



**Asia-Pacific  
Economic Cooperation**

# **Trade in Services in the APEC Region: Patterns, Determinants, and Policy Implications**

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Prepared by:

Ben Shepherd (Principal) and Erik Van Der Marel (Research Assistant)  
Developing Trade Consultants Ltd.

Produced for:

Asia-Pacific Economic Cooperation Policy Support Unit  
Asia-Pacific Economic Cooperation Secretariat  
35 Heng Mui Keng Terrace  
Tel: (65) 6891-9500 Fax: (65) 6891-9690  
Email: [psu@apec.org](mailto:psu@apec.org) Website: [www.apec.org](http://www.apec.org)

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## TABLE OF CONTENTS

<b>1. INTRODUCTION AND PROJECT OVERVIEW .....</b>	<b>1</b>
<b>A. THE ECONOMIC IMPORTANCE OF SERVICES .....</b>	<b>1</b>
<b>B. GLOBALIZATION OF SERVICES IN THE ASIA-PACIFIC .....</b>	<b>2</b>
<b>C. POLICY QUESTIONS AND PROJECT OBJECTIVES .....</b>	<b>6</b>
<b>D. OUTLINE OF THE REPORT.....</b>	<b>7</b>
<b>2. ECONOMIC IMPLICATIONS OF TRADE IN SERVICES FOR APEC MEMBER ECONOMIES .....</b>	<b>8</b>
<b>A. INTRODUCTION.....</b>	<b>8</b>
<b>B. DIRECT ECONOMIC GAINS FROM SERVICES TRADE .....</b>	<b>8</b>
<b>C. SPILLOVER EFFECTS OF SERVICES TRADE: PRODUCTIVITY AND GROWTH.....</b>	<b>9</b>
<b>D. ECONOMIC EFFECTS OF SERVICES OFFSHORING .....</b>	<b>11</b>
<b>E. CONSOLIDATION: THE ECONOMIC GAINS FROM SERVICES TRADE AND LIBERALIZATION.....</b>	<b>12</b>
<b>3. POLICIES AFFECTING INTERNATIONAL TRADE IN SERVICES . .....</b>	<b>14</b>
<b>A. AGGREGATE PERFORMANCE: A COMPARATIVE PERSPECTIVE .....</b>	<b>17</b>
<b>B. SECTORAL ANALYSIS OF SERVICES POLICIES IN APEC.....</b>	<b>19</b>
<b>C. CONSOLIDATION: POLICIES AFFECTING SERVICES TRADE IN THE ASIA-PACIFIC .....</b>	<b>29</b>
<b>4. DETERMINANTS OF CROSS-BORDER TRADE IN SERVICES IN APEC.....</b>	<b>30</b>
<b>A. THE GRAVITY MODEL OF TRADE.....</b>	<b>30</b>
<b>B. SUMMARY OF EMPIRICAL RESULTS AND INTERPRETATION .....</b>	<b>31</b>
<b>5. CONCLUSION AND POLICY IMPLICATIONS .....</b>	<b>34</b>
<b>6. REFERENCE LIST.....</b>	<b>36</b>
<b>7. APPENDIX 1: TECHNICAL ANNEX.....</b>	<b>39</b>
<b>A. SPECIFICATION OF THE GRAVITY MODEL.....</b>	<b>39</b>
<b>B. DATA SOURCES.....</b>	<b>40</b>
<b>C. EMPIRICAL RESULTS USING AGGREGATE TRADE FLOWS .....</b>	<b>42</b>
<b>D. EMPIRICAL RESULTS USING SECTORAL TRADE FLOWS.....</b>	<b>45</b>

## EXECUTIVE SUMMARY

International trade in services, and services sector growth more generally, is an important economic dynamic in the APEC region. Key features include:

- On average, *services account for over 50% of GDP* in APEC member economies.
- *Backbone services such as transport and telecommunications are important inputs* for the production and export of other goods and services.
- A more efficient services sector boosts economic performance both directly and through spillover effects, and can *contribute to faster economic growth*.
- Less than 20% of services value added is exported, on average, but *the sector has been rapidly globalizing since the early 2000s*.

Some policy measures can be a significant source of trade transaction costs in services sectors. They can play an important role in determining the pattern and extent of international trade in services, including within the APEC region. Key findings on the links between policy and services trade include:

- Gravity model results show that *policy-related factors may add at least as much to trade transaction costs as geographical factors such as distance*.
- Recent World Bank data indicate that, on average, *the services policy environment is relatively restrictive in the Asia-Pacific* compared with other regions.
- There is *major scope to boost services exports and imports* by lowering the transaction costs of international trade in services, including those associated with certain policy measures.
- As a result, *policymakers can play an important role in facilitating trade in services*, just as they have for goods trade.
- Gravity model results confirm that *the trade boost from efficient regulation is particularly strong in the transport, retail/distribution, and finance sectors*.

Policy implications based on this report's findings include:

- *Trade facilitation for services*—i.e., reducing the transaction costs affecting international services trade—should be an important part of overall liberalization and economic integration efforts. Efficient and effective regulation of services sectors is an important step towards reducing trade transaction costs.
- Given the complexity of the regulatory arrangements affecting services trade, it is important for policymakers to take a *holistic approach to reform*. Economy-wide measures, as well as sector-specific ones, need to be considered and complement each other.
- *Backbone services sectors should receive particular attention* as part of a balanced reform package, since they have the greatest potential to generate economy-wide spillovers. These sectors include transport, retail/distribution, and telecommunications.

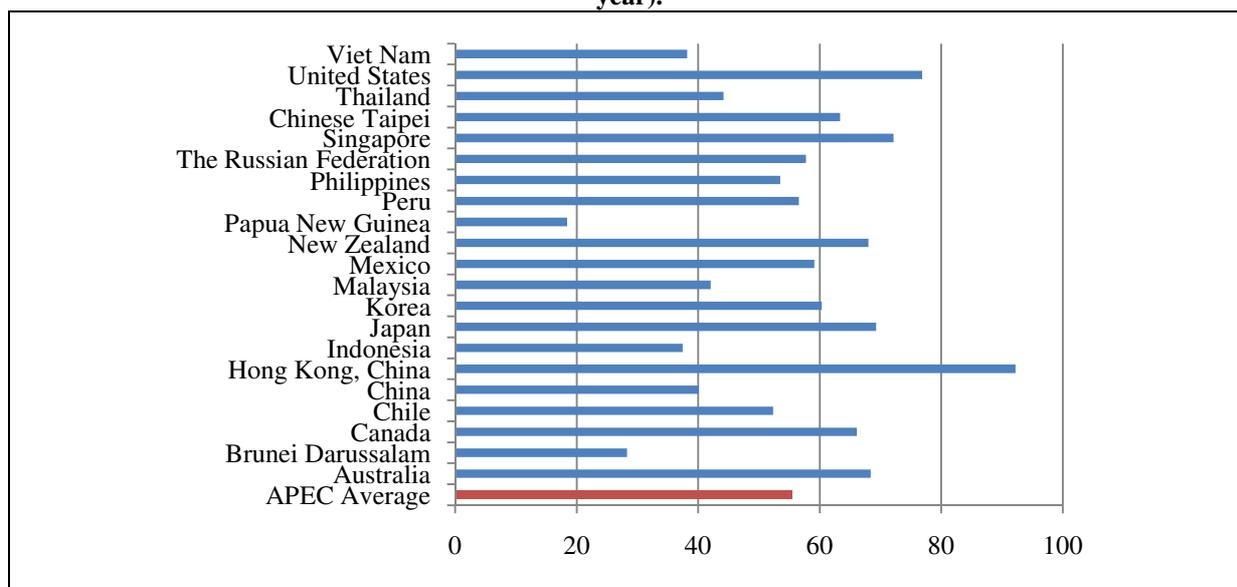
## 1. INTRODUCTION AND PROJECT OVERVIEW

### A. THE ECONOMIC IMPORTANCE OF SERVICES

*Services account for the bulk of all economic activity in the advanced economies.* APEC member economies are no exception. Services value added represents up to 90% of all economic activity in Hong Kong, China, over three-quarters in the United States, and over two-thirds in Australia, Canada, Japan, New Zealand, and Singapore (Figure 1.1). Even in developing economies such as Viet Nam and the Philippines, services account for over one-third and one-half respectively of total value added in the economy.

Traditionally, many services have been treated as essentially non-tradable. The reason for this assumption is that they often require proximity between producer and consumer, or at least the ability to communicate quickly and cost-effectively. Basic consumer services—a simple haircut, for example—have often been included in the non-tradable part of economic activity. Until recently, the same was true of many business and professional services too.

**Figure 1.1 Services value added as a percentage of GDP in APEC member economies (2008 or latest year).**



Source: World Development Indicators and WTO.

Advances in information and communication technologies (ICTs) have fundamentally changed this picture. *It is becoming increasingly possible to trade services across borders.* The rise of business process outsourcing is one important example. It is now possible for a New York-based investment bank to achieve around-the-clock processing of market research and other information by splitting operations across different time zones. Functions such as web design, accounting, and telephone-based or online customer service can now be efficiently and reliably performed overseas.

*The multilateral trading system and regional integration arrangements (RIAs) have both come to recognize the importance of international trade in services.* At the end of the Uruguay Round, the General Agreement on Trade in Services (GATS) established a multilateral legal framework and negotiating forum for trade in services. It adopts many of

the core principles familiar from the GATT and trade in goods, such as non-discrimination, gradual reciprocal liberalization, and special and differential treatment for developing economies. It also reaffirms the right to regulate the domestic economy, thereby setting the stage for progressive reform that takes account of the individual circumstances and institutional particularities of each economy. The GATS is now a core part of the World Trade Organization (WTO) system. Its approach now also finds application in an increasingly large number of RIAs.

The GATS takes an expansive approach to trade in services (see Box 1.1). This means that a wide range of services are now considered tradable for GATS purposes. Even the humble haircut can be seen as a tradable, albeit rarely traded, service. When a Japanese stylist works on a Hollywood movie set, there is trade in services under GATS Mode IV (movement of the service provider). If a US salon chain sets up a subsidiary in Canada, its sales are counted as trade in services under GATS Mode III (foreign affiliate sales).

### **Box 1.1: The GATS Modes of Supply**

Unlike trade in goods—where there must always be a cross-border movement of merchandise—it is a complicated task to analyze the international supply of services. The GATS uses four core analytical tools for this purpose, referred to as “modes of supply”. Many RIAs take a similar approach.

We can use the example of an Australian law firm providing advice to a client in Indonesia to illustrate the four modes of supply.

