	1.000	58	0.941	0.055	0.776	1.000	90	0.946	0.049	0.786	1.000
	規模效率	148	1.004	0.042	0.886	1.229	58	1.009	0.030	0.963	1.087	90	1.001	0.048	0.886	1.229
BOLIVIA	固定規模報酬技術效率	48	0.700	0.068	0.626	0.889	14	0.723	0.040	0.681	0.801	34	0.690	0.075	0.626	0.889
	變動規模報酬技術效率	48	0.751	0.124	0.611	1.000	14	0.851	0.137	0.687	1.000	34	0.711	0.092	0.611	0.946
	規模效率	48	0.943	0.087	0.690	1.025	14	0.869	0.133	0.690	1.014	34	0.974	0.025	0.929	1.025
BRAZIL	固定規模報酬技術效率	257	0.745	0.077	0.360	1.000	58	0.739	0.071	0.485	0.889	199	0.747	0.079	0.360	1.000
	變動規模報酬技術效率	257	0.742	0.104	0.321	1.000	58	0.744	0.083	0.590	1.000	199	0.742	0.109	0.321	1.000
	規模效率	257	1.017	0.143	0.485	1.487	58	0.999	0.101	0.485	1.275	199	1.022	0.153	0.672	1.487
BULGARIA	固定規模報酬技術效率	50	0.950	0.028	0.890	0.996	28	0.951	0.030	0.890	0.996	22	0.949	0.025	0.896	0.993
	變動規模報酬技術效率	50	0.954	0.027	0.894	0.991	28	0.956	0.031	0.894	0.991	22	0.952	0.021	0.912	0.987
	規模效率	50	0.995	0.015	0.943	1.053	28	0.994	0.010	0.961	1.009	22	0.997	0.020	0.943	1.053
CANADA	固定規模報酬技術效率	110	0.666	0.080	0.533	0.896	56	0.679	0.080	0.570	0.896	54	0.651	0.078	0.533	0.850
	變動規模報酬技術效率	110	0.776	0.127	0.399	1.000	56	0.712	0.094	0.399	0.909	54	0.842	0.123	0.571	1.000
	規模效率	110	0.879	0.186	0.620	2.248	56	0.968	0.188	0.761	2.248	54	0.787	0.132	0.620	1.059
CHILE	固定規模報酬技術效率	94	0.686	0.082	0.495	0.921	23	0.741	0.089	0.571	0.921	71	0.668	0.072	0.495	0.830
	變動規模報酬技術效率	94	0.711	0.107	0.512	0.975	23	0.758	0.126	0.585	0.975	71	0.695	0.097	0.512	0.914
	規模效率	94	0.979	0.144	0.716	1.503	23	0.989	0.099	0.814	1.216	71	0.975	0.156	0.716	1.503
COLOMBIA	固定規模報酬技術效率	74	0.752	0.077	0.601	0.957	15	0.712	0.044	0.640	0.807	59	0.762	0.081	0.601	0.957
	變動規模報酬技術效率	74	0.704	0.112	0.572	0.968	15	0.656	0.069	0.591	0.794	59	0.716	0.118	0.572	0.968
	規模效率	74	1.084	0.135	0.758	1.366	15	1.091	0.078	0.953	1.193	59	1.082	0.146	0.758	1.366
COSTA RICA	固定規模報酬技術效率	35	0.792	0.055	0.680	0.946	14	0.775	0.048	0.680	0.875	21	0.804	0.057	0.710	0.946
	變動規模報酬技術效率	35	0.718	0.131	0.502	0.977	14	0.787	0.092	0.689	0.965	21	0.673	0.136	0.502	0.977
	規模效率	35	1.140	0.231	0.778	1.569	14	0.998	0.139	0.778	1.224	21	1.235	0.234	0.902	1.569
CROATIA	固定規模報酬技術效率	82	0.943	0.042	0.718	1.000	33	0.960	0.017	0.916	1.000	49	0.932	0.050	0.718	0.983
	變動規模報酬技術效率	82	0.944	0.053	0.671	0.998	33	0.958	0.025	0.892	0.988	49	0.934	0.064	0.671	0.998
	規模效率	82	1.001	0.026	0.953	1.108	33	1.003	0.029	0.953	1.090	49	0.999	0.024	0.957	1.108
CYPRUS	固定規模報酬技術效率	35	0.965	0.015	0.930	0.986	8	0.969	0.013	0.946	0.984	27	0.963	0.016	0.930	0.986
	變動規模報酬技術效率	35	0.956	0.023	0.911	0.992	8	0.970	0.013	0.950	0.983	27	0.953	0.024	0.911	0.992
	規模效率	35	1.010	0.030	0.945	1.065	8	1.000	0.003	0.995	1.004	27	1.012	0.034	0.945	1.065
CZECH REPUBLIC	固定規模報酬技術效率	53	0.948	0.022	0.863	0.984	32	0.950	0.018	0.927	0.984	21	0.947	0.027	0.863	0.976
	變動規模報酬技術效率	53	0.955	0.034	0.856	0.998	32	0.966	0.020	0.928	0.998	21	0.939	0.044	0.856	0.997
	規模效率	53	0.993	0.033	0.909	1.092	32	0.983	0.019	0.956	1.015	21	1.009	0.042	0.909	1.092
DENMARK	固定規模報酬技術效率	327	0.967	0.022	0.811	1.000	12	0.976	0.014	0.954	0.995	315	0.966	0.022	0.811	1.000
	變動規模報酬技術效率	327	0.965	0.026	0.790	1.000	12	0.971	0.012	0.945	0.982	315	0.965	0.026	0.790	1.000
	規模效率	327	1.002	0.021	0.856	1.103	12	1.006	0.008	0.997	1.017	315	1.002	0.021	0.856	1.103
DOMINICAN REPUBL	固定規模報酬技術效率	39	0.787	0.070	0.619	1.000	14	0.822	0.099	0.619	1.000	25	0.768	0.036	0.701	0.886
	變動規模報酬技術效率	39	0.699	0.111	0.538	1.000	14	0.801	0.092	0.664	1.000	25	0.642	0.075	0.538	0.789
	規模效率	39	1.146	0.162	0.869	1.460	14	1.030	0.112	0.869	1.360	25	1.212	0.150	0.995	1.460
FRANCE	固定規模報酬技術效率	771	0.934	0.093	0.228	1.000	138	0.922	0.110	0.383	0.994	633	0.936	0.088	0.228	1.000
	變動規模報酬技術效率	771	0.927	0.089	0.321	1.000	138	0.919	0.116	0.445	1.000	633	0.929	0.082	0.321	1.000
	規模效率	771	1.009	0.065	0.323	1.442	138	1.005	0.059	0.859	1.325	633	1.009	0.066	0.323	1.442
GERMANY	固定規模報酬技術效率	4,722	0.962	0.036	0.398	1.000	152	0.914	0.102	0.398	1.000	4,570	0.964	0.030	0.582	1.000
	變動規模報酬技術效率	4,722	0.963	0.038	0.347	1.000	152	0.913	0.105	0.347	1.000	4,570	0.965	0.032	0.563	1.000
	規模效率	4,722	0.999	0.031	0.508	1.604	152	1.008	0.107	0.508	1.604	4,570	0.999	0.024	0.719	1.425

資料來源：本研究整理而成。

續表 3

國家	技術差距比率(TGR)	全體銀行					外國銀行					本國銀行				
		樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值
GREECE	固定規模報酬技術效率率	29	0.969	0.019	0.937	1.000	17	0.970	0.019	0.937	1.000	12	0.967	0.019	0.942	1.000
	變動規模報酬技術效率率	29	0.950	0.024	0.882	0.987	17	0.956	0.019	0.918	0.987	12	0.940	0.028	0.882	0.982
	規模效率率	29	1.020	0.030	0.978	1.091	17	1.015	0.028	0.978	1.078	12	1.029	0.031	0.991	1.091
GUATEMALA	固定規模報酬技術效率率	2	0.706	0.013	0.697	0.716	0	—	—	—	—	2	0.706	0.013	0.697	0.716
	變動規模報酬技術效率率	2	0.738	0.013	0.729	0.747	0	—	—	—	—	2	0.738	0.013	0.729	0.747
	規模效率率	2	0.957	0.000	0.957	0.957	0	—	—	—	—	2	0.957	0.000	0.957	0.957
HONDURAS	固定規模報酬技術效率率	56	0.749	0.068	0.642	0.920	10	0.746	0.054	0.662	0.803	46	0.750	0.071	0.642	0.920
	變動規模報酬技術效率率	56	0.773	0.095	0.636	0.957	10	0.768	0.086	0.636	0.889	46	0.774	0.098	0.646	0.957
	規模效率率	56	0.973	0.046	0.891	1.080	10	0.975	0.043	0.902	1.040	46	0.972	0.047	0.891	1.080
HONG KONG	固定規模報酬技術效率率	81	0.815	0.050	0.661	0.945	26	0.820	0.036	0.771	0.872	55	0.812	0.055	0.661	0.945
	變動規模報酬技術效率率	81	0.882	0.080	0.561	0.975	26	0.889	0.059	0.780	0.962	55	0.879	0.088	0.561	0.975
	規模效率率	81	0.931	0.095	0.777	1.279	26	0.927	0.082	0.806	1.076	55	0.932	0.101	0.777	1.279
HUNGARY	固定規模報酬技術效率率	47	0.961	0.018	0.922	0.997	34	0.964	0.018	0.922	0.997	13	0.954	0.018	0.928	0.992
	變動規模報酬技術效率率	47	0.951	0.022	0.905	0.997	34	0.949	0.024	0.905	0.997	13	0.956	0.016	0.924	0.992
	規模效率率	47	1.011	0.022	0.981	1.077	34	1.016	0.023	0.991	1.077	13	0.998	0.009	0.981	1.009
INDIA	固定規模報酬技術效率率	271	0.824	0.049	0.596	0.945	10	0.818	0.024	0.783	0.846	261	0.824	0.050	0.596	0.945
	變動規模報酬技術效率率	271	0.827	0.074	0.602	0.994	10	0.821	0.024	0.783	0.850	261	0.827	0.075	0.602	0.994
	規模效率率	271	1.004	0.100	0.709	1.256	10	0.997	0.003	0.992	1.000	261	1.004	0.102	0.709	1.256
INDONESIA	固定規模報酬技術效率率	145	0.803	0.058	0.661	0.921	58	0.781	0.058	0.693	0.897	87	0.817	0.053	0.661	0.921
	變動規模報酬技術效率率	145	0.783	0.080	0.547	1.000	58	0.784	0.073	0.613	0.926	87	0.782	0.085	0.547	1.000
	規模效率率	145	1.034	0.118	0.783	1.441	58	1.005	0.121	0.783	1.375	87	1.054	0.112	0.873	1.441
IRELAND	固定規模報酬技術效率率	35	0.954	0.029	0.903	0.996	22	0.946	0.030	0.903	0.996	13	0.966	0.021	0.911	0.984
	變動規模報酬技術效率率	35	0.947	0.037	0.862	1.000	22	0.953	0.030	0.880	1.000	13	0.938	0.046	0.862	1.000
	規模效率率	35	1.008	0.041	0.934	1.094	22	0.994	0.034	0.934	1.051	13	1.032	0.042	0.966	1.094
ITALY	固定規模報酬技術效率率	904	0.958	0.046	0.064	1.000	34	0.946	0.051	0.792	1.000	870	0.958	0.045	0.064	1.000
	變動規模報酬技術效率率	904	0.954	0.043	0.519	1.000	34	0.921	0.057	0.770	1.000	870	0.956	0.042	0.519	1.000
	規模效率率	904	1.004	0.045	0.088	1.535	34	1.027	0.033	0.991	1.106	870	1.003	0.045	0.088	1.535
JAPAN	固定規模報酬技術效率率	603	0.736	0.048	0.298	1.000	0	—	—	—	—	603	0.736	0.048	0.298	1.000
	變動規模報酬技術效率率	603	0.953	0.051	0.354	1.000	0	—	—	—	—	603	0.953	0.051	0.354	1.000
	規模效率率	603	0.774	0.052	0.680	1.018	0	—	—	—	—	603	0.774	0.052	0.680	1.018
KAZAKHSTAN	固定規模報酬技術效率率	30	0.761	0.036	0.692	0.850	0	—	—	—	—	30	0.761	0.036	0.692	0.850
	變動規模報酬技術效率率	30	0.797	0.079	0.615	0.947	0	—	—	—	—	30	0.797	0.079	0.615	0.947
	規模效率率	30	0.963	0.105	0.742	1.203	0	—	—	—	—	30	0.963	0.105	0.742	1.203
KENYA	固定規模報酬技術效率率	95	0.487	0.041	0.365	0.570	20	0.470	0.034	0.379	0.528	75	0.491	0.042	0.365	0.570
	變動規模報酬技術效率率	95	0.564	0.126	0.344	1.000	20	0.480	0.055	0.354	0.581	75	0.587	0.131	0.344	1.000
	規模效率率	95	0.890	0.131	0.460	1.106	20	0.988	0.083	0.867	1.085	75	0.864	0.130	0.460	1.106
South KOREA	固定規模報酬技術效率率	56	0.740	0.032	0.686	0.810	9	0.737	0.015	0.705	0.753	47	0.741	0.035	0.686	0.810
	變動規模報酬技術效率率	56	0.961	0.034	0.845	1.000	9	0.991	0.010	0.975	1.000	47	0.955	0.034	0.845	1.000
	規模效率率	56	0.772	0.053	0.698	0.889	9	0.744	0.018	0.709	0.769	47	0.777	0.055	0.698	0.889
LATVIA	固定規模報酬技術效率率	73	0.951	0.031	0.813	0.994	39	0.953	0.026	0.891	0.994	34	0.949	0.036	0.813	0.994
	變動規模報酬技術效率率	73	0.948	0.029	0.847	0.993	39	0.944	0.026	0.879	0.984	34	0.952	0.031	0.847	0.993
	規模效率率	73	1.004	0.020	0.959	1.073	39	1.010	0.022	0.980	1.073	34	0.997	0.015	0.959	1.019
LUXEMBOURG	固定規模報酬技術效率率	278	0.961	0.030	0.722	1.000	228	0.961	0.028	0.832	1.000	50	0.962	0.039	0.722	1.000
	變動規模報酬技術效率率	278	0.976	0.028	0.738	1.000	228	0.980	0.021	0.851	1.000	50	0.960	0.046	0.738	1.000
	規模效率率	278	0.985	0.030	0.832	1.236	228	0.982	0.027	0.832	1.051	50	1.003	0.037	0.954	1.236
MACAU	固定規模報酬技術效率率	24	0.894	0.044	0.788	0.951	17	0.908	0.023	0.874	0.951	7	0.861	0.065	0.788	0.928
	變動規模報酬技術效率率	24	0.848	0.044	0.776	0.921	17	0.868	0.033	0.821	0.921	7	0.799	0.021	0.776	0.840
	規模效率率	24	1.057	0.067	0.992	1.185	17	1.048	0.060	0.995	1.158	7	1.078	0.082	0.992	1.185
MALAYSIA	固定規模報酬技術效率率	129	0.762	0.090	0.389	1.000	57	0.787	0.052	0.668	0.924	72	0.741	0.108	0.389	1.000
	變動規模報酬技術效率率	129	0.877	0.124	0.410	1.000	57	0.859	0.085	0.675	0.973	72	0.890	0.146	0.410	1.000
	規模效率率	129	0.880	0.116	0.703	1.174	57	0.926	0.116	0.734	1.174	72	0.844	0.103	0.703	1.062
MEXICO	固定規模報酬技術效率率	3	0.645	0.314	0.402	1.000	0	—	—	—	—	3	0.645	0.314	0.402	1.000
	變動規模報酬技術效率率	3	0.630	0.324	0.399	1.000	0	—	—	—	—	3	0.630	0.324	0.399	1.000
	規模效率率	3	1.031	0.047	1.000	1.086	0	—	—	—	—	3	1.031	0.047	1.000	1.086
MONACO	固定規模報酬技術效率率	31	0.977	0.016	0.936	0.992	21	0.981	0.009	0.960	0.992	10	0.967	0.022	0.936	0.989
	變動規模報酬技術效率率	31	0.977	0.021	0.930	1.000	21	0.981	0.013	0.943	0.997	10	0.966	0.030	0.930	1.000
	規模效率率	31	1.000	0.009	0.988	1.022	21	1.000	0.007	0.992	1.016	10	1.001	0.011	0.988	1.022

資料來源：本研究整理而成。

續表 3

國家	技術差距比率(TGR)	全體銀行					外國銀行					本國銀行				
		樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值
NETHERLANDS	固定規模報酬技術效率	85	0.928	0.094	0.518	1.000	31	0.927	0.115	0.518	1.000	54	0.929	0.081	0.658	0.997
	變動規模報酬技術效率	85	0.932	0.100	0.546	1.000	31	0.945	0.103	0.546	1.000	54	0.924	0.098	0.561	0.995
	規模效率	85	0.999	0.057	0.765	1.214	31	0.980	0.049	0.765	1.049	54	1.009	0.059	0.911	1.214
NIGERIA	固定規模報酬技術效率	69	0.515	0.043	0.352	0.603	0	—	—	—	—	69	0.515	0.043	0.352	0.603
	變動規模報酬技術效率	69	0.516	0.053	0.362	0.746	0	—	—	—	—	69	0.516	0.053	0.362	0.746
	規模效率	69	1.002	0.070	0.808	1.281	0	—	—	—	—	69	1.002	0.070	0.808	1.281
NORWAY	固定規模報酬技術效率	111	0.914	0.052	0.449	0.993	12	0.925	0.042	0.796	0.957	99	0.912	0.053	0.449	0.993
	變動規模報酬技術效率	111	0.899	0.048	0.457	0.976	12	0.907	0.038	0.829	0.956	99	0.899	0.049	0.457	0.976
	規模效率	111	1.016	0.032	0.963	1.155	12	1.020	0.039	0.963	1.104	99	1.016	0.031	0.984	1.155
PAKISTAN	固定規模報酬技術效率	85	0.801	0.054	0.653	0.927	0	—	—	—	—	85	0.801	0.054	0.653	0.927
	變動規模報酬技術效率	85	0.817	0.062	0.639	0.952	0	—	—	—	—	85	0.817	0.062	0.639	0.952
	規模效率	85	0.985	0.083	0.794	1.216	0	—	—	—	—	85	0.985	0.083	0.794	1.216
PANAMA	固定規模報酬技術效率	6	0.598	0.009	0.587	0.609	0	—	—	—	—	6	0.598	0.009	0.587	0.609
	變動規模報酬技術效率	6	0.644	0.023	0.618	0.676	0	—	—	—	—	6	0.644	0.023	0.618	0.676
	規模效率	6	0.930	0.037	0.900	0.981	0	—	—	—	—	6	0.930	0.037	0.900	0.981
PARAGUAY	固定規模報酬技術效率	52	0.748	0.093	0.336	1.000	20	0.764	0.050	0.690	0.851	32	0.739	0.111	0.336	1.000
	變動規模報酬技術效率	52	0.827	0.105	0.643	1.000	20	0.830	0.094	0.712	1.000	32	0.825	0.112	0.643	1.000
	規模效率	52	0.914	0.117	0.336	1.146	20	0.926	0.051	0.811	0.991	32	0.907	0.144	0.336	1.146
PERU	固定規模報酬技術效率	53	0.725	0.043	0.627	0.844	28	0.725	0.039	0.660	0.807	25	0.726	0.047	0.627	0.844
	變動規模報酬技術效率	53	0.712	0.073	0.603	0.914	28	0.718	0.066	0.609	0.855	25	0.706	0.080	0.603	0.914
	規模效率	53	1.025	0.085	0.921	1.238	28	1.015	0.081	0.924	1.238	25	1.036	0.089	0.921	1.207
PHILIPPINES	固定規模報酬技術效率	67	0.811	0.051	0.681	0.900	7	0.810	0.011	0.795	0.825	60	0.811	0.054	0.681	0.900
	變動規模報酬技術效率	67	0.793	0.063	0.575	0.895	7	0.794	0.011	0.780	0.807	60	0.793	0.067	0.575	0.895
	規模效率	67	1.026	0.066	0.880	1.208	7	1.019	0.005	1.013	1.026	60	1.027	0.070	0.880	1.208
POLAND	固定規模報酬技術效率	75	0.959	0.022	0.880	0.998	39	0.969	0.018	0.914	0.998	36	0.949	0.021	0.880	0.990
	變動規模報酬技術效率	75	0.960	0.021	0.903	0.998	39	0.965	0.019	0.911	0.998	36	0.955	0.023	0.903	0.993
	規模效率	75	0.999	0.017	0.957	1.049	39	1.004	0.015	0.961	1.049	36	0.994	0.017	0.957	1.016
PORTUGAL	固定規模報酬技術效率	56	0.954	0.033	0.843	0.994	9	0.936	0.031	0.875	0.972	47	0.958	0.032	0.843	0.994
	變動規模報酬技術效率	56	0.936	0.038	0.835	1.000	9	0.909	0.034	0.835	0.939	47	0.941	0.037	0.878	1.000
	規模效率	56	1.020	0.043	0.925	1.107	9	1.030	0.027	1.000	1.080	47	1.019	0.046	0.925	1.107
RUSSIAN FEDERATI	固定規模報酬技術效率	49	0.881	0.110	0.568	0.989	5	0.970	0.016	0.949	0.986	44	0.870	0.112	0.568	0.989
	變動規模報酬技術效率	49	0.893	0.095	0.617	1.000	5	0.963	0.029	0.914	0.984	44	0.885	0.096	0.617	1.000
	規模效率	49	0.986	0.070	0.773	1.124	5	1.008	0.045	0.966	1.078	44	0.984	0.072	0.773	1.124
SINGAPORE	固定規模報酬技術效率	19	0.808	0.068	0.728	0.937	0	—	—	—	—	19	0.808	0.068	0.728	0.937
	變動規模報酬技術效率	19	0.923	0.065	0.796	0.996	0	—	—	—	—	19	0.923	0.065	0.796	0.996
	規模效率	19	0.880	0.110	0.732	1.057	0	—	—	—	—	19	0.880	0.110	0.732	1.057
SLOVAKIA	固定規模報酬技術效率	41	0.946	0.019	0.911	0.994	37	0.949	0.018	0.927	0.994	4	0.921	0.009	0.911	0.931
	變動規模報酬技術效率	41	0.958	0.025	0.900	0.996	37	0.963	0.020	0.926	0.996	4	0.910	0.007	0.900	0.918
	規模效率	41	0.988	0.022	0.945	1.013	37	0.985	0.021	0.945	1.013	4	1.012	0.002	1.009	1.013
SLOVENIA	固定規模報酬技術效率	53	0.951	0.016	0.902	0.978	16	0.964	0.006	0.953	0.978	37	0.945	0.015	0.902	0.969
	變動規模報酬技術效率	53	0.956	0.020	0.903	0.990	16	0.968	0.011	0.953	0.990	37	0.951	0.021	0.903	0.988
	規模效率	53	0.994	0.012	0.966	1.023	16	0.996	0.009	0.973	1.011	37	0.994	0.013	0.966	1.023
SOUTH AFRICA	固定規模報酬技術效率	70	0.451	0.113	0.028	0.572	25	0.485	0.054	0.384	0.572	45	0.432	0.132	0.028	0.567
	變動規模報酬技術效率	70	0.593	0.205	0.035	1.000	25	0.688	0.168	0.438	1.000	45	0.541	0.207	0.035	0.854
	規模效率	70	0.799	0.183	0.396	1.190	25	0.740	0.165	0.554	0.988	45	0.831	0.186	0.396	1.190
SPAIN	固定規模報酬技術效率	291	0.941	0.061	0.592	1.000	30	0.919	0.103	0.592	1.000	261	0.944	0.054	0.722	1.000
	變動規模報酬技術效率	291	0.921	0.058	0.606	1.000	30	0.905	0.098	0.606	1.000	261	0.922	0.052	0.727	1.000
	規模效率	291	1.023	0.040	0.892	1.145	30	1.016	0.036	0.972	1.132	261	1.024	0.040	0.892	1.145
SRI LANKA	固定規模報酬技術效率	40	0.777	0.045	0.672	0.884	0	—	—	—	—	40	0.777	0.045	0.672	0.884
	變動規模報酬技術效率	40	0.735	0.043	0.635	0.802	0	—	—	—	—	40	0.735	0.043	0.635	0.802
	規模效率	40	1.061	0.098	0.953	1.378	0	—	—	—	—	40	1.061	0.098	0.953	1.378
SWEDEN	固定規模報酬技術效率	30	0.899	0.141	0.423	1.000	0	—	—	—	—	30	0.899	0.141	0.423	1.000
	變動規模報酬技術效率	30	0.907	0.088	0.653	0.995	0	—	—	—	—	30	0.907	0.088	0.653	0.995
	規模效率	30	0.986	0.094	0.645	1.152	0	—	—	—	—	30	0.986	0.094	0.645	1.152

資料來源：本研究整理而成。

表 3

國家	技術差距比率(TGR)	全體銀行					外國銀行					本國銀行				
		樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值
SWITZERLAND	固定規模報酬技術效率	700	0.909	0.075	0.306	1.000	152	0.926	0.099	0.306	1.000	548	0.905	0.067	0.565	1.000
	變動規模報酬技術效率	700	0.915	0.078	0.422	1.000	152	0.918	0.111	0.448	1.000	548	0.914	0.067	0.422	1.000
	規模效率	700	0.995	0.052	0.689	1.551	152	1.012	0.069	0.689	1.551	548	0.991	0.045	0.817	1.449
TAIWAN	固定規模報酬技術效率	99	0.750	0.052	0.683	0.943	5	0.721	0.017	0.705	0.744	94	0.751	0.053	0.683	0.943
	變動規模報酬技術效率	99	0.958	0.038	0.801	1.000	5	0.977	0.009	0.967	0.989	94	0.957	0.039	0.801	1.000
	規模效率	99	0.785	0.086	0.704	1.152	5	0.738	0.017	0.720	0.758	94	0.788	0.087	0.704	1.152
THAILAND	固定規模報酬技術效率	78	0.746	0.060	0.574	0.889	10	0.771	0.069	0.670	0.846	68	0.742	0.059	0.574	0.889
	變動規模報酬技術效率	78	0.864	0.108	0.615	1.000	10	0.765	0.064	0.668	0.847	68	0.879	0.105	0.615	1.000
	規模效率	78	0.875	0.115	0.631	1.195	10	1.010	0.079	0.931	1.195	68	0.855	0.107	0.631	1.031
TUNISIA	固定規模報酬技術效率	48	0.496	0.027	0.467	0.569	21	0.507	0.039	0.467	0.569	27	0.488	0.008	0.470	0.504
	變動規模報酬技術效率	48	0.500	0.043	0.444	0.659	21	0.502	0.063	0.444	0.659	27	0.499	0.015	0.472	0.522
	規模效率	48	0.995	0.057	0.865	1.153	21	1.017	0.075	0.865	1.153	27	0.978	0.031	0.929	1.028
UKRAINE	固定規模報酬技術效率	49	0.912	0.078	0.705	1.000	8	0.957	0.037	0.895	0.998	41	0.903	0.081	0.705	1.000
	變動規模報酬技術效率	49	0.897	0.084	0.707	0.995	8	0.950	0.040	0.869	0.995	41	0.887	0.087	0.707	0.995
	規模效率	49	1.018	0.045	0.912	1.177	8	1.008	0.024	0.963	1.030	41	1.020	0.049	0.912	1.177
UNITED KINGDOM	固定規模報酬技術效率	48	0.940	0.067	0.625	0.996	13	0.948	0.052	0.795	0.995	35	0.937	0.073	0.625	0.996
	變動規模報酬技術效率	48	0.977	0.025	0.867	1.000	13	0.985	0.013	0.964	1.000	35	0.974	0.027	0.867	1.000
	規模效率	48	0.963	0.072	0.625	1.036	13	0.963	0.057	0.795	1.013	35	0.962	0.077	0.625	1.036
USA	固定規模報酬技術效率	3670	0.627	0.068	0.131	1.000	161	0.640	0.104	0.131	0.931	3509	0.626	0.066	0.186	1.000
	變動規模報酬技術效率	3670	0.720	0.125	0.140	1.000	161	0.791	0.166	0.140	1.000	3509	0.717	0.122	0.196	1.000
	規模效率	3670	0.889	0.131	0.333	2.228	161	0.848	0.228	0.333	2.228	3509	0.891	0.125	0.507	1.595
VENEZUELA	固定規模報酬技術效率	69	0.769	0.045	0.655	0.868	15	0.771	0.043	0.655	0.806	54	0.768	0.046	0.670	0.868
	變動規模報酬技術效率	69	0.684	0.096	0.499	0.908	15	0.674	0.067	0.542	0.760	54	0.686	0.104	0.499	0.908
	規模效率	69	1.147	0.180	0.767	1.607	15	1.157	0.145	0.926	1.464	54	1.145	0.189	0.767	1.607
VIETNAM	固定規模報酬技術效率	52	0.799	0.080	0.688	0.937	0	—	—	—	—	52	0.799	0.080	0.688	0.937
	變動規模報酬技術效率	52	0.827	0.065	0.713	0.972	0	—	—	—	—	52	0.827	0.065	0.713	0.972
	規模效率	52	0.970	0.098	0.741	1.244	0	—	—	—	—	52	0.970	0.098	0.741	1.244
總計	固定規模報酬技術效率	16,292	0.836	0.157	0.028	1.000	1,961	0.856	0.145	0.131	1.000	14,331	0.834	0.158	0.028	1.000
	變動規模報酬技術效率	16,292	0.871	0.139	0.035	1.000	1,961	0.878	0.137	0.140	1.000	14,331	0.870	0.139	0.035	1.000
	規模效率	16,292	0.963	0.109	0.088	2.248	1,961	0.981	0.118	0.333	2.248	14,331	0.960	0.108	0.088	1.607

資料來源：本研究整理而成。

在認定影響營銀行技術效率差距比率的因素後，為進一步檢驗是否此決定因素在外國銀行與本國銀行間存在差異影響性，本研究採用 Blinder-Oaxaca 拆解法(Blinder-Oaxaca Decomposition)進行分析。然而，因技術效率差距比率為介於 0 與 1 之間的數值，為一非連續的間斷數列，無法使用傳統解構連續變數的 Blinder-Oaxaca 拆解法(Blinder-Oaxaca Decomposition)進行評估。因而，本研究應用 Bauer and Sinning (2008)改良傳統 Blinder-Oaxaca 拆解法於非線性 Tobit 模型之估計方法，檢定決定外國銀行與本國銀行間其技術效率差距比率是否存在顯著的差異性。

在一般 Tobit 模型中，假定依變數銀行技術效率差距比率(TGR)為一介於 a_1 與 a_2 之間的數值，其結構式如下所示：

$$\begin{aligned}
TGR_{ig}^* &= X_{ig} \beta_g + \varepsilon_{ig}, \\
TGR_{ig} &= a_1 \quad \text{if } TGR_{ig}^* \leq a_1 \\
TGR_{ig} &= a_2 \quad \text{if } TGR_{ig}^* \geq a_2 \\
TGR_{ig} &= TGR_{ig}^* = X_{ig} \beta_g + \varepsilon_{ig} \quad \text{if } a_1 < TGR_{ig}^* < a_2 \\
\varepsilon_{ig} &\sim N(0, \sigma_g^2)
\end{aligned}$$

假定外國銀行(FB)與本國銀行(DB)在技術效率差距比率(TGR)的平均差異如下所示：

$$\begin{aligned}
E(TGR_{ig} | X_{ig}) &= a_1 \Phi_1(\beta_g, X_g, \sigma_g) + a_2 \Phi_2(\beta_g, X_g, \sigma_g) \\
&\quad + \Lambda(\beta_g, X_g, \sigma_g) \left[X_{ig} \beta_g + \sigma_g \frac{\lambda(\beta_g, X_g, \sigma_g)}{\Lambda(\beta_g, X_g, \sigma_g)} \right]
\end{aligned}$$

其中， $\Phi_1(\beta_g, X_g, \sigma_g) = \Phi[\sigma_g^{-1}(a_1 - X_{ig} \beta_g)]$ ， $\Phi_2(\beta_g, X_g, \sigma_g) = \Phi[\sigma_g^{-1}(a_2 - X_{ig} \beta_g)]$ ， $\Lambda(\cdot) = \Phi_2(\cdot) - \Phi_1(\cdot)$ ， $\lambda(\beta_g, X_g, \sigma_g) = \phi[\sigma_g^{-1}(a_1 - X_{ig} \beta_g)] - \phi[\sigma_g^{-1}(a_2 - X_{ig} \beta_g)]$ ， $g = \text{FB}$ (外國銀行)， DB (本國銀行)。 $\phi(\cdot)$ 為標準一般密度函數(standard normal density function)且 $\Phi(\cdot)$ 為累積標準一般密度函數(cumulative standard normal density function)。

$$\begin{aligned}
\Delta_{FB}^{TGR} &= \left[E_{\beta_{DB}, \sigma_{DB}}(TGR_{i,DB} | X_{i,DB}) - E_{\beta_{DB}, \sigma_{FB}}(TGR_{i,FB} | X_{i,FB}) \right] \\
&\quad + \left[E_{\beta_{DB}, \sigma_{FB}}(TGR_{i,FB} | X_{i,FB}) - E_{\beta_{FB}, \sigma_{FB}}(TGR_{i,FB} | X_{i,FB}) \right]
\end{aligned}$$

$$\begin{aligned}
\Delta_{DB}^{TGR} &= \left[E_{\beta_{DB}, \sigma_{DB}}(TGR_{i,DB} | X_{i,DB}) - E_{\beta_{DB}, \sigma_{DB}}(TGR_{i,FB} | X_{i,FB}) \right] \\
&\quad + \left[E_{\beta_{DB}, \sigma_{DB}}(TGR_{i,FB} | X_{i,FB}) - E_{\beta_{FB}, \sigma_{FB}}(TGR_{i,FB} | X_{i,FB}) \right]
\end{aligned}$$

基於外國銀行(FB)與本國銀行(DB)兩個對照樣本(sample counterpart)得到以下估計式：

$$\begin{aligned}
S(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g) &= N^{-1} \sum_{i=1}^N \left\{ a_1 \Phi_1(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g) + a_2 \Phi_2(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g) \right. \\
&\quad \left. + \Lambda(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g) \left[X_{ig} \hat{\beta}_g + \hat{\sigma}_g \frac{\lambda(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g)}{\Lambda(\hat{\beta}_g, X_{ig}, \hat{\sigma}_g)} \right] \right\}
\end{aligned}$$

因此，估算外國銀行(FB)與本國銀行(DB)在技術效率差距比率(TGR)的平均差異如下式：

$$\hat{\Delta}_{FB}^{TGR} = \left[S\left(\hat{\beta}_{DB}, X_{i,DB}, \hat{\sigma}_{DB}\right) - S\left(\hat{\beta}_{DB}, X_{i,FB}, \hat{\sigma}_{FB}\right) \right] + \left[S\left(\hat{\beta}_{DB}, X_{i,FB}, \hat{\sigma}_{FB}\right) - S\left(\hat{\beta}_{FB}, X_{i,FB}, \hat{\sigma}_{FB}\right) \right]$$

$$\hat{\Delta}_{DB}^{TGR} = \left[S\left(\hat{\beta}_{DB}, X_{i,DB}, \hat{\sigma}_{DB}\right) - S\left(\hat{\beta}_{DB}, X_{i,FB}, \hat{\sigma}_{FB}\right) \right] + \left[S\left(\hat{\beta}_{DB}, X_{i,FB}, \hat{\sigma}_{DB}\right) - S\left(\hat{\beta}_{FB}, X_{i,FB}, \hat{\sigma}_{FB}\right) \right]$$

四、資料來源

本研究所使用的實證資料，主要包含全球銀行財務報表資料、國家總體經濟資料以及國家機構治理品質指標等以下三個部分：

(一)全球銀行財務報表資料

全球銀行的基本財務報表資料主要收集自 *Bureau Van Dijk* 公司所彙編的 BankScope 資料庫，研究期間涵蓋 2002 年到 2006 年共計 5 年。實證銀行樣本選擇主要具有完整財務資料，足以估算出銀行的效率值為主要考量。

(二)國家總體經濟資料

跨國總體經濟變數主要收集自世界銀行所編製的「世界發展指標」(World Development Indicators)資料庫，變數涵蓋：「每人國內生產毛額成長率」、「通貨膨脹率」、及「實質利率」等項目。

(三)國家機構治理品質指標

各國機構治理品質指標主要下載自 Kaufmann et al. (2008)所編製的資料庫 (<http://info.worldbank.org/governance/wgi/index.asp>)，包含：(1)「言論與表達」、(2)「政治穩定度」、(3)「政府效能」、(4)「管制品質」、(5)「法律規範」、(6)「貪污控制」等六項重要指標。

五、實證分析

(一)敘述統計

表 4 為在不同銀行別下研究變數之敘述統計及變異數分析的估計結果，除了股東權益報酬率總資產取對數值兩個變數在外國銀行與本國銀行間不具統計的差異，其他研究變數包括銀行財務變數、總體經濟與機構治理變數在外國與本國銀行間皆具統計的顯著性。

(二)影響銀行技術差距比率之跨國決定因素

首先，針對全球銀行樣本認定影響銀行技術差距比率之跨國決定因素，且求證是否外國銀行的經營績效表現相對於國內銀行為優，表 5 表示外國銀行與本國銀行在技術差距比率差異之跨國決定因素的估計結果。分別就銀行財務變數與國家總體經濟變數來看，整體而言，解釋變數對技術差距比率(TGR)的解釋能力則相當理想。在所有技術效率(包括固定規模報酬、變動規模報酬、規模效率等四個指標)的估計結果來看，外國銀行的技術差距比率相對於國內銀行為高，顯示全球外國銀行的平均經營績效(技術效率)相對優於國內銀行。

其次，以固定規模報酬技術效率的估計結果來看，整體而言外國銀行的固定規模報酬技術效率相對於國內銀行為高。銀行具有較高(呆帳準備/淨利息收益)、(流動資產/總存款與借款)、(淨貸款/總存款融資)比例，則表現出較高的技術效率水準；若銀行營業所在的國家其實質利率愈高，則有助於其技術效率的提升；相反地，若銀行具有較高(總權益/總資產)、總資產、(總貸款/總資產)、(非利息支出/平均資產)、(其他營運收益/平均資產)等財務特性，同時且銀行營業所在國家其 GDP 成長率愈大，則其技術效率水準相對較不理想。分別比較影響外國銀行與本國銀行在技術差距比率差異的決定因素後發現，部分決定因素在兩者之間存在顯著的差異性。整體而言，(總權益/總資產)、總資產、(總貸款/總資產)、(非利息支出/平均資產)以及 GDP 成長率等因素，依舊同時顯著負向地影響本國銀行與外國銀行的技術差距比率。其中，當地主國的通貨膨脹水準愈高，則愈不利於外國銀行的技術效率表現，但此影響性對地主國的本國銀行卻不具顯著性。整體而言，非線性檢定結果顯示財務變數對外國銀行與本國銀行間解釋技術差距比率存在顯著差異，可解釋比例為 56.25%，未解釋的部分則為 43.75%。

再者，以變動規模報酬技術效率的估計結果來看，整體而言外國銀行的變動規模報酬技術效率相對於國內銀行為高。銀行具有較高(總營運資金/總資產)、Log(總資產)、(呆帳準備/淨利息收益)、(流動資產/總存款與借款)、(淨貸款/總存款融資)比例，則表現出較高的技術效率水準；若銀行營業所在的國家其實質利率愈高，則有助於其技術效率的提升，此結

表 4、不同銀行別下研究變數之敘述統計及變異數分析

研究變數	全體銀行					外國銀行					本國銀行					變異數分析
	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	樣本數	平均數	標準差	最小值	最大值	
總權益/總資產	16,290	0.091	0.075	-0.353	0.940	1,961	0.121	0.118	-0.349	0.940	14,329	0.087	0.066	-0.353	0.935	361.51***
總營運資金/總資產	14,436	0.099	0.071	-0.167	0.940	1,532	0.133	0.121	0.011	0.940	12,904	0.095	0.061	-0.167	0.935	418.74***
總營運資金/總負債	14,432	0.124	0.228	-0.143	9.702	1,529	0.207	0.512	0.011	9.702	12,903	0.114	0.162	-0.143	5.806	233.91***
Log(總資產)	16,292	3.567	1.320	0.826	8.392	1,961	3.535	1.194	1.167	7.818	14,331	3.571	1.337	0.826	8.392	1.27
呆帳準備/淨利息收益	15,870	0.169	0.375	-8.800	7.441	1,792	0.123	0.521	-8.800	6.200	14,078	0.175	0.351	-7.905	7.441	30.88***
總貸款/總資產	16,292	0.580	0.193	0.000	1.272	1,961	0.449	0.245	0.000	0.992	14,331	0.598	0.177	0.001	1.272	1107.73***
流動資產/總存款與借款	14,955	0.228	0.265	0.000	8.645	1,593	0.362	0.519	0.000	8.645	13,362	0.212	0.210	0.000	5.245	470.33***
資產負債表外金額/總資產	16,027	0.002	0.011	0.000	0.694	1,890	0.005	0.021	0.000	0.694	14,137	0.002	0.009	0.000	0.393	153.21***
淨貸款/總存款與借款	16,263	0.751	0.391	0.000	9.805	1,954	0.606	0.495	0.000	9.732	14,309	0.771	0.370	0.001	9.805	311.03***
淨貸款/總存款融資	15,479	0.679	0.251	0.000	8.158	1,690	0.574	0.369	0.000	8.158	13,789	0.692	0.229	0.001	6.410	341.71***
股東權益報酬率	16,288	0.089	0.186	-5.349	7.655	1,961	0.083	0.258	-3.594	4.983	14,327	0.090	0.174	-5.349	7.655	2.13
非利息支出/平均資產	16,292	0.036	0.035	-0.064	0.880	1,961	0.039	0.050	-0.027	0.876	14,331	0.036	0.033	-0.064	0.880	15.66***
成本收益比率	16,248	0.671	0.294	0.010	7.750	1,937	0.700	0.470	0.085	7.454	14,311	0.667	0.261	0.010	7.750	20.79***
其他營運收益/平均資產	16,292	0.017	0.036	-0.662	1.783	1,961	0.023	0.060	-0.599	1.783	14,331	0.016	0.031	-0.662	0.799	77.7***
非營運項目/淨收益	14,288	0.153	1.036	-9.957	9.857	1,511	0.089	0.914	-8.000	7.600	12,777	0.160	1.049	-9.957	9.857	6.45**
GDP 成長率	16,256	2.255	2.409	-11.000	28	1,935	3.293	3.000	-11.000	28	14,321	2.115	2.282	-11.000	28	417.61***
通貨膨脹	16,204	1.554	37.753	0.000	2,071	1,958	3.825	64.288	0.000	1,916	14,246	1.242	32.444	0.000	2,071	8.06***
實質利率	11,279	5.068	7.184	-12.000	47	1,467	6.215	9.355	-12.000	47	9,812	4.897	6.784	-12.000	47	43.14***
整體治理品質	16,288	2.773	1.685	-3.079	4.669	1,959	2.370	2.000	-2.499	4.669	14,329	2.828	1.630	-3.079	4.669	127.8***
言論與表達	16,288	1.116	0.582	-1.580	1.830	1,959	0.968	0.663	-1.200	1.830	14,329	1.136	0.567	-1.580	1.830	146.33***
政治穩定度	16,288	0.501	0.655	-2.210	1.680	1,959	0.576	0.802	-2.210	1.680	14,329	0.491	0.632	-2.210	1.680	29.34***
政府效能	16,288	1.330	0.737	-1.060	2.320	1,959	1.176	0.896	-1.060	2.320	14,329	1.351	0.710	-1.060	2.320	97.06***
管制品質	16,288	1.176	0.647	-1.300	2.010	1,959	1.043	0.761	-1.260	2.010	14,329	1.194	0.628	-1.300	2.010	94.09***
法律規範	16,288	1.239	0.792	-1.650	2.010	1,959	0.987	0.946	-1.360	2.010	14,329	1.273	0.762	-1.650	2.010	228.73***
貪污控制	16,288	1.360	0.882	-1.380	2.400	1,959	1.061	1.007	-1.280	2.400	14,329	1.400	0.856	-1.380	2.400	259.15***

資料來源：本研究整理而成。

註：**、***分別表示在 5%、1%的信賴水準下具統計顯著性。

表 5、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：銀行財務變數與國家總體經濟變數

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.019* (1.944)	—	—	0.012* (1.949)	—	—	0.014** (1.979)	—	—
總權益/總資產	-0.232*** (-3.822)	-0.352** (-2.042)	-0.234*** (-3.562)	-0.471*** (-7.493)	-0.490*** (-2.838)	-0.479*** (-7.025)	0.026 (0.412)	-0.080 (-0.355)	0.029 (0.429)
總營運資金/總資產	-0.066 (-1.053)	0.241 (1.463)	-0.208*** (-2.931)	0.256*** (3.973)	0.365** (2.197)	0.183** (2.489)	-0.218*** (-3.344)	-0.020 (-0.092)	-0.263*** (-3.656)
總營運資金/總負債	-0.023 (-1.338)	-0.031 (-1.170)	0.053** (2.036)	-0.036** (-2.072)	-0.038 (-1.438)	-0.004 (-0.153)	-0.028* (-1.651)	-0.032 (-1.009)	-0.004 (-0.163)
Log(總資產)	-0.015*** (-7.644)	-0.012* (-1.679)	-0.015*** (-7.286)	0.014*** (7.953)	0.003 (0.550)	0.015*** (8.191)	-0.038*** (-25.499)	-0.027*** (-3.635)	-0.039*** (-25.798)
呆帳準備/淨利息收益	0.013*** (5.729)	0.009 (1.632)	0.013*** (5.263)	0.010*** (4.482)	0.018*** (3.054)	0.010*** (3.993)	0.006** (2.466)	-0.005 (-0.746)	0.008*** (2.943)
總貸款/總資產	-0.197*** (-11.746)	-0.081* (-1.941)	-0.184*** (-9.494)	-0.080*** (-4.662)	-0.059 (-1.399)	-0.068*** (-3.440)	-0.180*** (-10.782)	-0.063 (-1.164)	-0.187*** (-10.158)
流動資產/總存款與借款	0.052*** (7.254)	0.010 (0.630)	0.064*** (7.983)	0.047*** (6.578)	0.015 (0.957)	0.056*** (6.953)	0.040*** (5.598)	0.038* (1.921)	0.042*** (5.406)
資產負債表外金額/總資	-0.050 (-0.391)	-0.241 (-1.204)	0.018 (0.114)	0.313** (2.423)	-0.050 (-0.245)	0.480*** (3.015)	-0.293** (-2.357)	-0.184 (-0.771)	-0.349** (-2.343)
淨貸款/總存款與借款	0.001 (0.320)	0.002 (0.108)	0.001 (0.324)	-0.019*** (-5.934)	-0.041** (-2.350)	-0.018*** (-5.526)	0.018*** (5.687)	0.039 (1.614)	0.017*** (5.495)
淨貸款/總存款融資	0.125*** (9.219)	0.031 (0.886)	0.114*** (7.262)	0.076*** (5.517)	0.060* (1.673)	0.072*** (4.492)	0.106*** (7.877)	0.019 (0.407)	0.107*** (7.189)
股東權益報酬率	-0.001 (-0.297)	-0.014 (-1.146)	-0.001 (-0.266)	-0.002 (-0.730)	-0.037*** (-2.970)	-0.001 (-0.247)	-0.001 (-0.379)	0.025 (1.530)	-0.003 (-0.818)
非利息支出/平均資產	-0.597*** (-10.166)	-0.797*** (-3.955)	-0.561*** (-9.047)	-0.644*** (-10.602)	-1.425*** (-7.323)	-0.588*** (-9.112)	-0.122* (-1.878)	0.105 (0.443)	-0.123* (-1.798)
成本收益比率	-0.005 (-1.448)	-0.012 (-0.847)	-0.006 (-1.517)	-0.006 (-1.521)	0.023* (1.691)	-0.008** (-2.172)	0.006 (1.520)	-0.014 (-0.796)	0.007* (1.824)
其他營運收益/平均資產	-0.119* (-1.661)	0.286 (1.089)	-0.159** (-2.127)	-0.046 (-0.630)	0.929*** (3.650)	-0.115 (-1.521)	-0.093 (-1.247)	-0.003 (-0.009)	-0.101 (-1.326)
非營運項目/淨收益	0.001** (2.521)	0.000 (0.050)	0.002*** (2.650)	0.000 (0.626)	-0.000 (-0.078)	0.001 (0.841)	0.002*** (2.662)	0.004 (1.589)	0.001** (2.203)
GDP 成長率	-0.001*** (-3.755)	-0.002** (-2.007)	-0.001*** (-3.101)	-0.002*** (-6.321)	-0.000 (-0.065)	-0.003*** (-6.453)	-0.000 (-0.374)	-0.002* (-1.713)	0.000 (0.422)
通貨膨脹	-0.000 (-1.321)	-0.000*** (-3.078)	-0.000 (-0.020)	-0.000 (-1.544)	-0.000* (-1.892)	-0.000 (-0.836)	-0.000 (-0.042)	-0.000 (-0.810)	0.000 (0.300)
實質利率	0.002*** (6.133)	0.000 (0.227)	0.002*** (6.662)	0.001*** (5.246)	0.001* (1.781)	0.001*** (4.953)	0.001*** (4.201)	0.000 (0.085)	0.001*** (4.813)
常數項	0.960*** (102.032)	0.970*** (28.539)	0.959*** (97.452)	0.867*** (94.952)	0.918*** (29.200)	0.862*** (89.703)	1.138*** (129.635)	1.104*** (27.948)	1.143*** (126.176)
樣本數	8,024	710	7,314	8,024	710	7,314	8,024	710	7,314
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似函數	10,812	1,050	9,799	10,883	1,072	9,846	7,301	445.9	6,883
χ^2	697.9***	65.83***	699.0***	643.3***	126.1***	588.3***	1,054***	38.69***	1,082***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(6.04)***	100%	0.021	(4.11)***	100%	0.006	(2.48)**	100%
	0.014	(3.28)***	56.25%	0.019	(4.89)***	89.83%	0.001	(0.42)	22%
未解釋部分	0.011	(2.3)**	43.75%	0.002	(0.5)	10.17%	0.005	(2.34)**	78.33%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

果與固定規模報酬技術效率的估計結果相同；相反地，若銀行具有較高(總權益/總資產)、(總營運資金/總資產)、(總貸款/總資產)、(淨貸款/總存款與借款)、(非利息支出/平均資產)、(其他營運收益/平均資產)等財務特性，同時且銀行營業所在國家其 GDP 成長率愈大，則其技術效率水準相對較不理想。分別比較影響外國銀行與本國銀行在技術差距比率差異的決定因素後發現，部分決定因素在兩者之間存在顯著的差異性。整體而言，(總權益/總資產)、總資產、(總貸款/總資產)、(非利息支出/平均資產)以及 GDP 成長率等因素，依舊同時顯著負向地影響本國銀行與外國銀行的技術差距比率，此結果與與固定規模報酬技術效率的估計結果相同。其中，當地主國的通貨膨脹水準愈高，則愈不利於外國銀行的技術效率表現，但此影響性對地主國的國內銀行依然不具顯著影響性。整體而言，非線性檢定結果顯示財務變數對外國銀行與本國銀行間解釋技術差距比率存在顯著差異，其中可解釋的比例相當高達到 89.83%，未解釋的部分則為 10.17%。

最後，就規模效率的估計結果來看，整體而言外國銀行的規模效率相對於國內銀行為高。銀行具有較高(流動資產/總存款與借款)、(淨貸款/總存款與借款)、(淨貸款/總存款融資)與(非營運項目/淨收益)比例，則顯示較高的技術效率水準；同時，若銀行營業所在的國家其實質利率愈高，則有助於其技術效率的提升，此結果與固定及變動規模報酬技術效率的估計結果相同；相反地，若銀行具有較高(總營運資金/總資產)、Log(總資產)、(總貸款/總資產)、(資產負債表外金額/總資產)及(非利息支出/平均資產)等財務特性，則其規模效率水準相對較不理想。分別比較影響外國銀行與本國銀行在技術差距比率差異的決定因素後發現，部分決定因素在兩者之間存在顯著的差異性。整體而言，僅 Log(總資產)同時顯著負向地影響本國銀行與外國銀行的規模效率之差距比率，但(流動資產/總存款與借款)卻顯著正向地影響本國銀行與外國銀行的規模效率之差距比率，此結果與固定及變動規模報酬技術效率之差距比率的估計結果不盡相同。其中，當地主國的實質利率水準愈高，則愈有利於國內銀行的規模效率表現，但此影響性對地主國的外國銀行卻不具顯著影響性。整體而言，非線性檢定結果顯示財務變數對外國銀行與本國銀行間解釋規模效率之技術差距比率存在顯著差異，但其中可解釋比例下降為 22%，而未解釋的部分卻提高到 78.33%。

(三)國家機構治理差異對銀行技術差距比率的影響

首先，就「國家整體治理品質」對銀行技術差距比率的影響來看，表 6 顯示除了規模效率的部分結果外，整體國家治理品質優劣皆對固定規模報酬技術效率與變動規模報酬的技術效率具正向的顯著影響關係，即意謂當國家整體治理品質愈高，愈會提升國內與國外銀行的經營效率水準。相反地，整體國家治理品質愈好，卻不利國內銀行的經營績效。

表 6、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家整體治理品質

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體 銀行	外國 銀行	本國 銀行	全體 銀行	外國 銀行	本國 銀行	全體 銀行	外國 銀行	本國 銀行
外國銀行所有權	0.02** (2.515)	—	—	0.02*** (2.673)	—	—	0.01 (1.423)	—	—
整體治理品質	0.01*** (6.006)	0.01*** (2.834)	0.01*** (5.351)	0.02*** (12.795)	0.01*** (3.890)	0.02*** (12.030)	-0.01*** (-6.293)	0.00 (0.222)	-0.01*** (-7.069)
總權益/總資產	-0.23*** (-3.862)	-0.31* (-1.781)	-0.24*** (-3.681)	-0.47*** (-7.536)	-0.44** (-2.538)	-0.49*** (-7.229)	0.01 (0.199)	-0.07 (-0.318)	0.02 (0.237)
總營運資金/總資產	-0.05 (-0.834)	0.21 (1.255)	-0.19*** (-2.627)	0.28*** (4.422)	0.32* (1.953)	0.23*** (3.145)	-0.23*** (-3.476)	-0.03 (-0.123)	-0.28*** (-3.916)
總營運資金/總負債	-0.03 (-1.516)	-0.03 (-1.148)	0.05* (1.829)	-0.05*** (-2.615)	-0.04 (-1.410)	-0.02 (-0.718)	-0.02 (-1.370)	-0.03 (-1.010)	0.00 (0.171)
Log(總資產)	-0.01*** (-5.605)	-0.01 (-0.986)	-0.01*** (-5.380)	0.02*** (11.527)	0.01 (1.445)	0.02*** (11.623)	-0.04*** (-26.584)	-0.03*** (-3.495)	-0.04*** (-27.198)
呆帳準備/淨利息收益	0.01*** (5.608)	0.01 (1.261)	0.01*** (5.250)	0.01*** (4.164)	0.01** (2.489)	0.01*** (3.901)	0.01*** (2.805)	-0.01 (-0.768)	0.01*** (3.207)
總貸款/總資產	-0.20*** (-11.898)	-0.08* (-1.878)	-0.19*** (-9.688)	-0.09*** (-5.263)	-0.06 (-1.389)	-0.08*** (-4.117)	-0.17*** (-10.434)	-0.06 (-1.153)	-0.18*** (-9.764)
流動資產/總存款與借款	0.05*** (7.476)	0.01 (0.582)	0.07*** (8.231)	0.05*** (7.251)	0.01 (0.802)	0.06*** (7.784)	0.04*** (5.460)	0.04* (1.918)	0.04*** (5.095)
資產負債表外金額/總資	-0.04 (-0.314)	-0.22 (-1.090)	0.03 (0.164)	0.33*** (2.589)	-0.02 (-0.093)	0.49*** (3.127)	-0.28** (-2.293)	-0.18 (-0.764)	-0.33** (-2.211)
淨貸款/總存款與借款	0.00 (0.472)	-0.00 (-0.023)	0.00 (0.486)	-0.02*** (-5.523)	-0.04** (-2.499)	-0.02*** (-5.080)	0.02*** (5.462)	0.04 (1.603)	0.02*** (5.215)
淨貸款/總存款融資	0.13*** (9.373)	0.03 (0.933)	0.12*** (7.451)	0.08*** (5.993)	0.06* (1.770)	0.08*** (5.039)	0.10*** (7.681)	0.02 (0.410)	0.10*** (6.970)
股東權益報酬率	-0.00 (-0.191)	-0.01 (-1.059)	-0.00 (-0.200)	-0.00 (-0.451)	-0.03*** (-2.792)	-0.00 (-0.044)	-0.00 (-0.597)	0.03 (1.554)	-0.00 (-1.051)
非利息支出/平均資產	-0.58*** (-9.962)	-0.73*** (-3.612)	-0.55*** (-8.906)	-0.60*** (-9.886)	-1.29*** (-6.590)	-0.55*** (-8.550)	-0.18*** (-2.725)	0.11 (0.464)	-0.18*** (-2.696)
成本收益比率	-0.01 (-1.504)	-0.01 (-1.035)	-0.01 (-1.542)	-0.01* (-1.704)	0.02 (1.402)	-0.01** (-2.292)	0.01* (1.785)	-0.01 (-0.831)	0.01** (2.097)
其他營運收益/平均資產	-0.12 (-1.609)	0.23 (0.866)	-0.15** (-2.038)	-0.05 (-0.750)	0.82*** (3.231)	-0.12 (-1.554)	-0.07 (-0.900)	-0.01 (-0.028)	-0.07 (-0.972)
非營運項目/淨收益	0.00** (2.358)	-0.00 (-0.040)	0.00** (2.500)	0.00 (0.331)	-0.00 (-0.212)	0.00 (0.553)	0.00*** (2.929)	0.00 (1.574)	0.00** (2.504)
GDP 成長率	-0.00*** (-3.103)	-0.00** (-2.144)	-0.00** (-2.403)	-0.00*** (-4.816)	-0.00 (-0.029)	-0.00*** (-4.836)	-0.00* (-1.651)	-0.00* (-1.723)	-0.00 (-1.153)
通貨膨脹	-0.00 (-1.523)	-0.00*** (-3.042)	-0.00 (-0.211)	-0.00 (-1.542)	-0.00* (-1.841)	-0.00 (-0.813)	-0.00 (-0.046)	-0.00 (-0.802)	0.00 (0.280)
實質利率	0.00*** (7.071)	0.00 (0.867)	0.00*** (7.420)	0.00*** (7.436)	0.00*** (2.629)	0.00*** (6.835)	0.00*** (3.129)	0.00 (0.149)	0.00*** (3.817)
常數項	0.92*** (76.498)	0.93*** (24.739)	0.92*** (72.028)	0.78*** (68.648)	0.86*** (25.355)	0.77*** (63.665)	1.18*** (109.230)	1.10*** (25.410)	1.19*** (105.836)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似函數	10,826	1,052	9,812	10,958	1,077	9,915	7,318	443.5	6,908
χ^2	740.7***	75.05***	732.7***	834.7***	143.5***	760.2***	1,119***	38.69***	1,166***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(5.53)***	100%	0.021	(4.87)***	100%	0.006	(1.41)	100%
	0.007	(2.09)**	30.69%	0.009	(1.93)*	42.89%	-0.001	(-0.23)	-10.63%
未解釋部分	0.017	(2.33)**	69.31%	0.012	(3.24)***	57.11%	0.007	(1.25)	110.63%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