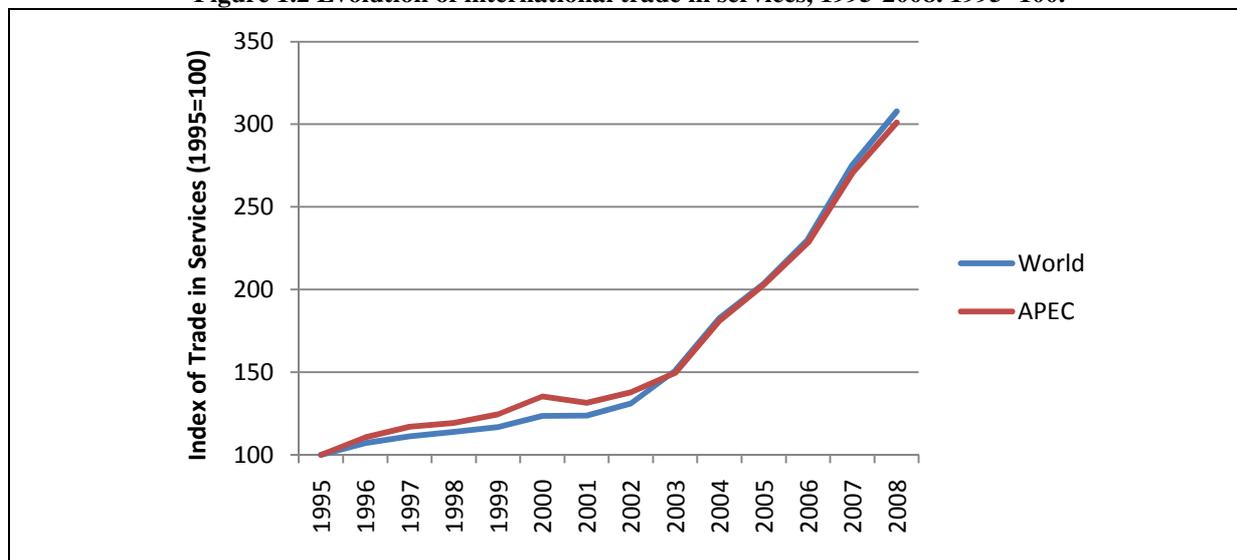
- ***Mode I (cross-border trade)***: A member of the Australian law firm provides advice to her client via email and over the telephone. This transaction is an example of pure cross-border trade in services, which bears the closest analogy to trade in goods.
- ***Mode II (movement of consumers)***: The Indonesian client travels to Sydney to meet with his lawyer, who provides verbal advice. In this case, it is the consumer of the service who moves in order to facilitate the transaction.
- ***Mode III (sales of foreign affiliates)***: The Australian law firm establishes a law office in Jakarta, and it is a lawyer from the local office who is responsible for advising the Indonesian client. The fees earned from this transaction are considered to be exports of services by the Australian law firm.
- ***Mode IV (temporary movement of service providers)***: The Australian law firm sends a lawyer to Jakarta for one week to meet with her client and provide advice. In this case, it is the producer of the service who moves temporarily in order to facilitate the transaction.

## **B. GLOBALIZATION OF SERVICES IN THE ASIA-PACIFIC**

*International trade in services has undergone spectacular growth in recent years* (Figure 1.2). In current US dollar terms, it more than tripled over the 1995-2008 period. There is an obvious upturn in the growth rate of services trade in the early 2000s. It persisted through

2008, but will have slowed somewhat since then due to the effects of the Global Financial Crisis (GFC). APEC economies essentially tracked the same pattern of growth as the world as a whole over the 1995-2008 timeframe.

Figure 1.2 Evolution of international trade in services, 1995-2008. 1995=100.

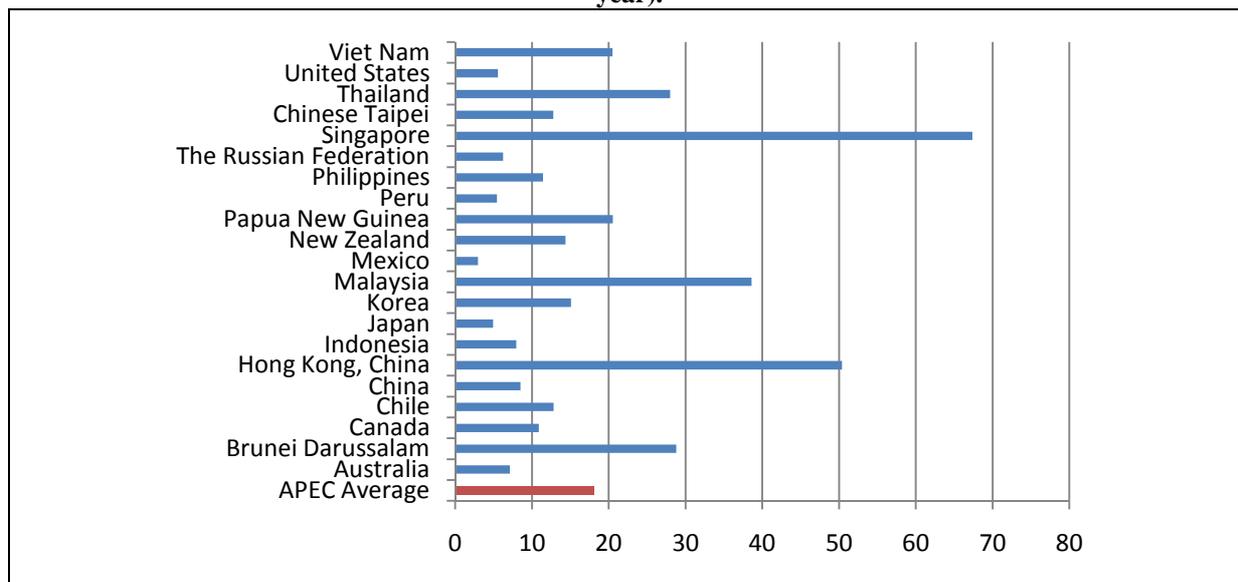


Source: World Development Indicators and author's calculations.

Despite the increasing tradability of services, *the proportion of services output that is actually traded remains relatively small in most member economies* (Figure 1.3).<sup>1</sup> An important part of the explanation must be that the overall transaction costs involved in trading services are relatively high. Transaction costs come from many sources. Some can be referred to as “natural”, in the sense that they reflect inherent factors such as geographical distance, or linguistic and cultural differences. There is relatively little that governments can do to compress these types of costs, although reform of the transport sector can obviously help reduce the “tyranny of distance”. Another part of the overall transaction costs affecting services trade stems from certain policy measures and regulations, which are amenable to substantial change through government action. Many regulations affecting trade in services are legitimate and relatively efficient, but others could be designed and implemented in such a way as to achieve important economic or social gains at lesser economic cost. Re-regulating so as to compress these types of costs can be an important way in which policymakers can lower the costs of international trade in services, and thereby promote trade among APEC member economies. The types of actions discussed below in the context of APEC’s approach to trade in services could make a substantial contribution to boosting the share of services production that is traded.

<sup>1</sup> Trade data are measured in gross shipment terms, and are therefore not strictly comparable with value added data. However, since the value added of services trade must be less than gross shipments, it follows that the trade to value added ratio presented here is an upper bound on the true figure. This point emerges clearly from a consideration of services exports as a percentage of total exports: on average, although services account for over half of all economic activity, they account for only 15% of APEC exports.

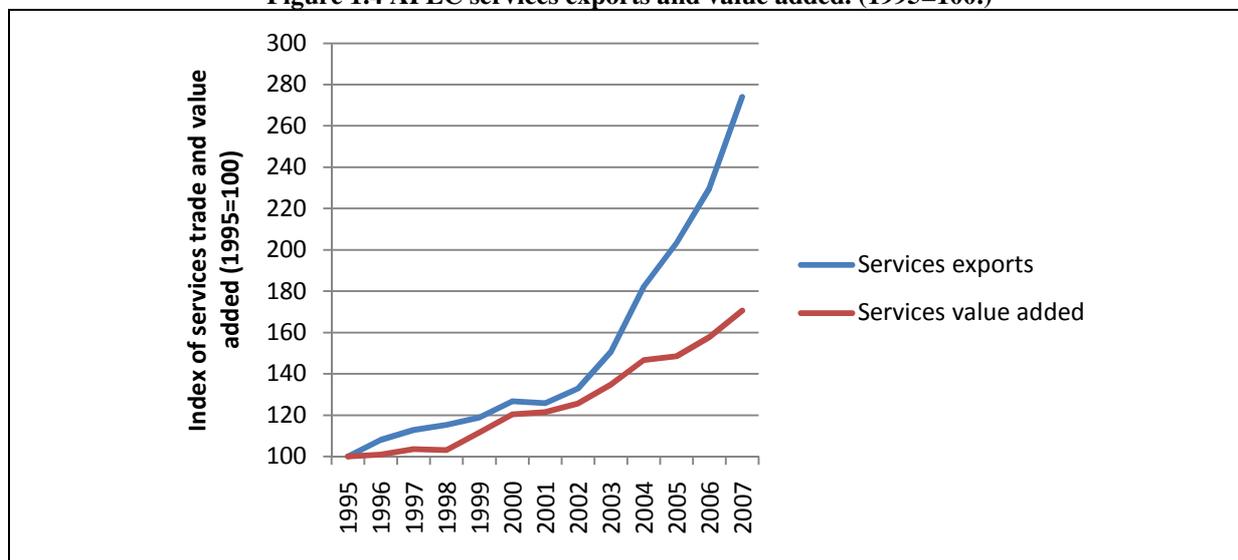
**Figure 1.3 Services exports as a percentage of value added in APEC member economies (2008 or latest year).**



Source: World Development Indicators, WTO and authors' calculations.

Since the early 2000s, however, *exports of services have increased at a much faster rate than services value added* (Figure 1.4). A relatively low initial position can only explain part of this pattern. As in goods markets, trade growth that is much faster than output growth can be seen as a sign of increasingly integrated international markets: globalization and/or regionalization of economic activity. Integration of services markets is therefore becoming an increasingly important aspect of overall economic integration.

**Figure 1.4 APEC services exports and value added. (1995=100.)**



Source: World Development Indicators and authors' calculations.