其次，就「國家言論與表達」估計結果而言，表 7 表示除外國銀行在固定規模報酬技術效率與規模效率外，國家言論與表達愈好，則愈有利銀行的經營績效的表現。再者，就「國家政治穩定度」估計結果而言，表 8 顯示除銀行在規模效率外，國家政治穩定度愈高，則愈有利銀行的經營績效的表現。

就「國家政府效能」的估計結果來看，表 9 顯示除外國銀行之規模效率外，國家政府效能愈高，則愈有利銀行的經營績效的表現，但卻不利於銀行(本國銀行)的表現。就「政府管制品質」的估計結果來看，表 10 顯示除外國銀行之規模效率外，國家政府效能愈高，則愈有利銀行的經營績效的表現，但卻不利於銀行(本國銀行)的表現。就「國家法規規範」的估計結果來看，表 11 顯示除外國銀行之規模效率外，國家政府效能愈高，則愈有利銀行的經營績效的表現，但卻不利於銀行(本國銀行)的表現。最後，就「國家貪污管制」的估計結果來看，表 12 顯示除外國銀行之變動規模報酬技術效率與規模效率外，國家貪污管制效能愈高，則愈有利銀行的經營績效的表現，但卻不利於銀行(本國銀行)的表現。

六、結論

本研究有鑑於全球銀行實證研究仍相對地不足，且本國銀行與外國銀行存在異質的生產技術與效率，採用 BankScope 資料庫中 2002 年至 2006 年之間個別銀行財務報表資料進行實證分析，銀行類型則包括商業銀行、儲蓄銀行、合作銀行以及金融控股公司等四種。首先，應用「共同邊際法」(Meta-Frontier approach)並使用「資料包絡法」(Data Envelope Analysis, DEA)針對外國銀行與本國銀行兩種不同共同邊界，分別評估其經營效率的優劣與比較兩者在技術差距比率(Technology Gap Ratio, TGR)的差異所在。其次，探討主要影響外國銀行與本國銀行在技術差距比率的關鍵決定因素，特別考慮「在地國」(host country)在總體經濟及機構治理品質等國家變數，分別對外國銀行與本國銀行在技術差距比率的影響，並使用非線性 Blinder-Oaxaca 拆解法針對 Tobit 模型估計，檢定決定外國銀行與本國銀行間其技術效率差距比率是否存在顯著的解釋變異。

就銀行財務變數與國家總體經濟變數來看，解釋變數對技術差距比率(TGR)的解釋能力則相當理想。在所有技術效率(包括固定規模報酬、變動規模報酬、規模效率等四個指標)的估計結果來看，外國銀行的技術差距比率相對於國內銀行為高，顯示全球外國銀行的平均經營績效(技術效率)相對優於國內銀行。同時非線性檢定結果顯示財務變數對外國銀行與本國銀行間解釋技術差距比率存在顯著差異。整體國家治理品質優劣皆對固定規模報酬技術效率與變動規模報酬的技術效率具正向的顯著影響關係，即意謂當國家整體治理品質愈高，愈會提升國內與國外銀行的經營效率水準。

表 7、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家言論與表達

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體 銀行	外國 銀行	本國 銀行	全體 銀行	外國 銀行	本國 銀行	全體 銀行	外國 銀行	本國 銀行
外國銀行所有權	0.02** (2.263)	—	—	0.02* (1.953)	—	—	0.01* (1.898)	—	—
言論與表達	0.02*** (5.734)	0.01 (0.708)	0.02*** (5.792)	0.03*** (8.554)	0.02** (2.558)	0.03*** (8.097)	-0.01 (-1.581)	-0.00 (-0.067)	-0.01* (-1.724)
總權益/總資產	-0.24*** (-3.857)	-0.33* (-1.899)	-0.24*** (-3.706)	-0.48*** (-7.539)	-0.43** (-2.474)	-0.49*** (-7.232)	0.02 (0.321)	-0.08 (-0.339)	0.02 (0.346)
總營運資金/總資產	-0.05 (-0.780)	0.23 (1.354)	-0.18** (-2.527)	0.28*** (4.350)	0.32* (1.932)	0.22*** (3.017)	-0.22*** (-3.366)	-0.02 (-0.107)	-0.27*** (-3.708)
總營運資金/總負債	-0.03 (-1.638)	-0.03 (-1.200)	0.04* (1.691)	-0.04** (-2.542)	-0.04 (-1.535)	-0.02 (-0.591)	-0.03 (-1.555)	-0.03 (-1.009)	-0.00 (-0.069)
Log(總資產)	-0.01*** (-6.361)	-0.01 (-1.513)	-0.01*** (-5.997)	0.02*** (9.901)	0.01 (1.135)	0.02*** (10.047)	-0.04*** (-24.807)	-0.03*** (-3.543)	-0.04*** (-25.098)
呆帳準備/淨利息收益	0.01*** (5.615)	0.01 (1.633)	0.01*** (5.137)	0.01*** (4.297)	0.02*** (2.974)	0.01*** (3.803)	0.01** (2.535)	-0.01 (-0.737)	0.01*** (3.019)
總貸款/總資產	-0.20*** (-11.876)	-0.08* (-1.946)	-0.19*** (-9.682)	-0.09*** (-4.976)	-0.06 (-1.504)	-0.07*** (-3.766)	-0.18*** (-10.721)	-0.06 (-1.155)	-0.19*** (-10.093)
流動資產/總存款與借款	0.05*** (7.634)	0.01 (0.648)	0.07*** (8.420)	0.05*** (7.304)	0.01 (0.934)	0.06*** (7.766)	0.04*** (5.536)	0.04* (1.930)	0.04*** (5.311)
資產負債表外金額/總資產	-0.04 (-0.293)	-0.24 (-1.179)	0.03 (0.218)	0.33*** (2.577)	-0.03 (-0.164)	0.50*** (3.173)	-0.29** (-2.350)	-0.18 (-0.772)	-0.35** (-2.328)
淨貸款/總存款與借款	0.00 (0.270)	0.00 (0.073)	0.00 (0.289)	-0.02*** (-5.925)	-0.04** (-2.471)	-0.02*** (-5.490)	0.02*** (5.682)	0.04 (1.613)	0.02*** (5.485)
淨貸款/總存款融資	0.13*** (9.463)	0.03 (0.928)	0.12*** (7.552)	0.08*** (5.946)	0.07* (1.869)	0.08*** (4.917)	0.11*** (7.814)	0.02 (0.401)	0.11*** (7.128)
股東權益報酬率	-0.00 (-0.187)	-0.01 (-1.108)	-0.00 (-0.179)	-0.00 (-0.561)	-0.04*** (-2.861)	-0.00 (-0.135)	-0.00 (-0.440)	0.03 (1.544)	-0.00 (-0.883)
非利息支出/平均資產	-0.59*** (-10.039)	-0.79*** (-3.937)	-0.55*** (-8.933)	-0.63*** (-10.308)	-1.37*** (-7.032)	-0.57*** (-8.860)	-0.13** (-2.033)	0.10 (0.419)	-0.13** (-1.966)
成本收益比率	-0.00 (-1.291)	-0.01 (-0.861)	-0.00 (-1.351)	-0.00 (-1.298)	0.02* (1.664)	-0.01* (-1.944)	0.01 (1.542)	-0.01 (-0.818)	0.01* (1.841)
其他營運收益/平均資產	-0.12* (-1.698)	0.28 (1.074)	-0.16** (-2.156)	-0.05 (-0.752)	0.88*** (3.463)	-0.12 (-1.620)	-0.09 (-1.163)	0.00 (0.002)	-0.09 (-1.238)
非營運項目/淨收益	0.00** (2.549)	0.00 (0.047)	0.00*** (2.669)	0.00 (0.726)	-0.00 (-0.108)	0.00 (0.931)	0.00*** (2.691)	0.00 (1.585)	0.00** (2.238)
GDP 成長率	-0.00*** (-3.838)	-0.00** (-2.108)	-0.00*** (-3.074)	-0.00*** (-6.414)	-0.00 (-0.315)	-0.00*** (-6.423)	-0.00 (-0.552)	-0.00* (-1.725)	0.00 (0.196)
通貨膨脹	-0.00 (-1.635)	-0.00*** (-3.078)	-0.00 (-0.324)	-0.00* (-1.712)	-0.00* (-1.920)	-0.00 (-0.984)	0.00 (0.014)	-0.00 (-0.806)	0.00 (0.363)
實質利率	0.00*** (7.115)	0.00 (0.369)	0.00*** (7.629)	0.00*** (6.896)	0.00** (2.264)	0.00*** (6.470)	0.00*** (3.743)	0.00 (0.072)	0.00*** (4.351)
常數項	0.92*** (82.259)	0.96*** (25.653)	0.92*** (77.754)	0.81*** (73.389)	0.88*** (25.308)	0.81*** (68.595)	1.15*** (104.743)	1.11*** (24.904)	1.15*** (101.238)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似似函數	10,825	1,048	9,814	1,0915	1,073	9,877	7,300	443.5	6,885
χ^2	731.2***	66.44***	732.3***	722.1***	133.4***	659.6***	1,061***	38.73***	1,091***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.030	(3.64)***	100%	0.040	(4.01)***	100%	0.006	(2.08)**	100%
	0.014	(1.73)*	46.89%	0.027	(3.20)***	67.15%	0.003	(1.16)	51.93%
未解釋部分	0.016	(4.13)***	53.11%	0.013	(3.00)***	32.85%	0.003	(0.87)	48.07%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

表 8、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家政治穩定度

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.02** (2.297)	—	—	0.01* (1.955)	—	—	0.01** (1.978)	—	—
政治穩定度	0.03*** (12.009)	0.02*** (3.180)	0.03*** (11.547)	0.05*** (19.613)	0.03*** (5.332)	0.05*** (18.951)	-0.00 (-0.098)	0.01 (0.912)	-0.00 (-0.693)
總權益/總資產	-0.20*** (-3.215)	-0.30* (-1.749)	-0.21*** (-3.132)	-0.41*** (-6.453)	-0.41** (-2.365)	-0.43*** (-6.297)	0.03 (0.397)	-0.06 (-0.266)	0.03 (0.378)
總營運資金/總資產	-0.11* (-1.689)	0.20 (1.182)	-0.24*** (-3.339)	0.19*** (2.922)	0.29* (1.771)	0.13* (1.709)	-0.22*** (-3.328)	-0.04 (-0.166)	-0.26*** (-3.625)
總營運資金/總負債	-0.02 (-1.215)	-0.03 (-1.083)	0.05** (1.973)	-0.03* (-1.823)	-0.03 (-1.312)	0.00 (0.092)	-0.03* (-1.652)	-0.03 (-0.989)	-0.00 (-0.167)
Log(總資產)	-0.01*** (-6.151)	-0.01 (-1.032)	-0.01*** (-5.913)	0.02*** (11.644)	0.01* (1.777)	0.02*** (11.753)	-0.04*** (-25.080)	-0.03*** (-3.356)	-0.04*** (-25.507)
呆帳準備/淨利息收益	0.01*** (5.619)	0.01 (1.133)	0.01*** (5.450)	0.01*** (4.219)	0.01** (2.131)	0.01*** (4.162)	0.01** (2.468)	-0.01 (-0.915)	0.01*** (2.966)
總貸款/總資產	-0.20*** (-11.780)	-0.08* (-1.925)	-0.19*** (-9.635)	-0.09*** (-5.062)	-0.06 (-1.462)	-0.07*** (-3.793)	-0.18*** (-10.779)	-0.06 (-1.164)	-0.19*** (-10.145)
流動資產/總存款與借款	0.05*** (7.459)	0.01 (0.548)	0.07*** (8.288)	0.05*** (6.934)	0.01 (0.668)	0.06*** (7.619)	0.04*** (5.591)	0.04* (1.880)	0.04*** (5.432)
資產負債表外金額/總資產	-0.02 (-0.119)	-0.24 (-1.200)	0.08 (0.484)	0.37*** (2.904)	-0.05 (-0.242)	0.57*** (3.640)	-0.29** (-2.355)	-0.19 (-0.778)	-0.35** (-2.340)
淨貸款/總存款與借款	0.00 (0.687)	-0.00 (-0.051)	0.00 (0.732)	-0.02*** (-5.160)	-0.05*** (-2.602)	-0.02*** (-4.688)	0.02*** (5.683)	0.04 (1.611)	0.02*** (5.476)
淨貸款/總存款融資	0.12*** (9.077)	0.03 (0.942)	0.11*** (7.275)	0.07*** (5.392)	0.06* (1.805)	0.07*** (4.405)	0.11*** (7.877)	0.02 (0.394)	0.11*** (7.199)
股東權益報酬率	-0.00 (-0.038)	-0.01 (-0.956)	-0.00 (-0.091)	-0.00 (-0.252)	-0.03*** (-2.619)	0.00 (0.088)	-0.00 (-0.384)	0.03 (1.579)	-0.00 (-0.844)
非利息支出/平均資產	-0.60*** (-10.145)	-0.74*** (-3.678)	-0.57*** (-9.141)	-0.62*** (-10.219)	-1.26*** (-6.500)	-0.58*** (-8.934)	-0.12* (-1.881)	0.14 (0.565)	-0.13* (-1.858)
成本收益比率	-0.01* (-1.789)	-0.01 (-0.999)	-0.01* (-1.831)	-0.01** (-2.179)	0.02 (1.295)	-0.01*** (-2.754)	0.01 (1.528)	-0.02 (-0.872)	0.01* (1.869)
其他營運收益/平均資產	-0.11 (-1.549)	0.23 (0.883)	-0.14* (-1.908)	-0.05 (-0.639)	0.77*** (3.037)	-0.10 (-1.334)	-0.09 (-1.241)	-0.03 (-0.100)	-0.10 (-1.304)
非營運項目/淨收益	0.00*** (2.623)	-0.00 (-0.011)	0.00*** (2.777)	0.00 (0.947)	-0.00 (-0.180)	0.00 (1.192)	0.00*** (2.664)	0.00 (1.566)	0.00** (2.214)
GDP 成長率	-0.00** (-2.335)	-0.00* (-1.866)	-0.00* (-1.707)	-0.00*** (-3.982)	0.00 (0.283)	-0.00*** (-4.164)	-0.00 (-0.383)	-0.00* (-1.696)	0.00 (0.249)
通貨膨脹	-0.00* (-1.724)	-0.00*** (-3.049)	-0.00 (-0.437)	-0.00* (-1.880)	-0.00* (-1.892)	-0.00 (-1.173)	-0.00 (-0.001)	-0.00 (-0.792)	0.00 (0.357)
實質利率	0.00*** (4.979)	0.00 (0.683)	0.00*** (5.042)	0.00*** (3.707)	0.00** (2.541)	0.00*** (2.643)	0.00*** (4.181)	0.00 (0.227)	0.00*** (4.863)
常數項	0.93*** (97.778)	0.94*** (27.334)	0.93*** (93.323)	0.82*** (90.417)	0.88*** (28.006)	0.82*** (85.239)	1.14*** (126.390)	1.09*** (26.917)	1.14*** (123.215)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似似函數	10,881	1,053	9,865	11,070	1,083	10,024	7,299	443.9	6,884
χ^2	832.8***	76.22***	821.0***	1,067***	160.5***	986.7***	1,054***	39.45***	1,083***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(3.59)***	100%	0.024	(4.04)***	100%	0.006	(1.91)*	100%
	0.020	(5.30)***	83.61%	0.029	(4.62)***	119.27%	-0.005	(-1.05)	-37.37%
未解釋部分	0.004	(0.54)	16.39%	-0.005	(-0.68)	-19.27%	0.011	(1.96)**	137.37%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

表 9、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家政府效能

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.02** (2.124)	—	—	0.02** (2.067)	—	—	0.01 (1.446)	—	—
政府效能	0.01** (2.275)	0.02** (2.320)	0.01* (1.695)	0.02*** (7.510)	0.02*** (3.189)	0.02*** (6.757)	-0.02*** (-6.408)	-0.00 (-0.139)	-0.02*** (-6.903)
總權益/總資產	-0.24*** (-3.906)	-0.34* (-1.947)	-0.24*** (-3.653)	-0.49*** (-7.779)	-0.47*** (-2.747)	-0.50*** (-7.368)	0.03 (0.455)	-0.08 (-0.335)	0.03 (0.502)
總營運資金/總資產	-0.06 (-0.907)	0.24 (1.429)	-0.20*** (-2.795)	0.29*** (4.426)	0.36** (2.169)	0.22*** (2.980)	-0.24*** (-3.641)	-0.03 (-0.115)	-0.29*** (-4.024)
總營運資金/總負債	-0.02 (-1.370)	-0.03 (-1.143)	0.05** (2.005)	-0.04** (-2.277)	-0.04 (-1.403)	-0.01 (-0.363)	-0.02 (-1.442)	-0.03 (-1.012)	0.00 (0.062)
Log(總資產)	-0.01*** (-6.716)	-0.01 (-1.206)	-0.01*** (-6.492)	0.02*** (9.772)	0.01 (1.144)	0.02*** (9.839)	-0.04*** (-26.685)	-0.03*** (-3.614)	-0.04*** (-27.180)
呆帳準備/淨利息收益	0.01*** (5.672)	0.01 (1.351)	0.01*** (5.250)	0.01*** (4.275)	0.02*** (2.620)	0.01*** (3.925)	0.01*** (2.794)	-0.00 (-0.712)	0.01*** (3.182)
總貸款/總資產	-0.20*** (-11.726)	-0.08* (-1.813)	-0.18*** (-9.495)	-0.08*** (-4.790)	-0.05 (-1.294)	-0.07*** (-3.620)	-0.18*** (-10.560)	-0.06 (-1.158)	-0.18*** (-9.922)
流動資產/總存款與借款	0.05*** (7.346)	0.01 (0.641)	0.06*** (8.061)	0.05*** (7.002)	0.01 (0.901)	0.06*** (7.419)	0.04*** (5.324)	0.04* (1.931)	0.04*** (4.963)
資產負債表外金額/總資產	-0.05 (-0.369)	-0.22 (-1.094)	0.02 (0.119)	0.32** (2.516)	-0.02 (-0.091)	0.49*** (3.058)	-0.29** (-2.310)	-0.19 (-0.777)	-0.33** (-2.224)
淨貸款/總存款與借款	0.00 (0.358)	0.00 (0.008)	0.00 (0.360)	-0.02*** (-5.732)	-0.04** (-2.454)	-0.02*** (-5.308)	0.02*** (5.468)	0.04 (1.616)	0.02*** (5.223)
淨貸款/總存款融資	0.13*** (9.245)	0.03 (0.883)	0.11*** (7.292)	0.08*** (5.696)	0.06* (1.694)	0.08*** (4.699)	0.10*** (7.713)	0.02 (0.403)	0.10*** (7.032)
股東權益報酬率	-0.00 (-0.245)	-0.01 (-1.037)	-0.00 (-0.244)	-0.00 (-0.555)	-0.03*** (-2.790)	-0.00 (-0.140)	-0.00 (-0.592)	0.03 (1.535)	-0.00 (-1.015)
非利息支出/平均資產	-0.59*** (-10.042)	-0.74*** (-3.665)	-0.56*** (-8.959)	-0.61*** (-10.129)	-1.32*** (-6.730)	-0.56*** (-8.736)	-0.18*** (-2.727)	0.10 (0.397)	-0.18*** (-2.666)
成本收益比率	-0.01 (-1.530)	-0.01 (-1.050)	-0.01 (-1.567)	-0.01* (-1.730)	0.02 (1.418)	-0.01** (-2.327)	0.01* (1.815)	-0.01 (-0.808)	0.01** (2.115)
其他營運收益/平均資產	-0.12* (-1.687)	0.23 (0.891)	-0.16** (-2.137)	-0.06 (-0.794)	0.84*** (3.307)	-0.12 (-1.629)	-0.06 (-0.843)	0.00 (0.012)	-0.07 (-0.926)
非營運項目/淨收益	0.00** (2.438)	-0.00 (-0.022)	0.00*** (2.583)	0.00 (0.422)	-0.00 (-0.173)	0.00 (0.645)	0.00*** (2.920)	0.00 (1.590)	0.00** (2.486)
GDP 成長率	-0.00*** (-3.690)	-0.00** (-2.069)	-0.00*** (-3.034)	-0.00*** (-5.978)	0.00 (0.020)	-0.00*** (-6.104)	-0.00 (-1.131)	-0.00* (-1.735)	-0.00 (-0.428)
通貨膨脹	-0.00 (-1.521)	-0.00*** (-3.085)	-0.00 (-0.219)	-0.00 (-1.507)	-0.00* (-1.891)	-0.00 (-0.778)	-0.00 (-0.088)	-0.00 (-0.807)	0.00 (0.215)
實質利率	0.00*** (6.419)	0.00 (0.694)	0.00*** (6.818)	0.00*** (6.685)	0.00** (2.425)	0.00*** (6.205)	0.00*** (2.807)	0.00 (0.055)	0.00*** (3.446)
常數項	0.94*** (79.622)	0.93*** (24.997)	0.95*** (75.339)	0.82*** (71.627)	0.87*** (25.543)	0.81*** (66.861)	1.18*** (109.263)	1.11*** (25.631)	1.19*** (105.745)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似然估計	10,811	1,051	9,799	10,906	1,075	9,867	7,319	443.5	6,907
χ^2	703.6***	72.14***	701.1***	708.4***	137.8***	641.6***	1,123***	38.78***	1,165***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(4.55)***	100%	0.026	(3.46)***	100%	-0.023	(-2.99)***	100%
	0.011	(3.42)***	44.51%	0.019	(4.24)***	74.36%	-0.028	(-3.62)***	122.30%
未解釋部分	0.013	(1.99)**	55.49%	0.007	(1.28)	25.64%	0.005	(1.43)	-22.30%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

表 10、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家管制品質

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.02** (2.157)	—	—	0.02** (2.315)	—	—	0.01 (1.084)	—	—
管制品質	0.01*** (2.962)	0.02* (1.901)	0.01** (2.377)	0.04*** (11.490)	0.03*** (3.803)	0.04*** (10.752)	-0.04*** (-11.651)	-0.01 (-1.178)	-0.04*** (-12.368)
總權益/總資產	-0.22*** (-3.661)	-0.34* (-1.957)	-0.23*** (-3.451)	-0.44*** (-6.999)	-0.47*** (-2.726)	-0.45*** (-6.610)	-0.02 (-0.347)	-0.08 (-0.372)	-0.02 (-0.318)
總營運資金/總資產	-0.08 (-1.228)	0.22 (1.327)	-0.22*** (-3.037)	0.22*** (3.408)	0.33** (2.000)	0.15** (2.085)	-0.18*** (-2.735)	-0.01 (-0.056)	-0.22*** (-3.145)
總營運資金/總負債	-0.02 (-1.357)	-0.03 (-1.115)	0.05** (1.999)	-0.04** (-2.289)	-0.04 (-1.345)	-0.01 (-0.435)	-0.02 (-1.428)	-0.03 (-1.041)	0.00 (0.109)
Log(總資產)	-0.01*** (-7.022)	-0.01 (-1.479)	-0.01*** (-6.728)	0.02*** (10.252)	0.01 (1.039)	0.02*** (10.434)	-0.04*** (-28.493)	-0.03*** (-3.788)	-0.04*** (-29.239)
呆帳準備/淨利息收益	0.01** (5.727)	0.01 (1.356)	0.01*** (5.314)	0.01*** (4.442)	0.01** (2.481)	0.01*** (4.195)	0.01*** (2.839)	-0.00 (-0.531)	0.01*** (3.091)
總貸款/總資產	-0.20*** (-11.902)	-0.08** (-1.994)	-0.19*** (-9.622)	-0.09*** (-5.533)	-0.07 (-1.547)	-0.08*** (-4.278)	-0.16*** (-9.886)	-0.06 (-1.108)	-0.17*** (-9.280)
流動資產/總存款與借款	0.05*** (7.379)	0.01 (0.647)	0.06*** (8.099)	0.05*** (7.212)	0.01 (0.903)	0.06*** (7.684)	0.04*** (5.082)	0.04* (1.947)	0.03*** (4.547)
資產負債表外金額/總資產	-0.05 (-0.409)	-0.24 (-1.213)	0.02 (0.102)	0.31** (2.397)	-0.05 (-0.248)	0.47*** (3.006)	-0.26** (-2.130)	-0.18 (-0.758)	-0.30** (-2.075)
淨貸款/總存款與借款	0.00 (0.341)	0.00 (0.064)	0.00 (0.344)	-0.02*** (-5.831)	-0.04** (-2.430)	-0.02*** (-5.416)	0.02*** (5.516)	0.04 (1.640)	0.02*** (5.299)
淨貸款/總存款融資	0.13*** (9.291)	0.03 (0.955)	0.12*** (7.322)	0.08*** (5.939)	0.07* (1.830)	0.08*** (4.904)	0.10*** (7.491)	0.02 (0.348)	0.10*** (6.845)
股東權益報酬率	-0.00 (-0.307)	-0.01 (-1.085)	-0.00 (-0.290)	-0.00 (-0.707)	-0.04*** (-2.833)	-0.00 (-0.257)	-0.00 (-0.460)	0.03 (1.517)	-0.00 (-0.870)
非利息支出/平均資產	-0.59*** (-10.060)	-0.76*** (-3.779)	-0.56*** (-8.978)	-0.61*** (-10.056)	-1.32*** (-6.760)	-0.56*** (-8.697)	-0.21*** (-3.331)	0.06 (0.247)	-0.22*** (-3.254)
成本收益比率	-0.01 (-1.520)	-0.01 (-1.004)	-0.01 (-1.557)	-0.01* (-1.779)	0.02 (1.387)	-0.01** (-2.364)	0.01** (2.068)	-0.01 (-0.733)	0.01** (2.362)
其他營運收益/平均資產	-0.11 (-1.589)	0.26 (1.007)	-0.15** (-2.053)	-0.04 (-0.503)	0.86*** (3.408)	-0.10 (-1.342)	-0.07 (-0.929)	0.02 (0.068)	-0.08 (-1.030)
非營運項目/淨收益	0.00** (2.427)	0.00 (0.070)	0.00** (2.561)	0.00 (0.294)	-0.00 (-0.077)	0.00 (0.480)	0.00*** (3.144)	0.00 (1.571)	0.00*** (2.781)
GDP 成長率	-0.00*** (-3.790)	-0.00** (-2.159)	-0.00*** (-3.111)	-0.00*** (-6.211)	-0.00 (-0.182)	-0.00*** (-6.291)	-0.00 (-1.024)	-0.00* (-1.689)	-0.00 (-0.310)
通貨膨脹	-0.00 (-1.504)	-0.00*** (-3.030)	-0.00 (-0.209)	-0.00 (-1.432)	-0.00* (-1.811)	-0.00 (-0.723)	-0.00 (-0.186)	-0.00 (-0.840)	0.00 (0.135)
實質利率	0.00*** (6.095)	0.00 (0.589)	0.00*** (6.549)	0.00*** (5.513)	0.00** (2.502)	0.00*** (4.877)	0.00*** (4.075)	-0.00 (-0.158)	0.00*** (5.132)
常數項	0.94*** (87.806)	0.95*** (26.388)	0.95*** (83.486)	0.81*** (77.216)	0.88*** (26.480)	0.80*** (72.349)	1.20*** (119.352)	1.12*** (26.734)	1.21*** (116.232)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似似函數	10,813	1050	9,800	10,944	1,077	9,901	7,365	444.3	6,958
χ^2	709.6***	70.06***	706.2***	789.6***	142.8***	716.3***	1,246***	40.57***	1,307***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(4.67)***	100%	0.026	(3.31)***	100%	-0.027	(-2.2)**	100%
	0.010	(2.45)**	39.94%	0.018	(3.91)***	69.29%	-0.032	(-2.33)**	117.27%
未解釋部分	0.014	(2.27)**	60.06%	0.008	(1.53)	30.71%	0.005	(1.46)	-17.27%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