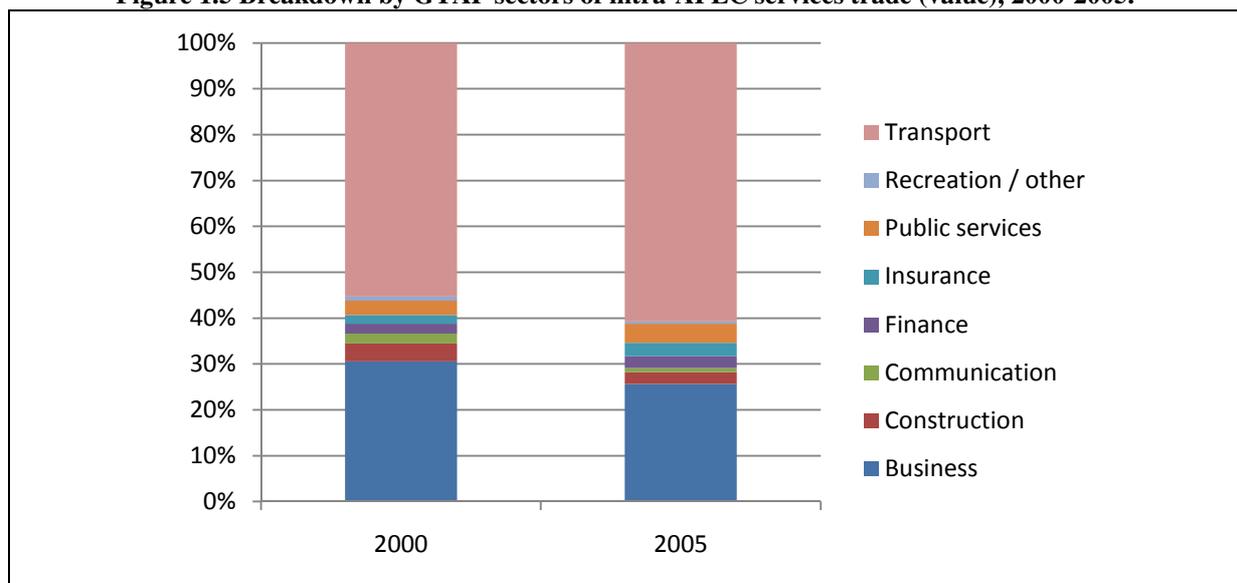
On a sectoral level, *the two largest contributors to intra-APEC trade in services are transport services and business services* (Figure 1.5 and Table 1.1).<sup>2</sup> The share of transport services increased noticeably between 2000 and 2005, as did public services and finance. Communication and recreation decreased. In the former case, this probably reflects

<sup>2</sup> These services correspond to sectors 205 (“transport”) and 268 (“other business services”) respectively in the Balance of Payments classification scheme.

improvements in efficiency that have reduced prices, and therefore also the total value of trade.

The importance of transport services reflects a well-known dynamic in the region, namely the importance of merchandise trade, and in particular trade in manufactured goods within international production networks. Internationalized production can only take place when the transport sector provides reliable and cost-effective services. Since goods cross borders multiple times during the production process, the value of transport services tends to increase with the importance of internationalized goods production processes.

**Figure 1.5 Breakdown by GTAP sectors of intra-APEC services trade (value), 2000-2005.<sup>3</sup>**



Source: Trade in Services Database (Francois et al., 2009) and authors' calculations.

**Table 1.1 Breakdown by GTAP sectors of intra-APEC services trade (% of total by value), 2000-2005.**

	2000	2005
Business	30.57%	25.62%
Construction	3.92%	2.62%
Communication	2.12%	0.86%
Finance	2.16%	2.61%
Insurance	1.93%	2.91%
Public services	3.09%	4.18%
Recreation / other	0.90%	0.50%
Transport	55.31%	60.71%

Source: Trade in Services Database (Francois et al., 2009) and authors' calculations.

***The economic importance of services trade has long been recognized by APEC member economies.*** The 1994 Bogor Declaration commits APEC member economies to the goal of free and open trade in the Asia-Pacific. It specifies a number of ways of advancing towards that goal, including the promotion of free flows of services among member economies.

<sup>3</sup> GTAP is the Global Trade Analysis Project, a commonly used trade database and computable general equilibrium (CGE) model. In terms of the Balance of Payments classification, these sectors correspond respectively to codes 205, 287, 291, 253, 260, 245, 249, and 268. The Trade in Services Database includes data on all APEC member economies except Chinese Taipei.

Since then, APEC member economies have adopted two other major sets of documents addressing trade in services. The first one is the *Osaka Action Agenda* (1995), which deals with implementation of the Bogor Declaration. In services, it encourages member economies to the progressive reduction of market access restrictions, extension of most-favored nation status and national treatment, fair and transparent regulation in services sectors, and recognition of the role of e-commerce. APEC economies commit to participate positively in WTO negotiations and expand GATS commitments, and take further actions with a view to appropriate voluntary liberalization.

The second part of APEC's services framework comprises the APEC *Principles for Cross-Border Trade in Services* and the APEC *Services Action Plan* (2009). The first document sets out core principles to guide actions aimed at advancing the goal of free flows of services among member economies. It incorporates the main GATT obligations of most-favored nation status and national treatment, which APEC economies will endeavor to extend to each other. It reaffirms the right to regulate, and provides some guidelines on transparency and predictability. All four GATS modes are dealt with in terms of commitments to progressively liberalize and facilitate trade in services.

The final document sets out a detailed matrix of actions to be undertaken. They cover policy and technical issues, as well as sector-specific questions. The matrix is a "living document" in the sense that it includes past, present, and prospective work on services. Together with the Bogor Declaration, Osaka Action Agenda, and the Principles for Cross-Border Trade in services, the Services Action Plan represents a comprehensive framework to promote liberalization and facilitation of international trade in services among APEC member economies.

### C. POLICY QUESTIONS AND PROJECT OBJECTIVES

This project is aimed at contributing to the policy process dealing with trade in services in APEC. Its aims are threefold:

1. To *better understand* the role that international trade in services plays in APEC member economies.
2. To *consolidate the existing evidence* on the nature and extent of policy measures that add to the costs of trading internationally in services, with a view to highlighting areas in which concerted policy reforms could have particularly large payoffs.
3. To *examine the determinants of international trade in services* using an econometric model, in order to better understand the role of policy in promoting trade development in this area.

As opposed to trade in goods, there have been few thorough and rigorous studies to examine the underlying nature, structure, and determinants of trade in services at a general level or within the APEC region, in part because of data limitations. Nevertheless, in recent years, the availability of information on trade in services for a number of APEC member economies has improved. This project exploits the availability of new data to push the policy research agenda forward.

In interpreting the analysis and conclusions presented in the report, it is important to keep in mind the particular situation of certain economies, in particular developing ones. As recognized in the GATS and elsewhere, it may be necessary for policy reforms aimed at

reducing trade transaction costs in services sectors to proceed gradually and in keeping with the institutional capabilities and particularities of developing economies. Liberalization can bring economic benefits in a wide range of situations, but it is important that the process be managed in a way that is appropriate given an economy's overall development pathway.

#### **D. OUTLINE OF THE REPORT**

The following section of this report discusses the economic implications of trade in services for APEC member economies. It analyzes direct and indirect (spillover) effects, and also includes a discussion of the economic effects of services offshoring.

Section 3 provides an analysis of policies affecting services trade in the Asia-Pacific region. It examines a number of sources at the aggregate and sector-specific levels. It provides a consolidation of the available information in this area, drawing on previous work that has collected data on regulatory measures affecting services trade across member economies.

Section 4 conducts an empirical analysis of APEC services trade using a gravity model. The gravity model is the most commonly used framework for empirical international trade analysis. It enables us to examine the impact of various factors—including policy—on the pattern of trade in services at the aggregate and sectoral levels.

Section 5 consolidates the report's findings, provides some policy implications, and concludes.

## 2. ECONOMIC IMPLICATIONS OF TRADE IN SERVICES FOR APEC MEMBER ECONOMIES

### A. INTRODUCTION

With the increasing significance of the services sector—and trade in services—for APEC member economies, it is important for policymakers to have as much information as possible and a good understanding of the economic implications of these developments. This section of the report contributes to that process.

First, it examines the direct gains from trade associated with increased openness to services flows. The analogy with trade in goods is strong here—specialization by comparative advantage brings more efficient resource allocation.

Next, we consider spillover effects from increased trade, particularly in producer or “backbone” services. Recent work clearly shows that services trade can help improve the competitiveness of domestic manufacturers and exporters, and contribute to faster economic growth.

Finally, the section deals with recent debates on offshoring and employment in services sectors. It relies on recent work showing that initial concerns in this area may have been overstated.

### B. DIRECT ECONOMIC GAINS FROM SERVICES TRADE<sup>4</sup>

The static gains from trade are familiar from the analysis of goods markets. As trade barriers fall and the transaction costs of trade are thus reduced, economies specialize according to comparative advantage. This process leads to more efficient resource allocation, and a one-off increase in GDP. Consumers are better off, as are exporters. Import-competing producers are worse off, but in simple models the aggregate losses are always outweighed by the aggregate gains.

As additional factors are introduced into the modeling process, the distribution of gains and losses changes. But simulations of regional and multilateral liberalization programs generally show that substantial economic gains exist overall. For example, modeling by the World Bank (2002) shows that the gains from global merchandise trade liberalization amount to nearly \$200bn annually for developing economies.

At its most basic level, services trade operates in much the same way. ***Pure cross-border trade in services has a strong analogy with goods trade:*** as trade is liberalized and transaction costs thus fall, trade flows increase and specialization by comparative advantage takes place. The one-off increase in economic welfare is of the same nature as in goods trade. Trade via GATS Mode I conforms most closely to this paradigm.

More recent models of international trade incorporate product differentiation and heterogeneous firms, i.e. they allow for firms to produce different varieties of output, and for

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<sup>4</sup> In addition to the gains discussed in this section, Borchert and Mattoo (2009) show that services trade has also proved more resilient than goods trade to the recent global financial crisis.

firms with different levels of productivity to co-exist within each sector (Chaney, 2008). Trade liberalization has an additional effect in this framework. It causes low productivity firms to contract or exit the market due to increased competition from foreign producers. This process leads to a transfer of resources towards large, more productive or efficient firms that are better able to face competition from overseas. Overall sectoral productivity increases. The trade in goods literature provides ample empirical evidence in support of this process: see Bernard et al. (2007) for a review. Although there is less evidence from the service sector, Miroudot et al. (Forthcoming) show that a 10% reduction in the trade transaction costs facing service providers is associated with a 0.5% increase in total factor productivity (TFP), and a nearly 0.1% increase in the rate of TFP growth.

***This dynamic process of “creative destruction” provides a solid microeconomic foundation for a direct linkage between trade and productivity growth.*** Although the trade and growth literature of the 1990s and early 2000s was largely inconclusive due to methodological difficulties, there is now strong and widely-accepted empirical evidence of a positive link between openness, productivity, and productivity growth.

### **C. SPILLOVER EFFECTS OF SERVICES TRADE: PRODUCTIVITY AND GROWTH**

***Services are an important input into many production processes elsewhere in the economy.*** One example is the logistics and distribution sector. Better logistics have been shown to be strongly correlated with trade outcomes in goods sectors, and in particular parts and components trade that takes place within international networks (Arvis et al., 2010). Countries with stronger logistics performance also tend to be more open to trade, and experience faster economic growth.