表 11、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家法律規範

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.02** (2.317)	—	—	0.02*** (2.664)	—	—	0.01 (0.859)	—	—
法律規範	0.01*** (3.252)	0.02*** (2.956)	0.01** (2.146)	0.03*** (10.406)	0.03*** (4.132)	0.03*** (9.334)	-0.03*** (-9.582)	-0.00 (-0.183)	-0.03*** (-10.782)
總權益/總資產	-0.22*** (-3.643)	-0.32* (-1.841)	-0.23*** (-3.462)	-0.44*** (-7.021)	-0.45*** (-2.617)	-0.45*** (-6.655)	-0.01 (-0.175)	-0.08 (-0.342)	-0.01 (-0.175)
總營運資金/總資產	-0.07 (-1.171)	0.20 (1.229)	-0.21*** (-2.968)	0.24*** (3.713)	0.32* (1.934)	0.18** (2.424)	-0.20*** (-3.137)	-0.02 (-0.102)	-0.26*** (-3.634)
總營運資金/總負債	-0.02 (-1.426)	-0.03 (-1.123)	0.05** (1.962)	-0.04** (-2.513)	-0.04 (-1.380)	-0.02 (-0.608)	-0.02 (-1.154)	-0.03 (-1.015)	0.01 (0.446)
Log(總資產)	-0.01*** (-6.810)	-0.01 (-1.203)	-0.01*** (-6.642)	0.02*** (10.095)	0.01 (1.240)	0.02*** (10.164)	-0.04*** (-27.637)	-0.03*** (-3.628)	-0.04*** (-28.449)
呆帳準備/淨利息收益	0.01*** (5.686)	0.01 (1.322)	0.01*** (5.266)	0.01*** (4.286)	0.01** (2.550)	0.01*** (3.959)	0.01*** (2.941)	-0.00 (-0.708)	0.01*** (3.314)
總貸款/總資產	-0.20*** (-11.939)	-0.08** (-2.026)	-0.19*** (-9.620)	-0.09*** (-5.551)	-0.07 (-1.550)	-0.08*** (-4.291)	-0.16*** (-9.868)	-0.06 (-1.148)	-0.17*** (-9.134)
流動資產/總存款與借款	0.05*** (7.334)	0.01 (0.525)	0.06*** (8.063)	0.05*** (6.991)	0.01 (0.739)	0.06*** (7.487)	0.04*** (5.248)	0.04* (1.936)	0.04*** (4.678)
資產負債表外金額/總資產	-0.05 (-0.401)	-0.24 (-1.179)	0.02 (0.104)	0.31** (2.426)	-0.04 (-0.197)	0.48*** (3.004)	-0.27** (-2.201)	-0.18 (-0.772)	-0.31** (-2.115)
淨貸款/總存款與借款	0.00 (0.441)	0.00 (0.053)	0.00 (0.411)	-0.02*** (-5.507)	-0.04** (-2.420)	-0.02*** (-5.108)	0.02*** (5.266)	0.04 (1.616)	0.02*** (4.992)
淨貸款/總存款融資	0.13*** (9.328)	0.03 (0.995)	0.12*** (7.340)	0.08*** (6.000)	0.07* (1.836)	0.08*** (4.973)	0.10*** (7.439)	0.02 (0.397)	0.10*** (6.692)
股東權益報酬率	-0.00 (-0.233)	-0.01 (-1.023)	-0.00 (-0.234)	-0.00 (-0.490)	-0.03*** (-2.751)	-0.00 (-0.057)	-0.00 (-0.723)	0.03 (1.535)	-0.00 (-1.195)
非利息支出/平均資產	-0.58*** (-9.934)	-0.73*** (-3.608)	-0.55*** (-8.903)	-0.59*** (-9.718)	-1.28*** (-6.559)	-0.54*** (-8.414)	-0.22*** (-3.384)	0.09 (0.388)	-0.23*** (-3.395)
成本收益比率	-0.01 (-1.552)	-0.01 (-0.988)	-0.01 (-1.579)	-0.01* (-1.854)	0.02 (1.455)	-0.01** (-2.443)	0.01** (2.054)	-0.01 (-0.809)	0.01** (2.396)
其他營運收益/平均資產	-0.12* (-1.672)	0.25 (0.939)	-0.16** (-2.126)	-0.06 (-0.848)	0.84*** (3.308)	-0.13* (-1.675)	-0.05 (-0.611)	0.00 (0.014)	-0.05 (-0.644)
非營運項目/淨收益	0.00** (2.452)	-0.00 (-0.032)	0.00*** (2.602)	0.00 (0.435)	-0.00 (-0.211)	0.00 (0.666)	0.00*** (2.951)	0.00 (1.590)	0.00** (2.526)
GDP 成長率	-0.00*** (-3.493)	-0.00** (-2.130)	-0.00*** (-2.892)	-0.00*** (-5.319)	0.00 (0.005)	-0.00*** (-5.442)	-0.00* (-1.939)	-0.00* (-1.735)	-0.00 (-1.415)
通貨膨脹	-0.00 (-1.510)	-0.00*** (-2.986)	-0.00 (-0.226)	-0.00 (-1.482)	-0.00* (-1.773)	-0.00 (-0.800)	-0.00 (-0.117)	-0.00 (-0.813)	0.00 (0.233)
實質利率	0.00*** (5.948)	0.00 (0.579)	0.00*** (6.441)	0.00*** (5.100)	0.00** (2.358)	0.00*** (4.510)	0.00*** (4.332)	0.00 (0.060)	0.00*** (5.410)
常數項	0.94*** (84.090)	0.93*** (25.998)	0.94*** (79.630)	0.81*** (75.646)	0.87*** (26.538)	0.80*** (70.552)	1.19*** (117.808)	1.11*** (26.533)	1.20*** (114.716)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似似函數	10,813	1,052	9,800	10,932	1,078	9,887	7,344	443.5	6,939
χ^2	712.2***	75.96***	704.8***	770.3***	145.6***	692.2***	1,187***	38.80***	1,255***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.024	(4.66)***	100%	0.021	(5.66)***	100%	0.006	(1.86)*	100%
	0.003	(0.53)	14.32%	0.006	(1.70)*	29.78%	0.006	(1.96)**	17.19%
未解釋部分	0.020	(2.60)***	85.68%	0.015	(2.40)**	70.22%	0.001	(0.09)	82.81%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

表 12、外國銀行與本國銀行在技術差距比率差異之跨國決定因素：國家貪污控制

研究變數	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行	全體銀行	外國銀行	本國銀行
外國銀行所有權	0.02** (2.148)	—	—	0.02** (1.994)	—	—	0.01 (1.645)	—	—
貪污控制	0.01** (2.400)	0.02** (2.278)	0.00* (1.940)	0.01*** (6.066)	0.01 (1.542)	0.01*** (5.680)	-0.01*** (-3.692)	0.01 (0.999)	-0.01*** (-4.215)
總權益/總資產	-0.24*** (-3.995)	-0.31* (-1.794)	-0.25*** (-3.738)	-0.50*** (-7.914)	-0.47*** (-2.678)	-0.51*** (-7.510)	0.03 (0.516)	-0.06 (-0.265)	0.04 (0.560)
總營運資金/總資產	-0.05 (-0.727)	0.22 (1.313)	-0.19*** (-2.602)	0.31*** (4.691)	0.35** (2.088)	0.24*** (3.287)	-0.24*** (-3.694)	-0.03 (-0.141)	-0.30*** (-4.100)
總營運資金/總負債	-0.03 (-1.472)	-0.03 (-1.204)	0.05* (1.922)	-0.04** (-2.451)	-0.04 (-1.451)	-0.01 (-0.514)	-0.02 (-1.427)	-0.03 (-1.024)	0.00 (0.075)
Log(總資產)	-0.01*** (-6.627)	-0.01 (-1.053)	-0.01*** (-6.410)	0.02*** (9.425)	0.01 (0.893)	0.02*** (9.561)	-0.04*** (-25.619)	-0.03*** (-3.281)	-0.04*** (-26.075)
呆帳準備/淨利息收益	0.01*** (5.695)	0.01 (1.421)	0.01*** (5.252)	0.01*** (4.370)	0.02*** (2.879)	0.01*** (3.940)	0.01*** (2.603)	-0.01 (-0.859)	0.01*** (3.062)
總貸款/總資產	-0.20*** (-11.722)	-0.07* (-1.765)	-0.18*** (-9.508)	-0.08*** (-4.751)	-0.06 (-1.326)	-0.07*** (-3.614)	-0.18*** (-10.694)	-0.06 (-1.088)	-0.18*** (-10.039)
流動資產/總存款與借款	0.05*** (7.359)	0.01 (0.604)	0.06*** (8.071)	0.05*** (6.918)	0.01 (0.910)	0.06*** (7.319)	0.04*** (5.534)	0.04* (1.891)	0.04*** (5.279)
資產負債表外金額/總資產	-0.04 (-0.352)	-0.20 (-1.012)	0.02 (0.125)	0.33** (2.524)	-0.02 (-0.118)	0.48*** (3.049)	-0.29** (-2.334)	-0.17 (-0.695)	-0.34** (-2.256)
淨貸款/總存款與借款	0.00 (0.361)	-0.00 (-0.003)	0.00 (0.365)	-0.02*** (-5.747)	-0.04** (-2.405)	-0.02*** (-5.322)	0.02*** (5.547)	0.04 (1.564)	0.02*** (5.315)
淨貸款/總存款融資	0.13*** (9.289)	0.03 (0.839)	0.12*** (7.342)	0.08*** (5.760)	0.06* (1.669)	0.08*** (4.793)	0.10*** (7.754)	0.02 (0.398)	0.10*** (7.042)
股東權益報酬率	-0.00 (-0.277)	-0.01 (-1.172)	-0.00 (-0.262)	-0.00 (-0.671)	-0.04*** (-2.944)	-0.00 (-0.219)	-0.00 (-0.458)	0.03 (1.556)	-0.00 (-0.906)
非利息支出/平均資產	-0.60*** (-10.159)	-0.75*** (-3.746)	-0.56*** (-9.042)	-0.64*** (-10.520)	-1.39*** (-7.064)	-0.58*** (-9.054)	-0.14** (-2.175)	0.14 (0.583)	-0.14** (-2.114)
成本收益比率	-0.00 (-1.402)	-0.01 (-1.003)	-0.01 (-1.465)	-0.01 (-1.371)	0.02 (1.586)	-0.01** (-2.000)	0.01 (1.520)	-0.02 (-0.870)	0.01* (1.804)
其他營運收益/平均資產	-0.12 (-1.619)	0.24 (0.919)	-0.16** (-2.088)	-0.04 (-0.576)	0.89*** (3.499)	-0.11 (-1.455)	-0.08 (-1.130)	-0.03 (-0.103)	-0.09 (-1.200)
非營運項目/淨收益	0.00** (2.428)	-0.00 (-0.087)	0.00*** (2.576)	0.00 (0.443)	-0.00 (-0.162)	0.00 (0.674)	0.00*** (2.856)	0.00 (1.494)	0.00** (2.415)
GDP 成長率	-0.00*** (-3.334)	-0.00** (-2.137)	-0.00*** (-2.685)	-0.00*** (-5.292)	-0.00 (-0.068)	-0.00*** (-5.318)	-0.00 (-1.288)	-0.00* (-1.719)	-0.00 (-0.766)
通貨膨脹	-0.00 (-1.531)	-0.00*** (-3.040)	-0.00 (-0.230)	-0.00 (-1.552)	-0.00* (-1.856)	-0.00 (-0.838)	-0.00 (-0.025)	-0.00 (-0.790)	0.00 (0.310)
實質利率	0.00*** (6.534)	0.00 (0.815)	0.00*** (6.847)	0.00*** (7.038)	0.00** (2.108)	0.00*** (6.661)	0.00*** (2.644)	0.00 (0.397)	0.00*** (3.036)
常數項	0.94*** (80.538)	0.94*** (25.106)	0.94*** (76.256)	0.83*** (73.153)	0.90*** (26.335)	0.82*** (68.220)	1.16*** (107.379)	1.09*** (25.177)	1.17*** (103.785)
樣本數	8,022	709	7,313	8,022	709	7,313	8,022	709	7,313
銀行家數	3,104	236	2,868	3,104	236	2,868	3,104	236	2,868
最大似然估計函數	10,811	1,050	9,799	10,897	1,071	9,860	7,305	444.0	6,892
χ^2	703.8***	71.97***	701.8***	687.0***	128.6***	627.4***	1,083***	39.53***	1,120***
外國銀行與本國銀行間在技術差距比率差異之非線性檢定									
技術差距比率差異(Δ)	固定規模報酬技術效率			變動規模報酬技術效率			規模效率		
	0.027	(2.49)**	100%	0.044	(4.32)***	100%	-0.021	(-1.84)*	100%
	0.015	(1.78)*	55.61%	0.033	(3.15)***	74.48%	-0.023	(-1.65)*	113.00%
未解釋部分	0.012	(1.60)	44.39%	0.011	(2.18)**	25.52%	0.003	(0.54)	-13.00%

資料來源：本研究整理而成。

註：*、**、***分別表示在 10%、5%、1%的信賴水準下具統計顯著性。

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行政院國家科學委員會補助國內專家學者出席國際學術會議報告

2009 年 12 月 30 日

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時間 會議 地點	2009 年 6 月 24 日~2009 年 6 月 27 日 義大利米蘭 Bocconi 大學	本會核定 補助文號	NSC 98-2410-H-343-004
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發表 論文 題目	(中文) 多角化折價或溢價？金融集團的新全球證據 (英文) Diversification Discount or Premium? New International Evidence from Financial Conglomerates		

報告內容應包括下列各項：

一、參加會議經過

本人經由新加坡轉機首先到達義大利羅馬，再搭乘歐洲之星快車前往米蘭 Bocconi 大學，參加由歐洲財務管理學會(European Financial Management Association)所舉辦 2009 年的學術年會。2009 年年會由 Bocconi 大學所主辦，此次研討會會期是從 2009 年 6 月 24 日至 27 日，共計 4 天，共有 96 個場次將近 250 篇論文進行口頭發表，與會學者多來自歐洲、美洲、亞洲及大洋洲等地，今年台灣共有 10 篇論文被接受口頭發表。在各財務與金融場次安排上，金融機構有 8 場次，公司治理有 9 場次，市場結構有 7 場次，資產定價有 7 場次，資本市場有 4 場次。由大會安排場次的多寡可見，金融機構及公司治理仍是歐洲財務管理學會的主要領域。

大會將本人安排於 2009 年 6 月 24 日上午在 Measuring and Management Firm Value I 場次進行論文報告，發表的論文題目為“Diversification Discount or Premium? New International Evidence from Financial Conglomerates”，不同於最近研究實證發現金融集團存在多角化折價的結果，本研究論文使用來自全球 54 國中較完整且研究期間較長的金融集團為實證樣本，在考慮過去文獻的完整研究方法後，首先驗證金融集團進行業務多角化活動是否會有利或不利於市場價值，同時認定影響存在多角化溢價的金融集團的決定因素。研究結果發現多角化存在時間變動的效果，長期而言金融集團進行業務多角化活動是有利其市場價值。本論文也獲得義大利 Bocconi 大學 Bonini 博士與英國 Glasgow 大學會計系 Danbolt 教授的寶貴建議，有利於本論文後續修改的工作。

報告內容應包括下列各項：

二、與會心得

本此大會僅安排一場專題講座，由哈佛商學院 Merton 教授以“On the Science of Finance in the Practice of Finance: Observations on the Financial Crisis”為題進行演說，主要針對近期因衍生性金融商品(次級房貸)所引發全球性的金融海嘯，提出關於投資理財、政府干預政策的有效性、可能誘發潛在的道德危險、各國央行所採行的貨幣政策、全球金融監理的合作與聯繫、各國金融市場重建、全球公司治理的重要性等，提出相當深入淺出的觀點。整體而言，本人參與此次研討會深感獲益匪淺，不僅也擔任評述與討論英國 Glasgow 大學會計系 Danbolt 教授的論文(題目：The Growth Companies Puzzle)，而且也特別是與幾位研究金融機構相當傑出的學者，有相當充分的請益。

三、考察參觀活動(無是項活動者省略)

本次研討會大會並無安排任何考察參觀活動，僅舉辦 1 場學術演講與晚宴活動。

四、建議

本次研討會在金融機構場次的與會學者其研究水準相當不錯，對於論文問題詢問與建議相當務實與中肯，特別是評論人都非常認真對論文提出很好的建議，對於公司理財與金融機構研究有興趣的學者，可藉由此研討會獲得相當重要的寶貴意見。

五、攜回資料名稱及內容

本人帶回此次會議手冊一份，大會所有發表的論文都可以在歐洲財務管理學會的網站下載(www.efmaefm.org)。

【附件】：2009 年歐洲財務管理學會學術論文研討會會場(義大利米蘭 Bocconi 大學)



Diversification Discount or Premium?
New International Evidence from Financial Conglomerates

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Diversification Discount or Premium?
New International Evidence from Financial Conglomerates

Abstract

Previous empirical evidences lack the consensus on whether banking business ought to be focused or diversified, yet there is little international evidence from financial conglomerates, formally defined as a financial institution undertaking a variety of banking activities with respect to assets, income, and internationalization. To this end, this paper empirically investigates whether diversification is beneficial or harmful to creating the value into financial conglomerates applying alternative measures for the degree of diversification and using comprehensive panel data on 863 banks for longer period over 1992 to 2006. Unlike previous studies, our results show that diversification does not destroy the market value of financial conglomerates. Surprisingly, there is a diversification premium in presence of time-varying effect on diversification trend resulted from financial liberalizations across country in last decades. The results still hold when consider the time-varying patterns of diversification, capital market characteristics, institutional governance, country risk and bank regulations. This implicates two explanations: first, different sample banks might gain different results, in particularly using a long-term database to examine the effect of diversification, however, we find that there is a diversification premium; second, the diversification discount would change along with time horizons. Next, we identify cross-country determinants of short- and long-term diversification premium in financial conglomerates. The results show that bank-level and capital market characteristics are the most important determinants in affecting the diversification premium in financial conglomerates. Moreover, financial conglomerates would benefit from international diversification as well, however, there is no link between international and functional diversification.

JEL Classification: G20, G32, G34

Keywords: Financial Conglomerates, Corporate Diversification, International Diversification, Time Effect, International Comparison

1. Introduction

Over the past two decades, the pro and con of diversification in finance has been thoroughly discussed among academic research and applied practice. However, previous studies on this issue lack for consensus in empirical evidences concerning whether banking business ought to be focused or diversified. These issues on specialization versus diversification are significant in the context of banks since they are influenced by regulatory policies creating incentives either to diversify or to focus their portfolios, such as the implementation of capital requirements affiliated with the risk of the banks' assets or asset investment restrictions. Therefore, policymakers show strong interests in probing whether banks benefit from diversification or not. This paper is aimed to empirically investigate whether diversification is beneficial or harmful to creating the value into financial conglomerates, banks that undertake variety of activities, based upon international evidences.

The benefits from diversification for banks come from numerous dimensions. For instance, economies of scope (Klein and Saldenberg, 1998), access to profitable business lines (Chandler, 1977), a higher resource allocation through internal capital markets than external capital markets (Williamson, 1975; Stein, 1997) and the advantage of tax shield due to higher financial leverage (Lewellen, 1971). Conversely, the disadvantage of diversification for banks might derive from agency problems afflicting diversifying investments (Jensen, 1986; Meyer et al., 1992), inefficient internal resource allocation due to malfunctioning of internal capital markets (Lamont, 1997; Rajan et al., 2000), and informational asymmetries between head office and divisional managers (Harris et al., 1992). Furthermore, it might also affect the quantity of activities (Scharfstein and Stein, 2000), resulting in bargaining problems (Rajan et al., 2000) or bureaucratic rigidity (Shin and Stulz, 1998). In terms of mixed results from diversification effects, more comprehensive investigation as international comparison is essential to verify whether diversification is really beneficial or harmful to financial conglomerates.

Furthermore, an ample number of empirical studies mainly concentrate on single country or selective region, but international comparison is surprisingly sparse. Even though Laeven and Levine (2007) is the leading study performing international comparison of 836 banks from 43 different countries, however, they do not consider the geographic diversification as well as the potential interaction between geographic and

activities diversity. Following and extending Laeven and Levine (2007), this paper sheds a new light on the interaction between geographic and functional diversity by using comprehensive panel data on 863 banks over the period 1992 to 2006. Moreover, we reexamine whether there is diversification discount or premium in financial conglomerates based on international evidences. Interestingly, our empirical findings indicate that financial conglomerates would substantially add their economic value from geographic diversification but such interaction between geographic and functional diversity is not economically significant. Furthermore, the results indicate that there is no clear diversification discount in financial conglomerates and documented as a significant diversification premium in contrast to findings from Laeven and Levine (2007) as well as Schmid and Walter (2009). Similar with Ahn (2009) who study the dynamic of diversification discount, we test the relationship between time-vary diversification and bank's valuation. The results show that the market value of banks would enhance as the level of diversification increase with the time trend. Besides, we additional consider more characteristics that might affect the diversification premium including capital market characteristics, institutional governance, and country risk and bank supervision. The results still hold and we argue that the diversification discount would change to diversification premium with time trend whereby affecting economic value for financial conglomerates. Whereas there is a lack of consensus about whether diversification is beneficial or harmful to financial conglomerates based on empirical evidences, this paper therefore is to fill the gap in literature by twofold contributions: (i) evaluating the diversification effect on financial conglomerates based upon international comparison; (ii) using more comprehensive measures to assess degree of diversification and testing the interaction between geographic and functional diversity, respectively.

The remainder of the paper is organized as follows. Section 2 provides a briefly review of the relevance empirical literature. Section 3 describes the variables and empirical model specified for estimation. Section 4 presents our data. In section 5 we show and discuss our empirical results. Section 6 concludes the remarks.

2. Literature Review

2.1 International Evidence for Diversification in Financial Conglomerates

Previous studies mainly focus on signal country and use US data. For instance, Schmid and Walter (2009) used data from U.S. financial firms over the period 1985-2004 and reported a substantial and persistent conglomerate discount among financial intermediaries. They also suggested that the discount applied to all financial services activity-areas with exception of investment banking. Additionally, Stiroh (2004) used U.S. banking data during the period 1984-2001 and found that according to aggregated industry-wide level the correlation between net interest income growth and non-interest income growth increased in the 1990s. Unfortunately, the empirical literature about international comparison of diversification in financial conglomerates is still at the earlier stage.

Besides, some researchers contribute to EU countries. For example, Chiorazzo et al. (2008) inspected the link between non-interest revenues and profitability among Italian banks. They found that there were limits to diversification gains as bank get larger. Especially, small banks could make gains from increasing non-interest income, but only when they had very little non-interest income share to start with. Likewise, Acharya et al. (2006) found that diversification of bank assets did not typically improve performance or reduce risk in Italian banks. Smith et al. (2003) analyze the variability of interest and non-interest income and their correlation, for the banking systems of the 15 EU countries during the period 1994-1998, indicating that the increased reliance on activities that generate non-interest income has stabilized profits. Hayden et al. (2007) examine the relation between return on asset and portfolio diversification of German banks. The result shows that there is no large performance benefits associated with diversification. Therefore, more empirical evidences based upon international comparison are requested to understand more about the substantial effects of diversification on market value for financial conglomerates.

2.2 Diversification Premiums in Financial Conglomerates

There is a vast and well-developed literature about benefit from diversification indicating the value creation from conglomeration. DeYoung and Rice (2004a) investigated commercial banks and found that commercial banks which marginal increases in non-interest income were associated with higher profits. Graham et al. (2002) confirmed that there is no evidence that diversification intensifies agency problems and

destroys value. In addition, Elsas et al. (2010) concluded that diversification enhanced bank profitability via higher margins from non-interest businesses and lower cost income ratios. Baele et al (2007) investigate the risk and return of bank diversification and find a positive relation between Tobin's Q and diversity measures. Likewise, Holzhäuser (2005) confirmed that BHCs with a strong change in diversification showed significant improvements in operating performance over a three year period after the event. Lelyveld and Knot (2009) focus on the valuation of bank-insurance conglomerates and find that there is no universal diversification discount. They suggest that size, complexity and risk would drive the results. These findings imply some benefits from diversification strategy for banks.

2.3 Diversification Discounts in Financial Conglomerates

In contrast, there is also a large body of literature indicating that diversification would destroy the value of financial conglomerates. Stiroh and Rumble (2006) found that diversification in U.S. financial holding companies from lending into non-interest activities damages risk-adjusted performance over the period 1997-2002. Maksimovic and Phillips (2002) examined U.S. manufacturing firms and found that less productive firms tended to diversify, but diversification did not cause lower productivity. Recently, Klein and Saidenberg (2010) discovered that BHCs with many subsidiaries are valued at a discount compare to similar BHCs with fewer subsidiaries. Stiroh (2004) investigated whether the shift toward noninterest income was good for U.S. banking industry or not. The findings suggested that a greater reliance on noninterest income, mainly trading revenue, was connected with higher risk and lower risk-adjusted profits. Acharya et al. (2004) use 105 Italian banks for the period 1993-1999 and investigate the relationship between bank return and risk and the degree of diversification. They find that diversification reduce bank return and lead to riskier loans for high risk banks. In summary, these studies document a mixed result about the impact of diversification to financial conglomerates.

2.4 Geographic Diversification in Financial Conglomerates

Berger and DeYoung (2001) use data over 7,000 U.S. banks from 1993 to 1998 and examine the relationship between geographic diversification and bank efficiency. The

authors conclude that the higher level of geographic diversification may destroy the banks efficiency. Choi and Kotrozo (2006) study the relation between Tobin's Q, geographic and activities diversification by using 675 banks from 42 countries over the period of 1995 to 2002. They suggest that more geographically diversified banks have higher market valuation and face higher level of risk. Moreover, Garcia-Herrero and Vazquez (2007) investigated 38 international banks from 1995 to 2004 and documented that international banks with a larger share of assets allocated to foreign subsidiaries, especially in emerging market countries, were reap higher risk-adjusted returns. In fact, previous researches mainly focus on activities or functional diversification and pay less attention to geographic diversification. This paper uses comprehensive approaches to investigate empirically whether diversification is beneficial or harmful to creating the value into financial conglomerates. We summarize the previous empirical findings in Table 1.

3. Methodology

3.1 Measuring the Degree of Diversification in Financial Conglomerates

Analyzing the impact of diversification on financial conglomerates is important to adopt an appropriate measure for diversification. In this paper, we use a number of alternative measures of diversification to identify the degree of diversification in financial conglomerates with respect to revenue, asset and geography.

3.1.1 Income Diversification

First, following Laeven and Levine (2007), measure of diversification across different origins of income and is calculated as

$$(1) \text{ Income Diversity} = 1 - \left| \frac{\text{Net Interest Income} - \text{Other Operating Income}}{\text{Total Operating Income}} \right|$$

This index ranges between zero and one with higher values indicating greater diversification. In addition, we use an adjusted Herfindahl-Hirschman index (HHI) to measure income diversification. Various authors have applied a closely related approach

(see, e.g., Acharya et al. 2006; Stiroh and Rumble 2003; Stiroh 2004; Chiorazzo et al., 2008). This index accounts for variation in the breakdown of total operating income into two broad categories: net interest income, (NII), and non interest income, (NNI), which includes fiduciary income, fees and service charges, trading revenue, and other sources of non interest income. Net operating income equals to net interest income plus net non interest income. Next, taking their respective shares in net operating income:

$$(2) \quad \text{NIIR} = \text{NII} / (\text{NII} + \text{NNI})$$

$$(3) \quad \text{NNIR} = \text{NNI} / (\text{NII} + \text{NNI})$$

where NIIR is the share of net interest income to total operating income and NNIR is the share of non interest income to total operating income. Using this categorization, we measure income diversification of financial conglomerates as

$$(4) \quad \text{Income HHI} = 1 - (\text{NIIR}^2 + \text{NNIR}^2)$$

Income HHI takes value from 0 to 0.5 with higher value indicates more diversified activities. For instance, 0 represents that all revenue comes from sole banking activities, while 0.5 is an equal divide between net interest income and non- interest income.

3.1.2 Asset Diversification

As suggested by Laeven and Levine (2007), asset diversity is used to measure the different sources of assets and calculated as

$$(5) \quad \text{Asset Diversity} = 1 - \left| \frac{\text{Net Loans} - \text{Other Earning Assets}}{\text{Total Earning Assets}} \right|$$

Asset diversity takes values between zero and one with higher values indicating greater diversification. Furthermore, an adjusted HHI is also applied to compute the degree of diversification of bank assets. We primarily consider two categories of assets:

net loans (NLS) and other earning assets (OEA). Total earning assets equal to net loans plus other earning assets. Next, taking their respective shares in total earning assets:

$$(6) \quad \text{NLSR} = \text{NLS} / (\text{NLS} + \text{OEA})$$

$$(7) \quad \text{OEAR} = \text{OEA} / (\text{NLS} + \text{OEA})$$

where NLSR is the share of net loans to total earning assets and OEAR is the share of other earning assets to total earning assets. Similar with previous section, we use this categorization to measure the degree of asset diversification of financial conglomerates as

$$(8) \quad \text{Asset HHI} = 1 - (\text{NLS}^2 + \text{OEA}^2)$$

Asset HHI takes value from 0 to 0.5 with higher value indicates more diversified activities. For instance, 0 represents that all revenue comes from sole banking activities, while 0.5 is an equal divide between net loans and other earning assets.

3.1.3 International Diversification

The Herfindahl index introduced by Choi and Kotrozo (2006) is then applied to measure international diversification in financial conglomerates. This index consists of the revenue of a particular bank in its home country as well as the bank's revenues in other countries. Only those banks with subsidiary ownership greater than 50% were used. It is computed as

$$(9) \quad \text{International HHI} = 1 - \sum_{i=1}^n \left(\frac{X_i}{X} \right)^2$$

where n is the number of foreign countries, X_i is the bank's revenues in foreign country i and X is the bank's total revenue. The value of the index is equal to zero if the bank does not have any foreign subsidiaries and ascends as the number of countries in which the bank operates increases (Appendix). We use 863 banks and cover 54 countries for

empirical estimation. During our sample period, 238 banks have more than one foreign subsidiary while 625 banks operate in single countries. Due to data limitation, we use the last year for which BankScope has data, 2006. Thus, we use cross-section analysis when consider international diversification.

3.2 Measuring the Market Value in Financial Conglomerates

3.2.1 Tobin's Q

First, following Laeven and Levine (2007) we use Tobin's Q to measure the market value of banks. Tobin's Q is counted as the sum of the market value of common equity plus the book value of preferred shares plus the book value of total debt divided by the book value of total assets. As noted by Baele et al (2007), the advantage of using Tobin's Q is that it allows comparability across banks of all sizes. However, Laeven and Levine (2007) indicate that different banking activities maybe value differently, there is a clear need to control for the degree to which banks undertake in different activities when comparing their valuations.

3.2.2 Adjusted Tobin's Q

As defined by Laeven and Levine (2007), Adjusted Tobin's Q is applied to estimate the Q that would exist if financial conglomerates were separated into activity-specific financial institutions and then calculated the Q 's associated with each of those specific activities. It is calculated as

$$(10) \text{ Adjusted Tobin's } Q_j = \sum_{i=1}^n \beta_{ji} Q^i$$

Where Q^i is the Tobin's Q of financial institutions that specialize in activity i . β_{ji} is the share of the i activity in the total activity of bank $_j$. They only consider two types of activities: lending (commercial banks) or non lending operations (investment banks) and calculate adjusted Tobin's Q based on both the asset and income measures of the share of

bank activity. From the asset side, β_{ji} is the ratio of net loans to earning assets for bank_j, as well as the ratio of net interest income to total operating income.

3.2.3 Excess Value

$$(11) \text{ Excess value} = \text{Tobin's } Q - \text{Adjusted Tobin's } Q$$

In this paper, we calculate two measures of excess value; one is settled by the asset composition of the bank, the other is determined by the income composition of the bank. A positive excess value represents premium as well as a negative excess value represents discount. Excess value measure avoid the problem that different banking activities maybe value differently, thus we primarily focus on excess value measures. We use excess value measure based on assets when consider the asset diversity measures as well as excess value measure based on income when consider the income diversity measures.

Figure 1 reports the distribution of diversification and excess value over 1992 to 2006. For the asset diversification, both of the two diversity measures change moderately during our sample period and the average asset diversity is 0.595 with a median of 0.606 as well as the average asset HHI is 0.390 with a median of 0.422. The average excess value (based on assets) is discount with a mean of -0.024; however, there is a trend toward premium over time. The diversification discount turns to the premium in 1999 and from 2004 to 2006. Previous researches suggest that there is a merger waves during late 90's and decrease the diversification discount (Moeller et al, 2005; Ahn, 2009). We supplement their findings by liking the distribution of excess value from 2004 to 2006. For the income diversification, there is a tendency toward income diversification within the two diversity measures. For instance, the average income diversity is 0.434 in 1992 and ascends to 0.523 in 2006. The average income HHI is 0.305 in 1992 and ascends to 0.355 in 2006. This is consistent with Elsas, et al. (2010) who finds that income diversification increased from below 30% in 1996 to over 38% in 2003 over nine countries. Consider the change of excess value (based on income), the average excess value is discount with a mean of -0.022 but still toward premium over time. We conjecture that the increase in income diversification from 1992 to 2003 has increased the average excess value of the banks in our sample.

We further investigate the impact of level of diversification on the excess value measures. The results are shown in Table 2 and report mean and median excess value for different kinds of diversity measures. We find that the excess value between lower and higher diversified banks are differently except for international diversification. There is a substantial discount when lower diversified (focused) banks increase the level of diversification. However, the discount is minor along with the degree of diversification. For instance, the average excess value in Panel A is -0.0003 when the level of diversification under 0.2 and increase to -0.051 when the level of diversification among 0.2 to 0.4. This is similar to Schmid and Walter (2009), who use Compustat database to study on the US experience and find that there is a substantial drop in excess value between focused and diversified firms. However, the results from Panel E (international HHI) show that excess values decrease as the HHI increases. This is inconsistent with Choi and Kotrozo (2006) who suggested that geographically focused banks have lower annualized stock returns than do more geographically diversified banks.

3.3 Empirical Specification

The empirical model in this study is specified as follows:

$$\begin{aligned}
(12) \quad Q_{i,j,t} = & \beta_0 + \beta_1 DIV_{i,j,t} + \beta_2 \text{Log}(TA)_{i,j,t} + \beta_3 \text{Log}(OI)_{i,j,t} + \beta_4 DL_{i,j,t} \\
& + \beta_5 EA_{i,j,t} + \beta_6 AG_{i,j,t} + \beta_7 IG_{i,j,t} + \beta_8 CI_{i,j,t} + \beta_9 ROE_{i,j,t} \\
& + \beta_{10} Merger_{i,j,t} + \beta_{11} GDP_{j,t} + \beta_{12} Inflation_{j,t} + \beta_{13} MR_{j,t} \\
& + \beta_{14} BOND_{j,t} + \beta_{15} FINFREE_{j,t} + \beta_{16} FISFREE_{j,t} \\
& + \beta_{17} PS_{j,t} + \beta_{18} GE_{j,t} + \beta_{19} ROL_{j,t} + \beta_{20} Risk_{j,t}^{Systemic} \\
& + \beta_{21} Risk_{j,t}^{Currency} + \beta_{22} Entry_{j,t} + \beta_{23} CR_{j,t} + \beta_{24} Activities_{j,t} \\
& + \beta_{25} Supervisory_{j,t} + \varepsilon_{i,j,t}
\end{aligned}$$

The dependent variable is the measure of market value of financial conglomerates, Tobin's Q and excess value namely varying over banks i , countries j and year t , are used in our empirical model. DIV stands for measures of diversification with respect to the degree of diversity in revenue, asset and geography for financial conglomerates.

We also consider a number of factors as explanatory variables used in our

empirical model. First, for the bank-level characteristics, $\text{Log}(TA)$ is the natural logarithm of the bank's total assets. Berger and Ofek (1995) suggested that diversification will erase any economies of scale and scope. Thus, we use this variable to capture the effect of the bank's size. Moreover, $\text{Log}(OI)$, calculated as the natural logarithm of the bank's total operating income, is used as an alternative proxy for the bank's size; DL is the ratio between deposits and liabilities. A higher DL may reflect a higher market valuation; EA is the ratio of book value of equity to total assets and represent the degree of financial leverage. We use this variable to proxy for the bank managers' risk aversion; AG and IG is the growth rate of the bank's assets and income, respectively. These variables are our proxies for growth opportunities of the banks. Besides, we use the relative profitability measured by using the ratio of cost to income (CI), return on assets (ROA) and return on equity (ROE), respectively. In addition, we also include *Merger* as a dummy equal to one if the bank if the bank merged with at least one other financial institution during year t .

Second, for the country-level characteristics, we consider the annual real growth in real Gross Domestic Product per capita (GDP) to control for country-level difference in economic conditions. We also control the current annual inflation rate (*Inflation*) because it may affect bank performance across countries. Third, for the Capital market characteristics, MR is the return of exchange where banks are public traded; $BOND$ is the 1-year Treasury bond yield and proxy for the short-term interest-rate; $FINFREE$ is an index of financial freedom and measures the relative openness of each country's banking and financial system; $FISFREE$ is an index of fiscal freedom defined as a measure of the burden of government from the revenue side. Fourth, for the institutional governance, PS is the governance indicator and stands for political instability. GE represents government effectiveness and ROL is rule of law. Fifth, for the country risk characteristics, *Systematic* is a dummy variable and equal to one if the country occur systematic banking crisis in year t ; zero for otherwise. *Currency* is a dummy equal to one if the country occur currency crisis in year t and zero for otherwise. Sixth, from the bank supervision and regulation perspective, we use the number of foreign application for banking license denied by the regulatory authorities (*Entry*) as a proxy for restrictions on the entry of new banks. CR is defined as the 5-bank concentration ratio. *Activities* is defined as the restriction of insurance activities and *Supervisory* is a dummy equal to one if a bank has more than one supervisory authority.

The variables definition, data Source, and summary statistics are listed in Table 3.

The average Tobin's Q is 1.059 with a median of 1.002. The average ratio of net interest income to total operating is 0.695 with a median of 0.737, while the average ratio of net loans to total operating income is 0.648. This indicates that most of banks do more traditional activities during our sample period.

4. Data

Data on bank's financial statement is mainly collected from *BankScope* which covering 3,159 listed banks worldwide. We also collect the stock market information and macroeconomic variables from *DataStream* database. Data on economic freedom are obtained from the *Heritage Foundation* which covering 162 countries across 10 specific factors of economic freedom from 1995 to 2008. Furthermore, information on regulation and supervision is captured from the *World Bank* database.

To match with banks with available share price information obtained from *DataStream*, we use the remaining 863 listed banks available from *BankScope* including Bank Holding Companies (BHCs), commercial banks, investment banks, cooperative bank, medium & long term credit bank, savings banks, mortgage banks and non-banking credit institution. To this end, banks in this sample were selected both because of the availability of balance sheet and income statement data in *BankScope*. We eliminate banks classified as Islamic banks because the accounting standard does not match with the other countries. In addition, we also exclude banks with missing data on basic accounting variables. The final sample contains 863 listed banks from 54 countries with a total of 12,946 observations for the years 1992 to 2006 (see Appendix 1). 39% of the sample banks are from North America, 28% are from Europe, 27% are from Far East and Central Asia and 3% from South and Central America.

5. Empirical Results

5.1 Diversity, Tobin's Q and Excess Value: First Results

The main purpose in this paper is to test the relationship between diversification per se and bank valuation. Thus, the most important thing is to control for the level to which banks undertake in different activities when compare their valuations. Besides using

Tobin's Q to measure the bank's valuation, we also use excess value introduced by Laeven and Levine (2007) to control the market valuations of different bank activities. The authors suggest that the advantage of using excess value is that it can remove adjusted-activities Q from Tobin's Q and therefore provide a more accurate way when testing the impact of diversification per se on the market's value of the bank.

We first do similar estimation in line with Laeven and Levine (2007) and identify whether there is a diversification discount using new sample. The results are reported in Table 4. When Tobin's Q is used as the dependence variable, we include both the ratio of net loans to total earning assets (Panel A) and the ratio of net interest income to total operating income (Panel B) to control for the mix financial activities of the bank. Noteworthy, different from the study of Laeven and Levine (2007), we use more comprehensive measures to assess the level of diversification adding asset-HHI, income-HHI and international-HHI. Moreover, we also use year dummy variables and bank fixed effect to control for the unobservable bank characteristics. In addition, we take advantage of a panel data set for 15 years so that we can examine the time-varying diversification generating. From Panel A and Panel B, when the dependence variable is Tobin's Q , the coefficients of all diversity measures are positive and significant. This is consistent with Baele et al. (2007) who investigate the risk and return of bank diversification and find a positive relation between Tobin's Q and diversity measures.

Furthermore, a positive influence of net loans to total earning assets on Tobin's Q is indicating that banks do more traditional activities, i.e. loan-making activities, are value higher than banks that do less traditional activities. The coefficient of net interest income to total operating income, however, is negative and significant with Tobin's Q . This implies that banks pursue more interest income activities are valued lower than others. When the dependence variable is excess value, however, the results are not significant. In addition, the coefficients of international-HHI are not significant in all specifications. A possible reason is that we do not control for the bank-level and country-level characteristics. In general, the result is in contrast to the conclusions of Laeven and Levine (2007) who find a diversification discount in financial conglomerates. Our results suggest that diversification will enhance the market value of banks, that is, the diversification premium. Since we use similar measures of diversification and conduct difference results, we argue that the diversification discount may change with the time horizons.

5.2 Diversity, Tobin's Q and Excess Value: Considering Time Effect of Diversification

In this section, we investigate the time effect of diversity, Tobin's Q and excess value. First, we generate the time-varying diversity variables based on our diversity measures, exception for the international-HHI. Second, we model the same specification discussed above by using time-varying diversity variables instead of diversity measures. The results are shown in Table 5. The coefficients associated with time-vary diversity variables are positive and statistically significant for all the specifications considered. This result confirm our prediction that diversification would change along with time trend and enhance the bank's valuation. Besides, a positive influence of net loans to total earning assets as well as a negative influence of net interest income to total operating income is similar with Table 4.

5.3 Tobin's Q and Excess Value of Diversified Banks: Controlling for Bank- and Country-Level Characteristics

As Laeven and Levine (2007) concluded, there is a diversification discount even controlling for country traits and bank-level characteristics. In this paper, however, we model the same specification and identify the diversification discount in our sample. Firstly, we use International Securities Identification Number (ISIN) in BankScope to seek the banks which listed in Laeven and Levine (2007) dataset as well as in our sample. This reduces the sample by 1,547 bank-year observations in asset diversity and 1,729 bank-year observations in income diversity.

Secondly, as suggested by Campa and Kedia (2002), we introduce bank fixed effect to control for unobservable bank characteristics that affect the diversification decision. The results are reported in Column 3 of Table 6 with respect to Tobin's Q and excess value. From Panel A (asset diversification) and Panel B (income diversification), the coefficient of diversity remain positive and significant. This indicates that the sample selection does not bias our previous finding, that is, a diversification premium. Column 4 and Column 7 of Table 6 displays the regression results in our full sample banks with the extended model.

To consider the bank's profitability, we include the relatively measures by return

on equity (ROE). Following Holzhäuser (2005), we include cost to income ratio to check for a reduction of operating expenses. We also control for mergers by including a dummy variables that takes the value one if the bank merged with at least one other financial institution during year t . From Panel A, the estimated coefficient of asset diversity measure is 0.04 (asset diversity) and 0.077 (asset-HHI) when the dependence variable is Tobin's Q as well as 0.093 (asset diversity) and 0.193 in excess value. From Panel B, the estimated coefficient of income diversity measure is 0.093 (income diversity) and 0.193 (income-HHI) when the dependence variable is Tobin's Q as well as 0.044 (income diversity) and 0.101 (income-HHI) in excess value.

After controlling for the bank-level and country characteristic, the positive relation between diversification and bank's valuation remain unchanged. Concerning the control variables, our proxy for the bank's size, total assets and total operating income, have negative influence on Tobin's Q and excess value. This indicates that larger banks are valued less than smaller ones and is consistent with Chiorazzo et al. (2008) who suggest that the greater complexity of a larger organizational structure and the rigidity of the cost structure destroy the market valuation of the banks. Deposits to liabilities ratio has a negative impact on Tobin's Q and excess value. This result is inconsistent with Laeven and Levine (2007), indicating that bank's value decrease with deposits to liabilities ratio.

So far, our empirical results show that there is a diversification premium among the financial conglomerates. The question remain is whether the results are driven by the underlying trait rather than diversification per se, that is endogeneity. Prior researches show that failure to control for the endogeneity would mislead the result to diversification instead of the underlying characteristics (Graham et al., 2002; Villalonga 2004a, b). Campa and Kedia (2002) estimate the decision of a firm to diversify and its firm value, the diversification discount turns to be a premium. The authors conclude that diversification is a value-enhance strategy for those firms that really pursue it. In this paper, we control for the potential endogeneity of diversification strategy in two ways. First, following Schmid and Walter (2009), we estimate instrumental variables regressions where the diversity measures are instrumented. We directly include all explanatory variables and instruments in the first step regressions (not reported). From Barth et al (2004), we use bank's regulation and supervision index as the instrumental variables. The first is the regulatory restrictiveness of bank ownership of nonfinancial firms as proxy for restrictions on bank activities. This index range from 0 to 3 and a higher value denote

tighter restriction. The second is a dummy equal to 1 if there are guidelines for asset diversification and 0 for otherwise as our proxy for bank's liquidity. The third is a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as proxy for bank's supervision. In the second stage, we investigate Tobin's Q and excess value measure on the fitted value from the first stage and a number of control variables. The results are shown in Column 5 and Column 8 of Table 6. As shown, asset diversity and income diversity variables remain positive and significantly associated with Tobin's Q and excess value. Most interesting, the results indicate that the diversification premium increases rather than decreases. For instance, the coefficient of asset diversity on Tobin's Q is 0.095 in fixed effect model and increase to 0.436 in IV regression.

Next, we use Heckman's (1979) two-step procedure to control for the potential endogeneity of diversification strategy. In the first stage, we estimate the probability of diversifying by using the probit model and the results of this model will be used in Heckman's self-selection model. For the probit estimation, the dependence variable is diversified bank which is a dummy equal to 1 if net interest income is between 10% and 90% of total income (Income diversification) or if net loans are between 10% and 90% of total earning assets (Asset diversification), and 0 for otherwise. We consider a series of explanatory variables that might affect the diversification decision which have been used in Campa and Kedia (2007); Laeven and Levine (2007) and Schmid and Walter (2009): the share of diversified banks in the economy, return on assets, the logarithm of total assets, a dummy variable if the bank is contained in the S&P index, a dummy variable if the bank is included in the NYSE and the average industrial interest income margin. In the second stage, we estimate Tobin's Q and excess value measure on the self-selection parameter (λ) and a number of control variables. The results in Column 6 and Column 9 of Table 6 display that the coefficient on the diversification variables remain positive and significant. The self-selection parameter (λ), however, has a coefficient with a positive but not significant sign in Panel A (asset diversification) and negative but not significant sign in Panel B (income diversification). This implies that there is no evidence of endogeneity with the self-selection models. The characteristics that make banks choose to diversify are not correlated with banks valuation.

Furthermore, the other purpose of this paper is to examine the interaction between geographic, functional diversity and bank's valuation. Table 7 displays the regression results for international diversity, Tobin's Q and excess value. Besides using the

explanatory variables discussed above, this paper also control for the institutional governance by using four governance indicators as developed by Kaufmann et al. (2006): government effectiveness (GE), political instability and violence (PS), rule of law (ROL) and control of corruption (COC). These indicators are based on wide range of individual variables measuring perceptions of governance and cover 215 countries from 1996 to 2005. The higher value of index imply that the higher governance of a bank. Choi and Kotrozo (2006) suggest that higher levels of governance may reduce the flexibility of a bank's decisions and affect performance. The results are shown in Panel A where the dependence variable is Tobin's Q and Panel B where the dependence variable is excess value. In both cases the coefficient on international HHI is positive and significant. This is consistent with Choi and Kotrozo (2006) who use the same HHI index and find that more geographically focused banks have lower market returns. Concerning the control variables, we find that larger banks have lower market value than smaller ones. The CI control variable has a negative impact on Tobin's Q and excess value. This result is in line with Baele et al. (2007) who find that banks with superior management or technology have lower costs and subsequently conduct higher market value. The DL and EA control variables have positive impact on Tobin's Q and excess value. This indicates that higher deposits to liabilities ratio and financial leverage will enhance the market valuation of banks undertaking geographic diversification. With respect to institutional governance, we find that banks with high control of corruption and low government effectiveness can reap higher market valuation. Further, we joint asset and income diversity measures to examine the relationship between international and activities diversification. The results are shown in Column 2 to Column 5 in Panel A and Column 3 to Column 6 in Panel B. we find that international-HHI continues to be positive and significant in all specifications. However, the coefficients of asset and income diversity measures are not significant. This indicates that there is no interaction between geographic, functional diversity and bank's valuation.

5.4 Robust Testing: Subsamples for Different Bank Types and World Regions

Next, we examine diversity and excess value based on difference banking properties. The categories are defined by BankScope database including diversified banks (DB), commercial banks (CB), investment banks (IB), bank holding companies (BHCs),

savings banks (SB), and cooperative banks (COB). We also control for year dummy (not reported) and log of total assets. The results are reported in Panel A of Table 8. We find that investment and savings banks engage in asset diversification will enhance the bank's valuation as well as BHCs engage in income diversification. This finding is similar to Holzhäuser (2005), who examines the performance of U.S. bank holding companies and concludes that bank diversification could enhance firm performance by lower their cost income ratio and changed asset mix. Savings banks and cooperative banks, however, engage in income diversification will destroy the market value of banks.

Besides, Panel B shows the relationship between diversity and excess value based on difference world region. As defined by BankScope, we consider seven major regions all over the world, including Africa (AF), Europe (EU), Far East and Central Asia (ASIA), Middle East (ME), North America (NA), Oceania (OC) and South and Central America (SC). Again, we include year dummy (not reported) and log of total assets. The results show that banks located in AF, EU and SC has higher market valuation with the higher level of diversification. Banks located in ME and OC, however, the market value decrease with the level of diversification.

5.5 Is There a Scale and Scope of Economy in Specialized Banks or Diversified Banks?

Theoretical prediction suggests that the scale and scope of specialized banks will tend to be larger than diversified ones. However, Leaven and Levine (2007) presents interesting finding that financial conglomerates tend to be larger than specialized commercial banks even with the specialized activity in lending. Thus, we use different banking activities to exploit the differences between diversified and specialized financial intermediaries in Table 9. The definition of specialized commercial banks is a dummy equal to one if net loans are more than 90% of total earning assets (Panel A) or if net interest income is more than 90% of total income (Panel B), and zero otherwise. Specialized investment banks is a dummy equal to one if other earning assets are more than 90% of total earning assets (Panel A) , or if non-interest income is more than 90% of total income (Panel B). We also introduce bank fixed effect and year dummy variables (not reported). It is interesting that the results are mixed. Specialized commercial banks have larger size and loan portfolios than diversified banks, as well as large traditional banking activities. Our result is inconsistent with Laeven and Levine (2007), but is

consistent with theory that the scale of scope of specialized banks are large than diversified banks.

5.6 The Time Effect of Diversification on Excess Value: Controlling for Bank- and Country-Level Characteristics

Based on above empirical findings, we still reveal a diversification premium even controlling for bank-level, country-level and potential problem of endogeneity in diversification decision in banks. The advantage of our panel dataset is that it can observe time-varying pattern of diversification. Ahn (2009) use a sample of diversified firms from 1980 to 2003 and examine the dynamic of diversification discount. The author focuses on the time-series pattern of excess value but does not account for the time-varying of diversification per se. As discussed in previous section, we use time-varying diversity variables instead diversity measures to investigate the relationship between time diversity and excess value by controlling for bank-level and country-level differences. Again, we use bank fixed effect to control for unobservable bank characteristics that affect the diversification decision. We primarily focus on the excess value measure because it adjusts banking activities difference that affect the market value of banks. The results are reported in Column 2 and Column 5 of Table 10. From Panel A (asset diversity) and Panel B (income diversity), the coefficients of all time diversity are positive and significant, indicating that as the level of diversification increase along with time trend, bank's valuation will increase. With respect to the control variables, we find that banks do more traditional activities have higher market valuation. Larger banks are valued less than smaller ones. Banks with low growth opportunities yield higher market return. The coefficients of GDP and inflation are both significant, implying that the economic environment of local market affect bank's valuation.

Furthermore, we also examine whether endogeneity would bias the results by using Instrument Variable (hereafter, IV) and Heckman two-selection model. In the first stage of IV model, the time diversity variables are instrumented. The select of instruments are similar with previous section which considers three perspectives of bank regulation and supervision: activities restriction, liquidity and supervision. In the second stage of IV model, we investigate excess value measure on the fitted value from the first stage and the control variables which used in fixed effect model. Column 3 and Column 6

of Table 10 show the results of IV model. The result of time diversity is consistent with diversity measures, indicating the diversification premium increases rather than decreases. For example, the coefficient of time-varying asset diversity on excess value is 0.004 in fixed effect model and increase to 0.021 in IV regression. Besides, the results of Heckman self-selection model are reported in Column 4 and Column 7 of Table 10. The coefficient of all time diversity variables remain positive and significant. The self-selection parameter (λ), however, still has a coefficient with a positive but not significant sign in Panel A (asset diversity) and negative but not significant sign in Panel B (income diversity). This implies that our results do not drive by the endogeneity problem.

5.7 The Time Effect of Diversification on Excess Value: Controlling for Capital Market Characteristics and Institutional Governance

Thus far, we mainly focus on bank and country-level characteristics that might affect the market value of banks. However, as suggested by Jonghe and Vennet (2008), the capital market characteristics and institutional governance also affect the performance of listed banks. The authors use the return of a local market index and the index of economic freedom to proxy for the cross-country difference in capital market. They find that the capital market characteristics are significant and positive related to bank's franchise value (Tobin's Q). Besides, they use a governance index as developed Kaufman et al. (2002) and find a negative and significant relationship between Tobin's Q and governance index, however, concluding that there is a downward bias in Tobin's Q in countries with higher institutional governance.

We do similar way to control for differences of capital market characteristics by using the following variables: MR, BOND, FINFREE and FISFREE. MR is the return of a local market index; a higher market return might enhance the market valuation of the listed banks. BOND is 1-year Treasury-bill yield as proxy for the short-term interest rate. FINFREE is financial freedom and FISFREE is fiscal freedom. These two indexes are part of an overall index of economic freedom developed by the Heritage Foundation. The higher value of index represents the lower government intervention in the economy and the more economic freedom of a country. As defined by the Heritage Foundation, the financial freedom factor measures the relative openness of each country's banking and financial system. The fiscal freedom measures of the burden of government from the

revenue side. To control for cross-country differences in institutional governance, we use three governance indicators introduced by Kaufman et al. (2006): political instability and violence (PS), government effectiveness (GE) and rule of law (ROL). The higher value of these indicators represents better institutional governance. The results are shown in Column 2 (asset diversity) and Column 5 (asset-HHI) of Table 11. Note worthily, we use time-varying diversity variables instead of diversity measures and still control for bank and country-level characteristics (the results are not reported). About the control variables of capital market characteristics, the coefficients of MR and FINFREE are positive and significant influence on excess value in all specifications. This confirms our prediction that the higher market return of a local market index and higher freedom of each country's banking system produce higher market valuation of the listed banks.

Further, the results for institutional governance are mixed. The coefficient of ROL is positive while it is negative in GE, indicating that higher index of rule of law and lower governance effectiveness has positive impact to the market value of banks. Again, we use IV model and Heckman self-selection model to control for the endogeneity. The select of instrument variables is somewhat difference with previous section. We consider two perspectives of bank regulation and supervision: liquidity and supervision. The results of Table 11 show that the diversification premium still positive and significant.

5.8 The Time Effect of Diversification on Excess Value: Controlling for Country Risk and Bank Supervision Characteristics

In this section, we focus on control for country risk and bank supervision characteristics that might affect bank's valuation. First, we use systemic banking crisis and currency crisis developed by Laeven and Valencia (2008) as proxy for the country risk. This banking crisis database covers the universe of banking crises for the period 1970-2007, with respect to systemic banking crisis, currency crisis and debt crisis. In their definition, the systemic banking crisis is a country's financial institutions experience a large number of defaults and face great difficulties repaying contracts on time. The currency crisis is a real depreciation of the currency of at least 30 percent or 10 percent increase which compared to the year before. In this paper, systemic banking crisis is a dummy equal to one if a county face systemic banking crisis in year t and currency crisis is a dummy equal to one if a country face currency crisis in year t. Second, following Barth et

al (2004), we consider four dimensions of bank supervision: the number of foreign application for banking license denied by the regulatory authorities as a proxy for restrictions on the entry of new banks, ownership is defined as the 5-bank concentration ratio, activities is defined as the restriction of insurance activities and supervisory is a dummy equal to one if a bank has more than one supervisory body.

More specifically, we use the generalized least squares (GLS) model to control for heterogeneity of banks instead of bank fixed effect model. Besides, we still control for the explanatory variables which discuss in previous section. The results are shown in Column 2 and Column 5 of Table 12. We find that the diversification premium still hold even we use different specification. It is surprised that, however, both the coefficients of systemic banking crisis and currency crisis are not significant. A positive influence of activities and supervisory on excess value is indicating that lower activities restrictions and higher supervision will earn higher market value of banks. The coefficients of entry and ownership are negative and significant is implying that higher restriction of new banks and bank's concentration in a country will destroy bank's valuation. We also report the IV and Heckman self-selection model in Table 12. As shown in Column 4 and Column 7, the self-selection parameter (λ), is positive in asset diversification and negative in income diversification. This represents that the characteristics that make banks choose to diversify are positive correlated with banks valuation in asset diversification, while negative in income diversification.

5.9 Identifying Cross-Country Determinants of Diversification Premiums in Financial Conglomerates: Panel Logit Model

In this section, we consider the estimation of the probability of diversifying. Bank-specific characteristics influence the decision of banks to diversify. Banks with low profitability in their current operations may diversify their activities to seek for growth opportunity. To control for current profitability, we include ROA and ROE as well as using asset growth and income growth to control for growth opportunity. We also control for banks size by including the log of total assets and its lagged values. To control for bank performance, we include Tobin's Q and its lagged values. We also include the ratio of equity to assets and the ratio of cost to income ratio which have been discussed in previous section. Merger may drive the decision of diversifying. We therefore include

merge and its lagged value. Besides, we control for macroeconomic conditions by using GDP, inflation and its lagged value. Furthermore, as discussed in section 5.5, capital market characteristics and institutional governance may affect the decision of banks to diversify. Thus, we include the return of local market index (MR), financial freedom (FINFREE), fiscal freedom (FISFREE), political instability and violence (PS), government effectiveness (GE) and rule of law (ROL). We also consider a series of explanatory variables that have been used in probit estimation of Heckman self-selection model: the share of diversified banks in the economy, return on assets, the logarithm of total assets, a dummy variable if the bank is contained in the S&P index, a dummy variable if the bank is included in the NYSE and the average industrial interest income margin. The dependence variables in Panel Logistic estimation is diversified premium banks, defined as a dummy equal to 1 if net interest income is between 10% and 90% of total income with respect to positive value of excess value measure (Income diversification) or if net loans are between 10% and 90% of total earning assets with respect to positive value of excess value measure (Asset diversification). We account diversified premium banks for one year until seven year. The results are reported in Table 13.