The telecommunications sector is another example. An efficient telecommunications sector makes it possible for other service providers in areas such as finance and business services to achieve higher levels of productivity, and can support export performance in these areas (Guerrieri and Meliciani, 2004). Telecommunications can also have important spillover effects for manufacturing: Freund and Weinhold (2004) show that diffusion of the internet has been an important force in the growth of international trade in goods. A 10 percentage point increase in the growth of web hosts in a country is associated with a 0.2 percentage point increase in export growth. Altogether, this effect contributed to about a 1% increase in annual export growth from 1997-1999. This development could not have taken place without sound regulations to support the efficient provision of telecommunications services.

Regulatory reform that reduces trade costs in services sectors therefore leads not only to improved resource allocation through specialization by comparative advantage, but also to significant “knock on” effects in other parts of the economy. ***Productivity in manufacturing can be increased as a result of gains in service sector efficiency*** (Arnold et al., 2008), which can result in improved export competitiveness. Blyde and Sinyavskaya (2007) find that, on average, a 10% increase in services trade is associated with a 6% increase in goods trade. They find that the strongest gains for manufacturing exports come from improved efficiency in transport and communication services.

### **Box 2.1 Services, Rural Development, and Poverty Reduction in Viet Nam**

Manufacturing is not the only beneficiary of spillovers from a productive services sector. Agricultural production also uses a wide range of services inputs, particularly transport, distribution, extension services, communication, electricity, and finance (credit). Rural producers can therefore also become more productive, and enter into closer contact with international markets, when associated services sectors perform well. This is a particularly important point for developing economies with large rural populations, where poverty is often concentrated in the hinterland.

Viet Nam is a case in point. Research by the World Bank (Aksoy and Isik-Dikmelik, 2007) underscores the hugely successful development of Viet Nam's rural economy in the 1990s and 2000s: rural household income increased by 60%, or about 10% per year, over the period 1993-1998. The authors show that the availability of production-related services contributed positively to households' ability to respond to the liberalization of agricultural trade policy, and to take advantage of the new market opportunities it provided.

Indeed, Viet Nam is a strong performer compared with other economies at similar income levels when it comes to provision of core services in rural areas. In 1993, almost 90% of rural communes had electricity, 85% had roads, 64% had regular markets, and 96% had basic health services. Almost 20% had agricultural extension services within the commune itself, and a greater number had them available within 10km.

Aksoy and Isik-Dikmelik (2007) find strong evidence that the quality of service availability is an important determinant of rural income due to the linkages mentioned above. This is particularly true for road quality as an indicator of transport sector performance, electricity provision, availability of markets, and ability to access credit markets. The spillovers from service sector performance are good not only for the economy as a whole, but also for poor people in developing rural areas.

Source: Aksoy and Isik-Dikmelik (2007).

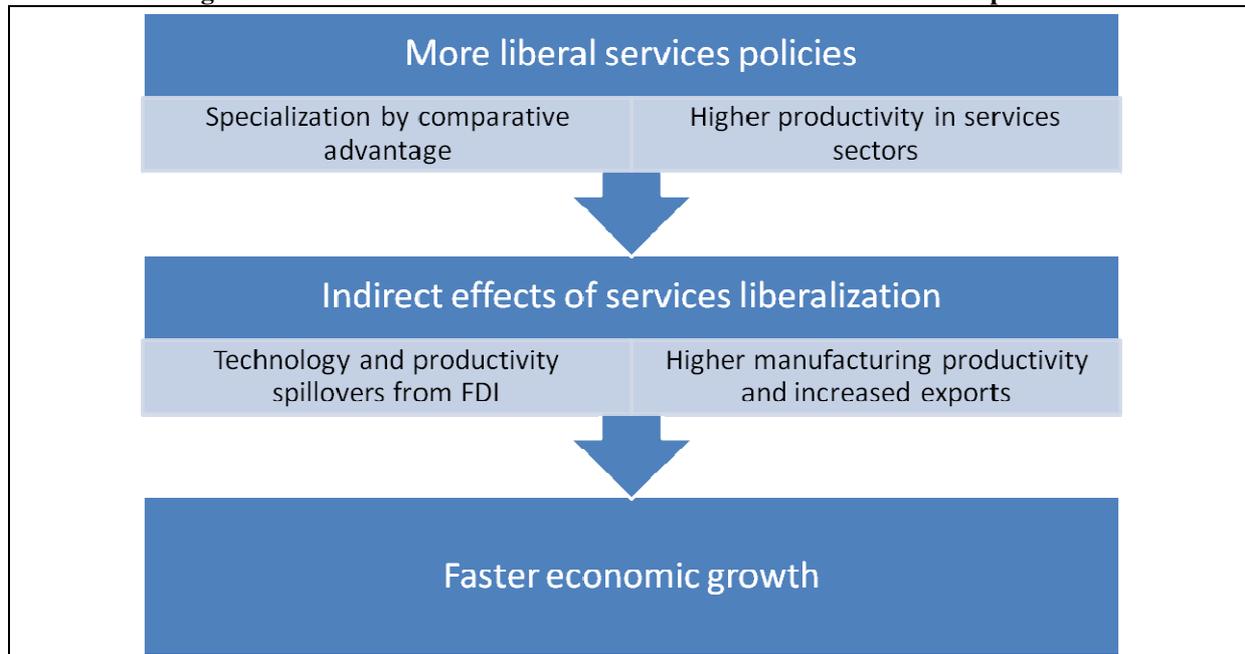
An additional set of spillovers from services trade come from the important role played by FDI and trade via GATS Mode III (sales by foreign affiliates). There is ample empirical evidence that *foreign-owned companies tend to be larger and more productive than their domestic counterparts, particularly in developing economies*. For instance, Arnold and Javorcik (2005) find that foreign acquired plants outperform a control group by 13.5% in terms of productivity after three years.

There can also be substantial *technology spillovers from FDI*, as well as skill upgrading in labor markets. Since FDI is an important vehicle for services trade, this dynamic is suggestive of an additional set of productivity gains that can be reaped by improving service sector productivity, including through additional efforts at trade liberalization.

At the macroeconomic level, there is evidence that these spillover effects matter for subsequent economic growth. Hoekman and Eschenbach (2005) find that liberalization of backbone services such as finance, infrastructure, telecommunications, power, and transport, is highly correlated with inward FDI. Moreover, they find that these policies explain a significant part of the post-1990 growth path of transition economies. Similarly, Mattoo et al.

(2006) show that economies with open telecommunications and finance sectors tend to grow about 1.5 percentage points faster than other economies.

**Figure 2.1 Direct and indirect economic effects of more liberal services policies.**



Source: Authors.

#### D. ECONOMIC EFFECTS OF SERVICES OFFSHORING

Offshoring refers generally to a company's decision to move a business process, or set of processes, to another geographical location. It thus involves trade in services, potentially focusing on Modes I (cross-border trade) and III (sales by foreign affiliates). Despite the hype and controversy surrounding offshoring, it is as yet a relatively small phenomenon on an economy-wide scale (Amiti and Wei, 2005). However, it has been steadily increasing over time.

It should come as no surprise that *firms that offshore experience faster productivity growth than those that do not*. It is a micro-level example of the gains that come from specialization by comparative advantage. Since the absolute and relative costs of offshoring can be very low compared with the domestic market, firms can experience major benefits from moving in this direction. Indeed, Amiti and Wei (2006) show that services offshoring accounted for 11% of US productivity growth in manufacturing between 1992 and 2000—approximately double the impact of offshoring material inputs. Although no detailed analytical work is yet available, it is plausible that the economic effects of offshoring differ according to the mode of supply used (I or III), although complementarities also exist between the two modes.

Of greater concern from a political point of view are the employment effects of offshoring. Empirical evidence suggests, however, that initial concerns in this area would appear to be overstated. Hijzen et al. (2007) show that importers of intermediate services—i.e. those that offshore—do not tend to experience greater job losses or worker turnover. Indeed, they tend to experience faster employment growth than firms that do not offshore. Similarly, Amiti and Wei (2005) find that sector-level employment in the UK has not been affected by offshoring. Crino (2007), on the other hand, finds that the employment effects of offshoring differ by occupation: offshoring raises employment in high-skill occupations, but lowers it among low-

and medium-skilled ones. Within skill groups, offshoring tends to benefit relatively non-tradable occupations, but penalize easily tradable ones.

***On balance, the effects of services offshoring on productivity and aggregate employment would appear to be positive.*** The potential for differential impacts across occupation and skill groups is a strong argument not for opposing offshoring, but for putting in place appropriate adjustment policies. It would not justify efforts at restricting offshoring, or promoting “onshoring”, i.e. the return of economic activities to their previous “home economy”.

### **Box 2.2 Business process offshoring in the Philippines**

The Philippines is now a mature provider in the offshoring field, with over 50 centres.

A number of reasons explain its success. The main one is cost-reduction. Compared to leading business process offshoring (BPO) markets like India where labor has become relatively more expensive, the Philippines allows companies to further specialise in their core activities by offering lower labor costs in combination with relatively good infrastructure. Yet, other motivations are also at play. Companies such as Sykes, GXS, Dell and RCG report the Philippines as especially attractive for their customer component services due to the country’s good language skills, culturally attuned attitude towards the West, and generally strong educational performance.

Despite the Global Financial Crisis, the Philippines reported a growth rate in offshore services employment of 19% in 2009. The Business Processing Association-Philippines estimated that at the end of 2010, the industry will reach US\$ 13 billion in revenue and employ close to 1 million people. Companies such as Accenture (US), Wipro (India), and Genpact (India) have made major investments in the Philippines market, employing thousands of people.

Overall, in 2009 the Philippines presented a higher industry revenue growth rate in total offshore services than India: 18% in the Philippines against 16% in India. This demand does not come from developed economies only. India’s largest BPO companies have also demonstrated a great interest in offshoring activities in the Philippines.

Although its offshore industry is mainly concentrated in the economy-wide BPO sector that remains mid-value added, there are signs of increasing value-added activities in the Philippines. During the recession in 2009, its Knowledge Process Outsourcing (KPO) sector increased by 35% according to BusinessMirror and currently the Philippines is diversifying its offshoring sector to more industry-specific service activities with innovative and quality services.

Source: Gereffi and Fernandez-Stark (2010a; 2010b).

## **E. CONSOLIDATION: THE ECONOMIC GAINS FROM SERVICES TRADE AND LIBERALIZATION**

Modeling the economic impacts of services trade is challenging in light of conceptual and data difficulties. Many models consider direct effects only, and do not capture the kinds of spillover effects discussed in the previous sections, except for input-output linkages with manufacturing sectors. But because services markets are generally subject to higher trade

costs than goods markets (Miroudot et al., Forthcoming), ***the economic gains from reform are likely to be higher in services than in goods.***

Because of the difficulties involved in obtaining data on services and the policies that affect trade in services, many computable general equilibrium (CGE) model simulations of trade liberalization do not include services in their reform scenarios. There are exceptions, however.