5.9.1 Determining the Short- and Long-Term Asset Diversification Premiums in Financial Conglomerates

As shown in panel A of Table 13 for assets diversification premiums in financial conglomerates with respect to short-term and long-term, respectively, we find that banks with higher market performance (proxied as Tobin's Q) and equity to assets ratio are likely to diversify their assets in response to adding economic value. Banks with low return on assets and low cost to income ratio would increase the probability to diversify their assets in short term, but the case is insignificant for exceeding three years diversification premiums for banks. In summary, bank-level characteristics are not highly significant in explaining the state of diversification premiums when considering for more than three year diversity. In regard to the capital market characteristics, banks in a country with higher financial and fiscal freedom are more likely to engage in asset diversify and tend to create economic value. Moreover, banks in country with bad institutional governance have higher likelihood to have asset diversification premium.

5.9.2 Determining the Short- and Long-Term Income Diversification Premiums in Financial Conglomerates

Panel B in Table 13 reports the factors influencing assets diversification premiums in financial conglomerates with respect to short-term and long-term, namely. It is similar that banks with higher market performance (measured as Tobin's Q) are inclined to diversify their income and create market value. Likewise with asset diversification premiums, banks with low return on assets and cost to income ratio would increase higher probability to diversify their income in sort run to enhance their economic value. As to country factors, banks in a country with higher GDP but with lower inflation are more likely to diversify their income activities to increase their market value. Banks in a country with higher financial and fiscal freedom would show higher likelihood to have income diversification premiums. Additionally, banks in a country with bad institutional governance are more likely to have diversification premiums in the short run.

6. Concluding Remarks

Using comprehensive panel data on 863 banks around the world for the period 1992 to 2006, this paper empirically investigates whether diversification is beneficial or harmful to creating the value into financial conglomerates in context of new international evidence. Unlike Laeven and Levine (2007) as well as Schmid and Walter (2009), our empirical results indicate that diversification does not destroy the market value of financial conglomerates but also exists a diversification premium on their economic value. There are two probably explanations. First, the scope of sample may conduct different results. As used a new establishment-level database to examine the phenomenon of

diversification discount, Villalonga (2004a) reported a diversification premium. Second, the results of our time effect diversity measure are indicate that the market valuation of a bank would enhance as the level of diversification increase with time trend even control for endogeneity. The diversification discount would change to diversification premium with time trend whereby affecting economic value for financial conglomerates. Furthermore, we identify cross-country determinants of short- and long-term diversification premium in financial conglomerates. The results show that bank-level and capital market characteristics are the most important determinants in affecting the diversification premium in financial conglomerates.

Specifically, financial conglomerates would benefit from international diversification; the economies of scope are stronger in banking than in many other industries. However, there is no link between international and functional diversification. This paper contributes to the literature on comprehensive measures for diversification by investigating diversity effect on financial conglomerates performing an international comparison and testing the interaction between geographic and functional diversity, respectively.

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Figure 1
The Evolution of Diversification and Excess Value over 1992-2006

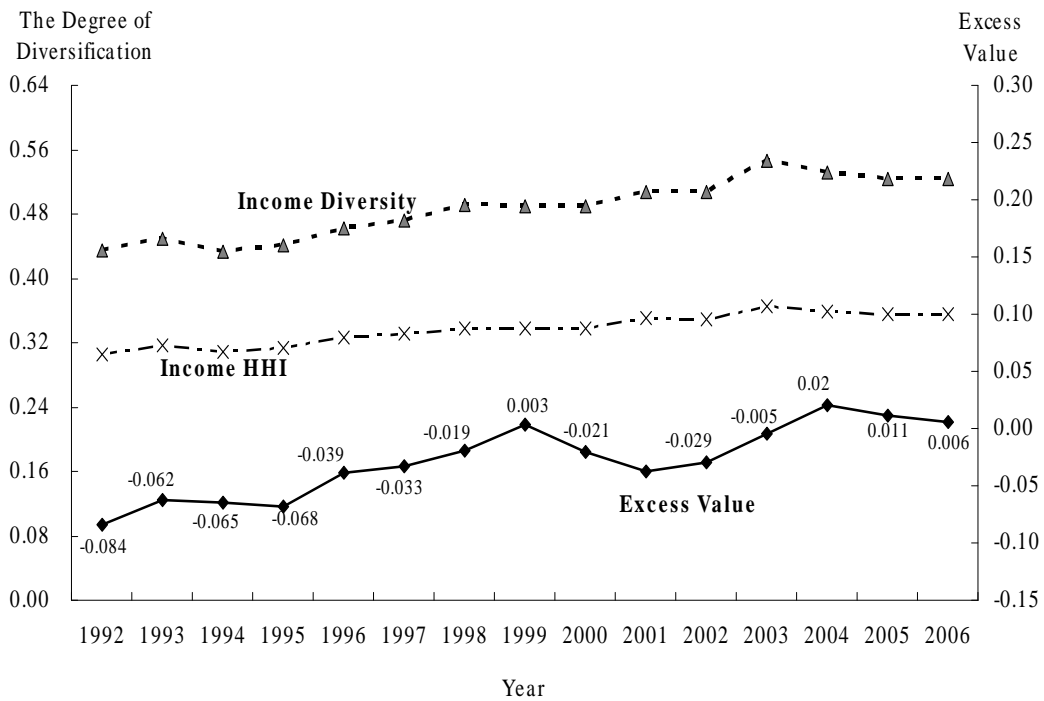
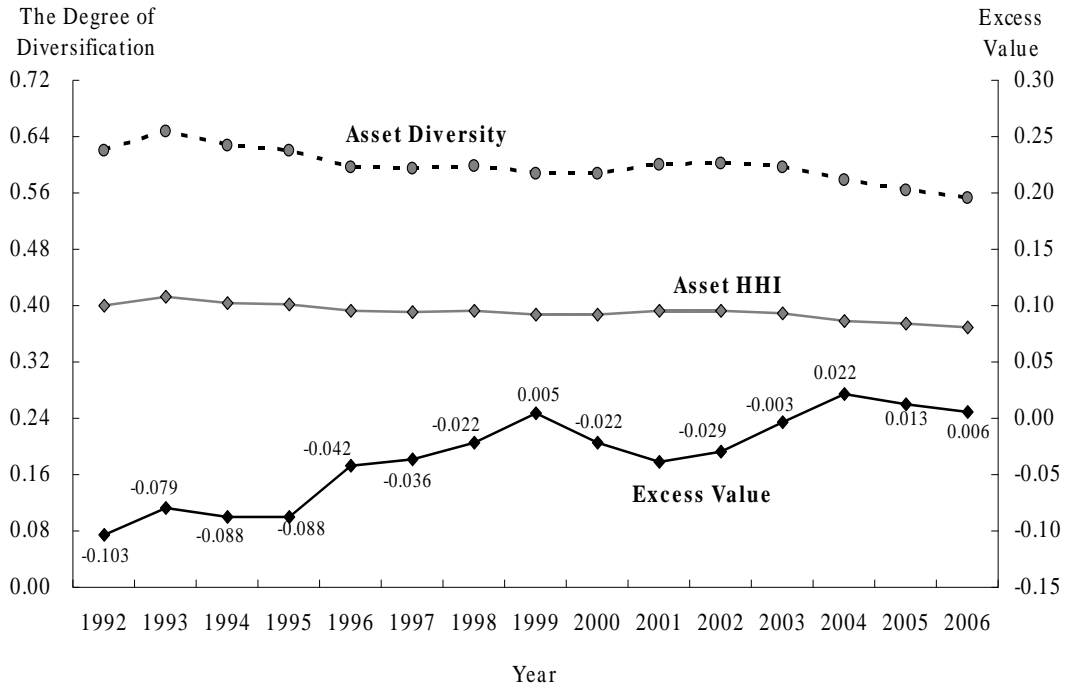


Table 1
Summary of Previous Studies on the Determinants of Bank Economic Value

Explanatory variable	Positive relation with bank value and performance	Negative relation with bank value and performance	No relation with bank value and performance
<i>Diversification</i>			
Asset DIV		Laeven and Levine (2007), Choi and Kotrozo (2006)	Baele et al. (2007)
Income DIV	Chiorazzo et al. (2008), Baele et al. (2007), Stiroh and Rumble (2006)	Laeven and Levine (2007)	
Geographic DIV	García-Herrero and Vázquez (2007), Choi and Kotrozo (2006), Deng and Elyasiani (2008)		
<i>Banks Characteristics</i>			
Non-interest income to total operating income	Chiorazzo et al. (2008), Baele et al. (2007)	Elsas et al. (2010)	
Log(total assets)	Chiorazzo et al. (2008), Stiroh and Rumble (2006), Choi and Kotrozo (2006), DeYoung and Rice (2004)	Lelyveld and Knot (2009), Schmid and Walter (2008), Baele et al. (2007), Elsas et al. (2010), Hayden et al. (2007), Deng and Elyasiani (2006)	Klein and Saidenberg (1998), Laeven and Levine (2007), Acharya et al. (2006)
Equity to assets	Stiroh and Rumble (2006), Hayden et al. (2007), Acharya et al. (2004)		Chiorazzo et al. (2008), Baele et al. (2007), Laeven and Levine (2007)
Deposits to liabilities	Laeven and Levine (2007)		
Leverage	Lelyveld and Knot (2009)	Schmid and Walter (2009)	
Sales growth	Schmid and Walter (2009)		
Assets growth	Laeven and Levine (2007), Stiroh and Rumble (2006)		Chiorazzo et al. (2008)
Income growth			Laeven and Levine (2007)
Non-performing loans to total loans		Chiorazzo et al. (2008)	
Loans to assets	Chiorazzo et al. (2008), DeYoung and Rice (2004)	Deng and Elyasiani (2006)	Baele et al. (2007), Stiroh and Rumble (2006)
Cost to income		Baele et al. (2007), Holzhäuser (2005)	
Loan loss provision			Baele et al. (2007)
<i>Macroeconomic Conditions</i>			
GDP	Laeven and Levine (2007)		García-Herrero and Vázquez (2007),
Inflation	Laeven and Levine (2007)		
<i>Capital market</i>			
The economic freedom		Jonghe and Vennet (2008)	
<i>Institutional Governance</i>			
Governance index		Jonghe and Vennet (2008)	

Table 2

Mean and Median Excess Value for Various Degrees of Diversification

		Panel A: Asset diversity				
		DIV<0.2	0.2≤DIV<0.4	0.4≤DIV<0.6	0.6≤DIV<0.8	DIV≥0.8
Excess Value (Asset)	Mean	-0.0003	-0.051	-0.026	-0.020	-0.015
	Median	-0.079	-0.084	-0.080	-0.080	-0.088
	Obs.	535	1,382	2,392	2,451	2,119

		Panel B : Asset HHI				
		HHI<0.1	0.1≤HHI<0.2	0.3≤HHI<0.2	0.4≤HHI<0.3	HHI≥0.4
Excess Value (Asset)	Mean	0.005	-0.013	-0.047	-0.027	-0.021
	Median	-0.072	-0.081	-0.079	-0.082	-0.083
	Obs.	180	444	968	2,180	5,107

		Panel C: Income diversity				
		DIV<0.2	0.2≤DIV<0.4	0.4≤DIV<0.6	0.6≤DIV<0.8	DIV≥0.8
Excess Value (Income)	Mean	-0.008	-0.031	0.012	-0.034	-0.066
	Median	-0.038	-0.064	-0.080	-0.087	-0.100
	Obs.	1,343	2,401	2,526	1,972	1,428

		Panel D : Income HHI				
		HHI<0.1	0.1≤HHI<0.2	0.2≤HHI<0.3	0.3≤HHI<0.4	HHI≥0.4
Excess Value (Income)	Mean	0.010	-0.018	-0.035	-0.001	-0.035
	Median	-0.031	-0.043	-0.065	-0.078	-0.091
	Obs.	504	1,126	1,720	2,362	3,958

		Panel E : International HHI		
		HHI<0.2	0.2≤HHI<0.9	HHI≥0.9
Excess Value (Asset)	Mean	0.007	0.006	-0.004
	Median	-0.066	-0.021	-0.048
	Obs.	486	156	44

		Panel E : International HHI		
		HHI<0.2	0.2≤HHI<0.9	HHI≥0.9
Excess Value (Income)	Mean	0.022	-0.031	-0.033
	Median	-0.047	-0.042	-0.065
	Obs.	519	162	46

Table 3
Variables Definition, Data Source, and Summary Statistics

Variable	Definition	Data Source	Obs.	Mean	Median	SD
Tobin's Q	The market value of common equity plus the book value of preferred shares plus the book value of debt all divided by the book value of total assets	BankScope and DataStream	9,847	1.05	1.00	0.43
Excess value for assets	Tobin's Q_{assets} – Adjusted Tobin's Q_{assets}	BankScope	8879	-0.02	-0.08	0.45
Excess value for income	Tobin's Q_{income} – Adjusted Tobin's Q_{income}	BankScope	9670	-0.02	-0.07	0.43
NI/OI	Net interest income divided by total operating income	BankScope	9,949	0.69	0.73	0.20
NL/EA	Net loans divided by total earning assets	BankScope	9,977	0.64	0.67	0.18
Asset diversity	$1 - \frac{(\text{net loans} - \text{other earning assets})}{\text{total earning assets}}$	BankScope	9,971	0.59	0.60	0.23
Asset HHI	One minus the sum of the square of the share of net loans over total earning assets and the share of other earning assets over total earning assets	BankScope	9,971	0.39	0.42	0.10
Income diversity	$1 - \frac{(\text{net interest income} - \text{other operating income})}{\text{total operating income}}$	BankScope	9,943	0.49	0.48	0.25
Income HHI	One minus the sum of the square of the share of net interest income over total operating income and the share of other operating income over the total operating income	BankScope	9,949	0.34	0.36	0.12
International HHI	One minus the sum of the square of banks assets in foreign subsidiaries over the total banks assets	BankScope	862	0.20	0.00	0.33
TA	The logarithm of the bank's total assets.	BankScope	10,146	15.20	15.14	2.04
OI	The logarithm of the bank's total operating income.	BankScope	10,028	12.03	11.98	1.90
DL	The ratio of total deposits to total liabilities.	BankScope	10,121	0.88	0.93	0.15
EA	The ratio of book value of equity to total assets.	BankScope	10,146	9.87	7.90	10.46
CI	The ratio of total operating expense to net income	BankScope	9,978	63.99	62.85	24.21
AG	The three-year growth rate in total assets.	BankScope	8,419	0.10	-0.16	15.53
IG	The three-year growth rate in operating income.	BankScope	8,347	-0.10	-0.15	24.86
GDP	The annual real growth in real Gross Domestic Product per capita	DataStream	11,801	0.02	0.02	0.02
INF	The annual change in the CPI index.	DataStream	12,634	6.57	3.00	56.63
MR	Return of the exchange where banks are public listed	DataStream	12,045	0.33	0.40	1.07
BOND	1-year Treasury bond yield	DataStream	8,427	-0.13	-0.30	1.85
FINFREE	An index of financial freedom which measures the relative openness of each country's banking and financial system	The Heritage Foundation	9,857	65.67	70.00	18.71
FISFREE	An index of fiscal freedom defined as a measure of the burden of government from the revenue side.	The Heritage Foundation	9,857	63.05	64.30	12.15
PS	An indicator of political instability and violence	Kaufmann et al. (2006)	6,624	0.48	0.58	0.71
GE	An indicator of government effectiveness	Kaufmann et al. (2006)	6,624	1.32	1.62	0.74
ROL	An indicator of rule of law	Kaufmann et al. (2006)	6,624	1.19	1.52	0.72
Systematic Risk	A dummy equals to one if the country occur systematic banking crisis in year t ; zero for otherwise.	Laeven and Valencia (2008)	12,420	0.02	0.00	0.13
Currency Risk	A dummy equal to one if the country occur currency crisis in year t and zero for otherwise.	Laeven and Valencia (2008)	12,420	0.01	0.00	0.09
Entry barrier	The number of foreign application for banking license denied by the regulatory authorities	World Bank	7,767	0.43	0.00	1.71
Concentration Ratio	The 5-bank concentration ratio	World Bank	7,767	0.72	0.40	3.86
Insurance Activities	Restrictions of insurance	World Bank	7,767	1.51	1.00	0.71
Supervisory Authority	A dummy equal to one if a bank has more than one supervisory body	World Bank	7,746	0.46	0.00	0.49

Table 4
Diversity, Tobin's Q and Excess Value: First Results

LL denotes the study of Leaven and Levine (2007) and CL stands Chen and Lin (2009) for this study. From Panel A and Panel B, the dependent variable in Column 2 to Column 4 is Tobin's Q . The dependent variable in Column 5 to Column 7 of Panel A is the excess value measure based on asset diversity. The dependent variable in Column 5 to Column 7 of Panel B is the excess value measure based on income diversity. The dependent variable in Column 2 of Panel C is Tobin's Q . The dependent variable in Column 3 of Panel C is the excess value measure based on income diversity. The dependent variable in Column 4 of Panel C is the excess value measure based on asset diversity. NL/EA is the ratio of net loans to total earning assets. NI/OI is the ratio of net interest income to total operating income. We also include year dummy in all specifications (not reported). F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding t -statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Independence variables	Tobin's Q			Excess Value		
	LL	CL	CL	LL	CL	CL
	(1998-2002)	(1992-2006)	(1992-2006)	(1998-2002)	(1992-2006)	(1992-2006)
Panel A: Asset Diversity						
Diversification	-0.106** (-2.445)	0.060*** (2.946)		-0.130*** (-3.745)	0.006 (0.273)	
Asset HHI			0.135*** (2.979)			0.035 (0.737)
NL/EA	-0.233*** (-3.357)	0.108*** (3.348)	0.105*** (3.304)			
Observations	3,415	8,850	8,850	3,415	8,857	8,857
R ²	0.161	0.019	0.019	0.214	0.013	0.013
F-statistics		9.434***	9.446***		7.202***	7.233***
Panel B: Income Diversity						
Diversification	-0.110*** (-2.690)	0.060*** (3.133)		-0.103** (-2.371)	0.025 (1.483)	
Income HHI			0.116*** (3.041)			0.053 (1.522)
NI/OI	-0.233*** (-3.765)	-0.052* (-1.676)	-0.056* (-1.853)			
Observations	3,415	9,646	9,652	3,415	9,646	9,652
R ²	0.087	0.019	0.019	0.149	0.013	0.013
F-statistics		10.41***	10.39***		7.432***	7.445***
Panel C: International Diversity (HHI)						
Diversification		0.035 (0.705)		-0.057 (-1.129)		0.017 (0.322)
Observations		737		727		686
R ²		0.039		0.042		0.036

Table 5

The Time Effect of Diversity on Tobin's Q and Excess Value

From Panel A and Panel B, the dependent variable in Column 2 to Column 4 is Tobin's Q . The dependent variable in Column 5 to Column 7 of Panel A is the excess value measure based on asset diversity. The dependent variable in Column 5 to Column 7 of Panel B is the excess value measure based on income diversity. The dependent variable in Column 2 of Panel C is Tobin's Q . The dependent variable in Column 3 of Panel C is the excess value measure based on income diversity. The dependent variable in Column 4 of Panel C is the excess value measure based on asset diversity. Time Trend is defined as a continuous indicator from 1 (if year=1992) to 16 (if year=2006). NL/EA is the ratio of net loans to total earning assets. NI/OI is the ratio of net interest income to total operating income. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding t -statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Independent Variables	Tobin's Q		Excess Value	
	DIV	HHI	DIV	HHI
Panel A: Asset Diversity				
Diversification*Time Trend	0.007*** (8.017)	0.013*** (8.334)	0.007*** (6.755)	0.013*** (7.365)
NL/EA	0.126*** (4.330)	0.111*** (3.869)		
Observations	8,850	8,850	8,857	8,857
R^2	0.009	0.010	0.006	0.007
F -statistics	37.60***	40.19***	45.63***	54.24***
Panel B: Income Diversity				
Diversification*Time Trend	0.006*** (6.865)	0.011*** (7.282)	0.005*** (5.904)	0.009*** (6.376)
NI/OI	-0.074** (-2.550)	-0.075*** (-2.636)		
Observations	9,646	9,652	9,646	9,652
R^2	0.010	0.010	0.004	0.005
F -statistics	42.81***	45.85***	34.86***	40.65***

Table 6

Diversity, Tobin's Q and Excess Value: Controlling for Bank- and Country-Level Characteristics

The dependent variable in Panel A is Tobin's Q and excess value measure based on asset diversity. The dependent variable in Panel B is Tobin's q and excess value measure based on income diversity. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. The regression in Column 5 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 8 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use the regulatory restrictiveness of bank ownership of nonfinancial firms, a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 6 and Column 9 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%; ***significant at 1%.

Independent Variables	Laeven & Levine (2007)				Extended Laeven & Levine (2007)			
	OLS (1998-2002)		Fixed-Effect (1992-2006)		Diversity		HHI	
		Fixed-Effect	Instrument Variable	Fixed-Effect	Instrument Variable	Fixed-Effect	Instrument Variable	Heckman Two Stages
Diversification	-0.117** (-2.562)	0.115*** (5.829)	0.505*** (2.652)	0.095*** (4.080)	0.096*** (4.089)	0.184*** (3.604)	1.057*** (2.671)	0.188*** (3.627)
NL/ EA	-0.210** (-2.581)	0.174*** (5.357)	0.316** (2.297)	0.153*** (4.108)	0.152*** (4.081)	0.138*** (3.784)	0.256** (2.226)	0.137*** (3.759)
TA	0.005 (1.581)	-0.027*** (-4.660)	0.001 (0.0758)	-0.039*** (-5.923)	-0.041*** (-4.506)	-0.039*** (-5.921)	-0.001 (-0.183)	-0.042*** (-4.572)
DL	0.052 (0.994)	-0.101*** (-2.681)	-0.149*** (-3.242)	-0.099** (-2.131)	-0.098** (-2.108)	-0.096** (-2.077)	-0.154*** (-3.332)	-0.095** (-2.047)
EA	0.121 (1.015)	-0.007*** (-12.43)	0.006*** (6.152)	0.001 (1.014)	0.001 (1.039)	0.001 (1.003)	0.001 (6.124)	0.001 (1.039)
AG	0.041 (1.515)	0.010 (1.040)	-0.025** (-2.549)	-0.014 (-1.201)	-0.013 (-1.177)	-0.014 (-1.207)	-0.024** (-2.448)	-0.013 (-1.175)
IG	0.025 (0.923)	0.000 (0.778)	0.000 (1.039)	0.000 (0.528)	0.000 (0.532)	0.000 (0.575)	0.001 (1.365)	0.000 (0.582)
ROE			0.000*** (2.995)	0.000 (0.696)	0.000 (0.694)	0.000 (0.651)	0.000*** (3.031)	0.000 (0.648)
CI			-0.000 (-1.597)	-0.000 (-0.884)	-0.000 (-0.880)	-0.000 (-0.838)	-0.000 (-1.192)	-0.000 (-0.832)
GDP	0.003* (1.710)	0.345*** (3.198)	0.430*** (3.821)	0.308** (2.417)	0.310** (2.427)	0.311** (2.441)	0.450*** (4.018)	0.313** (2.455)
Inflation Rate	0.001 (0.538)	-0.000 (-0.830)	-0.000*** (-0.0772)	-0.000*** (-3.694)	-0.000*** (-3.700)	-0.000*** (-3.646)	-0.000 (-0.256)	-0.000*** (-3.655)
Merger and Acquisitions			0.005 (0.479)	0.005 (0.348)	0.004 (0.339)	0.005 (0.362)	0.005 (0.493)	0.005 (0.350)
Lambda			0.002 (0.332)	0.002 (0.332)	0.002 (0.332)	0.002 (0.332)	0.003 (0.458)	0.003 (0.458)
Observations	2,773	4,657	4,443	6,202	6,202	6,202	4,443	6,202
R ²	0.204	0.060	0.018	0.018	0.018	0.017	0.017	0.017
F-statistics		29.75***	7.592***	8.483***	7.838***	8.173***	7.670***	7.560***

Table 6 (Continued)

The dependent variable in Panel A is Tobin's q and excess value measure based on asset diversity. The dependent variable in Panel B is Tobin's q and excess value measure based on equity to total assets. AG is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. The regression in Column 5 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 8 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use the regulatory restrictiveness of bank ownership of nonfinancial firms, a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 6 and Column 9 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE, and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%, **significant at 5%, ***significant at 1%.

Independent Variables	Panel A: Assets Diversity									
	Laeven & Levine (2007)					Extended Laeven & Levine (2007)				
	OLS		Fixed-Effect			Diversity		HHI		
	(1998-2002)	(1992-2006)	Fixed-Effect	Instrument Variable	Fixed-Effect	Instrument Variable	Fixed-Effect	Instrument Variable	Fixed-Effect	Instrument Variable
Diversification	-0.142***	0.054***	0.043**	0.579***	0.045**	0.088*	1.193***	0.094**		
TA	(-5.450)	(3.165)	(2.104)	(2.926)	(2.179)	(1.897)	(2.920)	(1.995)		
DL	0.005	-0.028***	-0.040***	-0.002	-0.044***	-0.040***	-0.004	-0.044***		
	(1.532)	(-4.862)	(-6.045)	(-0.248)	(-4.792)	(-6.038)	(-0.467)	(-4.802)		
EIA	0.076*	-0.1106***	-0.108**	-0.174***	-0.106**	-0.106**	-0.175**	-0.105**		
	(1.956)	(-2.805)	(-2.330)	(-3.477)	(-2.290)	(-2.297)	(-3.534)	(-2.254)		
AG	0.138	-0.008***	0.001	0.006***	0.001	0.001	0.006***	0.001		
	(1.053)	(-12.86)	(0.891)	(5.998)	(0.940)	(0.890)	(6.002)	(0.945)		
IG	0.030	0.012	-0.012	-0.019*	-0.011	-0.012	-0.019*	-0.011		
	(1.320)	(1.213)	(-1.026)	(-1.827)	(-0.986)	(-1.037)	(-1.841)	(-0.993)		
ROE	0.021	0.000	0.000	0.000	0.000	0.000	0.001	0.000		
	(0.815)	(0.970)	(0.573)	(0.934)	(0.580)	(0.593)	(1.313)	(0.603)		
CI			0.000	0.000***	0.000	0.000	0.000***	0.000		
			(-1.240)	(3.234)	(0.591)	(0.577)	(3.245)	(0.573)		
GDP	0.005**	0.346***	0.315**	0.372***	0.318**	0.316**	0.405***	0.319**		
	(2.221)	(3.195)	(2.467)	(3.130)	(2.486)	(2.477)	(3.511)	(2.497)		
Inflation Rate	0.005**	-0.000	-0.000***	-0.000	-0.000***	-0.000***	-0.000	-0.000***		
	(2.134)	(-0.566)	(-3.435)	(-0.380)	(-3.449)	(-3.422)	(-0.522)	(-3.438)		
Merger and Acquisitions			0.005	0.007	0.004	0.005	0.007	0.005		
			(0.355)	(0.649)	(0.339)	(0.361)	(0.636)	(0.345)		
Lambda					0.004			0.005		
					(0.610)			(0.661)		
Observations	2,773	4,657	6,202	4,443	6,202	6,202	4,443	6,202		
R ²	0.287	0.054	0.015	0.015	0.015	0.015	0.015	0.015		
F-statistics		29.49***	7.629***	7.786***	7.023***	7.552***	7.989***	6.958***		

Table 6 (Continued)

The dependent variable in Panel A is Tobin's Q and excess value measure based on asset diversity. The dependent variable in Panel B is Tobin's Q and excess value measure based on income diversity. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t . The regression in Column 5 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 8 is estimated using instrumental variables (IV) based on asset HHH. From Barth et al (2004) we use the regulatory restrictiveness of bank ownership of nonfinancial firms, a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 6 and Column 9 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%; ***significant at 1%.

Independent Variables	Panel B: Income Diversity													
	Laeven & Levine (2007)			Diversity			Extended Laeven & Levine (2007)			HHH				
	Fixed Effect			Instrument Variable			Heckman Two Stages			Instrument Variable			Heckman Two Stages	
	(1998-2002)	(1992-2006)	Fixed-Effect	Instrument Variable	Heckman Two Stages	Fixed-Effect	Instrument Variable	Heckman Two Stages	Fixed-Effect	Instrument Variable	Heckman Two Stages			
Diversification	-0.090** (-2.192)	0.061*** (3.302)	0.092*** (4.158)	0.477*** (2.803)	0.090*** (4.060)	0.188*** (4.134)	1.141*** (2.735)	0.182*** (3.982)						
NI/OI	-0.202*** (-3.359)	-0.077** (-2.455)	-0.018 (-0.499)	0.276* (1.955)	-0.012 (-0.315)	-0.025 (-0.698)	0.286* (1.931)	-0.020 (-0.546)						
OI	0.011*** (3.549)	-0.021*** (-4.153)	-0.033*** (-5.460)	0.008 (1.096)	-0.026*** (-5.523)	-0.032*** (-5.381)	0.011 (1.441)	-0.026*** (-3.549)						
DL	0.113** (1.990)	-0.028 (-0.806)	-0.097** (-2.321)	-0.166*** (-5.460)	-0.097** (-2.299)	-0.100** (-2.378)	-0.176*** (-3.935)	-0.099** (-2.356)						
EA	0.145 (1.170)	-0.004** (-5.520)	0.000 (0.411)	0.004** (5.073)	0.000 (0.479)	0.000 (0.409)	0.005*** (5.062)	0.000 (0.471)						
AG	0.063** (2.369)	0.009 (0.981)	-0.016* (-1.667)	-0.033*** (-3.253)	-0.016* (-1.718)	-0.016 (-1.643)	-0.036*** (-3.310)	-0.016* (-1.687)						
IG	0.014 (0.505)	0.000 (1.197)	0.000 (0.653)	0.000 (0.824)	0.000 (0.652)	0.000 (0.676)	0.000 (0.900)	0.000 (0.675)						
ROE			0.000 (0.787)	0.000 (1.381)	0.000 (0.792)	0.000 (0.843)	0.000 (1.579)	0.000 (0.845)						
CI			-0.000 (-0.953)	-0.000 (-0.377)	-0.000 (-0.863)	-0.000 (-0.927)	-0.000 (-0.107)	-0.000 (-0.846)						
GDP	0.003 (1.462)	0.424*** (4.257)	0.370*** (3.088)	0.559*** (4.900)	0.367*** (3.069)	0.373*** (3.115)	0.581*** (4.869)	0.371*** (3.095)						
Inflation Rate	0.000 (0.157)	-0.000 (-0.564)	-0.000*** (-3.594)	0.001 (0.727)	-0.000*** (-3.454)	-0.000*** (-3.592)	0.001 (0.963)	-0.000*** (-3.464)						
Merger and Acquisitions			0.003 (0.278)	0.001 (0.122)	0.003 (0.240)	0.003 (0.272)	0.001 (0.0656)	0.003 (0.237)						
Lambda					-0.013 (-1.612)			-0.012 (-1.474)						
Observations	2,773	5,094	6,823	4,725	6,823	6,823	4,725	6,823						
R ²	0.221	0.027	0.020	0.020	0.020	0.020	0.020	0.020						
F-statistics		13.92***	10.30***	8.802***	9.706***	10.28***	8.543***	9.658***						

Table 6 (Continued)

The dependent variable in Panel A is Tobin's Q and excess value measure based on asset diversity. The dependent variable in Panel B is Tobin's Q and excess value measure based on income diversity. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t . The regression in Column 5 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 8 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992-2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%, **significant at 5%, ***significant at 1%.

Independent Variables	Panel B: Income Diversity									
	Laeven & Levine (2007)		Fixed-Effect		Diversity		Extended Laeven & Levine (2007)		HHH	
	OLS	Fixed-Effect	Fixed-Effect	Instrument Variable	Heckman Two Stages	Fixed-Effect	Instrument Variable	Heckman Two Stages	Heckman Two Stages	
Diversification	-0.090*** (-2.632)	0.030* (1.923)	0.043** (2.248)	0.251** (2.126)	0.040** (2.081)	0.095** (2.383)	0.574** (2.055)	0.088** (2.188)		
OI	0.011*** (2.669)	-0.019*** (-3.763)	-0.029*** (-4.905)	0.010 (1.407)	-0.024*** (-3.313)	-0.029*** (-4.848)	0.011 (1.515)	-0.024*** (-3.323)		
DL	0.120*** (2.886)	-0.013 (-0.385)	-0.075* (-1.803)	-0.113*** (-2.804)	-0.074* (-1.772)	-0.076* (-1.834)	-0.118*** (-2.934)	-0.075* (-1.804)		
EA	0.173 (1.310)	-0.004*** (-5.451)	0.000 (0.393)	0.004*** (4.414)	0.000 (0.439)	0.000 (0.391)	0.004*** (4.483)	0.000 (0.434)		
AG	0.057** (2.356)	0.007 (0.822)	-0.017* (-1.782)	-0.026*** (-2.830)	-0.017* (-1.820)	-0.017* (-1.780)	-0.027*** (-2.874)	-0.017* (-1.814)		
IG	0.017 (0.647)	0.000 (1.323)	0.000 (0.572)	0.000 (0.800)	0.000 (0.570)	0.000 (0.582)	0.000 (0.867)	0.000 (0.579)		
ROE			0.000 (0.676)	0.000 (1.267)	0.000 (0.676)	0.000 (0.705)	0.000 (1.405)	0.000 (0.703)		
CI			-0.000 (-1.343)	-0.000 (-1.188)	-0.000 (-1.291)	-0.000 (-1.325)	-0.000 (-1.051)	-0.000 (-1.277)		
GDP	0.003* (1.865)	0.420*** (4.217)	0.354*** (2.952)	0.471*** (4.518)	0.352*** (2.935)	0.356*** (2.971)	0.480*** (4.545)	0.354*** (2.953)		
Inflation	0.004* (1.845)	-0.000 (-0.505)	-0.000*** (-3.426)	-0.000 (-0.0519)	-0.000*** (-3.321)	-0.000*** (-3.421)	0.000 (0.084)	-0.000*** (-3.323)		
Merge			0.002 (0.150)	-0.000 (-0.006)	0.001 (0.120)	0.002 (0.149)	-0.000 (-0.032)	0.001 (0.121)		
Lambda					-0.009 (-1.115)			-0.008 (-1.039)		
Observations	2,773	5,094	6,823	4,725	6,823	6,823	4,725	6,823		
R ²	0.202	0.016	0.012	0.013	0.013	0.012	0.013	0.013		
F-statistics		9.042***	6.983***	7.205***	6.505***	7.040***	7.158***	6.543***		

Table 7

International Diversification, Tobin's *Q* and Excess Value: Controlling for Bank, Country-Level Characteristics and Institutional Governance

The dependent variable of Panel A is Tobin's *Q*. The dependent variable of Columns 1, Column 3 and Column 4 is excess value measure based on asset diversity. The dependent variable of Columns 2, Column 5 and Column 6 is excess value measure based on income diversity. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year *t*. VA is voice and accountability, PS is political instability and violence, ROL is rule of law and COC is control of corruption. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel A: Tobin's <i>Q</i>					
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
International HHI	0.082*** (3.542)	0.078*** (3.130)	0.079*** (3.135)	0.076*** (3.142)	0.075*** (3.096)
Asset Diversity		0.035 (1.208)			
Asset HHI			0.067 (1.052)		
Income Diversity				0.012 (0.359)	
Income HHI					0.037 (0.496)
TA	-0.013*** (-2.851)	-0.017*** (-3.321)	-0.016*** (-3.276)	-0.015*** (-2.992)	-0.014*** (-2.918)
DL	0.117** (2.026)	0.105* (1.717)	0.107* (1.758)	0.126** (2.212)	0.127** (2.227)
EA	0.010*** (5.115)	0.005** (2.155)	0.005** (2.190)	0.006*** (2.603)	0.006*** (2.626)
AG	-0.023 (-0.464)	-0.010 (-0.192)	-0.012 (-0.222)	-0.016 (-0.316)	-0.016 (-0.318)
IG	0.003 (0.0838)	-0.008 (-0.193)	-0.008 (-0.193)	-0.007 (-0.185)	-0.008 (-0.208)
ROE	-0.000 (-0.201)	-0.000 (-0.299)	-0.000 (-0.311)	0.000 (0.0878)	0.000 (0.103)
CI	-0.003*** (-3.939)	-0.003*** (-4.056)	-0.003*** (-4.035)	-0.003*** (-3.923)	-0.003*** (-3.882)
GDP	-0.016 (-0.0323)	-0.455 (-0.860)	-0.451 (-0.851)	-0.219 (-0.447)	-0.222 (-0.455)
Inflation	-0.006 (-1.606)	-0.003 (-0.841)	-0.003 (-0.797)	-0.005 (-1.248)	-0.005 (-1.276)
Merger and Acquisition	0.001 (0.0187)	0.006 (0.186)	0.005 (0.167)	0.005 (0.176)	0.005 (0.169)
GE	-0.155*** (-3.810)	-0.130*** (-2.992)	-0.132*** (-3.036)	-0.147*** (-3.556)	-0.148*** (-3.569)
PS	0.018 (1.048)	0.012 (0.682)	0.012 (0.683)	0.016 (0.956)	0.017 (0.995)
ROL	-0.014 (-0.328)	-0.024 (-0.533)	-0.023 (-0.505)	-0.022 (-0.515)	-0.022 (-0.505)
COC	0.128*** (3.163)	0.119*** (2.830)	0.120*** (2.850)	0.128*** (3.120)	0.127*** (3.100)
Observations	273	250	250	271	271
R ²	0.308	0.257	0.256	0.257	0.258
F-statistics	7.620***	5.042***	5.012***	5.496***	5.506***

Table 7 (Continued)

The dependent variable of Panel A is Tobin's Q . The dependent variable of Columns 1, Column 3 and Column 4 is excess value measure based on asset diversity. The dependent variable of Columns 2, Column 5 and Column 6 is excess value measure based on income diversity. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t . VA is voice and accountability, PS is political instability and violence, ROL is rule of law and COC is control of corruption. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel B: Excess value						
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
International HHI	0.078*** (3.129)	0.048** (2.038)	0.078*** (3.104)	0.078*** (3.107)	0.053** (2.122)	0.050** (2.028)
Asset Diversity			0.025 (0.851)			
Asset HHI				0.045 (0.713)		
Income Diversity					-0.021 (-0.604)	
Income HHI						-0.024 (-0.321)
TA	-0.016*** (-3.304)	-0.015*** (-3.176)	-0.017*** (-3.382)	-0.017*** (-3.352)	-0.016*** (-3.213)	-0.016*** (-3.116)
DL	0.107* (1.758)	0.159*** (2.736)	0.105* (1.710)	0.106* (1.740)	0.156*** (2.671)	0.157*** (2.687)
EA	0.005** (2.167)	0.003 (1.379)	0.005** (2.165)	0.005** (2.188)	0.003 (1.295)	0.003 (1.304)
AG	-0.012 (-0.226)	-0.014 (-0.274)	-0.007 (-0.140)	-0.009 (-0.164)	-0.009 (-0.167)	-0.012 (-0.232)
IG	-0.008 (-0.190)	-0.012 (-0.302)	-0.008 (-0.205)	-0.008 (-0.204)	-0.012 (-0.299)	-0.011 (-0.285)
ROE	-0.000 (-0.303)	-0.000 (-0.461)	-0.000 (-0.321)	-0.000 (-0.328)	-0.000 (-0.385)	-0.000 (-0.441)
CI	-0.003*** (-4.032)	-0.003*** (-4.901)	-0.003*** (-4.067)	-0.003*** (-4.051)	-0.003*** (-4.897)	-0.003*** (-4.903)
GDP	-0.414 (-0.791)	-0.381 (-0.763)	-0.475 (-0.897)	-0.470 (-0.886)	-0.404 (-0.806)	-0.388 (-0.774)
Inflation	-0.004 (-0.865)	-0.006 (-1.582)	-0.004 (-0.864)	-0.003 (-0.834)	-0.006 (-1.453)	-0.006 (-1.491)
Merger and Acquisition	0.006 (0.197)	-0.004 (-0.141)	0.006 (0.195)	0.006 (0.182)	-0.003 (-0.0812)	-0.003 (-0.112)
GE	-0.130*** (-2.995)	-0.139*** (-3.291)	-0.130*** (-2.989)	-0.131*** (-3.018)	-0.136*** (-3.202)	-0.138*** (-3.241)
PS	0.011 (0.660)	0.022 (1.281)	0.012 (0.669)	0.012 (0.670)	0.019 (1.085)	0.020 (1.146)
ROL	-0.025 (-0.547)	-0.030 (-0.697)	-0.025 (-0.544)	-0.024 (-0.524)	-0.032 (-0.723)	-0.031 (-0.712)
COC	0.119*** (2.838)	0.115*** (2.737)	0.119*** (2.825)	0.120*** (2.838)	0.116*** (2.767)	0.116*** (2.749)
Observations	251	271	250	250	271	271
R ²	0.256	0.237	0.258	0.258	0.238	0.237
F-statistics	5.395***	5.278***	5.075***	5.057***	4.959***	4.937***

Table 8

Diversity and Excess Value : Activity and World Regions

The dependent variable in asset diversity and asset-HHI is the excess value based on income diversity. The dependent variable in income diversity and income-HHI is the excess value based on asset diversity. From panel A, in Column 1, we restrict the sample to diversified firms only. In Column 2, we restrict the sample to commercial banks (CB) only. In Column 3, restrict the sample to investment banks (IB) only. In Columns 4, we restrict the sample to banks holding companies (BHCs) only. In Columns 5, we restrict the sample to savings banks (SB) only. In Columns 6, we restrict the sample to cooperative banks (COB) only. From panel B, in Columns 1, we restrict the sample to those banks located in Africa (AF). In Columns 2, we restrict the sample to those banks located in Europe (EU). In Columns 3, we restrict the sample to those banks located in Far East and Central Asia (ASIA). In Columns 4, we restrict the sample to those banks who located in Middle East (ME). In Columns 5, we restrict the sample to those banks located in North America (NA). In Columns 6, we restrict the sample to those banks located in Oceania (OC). In Columns 7, we restrict the sample to those banks located in South and Central America (SC). We also include year dummy (not reported). The world region is defined by BankScope. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel A: Activities						
Independent Variables	DB	CB	IB	BHCs	SB	COB
<i>Asset Diversity</i>						
Diversification	0.027 (1.139)	0.014 (0.693)	0.382*** (4.385)	0.043 (0.780)	0.211*** (4.475)	-0.024 (-1.034)
TA	-0.031*** (-3.431)	-0.043*** (-5.532)	-0.101*** (-2.931)	-0.008 (-0.348)	0.103*** (5.550)	-0.017 (-1.403)
Observations	6,328	4,220	151	2,287	156	246
R ²	0.020	0.023	0.296	0.044	0.526	0.121
F-statistics	7.164***	5.631***	3.016***	5.760***	8.394***	1.812***
<i>Asset HHI</i>						
Diversification	0.063 (1.105)	0.050 (1.106)	0.665*** (3.833)	0.062 (0.488)	0.615*** (5.735)	0.001 (0.0280)
TA	-0.031*** (-3.420)	-0.043*** (-5.543)	-0.097*** (-2.750)	-0.010 (-0.400)	0.094*** (5.206)	-0.017 (-1.405)
Observations	6,328	4,220	151	2,287	156	246
R ²	0.020	0.023	0.271	0.044	0.566	0.117
F-statistics	7.159***	5.678***	2.671***	5.736***	9.850***	1.736***
<i>Income Diversity</i>						
Diversification	0.029 (1.388)	0.016 (0.917)	0.086 (1.386)	0.163*** (2.848)	-0.105*** (-2.790)	-0.051** (-2.286)
TA	-0.026*** (-3.182)	-0.041*** (-5.834)	-0.112*** (-3.622)	-0.012 (-0.635)	0.094*** (4.874)	0.001 (0.0544)
Observations	6,650	4,659	196	2,513	183	245
R ²	0.014	0.020	0.253	0.031	0.337	0.134
F-statistics	5.453***	5.471***	3.391***	4.407***	4.707***	2.022***
<i>Income HHI</i>						
Diversification	0.051 (1.178)	-0.000 (-0.0131)	0.190 (1.640)	0.374*** (3.360)	-0.180*** (-2.655)	-0.068 (-1.472)
TA	-0.026*** (-3.190)	-0.041*** (-5.824)	-0.110*** (-3.561)	-0.009 (-0.479)	0.095*** (4.908)	0.002 (0.229)
Observations	6,655	4,663	196	2,514	183	245
R ²	0.014	0.020	0.257	0.032	0.334	0.121
F-statistics	5.414***	5.425***	3.455***	4.603***	4.641***	1.806***

Table 8 (Continued)

The dependent variable in asset diversity and asset-HHI is the excess value based on income diversity. The dependent variable in income diversity and income-HHI is the excess value based on asset diversity. From panel A, in Column 1, we restrict the sample to diversified firms only. In Column 2, we restrict the sample to commercial banks (CB) only. In Column 3, restrict the sample to investment banks (IB) only. In Columns 4, we restrict the sample to banks holding companies (BHCs) only. In Columns 5, we restrict the sample to savings banks (SB) only. In Columns 6, we restrict the sample to cooperative banks (COB) only. From panel B, in Columns 1, we restrict the sample to those banks located in Africa (AF). In Columns 2, we restrict the sample to those banks located in Europe (EU). In Columns 3, we restrict the sample to those banks located in Far East and Central Asia (ASIA). In Columns 4, we restrict the sample to those banks who located in Middle East (ME). In Columns 5, we restrict the sample to those banks located in North America (NA). In Columns 6, we restrict the sample to those banks located in Oceania (OC). In Columns 7, we restrict the sample to those banks located in South and Central America (SC). We also include year dummy (not reported). The world region is defined by Bankscope. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel B: World Region							
Independent Variables	AF	EU	ASIA	ME	NA	OC	SC
<i>Asset Diversity</i>							
Diversification	0.104 (1.142)	0.044*** (2.592)	-0.010 (-0.488)	-0.036** (-2.283)	0.036 (0.597)	-0.103*** (-3.546)	0.501** (2.130)
TA	-0.016 (-0.711)	-0.009 (-1.329)	-0.018** (-1.966)	0.012 (1.311)	-0.001 (-0.0201)	0.010 (0.784)	-0.201** (-2.213)
Observations	143	2,129	2,234	83	2,113	113	300
R ²	0.202	0.108	0.027	0.785	0.049	0.569	0.086
F-statistics	1.730	14.45	3.542	13.68	6.061	7.354	1.525
<i>Asset HHI</i>							
Diversification	0.413** (2.112)	0.111*** (2.922)	0.005 (0.102)	-0.073** (-2.547)	0.048 (0.346)	-0.214*** (-3.505)	1.129** (2.032)
TA	-0.024 (-1.111)	-0.009 (-1.277)	-0.018** (-2.006)	0.013 (1.445)	-0.001 (-0.0481)	0.008 (0.688)	-0.197** (-2.171)
Observations	143	2,129	2,234	83	2,113	113	300
R ²	0.225	0.109	0.027	0.789	0.049	0.568	0.085
F-statistics	1.974***	14.57***	3.528***	14.02***	6.046***	7.317***	1.498***
<i>Income Diversity</i>							
Diversification	0.110* (1.948)	0.001 (0.0674)	-0.011 (-0.580)	-0.098*** (-4.873)	0.067 (0.957)	-0.062** (-2.033)	0.231 (1.364)
TA	-0.006 (-0.299)	-0.011* (-1.657)	-0.015* (-1.831)	0.014 (1.309)	-0.001 (-0.0355)	0.036** (2.394)	-0.163* (-1.851)
Observations	163	2,396	2,479	98	2,303	116	323
R ²	0.217	0.069	0.032	0.783	0.031	0.320	0.071
F-statistics	2.230***	10.02***	4.745***	16.92***	4.131***	2.706***	1.341***
<i>Income HHI</i>							
Diversification	0.272** (2.005)	-0.006 (-0.180)	-0.028 (-0.818)	-0.412*** (-5.193)	0.219 (1.547)	-0.155** (-1.987)	0.562 (1.509)
TA	-0.004 (-0.198)	-0.010 (-1.623)	-0.015* (-1.827)	0.010 (1.015)	-0.001 (-0.0473)	0.036** (2.401)	-0.157* (-1.782)
Observations	163	2,398	2,482	98	2,303	116	323
R ²	0.218	0.068	0.032	0.790	0.032	0.319	0.072
F-statistics	2.247***	10.00***	4.762***	17.63***	4.226***	2.690***	1.369***

Table 9

Scale and Scope of Activities of Specialized and Diversified Banks

The dependent variable in Column 1 is the logarithm of total assets. The dependent variable in Column 2 is the logarithm of net loans. The dependent variable in Column 3 is the logarithm of total other earning assets. The dependent variable in Column 4 is the logarithm of total operating income. The dependent variable in Column 5 is the logarithm of total net interest income. The dependent variable in Column 6 is the logarithm of total non-interest income. Specialized commercial bank (CB) is a dummy variable that takes the value one if net loans are more than 90% of total earning assets (Panel A) or if net interest income is more than 90% of total income (Panel B), and zero otherwise. Specialized investment bank (IB) is a dummy variable that takes the value one if other earning (non-loan) assets are more than 90% of total earning assets (Panel A), or if non-interest income is more than 90% of total income (Panel B). The default category is Diversified bank, which is a dummy variable that takes the value one if net loans are between 10% and 90% of total earning assets (Panel A), or if net interest income is between 10% and 90% of total income (Panel B) and zero otherwise. We also include year dummy and the results are not reported. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Independent Variables	Dependent Variable:					
	TA	NL	OEA	OI	NII	NNI
Panel A: Asset Diversity						
CB (Specialized)	0.086*** (3.055)	0.239*** (7.008)	-0.721*** (-21.34)	0.092*** (2.955)	0.117*** (3.492)	-0.002 (-0.0556)
IB (Specialized)	-0.273*** (-5.403)	-1.067*** (-16.90)	-0.099 (-1.630)	-0.288*** (-5.058)	-0.349*** (-5.762)	-0.434*** (-5.876)
Observations	9,117	9,062	9,116	9,025	8,982	8,893
R ²	0.516	0.455	0.408	0.390	0.292	0.428
Panel B: Income Diversity						
CB (Specialized)	0.123*** (7.367)	0.139*** (6.895)	0.068*** (3.324)	0.057*** (3.138)	0.164*** (8.503)	-0.809*** (-35.59)
IB (Specialized)	-0.283*** (-6.968)	-0.627*** (-11.69)	-0.165*** (-3.313)	0.046 (1.021)	-1.429*** (-29.90)	0.264*** (4.776)
Observations	9949	9875	9949	9906	9890	9819
R ²	0.517	0.443	0.383	0.397	0.347	0.500

Table 10
The Time Effect of Diversification on Excess Value: Controlling for Bank- and Country-Level Characteristics

The dependent variable in Panel A is excess value measure based on asset diversity. The dependent variable in Panel B is excess value measure based on income diversity. Diversification in Panel A is asset diversity and asset-HHI multiply time trend, respectively. Time Trend is defined as a continuous indicator form 1 (if year=1992) to 16 (if year=2006). Diversification in Panel B is income diversity and income-HHI multiply time trend, respectively. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. The regression in Column 3 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 6 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use the regulatory restrictiveness of bank ownership of nonfinancial firms, a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 4 and Column 7 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding *t*-statistics are given in parentheses below. *significant at 10%; **significant at 5%; ***significant at 1%.

Panel A: Assets Diversity						
Independent Variables	Diversity			HHI		
	FE	IV	HECK	FE	IV	HECK
Diversification* Time Trend	0.004*** (3.205)	0.025*** (3.121)	0.004*** (3.201)	0.007*** (2.986)	0.042*** (3.131)	0.007*** (2.981)
NL/TA	0.137*** (3.978)	0.161** (2.467)	0.136*** (3.946)	0.127*** (3.765)	0.104** (2.065)	0.127*** (3.730)
TA	-0.022*** (-2.658)	0.074*** (3.058)	-0.023** (-2.250)	-0.021** (-2.455)	0.081*** (3.084)	-0.022** (-2.115)
DL	-0.087* (-1.886)	-0.106** (-2.419)	-0.087* (-1.874)	-0.087* (-1.869)	-0.099** (-2.260)	-0.086* (-1.857)
EA	0.001 (0.584)	0.004*** (4.025)	0.001 (0.591)	0.001 (0.554)	0.004*** (3.617)	0.001 (0.560)
AG	-0.021* (-1.802)	-0.039*** (-3.554)	-0.021* (-1.795)	-0.021* (-1.829)	-0.039*** (-3.588)	-0.021* (-1.822)
IG	0.000 (0.524)	0.000 (1.086)	0.000 (0.525)	0.000 (0.536)	0.000 (1.198)	0.000 (0.537)
ROE	0.000 (0.582)	0.000** (2.095)	0.000 (0.580)	0.000 (0.558)	0.000* (1.869)	0.000 (0.557)
CI	-0.000 (-0.757)	-0.000 (-0.586)	-0.000 (-0.755)	-0.000 (-0.719)	-0.000 (-0.214)	-0.000 (-0.716)
GDP	0.300** (2.350)	0.207 (1.558)	0.300** (2.352)	0.303** (2.372)	0.195 (1.453)	0.303** (2.374)
Inflation Rate	-0.000*** (-3.414)	-0.000 (-0.485)	-0.000*** (-3.415)	-0.000*** (-3.399)	-0.001 (-0.669)	-0.000*** (-3.399)
Merger and Acquisition	0.004 (0.287)	0.005 (0.525)	0.004 (0.284)	0.004 (0.279)	0.005 (0.452)	0.004 (0.276)
Lambda			0.001 (0.119)			0.001 (0.111)
Observations	6,202	4,443	6,202	6,202	4,443	6,202
R ²	0.018		0.018	0.018		0.018
F-statistics	8.348***	8.048***	7.706***	8.233***	8.124***	7.599***

Table 10 (Continued)

The dependent variable in Panel A is excess value measure based on asset diversity. The dependent variable in Panel B is excess value measure based on income diversity. Diversification in Panel A is asset diversity and asset-HHI multiply time trend, respectively. Time Trend is defined as a continuous indicator form 1 (if year=1992) to 16 (if year=2006). Diversification in Panel B is income diversity and income-HHI multiply time trend, respectively. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. Inflation is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. The regression in Column 3 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 6 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use the regulatory restrictiveness of bank ownership of nonfinancial firms, a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 4 and Column 7 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel B: Income Diversity						
Independent Variables	Diversity			HHI		
	FE	IV	HECK	FE	IV	HECK
Diversification* Time Trend	0.004*** (2.808)	0.016** (2.443)	0.003** (2.442)	0.006*** (2.837)	0.026** (2.285)	0.005** (2.410)
NL/TA	0.121*** (3.494)	0.233*** (3.126)	0.123*** (3.552)	0.117*** (3.436)	0.190*** (3.074)	0.118*** (3.481)
TA	-0.025*** (-3.585)	0.038** (2.361)	-0.021*** (-2.641)	-0.024*** (-3.266)	0.041** (2.243)	-0.020** (-2.526)
DL	-0.089** (-2.101)	-0.069 (-1.426)	-0.089** (-2.109)	-0.089** (-2.110)	-0.069 (-1.423)	-0.089** (-2.121)
EA	0.000 (0.278)	0.004*** (4.455)	0.000 (0.347)	0.000 (0.253)	0.004*** (4.312)	0.000 (0.320)
AG	-0.018* (-1.864)	-0.026*** (-2.857)	-0.018* (-1.859)	-0.018* (-1.887)	-0.025*** (-2.770)	-0.018* (-1.871)
IG	0.000 (0.673)	0.001 (1.308)	0.000 (0.675)	0.000 (0.681)	0.001 (1.387)	0.000 (0.683)
ROE	0.000 (0.737)	0.000 (1.405)	0.000 (0.746)	0.000 (0.749)	0.000 (1.488)	0.000 (0.757)
CI	-0.000 (-0.885)	0.000 (0.112)	-0.000 (-0.832)	-0.000 (-0.862)	0.000 (0.147)	-0.000 (-0.820)
GDP	0.362*** (3.024)	0.398*** (3.870)	0.360*** (3.005)	0.362*** (3.027)	0.370*** (3.512)	0.360*** (3.008)
Inflation Rate	-0.000*** (-3.585)	-0.000 (-0.0141)	-0.000*** (-3.487)	-0.000*** (-3.566)	-0.000 (-0.224)	-0.000*** (-3.482)
Merger and Acquisition	0.001 (0.123)	0.001 (0.108)	0.001 (0.106)	0.001 (0.104)	0.001 (0.0685)	0.001 (0.093)
Lambda			-0.010 (-1.216)			-0.009 (-1.078)
Observations	6,823	4,725	6,823	6,823	4,725	6,823
R ²	0.014		0.014	0.014		0.014
F-statistics	7.181***	7.180***	6.743***	7.195***	7.138***	6.731***

Table 11

The Time Effect of Diversification on Excess Value: Controlling for Capital Market Characteristics and Institutional Governance

The dependent variable in Panel A is excess value measure based on asset diversity. The dependent variable in Panel B is excess value measure based on income diversity. Diversification in Panel A is asset diversity and asset-HHI multiply time trend, respectively. Time Trend is defined as a continuous indicator from 1 (if year=1992) to 16 (if year=2006). Diversification in Panel B is income diversity and income-HHI multiply time trend, respectively. We also control for bank-level and country-level characteristics (not reported). MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. The regression in Column 3 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 6 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 4 and Column 7 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel A: Asset Diversification						
Independent variables	Diversity			HHI		
	FE	IV	HECK	FE	IV	HECK
Diversification*Time Trend	0.004** (2.285)	0.029* (1.923)	0.004** (2.100)	0.007** (2.354)	0.041** (2.152)	0.007** (2.144)
<i>Capital Market Characteristics</i>						
MR	0.007** (2.364)	0.005 (1.213)	0.008** (2.390)	0.007** (2.327)	0.005 (1.511)	0.007** (2.351)
BOND	-0.000 (-0.185)	-0.005* (-1.724)	-0.000 (-0.0580)	-0.001 (-0.348)	-0.005* (-1.890)	-0.000 (-0.220)
FINFREE	0.001*** (3.028)	0.001*** (2.776)	0.001*** (2.990)	0.001*** (2.999)	0.001*** (2.847)	0.001*** (2.967)
FISFREE	-0.000 (-0.802)	-0.002* (-1.792)	-0.000 (-0.762)	-0.001 (-0.923)	-0.002** (-1.965)	-0.000 (-0.874)
<i>Institutional Governance</i>						
PS	-0.022 (-1.272)	0.003 (0.105)	-0.019 (-1.059)	-0.022 (-1.311)	-0.006 (-0.281)	-0.020 (-1.114)
GE	-0.069*** (-3.621)	-0.131** (-2.011)	-0.069*** (-3.655)	-0.068*** (-3.600)	-0.110** (-2.225)	-0.069*** (-3.629)
ROL	0.095** (2.563)	0.182*** (3.299)	0.091** (2.428)	0.100*** (2.667)	0.184*** (3.584)	0.096** (2.525)
Lambda			-0.005 (-0.731)			-0.005 (-0.631)
Observations	2,703	2,317	2,703	2,703	2,317	2,703
R ²	0.044		0.044	0.044		0.044
F-statistics	5.153***	6.867***	4.921***	5.170***	7.584***	4.931***