In the APEC context, Kiyota and Stern (2008) show that ***removal of barriers to services trade could be a major source of economic gains as part of a broader program of APEC free trade.*** This complements a study by the World Bank (2002), which used a global model. In that research, the gains from reforming services sectors by reducing costs, markups, and trade penalties by 10% each are at least four times as high as the gains from liberalization of goods trade. Hertel and Keeney (2006) find that the gains from global trade liberalization can be boosted by about 80% if services are included in the reform package. Using different data, Francois et al. (2005) find that the gains from a 50% reduction in services rates of protection produce income gains at least equivalent to those from elimination of tariffs affecting manufactured goods.

Economy-specific CGE studies also back up these results, and are particularly strong once endogenous productivity effects are accounted for. For the Russian case, Jensen et al. (2008) find that the gains from liberalizing investment restrictions in services sectors could amount to 5.2% of the value of consumption—nearly three-quarters of the total gains likely to accrue to Russia based on the authors' simulation of WTO accession. Balistreri et al. (2009) find that Kenya could experience a gain of around 8% of GDP from further liberalizing services markets.

### 3. POLICIES AFFECTING INTERNATIONAL TRADE IN SERVICES

Intuitively, it is clear that policy should play an important role as a determinant of the pattern of international trade in services. The reason is that policy is itself an important determinant of trade transaction costs, in addition to other factors such as geographical distance and cultural or institutional factors. In certain circumstances, policies can contribute to transaction costs in two main ways: by restricting market entry, and by increasing the ongoing business costs facing current operators. ***However, it is extremely difficult to quantify the impact of policies affecting services trade.*** The reason is that transparent ad valorem measures similar to goods tariffs are rare in services sectors. More often, complex regulatory policies need to be analyzed, and their effects modeled. In many sectors, it is not just a question of individual regulations and their effects, but also the added business costs that come with a lack of international or regional coordination of regulatory policies.

This section brings together existing work on policies affecting services trade in the Asia-Pacific. It relies primarily on data sourced from the OECD, because they represent the most up-to-date information (2008) available as at the date of writing (August 2010). The focus is on considering relative patterns of performance, as captured by the various policy indices produced by the OECD. All data are publicly available through the OECD website, and in some cases are based on responses to detailed questionnaires provided by governments. In all cases, the regulatory data on which the indices are based are also made freely available on the OECD website.

Before embarking on this exercise, it is important to be aware of four important limitations of the so-called “restrictiveness index” perspective. First, the broader analysis in this report focuses on the more neutral concept of trade costs, rather than policy restrictiveness as such. More restrictive policies are generally associated with higher levels of trade costs. But in drawing conclusions based on the analysis, it is important to keep in mind that these costs need to be balanced against the benefits that can come with regulation in terms of the achievement of important social and economic objectives. A pragmatic approach, based on rigorous cost-benefit analysis, is likely to lead to better policy outcomes than focusing exclusively on restrictiveness.

Second, since each index summarizes policies rather than their effects, small differences across economies may not necessarily translate into significant economic welfare differences. An index score of “2” compared with “1” does not suggest that the first economy’s policies are twice as economically damaging as the second economy’s. The important information to take away from the indicators presented here is the relative pattern of policy restrictiveness observed across economies: it provides a guide to emerging best practice within the region, which fora such as APEC can help diffuse.

Third, the OECD indices used here primarily collect data for OECD members, or other economies that have a special relationship with that organization. As a result, even the most recent data (2008) exclude about half of APEC member economies. There is at present no way to overcome the lack of comparable data for other member economies, and so we present the maximum amount of data possible even though coverage for present purposes is limited. In interpreting results, it is important not to extrapolate too far from existing data to characterize the performance of those economies not included in the OECD dataset.

Fourth, the same data availability constraints mentioned in the previous paragraph mean that it is impossible to give a dynamic picture of the evolution of policy stances across APEC member economies in a quantitative fashion. Although some economies may appear relatively restricted in a static sense, an analysis of their policies through time might show that considerable reform and liberalization have taken place, with corresponding falls in trade transaction costs. It is important to be aware of this possibility, and not to draw overly strong conclusions from one year of data.

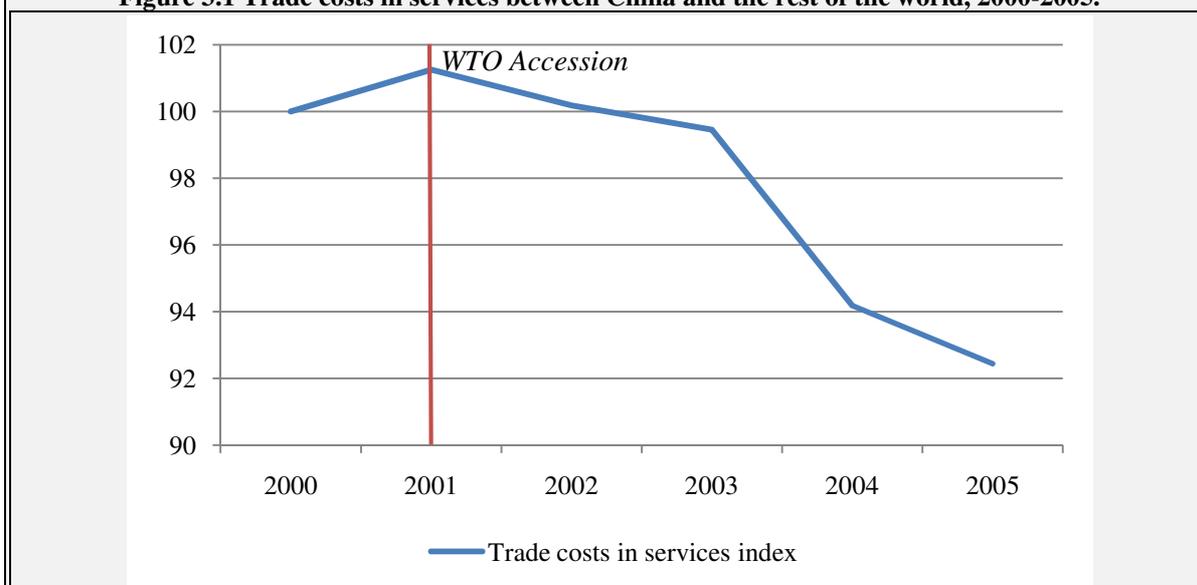
### **Box 3.1 Services Liberalization in China**

China has embarked on a program of substantial regulatory reform and liberalization of service sectors over recent years. The rapidity of change in this economy highlights the difficulty of assessing services policies statically, i.e. on the basis of a single year of data, as is currently necessary due to limitations in the available global data sources. In interpreting the data presented elsewhere in this report, it is important to keep in mind that they do not say anything about the direction or extent of ongoing reforms in particular economies. They should be interpreted as a guide to current policy settings only.

One factor behind the rapid changes in China's trade in services environment is implementation of its WTO Accession Agreement. Mattoo (2002) provides an exhaustive review of its provisions. Unlike many economies' Uruguay Round Schedules of Commitments—which generally locked in existing policies—China's Agreement contained genuine “bite” in terms of liberalization commitments. For example, many restrictions on foreign entry and ownership, as well as many forms of discrimination against foreign service providers, were to be eliminated during the phase-in period.

Recent quantitative research by Miroudot et al. (Forthcoming) shows that the data tend to support the type of dynamic described by Mattoo (2002). Those authors use new data to measure average bilateral trade costs in services sectors around the world. Figure 3.1 shows their results for China, using an index number approach (2000 = 100). There is evidence of a strong drop in services trade costs over the five year period considered. Partly, this fall is due to China's own changes in its trade policy environment, including those related to WTO Accession. But since these data measure the average of trade costs facing foreign exporters to China and Chinese exporters to the rest of the world, they also capture the fact that trade costs abroad have fallen for Chinese manufacturers. Again, the reason is WTO Accession, and the entrenchment of permanent, legally-bound MFN status around the globe.

**Figure 3.1 Trade costs in services between China and the rest of the world, 2000-2005.**



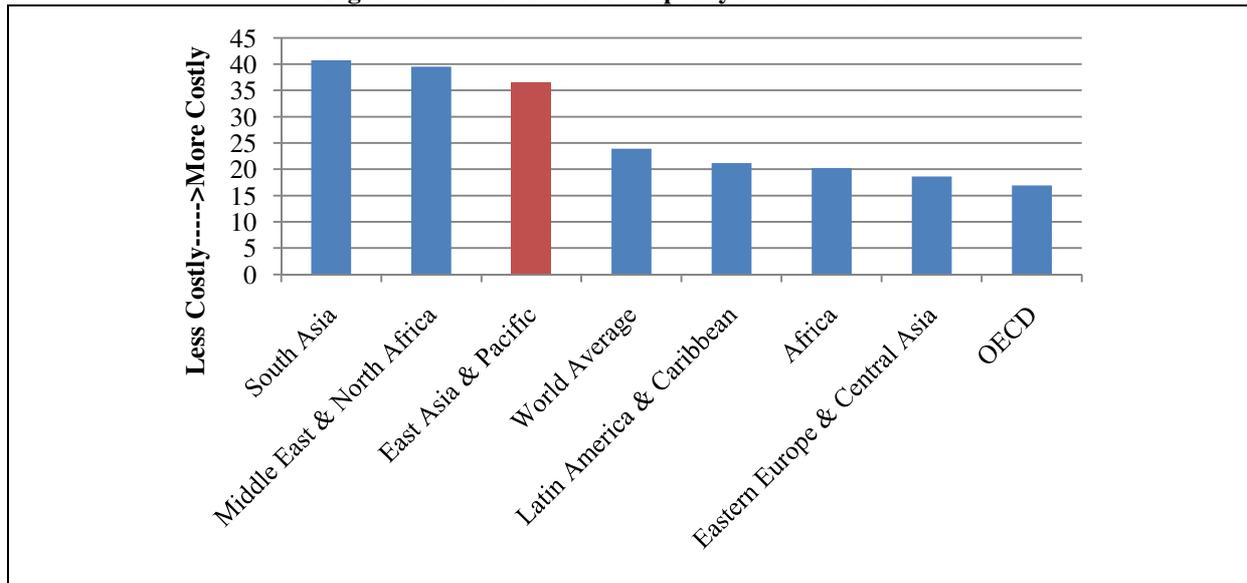
Source: Miroudot et al. (Forthcoming).

Source: Mattoo (2002); and Miroudot et al. (Forthcoming).