Table 11 (Continued)

The dependent variable in Panel A is excess value measure based on asset diversity. The dependent variable in Panel B is excess value measure based on income diversity. Diversification in Panel A is asset diversity and asset-HHI multiply time trend, respectively. Time Trend is defined as a continuous indicator from 1 (if year=1992) to 16 (if year=2006). Diversification in Panel B is income diversity and income-HHI multiply time trend, respectively. We also control for bank-level and country-level characteristics (not reported). MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. The regression in Column 3 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 6 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 4 and Column 7 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel B: Income Diversification						
Independent variables	Diversity			HHI		
	FE	IV	HECK	FE	IV	HECK
Diversification*Time Trend	0.005*** (3.268)	0.013* (1.857)	0.004*** (2.901)	0.009*** (3.289)	0.025* (1.840)	0.008*** (2.829)
<i>Capital Market Characteristics</i>						
MR	0.005* (1.718)	0.007*** (2.660)	0.004 (1.398)	0.005* (1.674)	0.006** (2.207)	0.004 (1.385)
BOND	0.000 (0.0800)	-0.002 (-0.876)	-0.000 (-0.0385)	-0.000 (-0.0910)	-0.002 (-1.108)	-0.000 (-0.162)
FINFREE	0.001*** (2.940)	0.001* (1.847)	0.001*** (2.831)	0.001*** (2.931)	0.001** (1.966)	0.001*** (2.845)
FISFREE	-0.000 (-0.567)	-0.001 (-1.234)	-0.000 (-0.626)	-0.000 (-0.721)	-0.001 (-1.376)	-0.000 (-0.743)
<i>Institutional Governance</i>						
PS	-0.023 (-1.362)	-0.007 (-0.287)	-0.024 (-1.438)	-0.026 (-1.552)	-0.010 (-0.397)	-0.027 (-1.612)
GE	-0.069*** (-3.763)	-0.049* (-1.772)	-0.073*** (-3.966)	-0.069*** (-3.788)	-0.062* (-1.857)	-0.073*** (-3.968)
ROL	0.109*** (3.107)	0.137*** (4.087)	0.121*** (3.394)	0.117*** (3.309)	0.158*** (4.106)	0.127*** (3.534)
Lambda			-0.019* (-1.791)			-0.018 (-1.629)
Observations	2,911	2,458	2,911	2,911	2,458	2,911
R ²	0.045		0.046	0.045		0.046
F-statistics	5.795***	10.81***	5.671***	5.803***	10.78***	5.649***

Table 12
The Time Effect of Diversification on Excess Value: Controlling for Country Risk and Bank Supervision

The dependent variable in Panel A is excess value measure based on asset diversity. The dependent variable in Panel B is excess value measure based on income diversity. Diversification in Panel A is asset diversity and asset-HHI multiply time trend, respectively. Time Trend is defined as a continuous indicator from 1 (if year=1992) to 16 (if year=2006). Diversification in Panel B is income diversity and income-HHI multiply time trend, respectively. We also control for bank-level and country-level characteristics (not reported). MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. Systemic is systematic banking crisis. Currency is currency crisis. Entry is foreign application for banking license denied by the regulatory authorities. Ownership is defined as the 5-bank concentration ratio. Activities is defined as the restriction of insurance activities and Supervisory is a dummy equal to one if a bank has more than one supervisory body. The regression in Column 3 is estimated using instrumental variables (IV) based on asset diversity and the regression in Column 6 is estimated using instrumental variables (IV) based on asset HHI. From Barth et al (2004) we use a dummy variable of diversification index and a dummy equal to 1 if supervisors are legally liable for their actions and 0 for otherwise as instrument for income (asset) diversity measures. The self-selection model in Column 4 and Column 7 is estimated using Heckman's (1979) two-step procedure. The selection variable in the first-stage regression is Diversified bank, which is a dummy variable that takes value of 1 if net interest income is between 10% and 90% of total income (Panel B) or if net loans are between 10% and 90% of total earning assets (Panel A). The self-selection regression includes the following control variables: the log of total assets, return on assets, share of diversified banks, S&P financial index, listed on NYSE and net interest margin (not reported). Lambda is the self-selection parameter. F-statistics is performed for the simultaneous significance of all coefficients. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel A: Asset Diversification						
Independent variables	Diversity			HHI		
	GLS	IV	HECK	GLS	IV	HECK
Diversification*Time Trend	0.003*** (9.338)	0.081* (1.869)	0.003*** (8.947)	0.005*** (8.945)	0.089*** (2.779)	0.005*** (9.012)
<i>Country Risk</i>						
Systemic Risk	-0.111*** (-2.848)	0.049 (0.482)	-0.113*** (-2.865)	-0.114*** (-2.928)	0.065 (0.827)	-0.115*** (-2.949)
Currency Risk	-0.013 (-1.494)	-0.074 (-1.115)	-0.012 (-1.311)	-0.010 (-1.115)	-0.049 (-1.147)	-0.010 (-1.041)
<i>Bank Supervision</i>						
Entry Barrier	-0.002*** (-4.691)	0.006* (1.767)	-0.002*** (-4.989)	-0.002*** (-4.759)	0.003 (1.527)	-0.002*** (-5.120)
Concentration Ratio	-0.097*** (-16.62)	-0.453** (-2.090)	-0.094*** (-16.09)	-0.098*** (-16.59)	-0.332*** (-3.134)	-0.095*** (-16.19)
Activities	0.003*** (2.614)	0.006 (0.727)	0.004*** (3.089)	0.003*** (2.634)	0.003 (0.590)	0.004*** (3.113)
Supervisory	0.010*** (3.338)	-0.019 (-0.719)	0.011*** (3.313)	0.010*** (3.262)	-0.025 (-1.225)	0.010*** (3.194)
Lambda			-0.001 (-0.650)			-0.000 (-0.295)
Observations	2,317	2,309	2,317	2,317	2,309	2,317
χ^2	1,935***		2,508***	1,952***		3,561***
F-statistics		2.725***			4.798***	
Panel B: Income Diversification						
Independent variables	Diversity			HHI		
	GLS	IV	HECK	GLS	IV	HECK
Diversification*Time Trend	0.003*** (6.719)	0.021** (2.576)	0.002*** (4.685)	0.006*** (7.634)	0.042*** (2.621)	0.004*** (5.602)
<i>Country Risk</i>						
Systemic	-0.099** (-2.564)	-0.021 (-0.291)	-0.074** (-2.016)	-0.095** (-2.457)	-0.001 (-0.0142)	-0.068* (-1.852)
Currency	-0.015 (-1.523)	0.009 (0.272)	-0.021*** (-2.839)	-0.014 (-1.417)	0.013 (0.411)	-0.019** (-2.564)
<i>Bank Supervision</i>						
Entry	-0.002*** (-3.855)	0.004** (2.008)	-0.001*** (-2.826)	-0.002*** (-3.617)	0.004** (1.964)	-0.001*** (-2.651)
Ownership	-0.086*** (-14.27)	-0.180*** (-3.127)	-0.090*** (-14.18)	-0.086*** (-14.25)	-0.202*** (-3.171)	-0.091*** (-14.37)
Activities	0.002** (2.035)	-0.012** (-2.272)	0.005*** (4.132)	0.003** (2.360)	-0.011** (-2.148)	0.005*** (4.318)
Supervisory	0.014*** (4.075)	-0.008 (-0.490)	0.015*** (4.382)	0.015*** (4.392)	-0.008 (-0.477)	0.016*** (4.713)
Lambda			-0.014*** (-8.431)			-0.014*** (-8.406)
Observations	2,455	2,446	2,455	2,455	2,446	2,455
χ^2	2,092***		2,200	2,108		2,100
F-statistics		8.028***			7.976***	

Table 13

Panel Logistic Estimation with Random Effect for Diversification Premium Banks

The dependence variables in Logistic estimation is diversified premium banks, defined as a dummy equal to 1 if net interest income is between 10% and 90% of total income with respect to positive value of excess value measure (Income diversification) or if net loans are between 10% and 90% of total earning assets with respect to positive value of excess value measure (Asset diversification). We account diversified premium banks for one year until seven year. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. INF is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t . MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. Systemic is systematic banking crisis. Currency is currency crisis. NYSE is a dummy equal to one if a bank listed on NYSE. SPINDEX is a dummy equal to one if a bank belonged to S&P index. Profit is the average industrial interest income margin. PNDIV is the fraction of diversified banks in a country. Data are for the years 1992–2006 and the corresponding t -statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel A : Asset Diversification

Independent variables	1 year	2 year	3 year	4 year	5 year	6 year	7 year
Tobin's Q	12.464*** (6.802)	11.752*** (6.117)	7.367*** (6.255)	3.530*** (4.197)	4.950*** (4.253)	1.795** (2.124)	1.324 (1.133)
Tobin's Q (1 lag)	12.547*** (6.181)	5.455*** (3.136)	0.955 (0.718)	-0.195 (-0.168)	-1.780 (-1.158)	-0.859 (-0.640)	-0.639 (-0.353)
Tobin's Q (2 lag)	3.733*** (2.786)	9.997*** (7.280)	0.031 (0.0452)	0.383 (0.568)	1.175 (1.405)	1.174 (1.631)	1.894** (2.039)
TA	-1.180 (-1.541)	1.231 (1.001)	0.181 (0.148)	0.375 (0.241)	3.138 (0.913)	6.708 (1.422)	3.026 (1.021)
TA (1 lag)	-0.844 (-1.210)	-0.713 (-0.635)	-0.712 (-0.659)	-2.194* (-1.794)	-1.115 (-0.513)	-2.404 (-1.248)	-3.216* (-1.753)
TA (2 lag)	1.776* (1.756)	-0.755 (-0.635)	0.369 (0.308)	1.533 (1.040)	-2.423 (-0.781)	-4.746 (-1.083)	0.020 (0.00726)
DL	3.171** (2.512)	2.857* (1.841)	1.460 (1.049)	0.765 (0.416)	-1.054 (-0.483)	-0.442 (-0.201)	1.385 (0.538)
EA	-0.071** (-1.996)	0.007 (0.200)	0.078*** (2.863)	0.138*** (3.602)	0.157*** (2.794)	0.106** (2.517)	0.138** (2.493)
AG	2.089** (2.401)	-0.425 (-0.351)	-0.185 (-0.145)	-0.325 (-0.208)	-3.488 (-0.930)	-6.519 (-1.293)	-1.354 (-0.440)
AG (1 lag)	-0.260 (-0.430)	-1.327 (-1.403)	-0.312 (-0.356)	0.570 (0.647)	-1.647 (-0.983)	-1.443 (-0.807)	-0.336 (-0.168)
AG (2 lag)	0.767* (1.782)	0.932 (1.452)	0.877* (1.801)	-0.222 (-0.421)	-0.256 (-0.380)	-0.109 (-0.185)	-1.163 (-1.197)
ROA	-1.283*** (-6.082)	-1.605*** (-8.048)	-0.718*** (-5.787)	-0.515*** (-3.414)	-0.528*** (-2.729)	-0.040 (-0.284)	-0.118 (-0.542)
ROE	0.093*** (4.352)	0.119*** (4.844)	0.055** (2.285)	0.017 (0.722)	0.010 (0.321)	0.000 (0.0107)	0.073 (1.170)
CI	-0.043*** (-3.720)	-0.033** (-2.517)	-0.056*** (-3.893)	-0.045*** (-2.596)	-0.033 (-1.562)	-0.032 (-1.349)	-0.021 (-0.694)
GDP	5.736 (0.836)	7.869 (0.975)	-1.124 (-0.145)	-4.129 (-0.400)	13.048 (0.973)	-15.743 (-0.943)	20.162 (0.961)
GDP (1 lag)	0.660 (0.098)	-0.600 (-0.073)	1.116 (0.139)	-13.791 (-1.284)	-11.765 (-0.844)	11.996 (0.703)	-17.730 (-0.883)
GDP (2 lag)	5.116 (0.911)	13.144* (1.756)	4.922 (0.724)	-6.441 (-0.662)	-16.207 (-1.446)	-31.636** (-2.183)	-37.615** (-2.105)
INF	0.048 (1.186)	0.088* (1.847)	0.067 (1.411)	0.091 (1.298)	0.109 (1.311)	0.093 (0.991)	0.305** (2.459)
INF (1 lag)	0.040 (0.584)	-0.036 (-0.539)	-0.004 (-0.0510)	-0.032 (-0.241)	0.015 (0.0865)	-0.188 (-0.793)	-0.104 (-0.389)
INF (2 lag)	-0.055 (-1.042)	-0.044*** (-2.809)	-0.050 (-0.812)	-0.101 (-1.232)	-0.211 (-1.364)	-0.316* (-1.695)	-0.766*** (-2.799)
M&A	0.054 (0.132)	0.370 (0.783)	1.148** (2.491)	0.358 (0.511)	-1.292 (-1.234)	-0.686 (-0.668)	-0.973 (-0.849)
M&A (1 lag)	0.250 (0.579)	0.433 (0.858)	-0.060 (-0.113)	-0.069 (-0.0940)	-0.837 (-0.870)	-0.605 (-0.607)	-0.542 (-0.510)
M&A (2 lag)	-0.645 (-1.328)	0.299 (0.579)	0.871* (1.727)	0.165 (0.214)	1.070 (1.102)	0.102 (0.0910)	-0.119 (-0.0921)
Observations	3,651	3,651	3,651	3,651	3,651	3,651	3,651
Log-Likelihood	-538.5	-404.4	-406.6	-277.1	-223.0	-209.4	-154.0

Table 13 (Continued)

The dependence variables in Logistic estimation is diversified premium banks, defined as a dummy equal to 1 if net interest income is between 10% and 90% of total income with respect to positive value of excess value measure (Income diversification) or if net loans are between 10% and 90% of total earning assets with respect to positive value of excess value measure (Asset diversification). We account diversified premium banks for one year until seven year. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. INF is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. Systemic is systematic banking crisis. Currency is currency crisis. NYSE is a dummy equal to one if a bank listed on NYSE. SPINDEX is a dummy equal to one if a bank belonged to S&P index. Profit is the average industrial interest income margin. PNDIV is the fraction of diversified banks in a country. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%; ***significant at 1%.

Panel A : Asset Diversification

Independent variables	1 year	2 year	3 year	4 year	5 year	6 year	7 year
MR	0.067 (0.559)	-0.090 (-0.618)	-0.320** (-2.197)	-0.029 (-0.159)	-0.279 (-1.251)	-0.323 (-1.359)	-0.358 (-1.204)
FINFREE	0.034*** (3.201)	0.030** (2.299)	0.037*** (2.751)	0.084*** (3.898)	0.111*** (3.227)	0.070** (2.434)	0.045 (1.168)
FISFREE	0.007 (0.578)	0.038** (2.199)	0.033* (1.821)	0.091*** (2.991)	0.098** (2.445)	0.123* (1.941)	0.122* (1.880)
PS	-0.409 (-1.174)	-0.510 (-1.153)	-0.213 (-0.483)	-0.486 (-0.758)	-0.947 (-1.170)	-2.207** (-2.241)	-3.383*** (-2.774)
GE	-0.177 (-0.286)	-0.490 (-0.639)	-0.049 (-0.0643)	-1.856* (-1.666)	-1.942 (-1.347)	1.312 (0.863)	0.804 (0.449)
ROL	0.619 (0.822)	1.438 (1.519)	0.482 (0.499)	1.918 (1.359)	1.680 (0.927)	-0.113 (-0.0535)	2.772 (1.053)
NYSE	0.345 (0.468)	0.350 (0.369)	-0.619 (-0.591)	-0.627 (-0.480)	-0.258 (-0.179)	0.091 (0.0509)	0.204 (0.117)
SPINDEX	0.653 (0.927)	0.952 (1.052)	0.515 (0.534)	1.043 (0.779)	1.609 (1.020)	1.433 (0.678)	1.337 (0.651)
Profit	-0.005 (-0.084)	0.063 (1.018)	0.025 (0.355)	-0.003 (-0.022)	0.063 (0.488)	0.115 (0.731)	0.229 (1.407)
Profit (1 lag)	0.020 (0.278)	-0.067 (-0.825)	-0.006 (-0.0617)	-0.103 (-0.512)	-0.300 (-1.199)	-0.353 (-1.285)	-0.253 (-0.980)
Profit (2 lag)	0.019 (0.239)	0.035 (0.388)	-0.028 (-0.270)	0.028 (0.159)	0.103 (0.523)	0.025 (0.112)	0.102 (0.536)
PNDIV	3.064*** (2.813)	0.419 (0.319)	-1.493 (-1.167)	-2.024 (-1.079)	-2.412 (-1.097)	-3.957 (-1.544)	-7.363** (-2.351)
Observations	3,651	3,651	3,651	3,651	3,651	3,651	3,651
Log-Likelihood	-538.5	-404.4	-406.6	-277.1	-223.0	-209.4	-154.0

Table 13 (Continued)

The dependence variables in Logistic estimation is diversified premium banks, defined as a dummy equal to 1 if net interest income is between 10% and 90% of total income with respect to positive value of excess value measure (Income diversification) or if net loans are between 10% and 90% of total earning assets with respect to positive value of excess value measure (Asset diversification). We account diversified premium banks for one year until seven year. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. INF is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. Systemic is systematic banking crisis. Currency is currency crisis. NYSE is a dummy equal to one if a bank listed on NYSE. SPINDEX is a dummy equal to one if a bank belonged to S&P index. Profit is the average industrial interest income margin. PNDIV is the fraction of diversified banks in a country. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%; ***significant at 1%.

Panel B : Income Diversification

Independent variables	1 year	2 year	3 year	4 year	5 year	6 year	7 year
Tobin's Q	5.167*** (3.501)	6.645*** (4.695)	6.461*** (5.144)	2.462** (2.145)	3.271** (2.458)	0.696 (0.514)	0.447 (0.142)
Tobin's Q (1 lag)	24.179*** (8.434)	8.626*** (4.871)	1.079 (0.623)	0.002 (0.00124)	-0.797 (-0.403)	0.918 (0.433)	1.173 (0.273)
Tobin's Q (2 lag)	0.116 (0.0926)	6.529*** (5.350)	0.169 (0.189)	0.849 (0.941)	0.908 (0.863)	0.774 (0.730)	3.088 (1.610)
TA	0.276 (0.416)	0.374 (0.516)	0.732 (0.975)	1.002 (1.123)	1.567 (1.455)	2.163* (1.667)	3.277 (1.548)
TA (1 lag)	-0.332 (-0.342)	0.109 (0.0992)	-0.257 (-0.223)	-1.439 (-1.022)	-0.451 (-0.261)	-0.425 (-0.199)	-5.816* (-1.778)
TA (2 lag)	-0.166 (-0.243)	-0.652 (-0.826)	-0.547 (-0.637)	0.276 (0.262)	-1.476 (-1.066)	-2.328 (-1.357)	1.884 (0.703)
DL	8.638*** (5.048)	6.917*** (3.867)	4.155** (2.102)	-0.158 (-0.0710)	0.528 (0.164)	1.976 (0.406)	-2.094 (-0.289)
EA	-0.207*** (-4.577)	-0.162*** (-3.401)	-0.044 (-0.857)	-0.023 (-0.402)	-0.181 (-1.431)	-0.369** (-2.187)	-0.121 (-0.493)
IG	-0.023 (-0.109)	0.006 (0.0817)	-0.403** (-2.030)	-0.533** (-2.192)	-0.322 (-1.041)	-0.414 (-1.138)	-1.879*** (-3.756)
IG (1 lag)	0.006 (0.415)	0.012 (0.554)	-0.065 (-0.431)	-0.037 (-0.255)	-0.064 (-0.538)	-0.078 (-0.543)	0.050 (0.262)
IG (2 lag)	0.007 (0.164)	0.020 (0.579)	0.007 (0.121)	0.016 (0.279)	-0.005 (-0.0486)	-0.011 (-0.0978)	0.065 (0.529)
ROA	-1.627*** (-7.879)	-1.056*** (-6.095)	-0.544*** (-2.862)	-0.169 (-0.839)	-0.189 (-0.593)	0.181 (0.477)	-1.374** (-2.047)
ROE	0.074*** (3.803)	0.068*** (2.884)	0.028 (1.030)	-0.001 (-0.0513)	0.004 (0.100)	-0.035 (-0.987)	0.291** (2.303)
CI	-0.099*** (-6.789)	-0.080*** (-5.496)	-0.106*** (-5.881)	-0.104*** (-4.547)	-0.085*** (-2.832)	-0.130*** (-3.362)	-0.154** (-2.489)
GDP	14.046** (2.062)	4.517 (0.645)	-3.236 (-0.458)	-1.578 (-0.175)	-9.430 (-0.745)	-24.582 (-1.492)	-2.667 (-0.0834)
GDP (1 lag)	13.126* (1.812)	12.383 (1.585)	24.876*** (2.979)	20.764** (2.052)	19.848 (1.504)	25.676 (1.449)	-1.523 (-0.0489)
GDP (2 lag)	-3.196 (-0.647)	7.210 (1.107)	0.286 (0.0437)	-1.840 (-0.212)	-24.072** (-2.022)	-36.920** (-2.361)	-63.647** (-2.105)
INF	0.065 (1.225)	0.109** (2.311)	0.044 (0.840)	0.028 (0.448)	0.058 (0.531)	0.220 (1.638)	0.443** (2.114)
INF (1 lag)	0.005 (0.0840)	-0.080 (-1.290)	-0.005 (-0.0837)	-0.004 (-0.0324)	-0.016 (-0.0964)	-0.256 (-1.159)	-0.055 (-0.149)
INF (2 lag)	-0.019* (-1.800)	-0.023* (-1.789)	-0.025*** (-2.899)	-0.058 (-0.605)	-0.234 (-1.632)	-0.301* (-1.703)	-1.075*** (-2.595)
M&A	0.710* (1.699)	0.686 (1.481)	0.785 (1.532)	1.031 (1.631)	0.886 (1.147)	1.212 (1.312)	1.882 (1.304)
M&A (1 lag)	0.201 (0.434)	0.653 (1.379)	-0.275 (-0.486)	-0.114 (-0.169)	0.258 (0.311)	0.648 (0.629)	0.107 (0.0715)
M&A (2 lag)	-0.359 (-0.693)	0.047 (0.0896)	0.613 (1.090)	0.392 (0.563)	0.768 (0.903)	0.772 (0.753)	-0.036 (-0.0221)
Observations	3,612	3,612	3,612	3,612	3,612	3,612	3,612
Log-Likelihood	-541.6	-425.7	-394.3	-306.2	-222.2	-193.5	-118.7

Table 13 (Continued)

The dependence variables in Logistic estimation is diversified premium banks, defined as a dummy equal to 1 if net interest income is between 10% and 90% of total income with respect to positive value of excess value measure (Income diversification) or if net loans are between 10% and 90% of total earning assets with respect to positive value of excess value measure (Asset diversification). We account diversified premium banks for one year until seven year. TA is the logarithm of the bank's total assets. OI is the logarithm of the bank's total operating income. DL is the ratio of total deposits to total liabilities. EA is the ratio of book value of equity to total assets. AG is the three-year growth rate in total assets. IG is the three-year growth rate in operating income. CI is the ratio of total cost to total income. GDP is the annual real growth in GDP per capita. INF is the annual change in the CPI index. Merge is a dummy variable that takes the value one if the bank merged with at least one other financial institution during year t. MR is the return of a local market index. BOND is 1-year Treasury bill yield. FINFREE is financial freedom. FISFREE is fiscal freedom. PS is political instability and violence. GE is governance effectiveness. ROL is rule of law. Systemic is systematic banking crisis. Currency is currency crisis. NYSE is a dummy equal to one if a bank listed on NYSE. SPINDEX is a dummy equal to one if a bank belonged to S&P index. Profit is the average industrial interest income margin. PNDIV is the fraction of diversified banks in a country. Data are for the years 1992–2006 and the corresponding T-statistics are given in parentheses below. *significant at 10%; **significant at 5%, ***significant at 1%.

Panel B : Income Diversification							
Independent variables	1 year	2 year	3 year	4 year	5 year	6 year	7 year
MR	0.121 (0.978)	-0.118 (-0.863)	-0.360** (-2.394)	-0.200 (-1.155)	-0.230 (-1.096)	-0.662** (-2.553)	-0.511 (-1.268)
FINFREE	0.062*** (4.687)	0.049*** (3.682)	0.052*** (3.440)	0.100*** (4.483)	0.110*** (3.702)	0.103*** (3.315)	0.125* (1.683)
FINFREE	0.016 (0.933)	0.028 (1.573)	0.025 (1.278)	0.037 (1.397)	0.042 (1.286)	0.114** (2.365)	0.186** (2.451)
PS	-0.674* (-1.665)	-0.521 (-1.278)	-0.529 (-1.193)	-0.053 (-0.0944)	-0.209 (-0.278)	-1.717* (-1.876)	-2.117 (-0.989)
GE	0.145 (0.207)	-1.487** (-1.990)	-1.497* (-1.865)	-2.603** (-2.548)	-2.382* (-1.735)	-0.435 (-0.252)	0.566 (0.205)
ROL	0.264 (0.298)	2.060** (2.145)	2.358** (2.213)	2.047 (1.512)	1.471 (0.791)	1.150 (0.468)	1.982 (0.430)
NYSE	1.631* (1.787)	1.049 (1.226)	0.412 (0.423)	-0.022 (-0.0173)	0.532 (0.359)	1.125 (0.518)	2.118 (0.746)
SPINDEX	-0.317 (-0.328)	-0.044 (-0.0471)	-1.154 (-0.994)	-0.665 (-0.480)	-0.543 (-0.306)	-1.274 (-0.519)	-1.469 (-0.431)
Profit	-0.003 (-0.0534)	0.085 (1.390)	0.082 (1.236)	0.071 (0.756)	0.123 (1.056)	0.099 (0.546)	0.341 (1.057)
Profit (1 lag)	0.078 (1.023)	-0.068 (-0.811)	-0.026 (-0.282)	-0.088 (-0.702)	-0.190 (-1.146)	-0.200 (-0.767)	-0.620 (-1.301)
Profit (2 lag)	-0.087 (-0.990)	0.025 (0.295)	0.048 (0.527)	0.085 (0.837)	0.251* (1.757)	0.269 (1.220)	0.419 (1.236)
PNDIV	4.486** (2.071)	4.964** (2.095)	4.306 (1.643)	2.595 (0.803)	16.039** (2.062)	38.271*** (2.757)	39.476* (1.840)
Observations	3,612	3,612	3,612	3,612	3,612	3,612	3,612
Log-Likelihood	-541.6	-425.7	-394.3	-306.2	-222.2	-193.5	-118.7

Appendix
Countries represented and number of banks from each country

Country	Country code	No. of banks	Banks with subs	Banks with no subs	Country	Country code	No. of banks	Banks with subs	Banks with no subs
ARGENTINA	AR	6	2	4	KENYA	KE	2	1	1
AUSTRIA	AT	6	6	0	KOREA REP. OF	KR	13	6	7
AUSTRALIA	AU	9	5	4	LITHUANIA	LT	4	1	3
BELGIUM	BE	4	4	0	LUXEMBOURG	LU	2	2	0
BULGARIA	BG	1	0	1	MOROCCO	MA	3	1	2
BRAZIL	BR	4	2	2	MALTA	MT	4	1	3
CANADA	CA	13	7	6	MEXICO	MX	3	0	3
SWITZERLAND	CH	15	7	8	MALAYSIA	MY	15	7	8
CHILE	CL	5	4	1	NETHERLANDS	NL	5	5	0
COLOMBIA	CO	2	2	0	NORWAY	NO	14	1	13
GERMANY	DE	18	10	8	PERU	PE	5	1	4
DENMARK	DK	32	5	27	PHILIPPINES	PH	14	4	10
EGYPT	EG	4	0	4	PAKISTAN	PK	4	2	2
SPAIN	ES	11	5	6	POLAND	PL	12	7	5
FINLAND	FI	2	0	2	PORTUGAL	PT	5	4	1
FRANCE	FR	25	6	19	ROMANIA	RO	2	0	2
UNITED KINGDOM	GB	7	6	1	RUSSIAN FEDERATION	RU	2	2	0
GREECE	GR	11	11	0	SWEDEN	SE	4	4	0
HONG KONG	HK	9	9	0	SINGAPORE	SG	7	6	1
HUNGARY	HU	1	1	0	SLOVENIA	SI	1	1	0
INDONESIA	ID	15	1	14	SLOVAKIA	SK	2	0	2
IRELAND	IE	4	4	0	THAILAND	TH	12	3	9
ISRAEL	IL	7	5	2	TURKEY	TR	13	10	3
INDIA	IN	25	5	20	TAIWAN	TW	20	4	16
ICELAND	IS	2	2	0	USA	US	327	26	301
ITALY	IT	22	13	9	VENEZUELA	VE	4	1	3
JAPAN	JP	95	11	84	SOUTH AFRICA	ZA	9	5	4
Totals							863	238	625