## A. AGGREGATE PERFORMANCE: A COMPARATIVE PERSPECTIVE

The World Bank is currently compiling data on applied services policies in 56 industrialized and developing economies, including APEC member economies. Those data are not currently available on a disaggregated basis. Gootiiz and Mattoo (2009) provide aggregate results from their survey, which provides a useful place to start in assessing APEC policies in comparative perspective (Figure 3.2). As a proxy, we consider the World Bank's East Asia and Pacific region, since the economy groupings that Gootiiz and Mattoo (2009) use do not allow us to identify APEC as such.<sup>5</sup>

Figure 3.2 World Bank trade policy index in services.



Source: Gootiiz and Mattoo (2009).

The main conclusion to emerge from Figure 3.2 is that *services markets in the Asia-Pacific are relatively restricted compared with other regions*, and even with the world average. The level of restrictiveness is considerably higher than in the OECD, for example. Based on these data, it is likely that policy-related trade transaction costs are relatively high. This indicates there is a lot of room for APEC economies to facilitate trade in services—and enjoy the corresponding economic gains—through targeted regulatory interventions in this area.

To give a first picture of the performance of individual APEC member economies in relation to trade-related services sector regulations, we use the aggregate indicators developed by the OECD: the PMRs and the ETCRs. As the following discussion shows, *the performance of APEC member economies on these metrics is mixed*.

<sup>5</sup> The World Bank's data for the East Asia and Pacific region cover seven economies, of which five are APEC member economies. The OECD group includes an additional six APEC member economies. The Latin America and Caribbean group includes two APEC member economies.

### **Box 3.2: Constructing Trade Policy Indices for Services**

Measuring the costs imposed by services trade policies is complex. One reason is that it is necessary to catalogue a vast number of regulatory measures that differ across economies. These measures cover two broad types of policies: those that restrict market entry, and those that place cost burdens on the ongoing operations of firms. Examples of these two types of measures are licensing or joint venture requirements (entry restrictions), and limitations on the types of related activities that service firms can undertake (cost burdens). (For further details, see Dee, 2005.) Regulatory measures should be classified into those that affect all firms in the market, and those aimed at foreign firms only. This allows analysts to identify the degree of discrimination involved.

A so-called “trade restrictiveness index” is constructed as a summary measure of the various regulations captured in the data collection exercise. After cataloguing them, an economic model is used to measure their impacts on trade flows and economic welfare.

A number of efforts have been made to summarize services policies in this way. The OECD produces four sets of indices that are commonly used as proxies for the state of services policies. The first is the Product Market Regulation (PMR) indicators (Conway and Nicoletti, 2006). They cover areas such as: state control of the economy; barriers to entrepreneurship; and barriers to trade and investment. Information is coded from regulatory surveys completed by participating economies; the full database of responses is available online at <http://www.oecd.org/dataoecd/33/11/42135998.xls>. Data are available for 1998, 2003, and 2008, and cover 37 economies in their latest iteration. The economies covered are all OECD members, plus Estonia, Israel, Russia, Slovenia, Brazil, and China.

The second commonly used OECD database is the Energy, Transport, and Communication (ETCR) indicators (Conway and Nicoletti, 2006). They summarize regulatory positions in relevant sub-sectors, and are more directly related to services than are the economy-wide PMRs. They generally cover areas such as: barriers to entry; public ownership; and market structure. They are available for 1975-2007, for up to 37 economies: OECD members plus Estonia, Israel, Russia, Slovenia, Brazil, and China. The full database of regulatory information used to construct the indicators is available at [http://www.oecd.org/document/32/0,3343,en\\_2649\\_34323\\_35791136\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/32/0,3343,en_2649_34323_35791136_1_1_1_1,00.html).

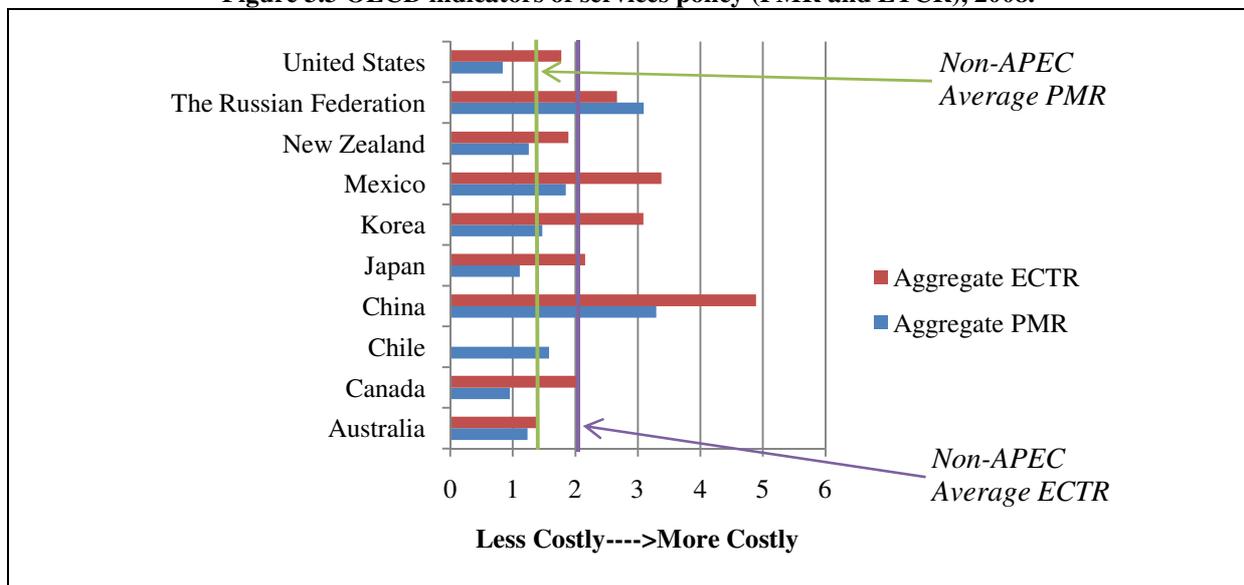
The third and fourth OECD databases cover professional services and retail distribution respectively. They capture measures that relate to entry restrictions, as well as barriers to ongoing operations. The distribution data also include information on the prevalence of price controls. They are available for 1998, 2003, and 2008, and cover up to 37 economies: OECD members plus Estonia, Israel, Russia, Slovenia, Brazil, and China. The full database of regulatory information used to construct the indicators is available at <http://www.oecd.org/dataoecd/25/18/42220505.xls>.

In the early 2000s, the Australian Productivity Commission developed detailed indices of service sector regulations affecting domestic and foreign firms. Their measures cover telecommunications, financial services, maritime transport, distribution, and professional services in up to 136 economies for the year 2000. All data are available at <http://www.pc.gov.au/research/researchmemorandum/servicesrestriction>. Dihel and Shepherd (2007) extended the Productivity Commission approach by devising separate restrictiveness indices for each GATS mode of supply. However, the Dihel and Shepherd (2007) data are only publicly available for a small number of economies, and as a result, their work cannot be included directly in this report.

Figure 3.3 shows that *five of the 10 APEC economies for which data are available have a PMR score below the non-APEC average.*<sup>6</sup> This means that the level of transaction costs imposed by their policy stance is less than is observed in 27 non-APEC economies in this sample. However, two of the five remaining APEC economies exhibit levels of regulatory intervention in the economy that are well in excess of the non-APEC average. This suggests that those economies have considerable scope for realizing additional gains from reform.

A similar picture emerges from a consideration of ETCR scores. *Four out of nine APEC member economies for which data are available have scores below the non-APEC average,* which suggests that they have a generally more liberal regulatory stance in the energy, communication, and transport sectors. However, four economies are in this case well above the non-APEC average. They too have the capacity to realize major benefits from future reform by reducing regulation-related trade costs.

**Figure 3.3 OECD indicators of services policy (PMR and ETCR), 2008.**



Source: OECD and authors' calculations.

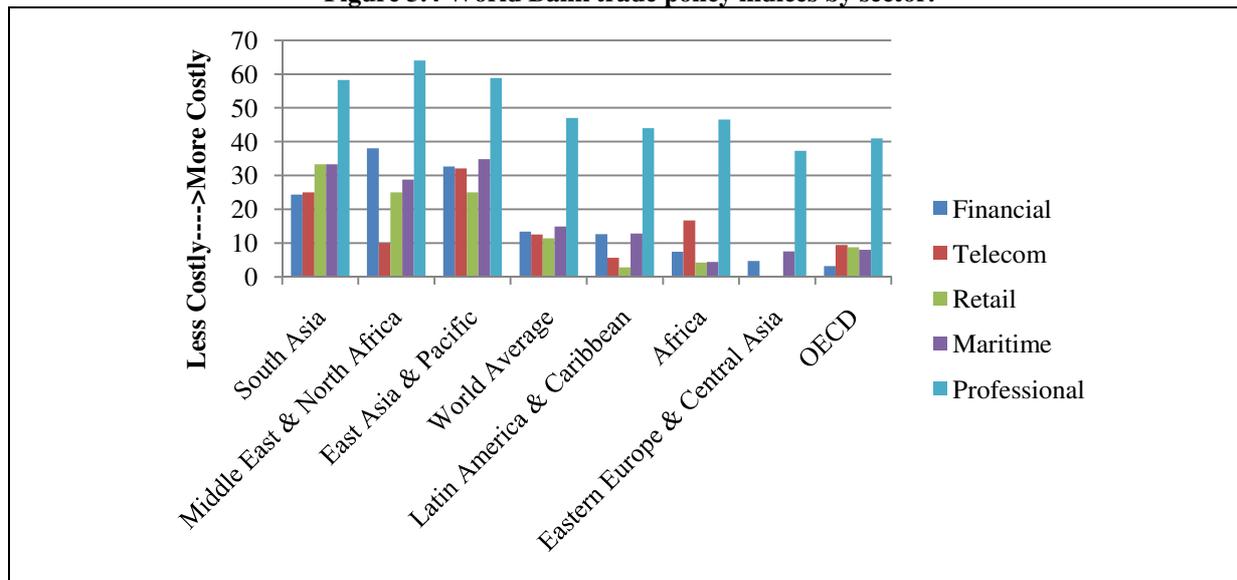
## B. SECTORAL ANALYSIS OF SERVICES POLICIES IN APEC

As with all types of trade-related policies, there is considerable scope for heterogeneity in the nature and extent of services-related regulatory measures across sectors. We investigate this question further by examining more disaggregated policy data in this subsection.

The World Bank dataset presented by Gootiiz and Mattoo (2009) again provides a good place to start. Their data cover five sectors: finance, telecom, retail, maritime, and professional services. As Figure 3.4 shows, *the East Asia and Pacific region again appears quite restrictive relative to other regions.* In particular, professional services sectors are subject to relatively high regulation-related trade costs compared with the other sectors. The least restricted sector is retail.

<sup>6</sup> Due to data limitations, the Non-APEC average in this report consists of the following economies: Austria, Belgium, Brazil, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Israel, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom. In this report, the figures with OECD indicators include APEC economies that are also OECD members or have an "Enhanced Engagement" with OECD.

Figure 3.4 World Bank trade policy indices by sector.

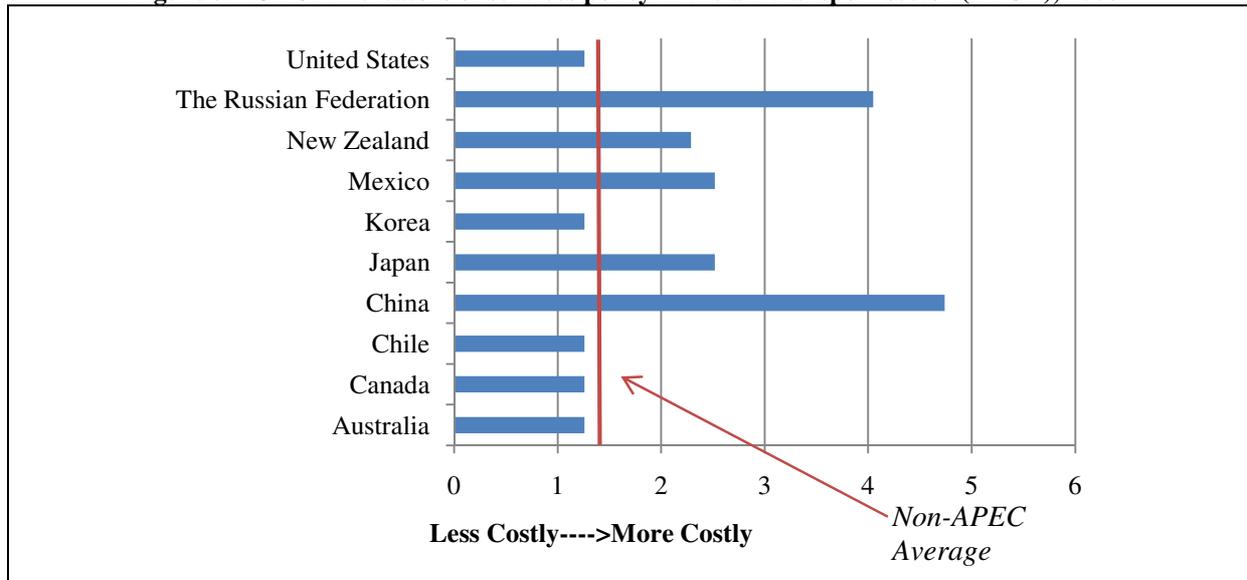


Source: Gootiiz and Mattoo (2009).

### i. Transport services

As noted above, transport services are particularly important for economic performance. They constitute an important backbone service sector, in which greater efficiency can help manufacturers and goods exporters perform better.

The OECD provides data on three types of transport services: air, rail, and road. Figure 3.5 shows the situation for air transport. *Five of the ten APEC economies for which data are available have policies that are more liberal than the non-APEC average.* However, a number of member economies have considerably more constraining policies, and thus higher trade transaction costs. One explanation might be the different ways in which liberalization takes place in different sectors, and the important role played by reciprocity in areas such as air services. Although all member economies can enjoy economic gains from further liberalizing markets in this area, those gains would be particularly large for economies starting from a relatively restrictive baseline.

**Figure 3.5 OECD indicators of services policy in the air transport sector (ETCR), 2008.**

Source: OECD and authors' calculations.

### **Box 3.3 Air transport services and APEC merchandise trade**

Transport is one of the most important backbone services sectors. It serves as an input into just about every other production process in the economy. Better quality and more cost-effective transport services make it possible for manufacturers to keep costs down, and remain competitive in international markets.

Geloso-Grosso and Shepherd (2009) use the example of air transport to look at the ways in which a more liberal transport environment—which reduces trade transaction costs—can help boost exports of goods within APEC. Using the gravity model and employing the Air Liberalization Index (ALI) developed by the WTO Secretariat, they show that the data support two policy-relevant findings.

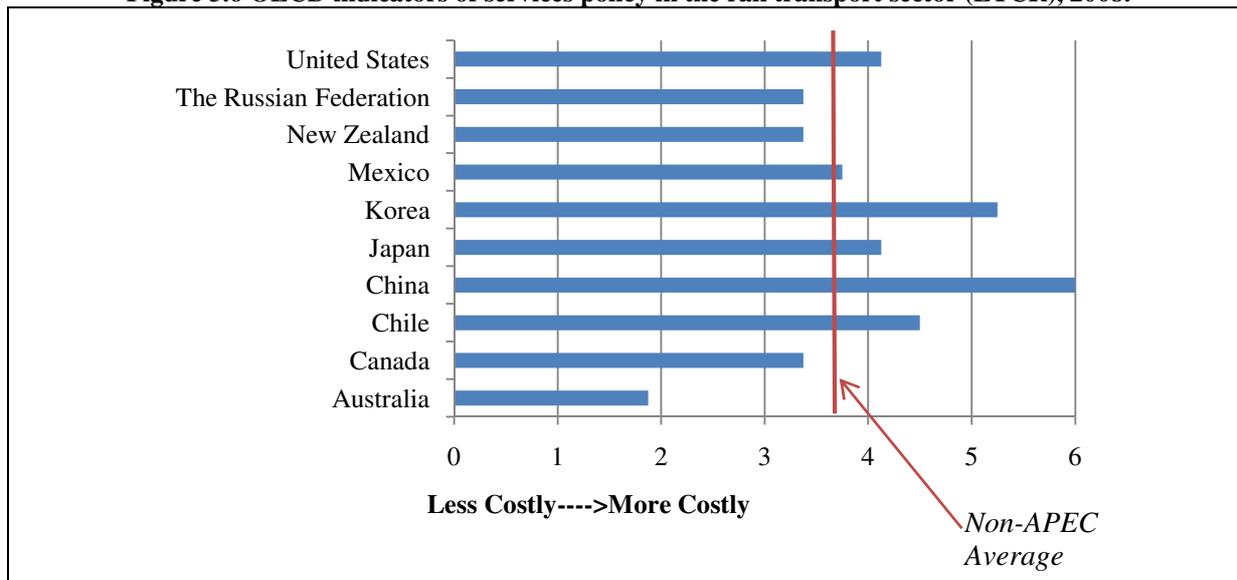
First, more liberal air services policies are positively, significantly and robustly associated with higher bilateral merchandise trade. Second, the results also show that air transport policy matters more for some sectors than for others. A particularly strong relationship is found between bilateral liberalization and trade in manufactured goods, time sensitive products, and parts and components.

Considering the sector found to be most sensitive to the degree of aviation liberalization, the estimates imply that a modest increase in the degree of liberalization is associated with an increase of 4% in bilateral parts and components trade. These findings have important policy implications. In particular, economies actively seeking greater integration in international production networks could greatly benefit from a more liberal aviation policy regime.

Source: Geloso-Grosso and Shepherd (2009).

A similar situation prevails in rail transport (Figure 3.6). *Four economies have a level of policy-related trade costs that is lower than the non-APEC average*, and Mexico's score is comparable. However, a number of member economies still have considerable room to benefit from reform in this area.

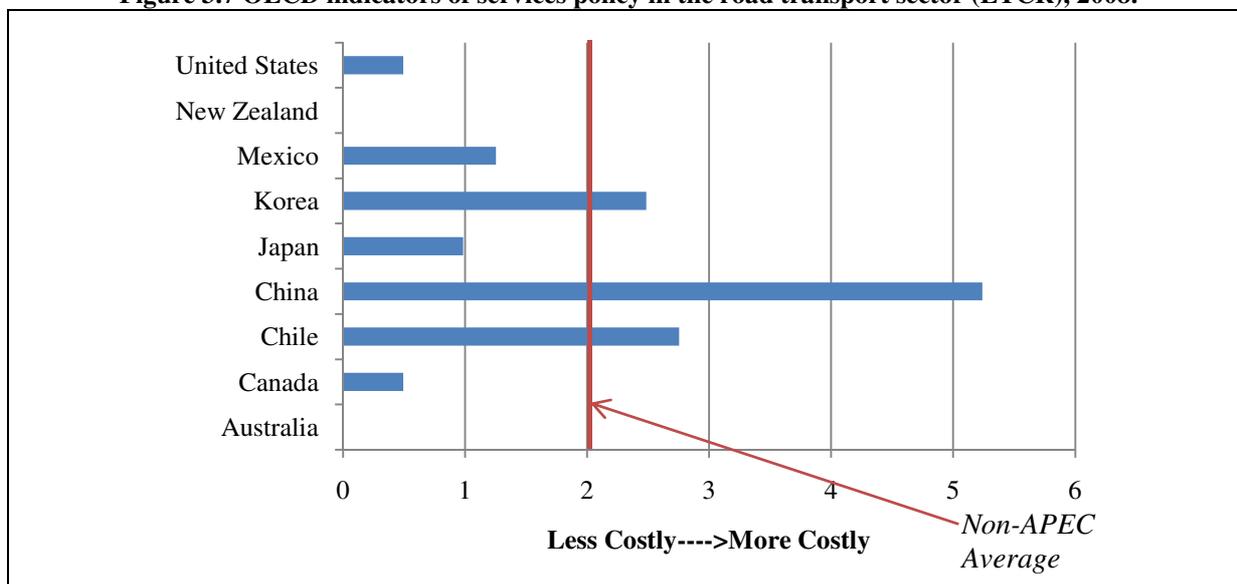
**Figure 3.6 OECD indicators of services policy in the rail transport sector (ETCR), 2008.**



Source: OECD and authors' calculations.

The picture is stronger in the area of road transport (Figure 3.7). Two economies—Australia and New Zealand—are characterized as having a completely open regulatory regime, i.e. a score of zero. Four other economies have levels of policy-related trade costs that are below the non-APEC average. However, there is still room for liberalization to reap further economic gains in a number of other member economies.

**Figure 3.7 OECD indicators of services policy in the road transport sector (ETCR), 2008.**

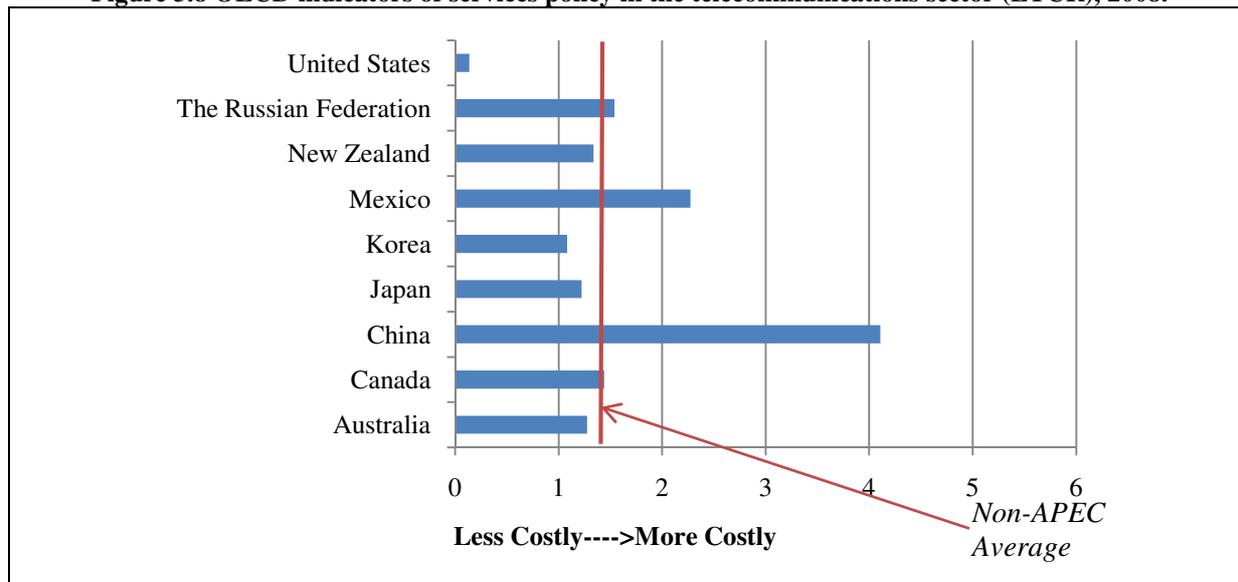


Source: OECD and authors' calculations. Note: Australia and New Zealand have index scores of zero.

**ii. Telecommunication services**

Telecommunication services are, like transport, an important set of backbone services. Without high quality and cost-effective means of communication, it is difficult for other service providers and manufacturers to access foreign markets. Participation in international production networks—a key feature of the East Asian regional economy—also becomes difficult.

**Figure 3.8 OECD indicators of services policy in the telecommunications sector (ETCR), 2008.**



Source: OECD and authors' calculations.

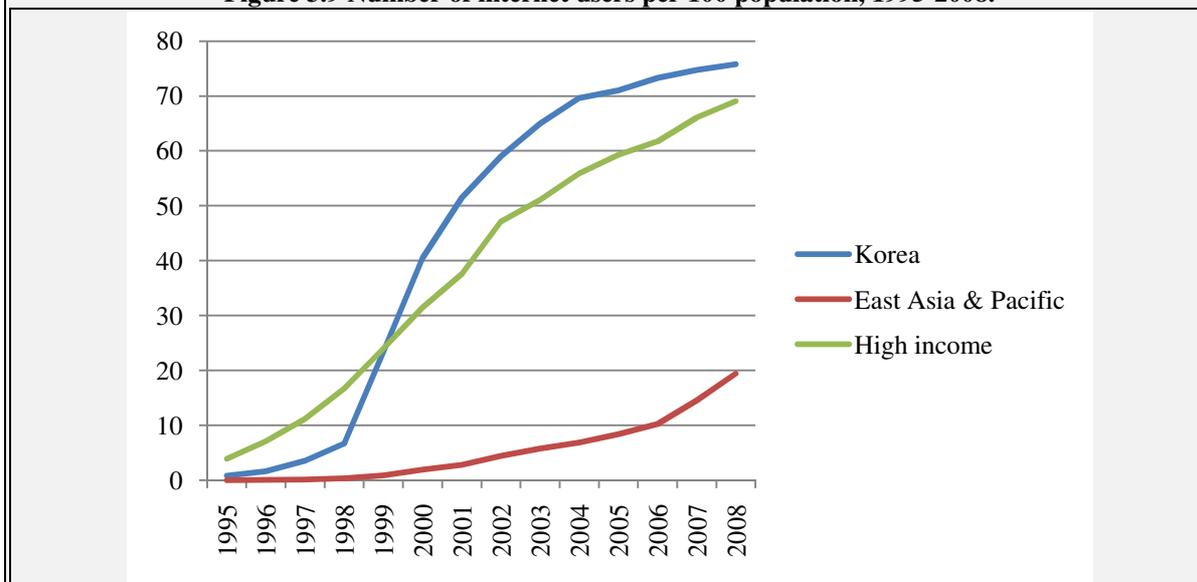
*Five APEC economies have telecom restrictiveness scores that are noticeably lower than the non-APEC average; Canada's score is only very slightly higher (Figure 3.8). Telecommunications is an area in which APEC performs quite well relative to the rest of the sample—an outcome that is not surprising in light of the rapid growth this sector has undergone in the region, and its impressive outputs in terms of technology and population coverage.*

### **Box 3.4 Telecommunications services in Korea**

Efficient regulation and promotion of international openness have served Korean telecommunications users particularly well. As just one example, the cost of a three-minute phone call to the United States dropped by over 80% between 1996 and 2004. Over the same period, teledensity and internet access exploded (Figure 3.7). Korea now has one of the highest rates of broadband internet access in the world.

Regulatory reform proceeded sequentially but rapidly in the Korean context. The starting point was privatization of the three state telecommunications monopolies, covering fixed and mobile telephony, and data services respectively. This occurred in the 1990s. Korea took the opportunity presented by the Uruguay Round telecom negotiations to lock in reform, by committing to full liberalization of the resale sector and step-by-step relaxation of foreign investment limits. The government actively encouraged competition by issuing new licenses across all market segments, thereby encouraging entry by new operators and expansion of services by existing ones. Establishment of an independent regulatory agency, and acceptance of the general principles contained in the WTO Reference Paper, complete the picture of a comprehensive process of regulatory reform.

**Figure 3.9 Number of internet users per 100 population, 1995-2008.**



Source: World Development Indicators.

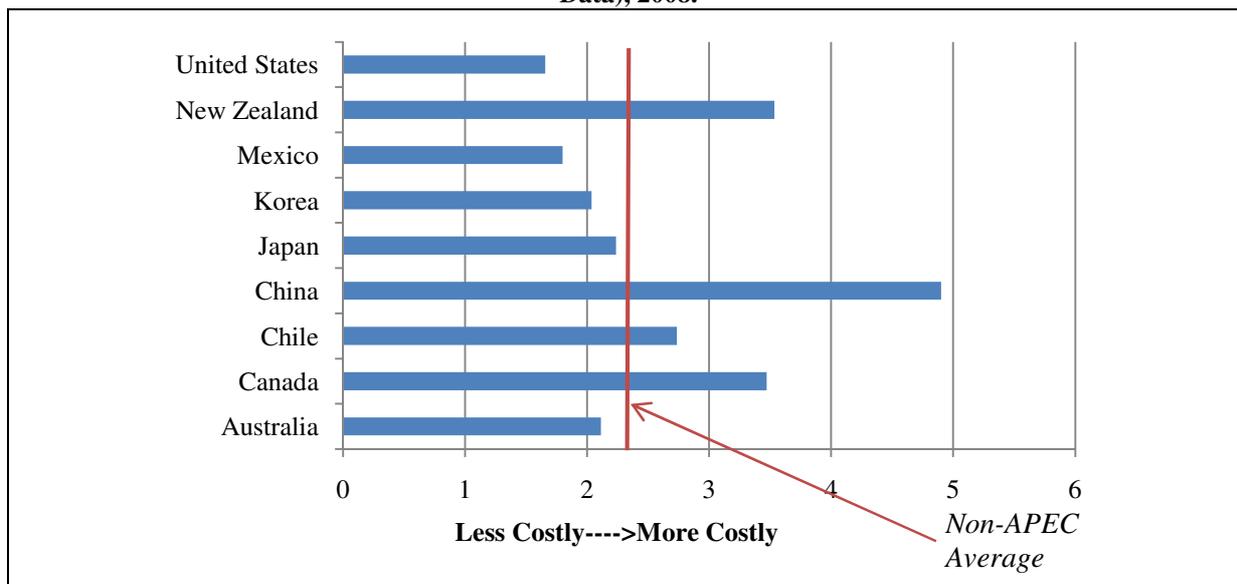
Source: Hong et al. (2007).

### **iii. Professional services**

The professional services classification covers a wide range of economic activities. The OECD data allow us to analyze four types of professional services: accounting, architecture, engineering, and legal. The general picture that emerges is of a relatively liberal policy environment in the Asia-Pacific region compared with the rest of the sample.

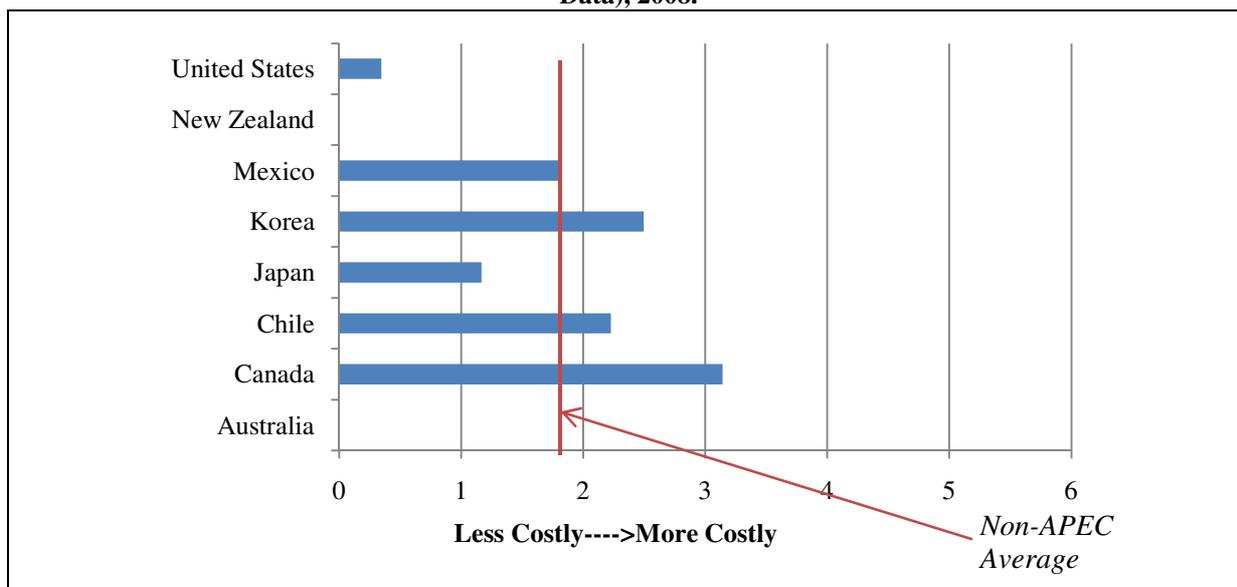
*In the area of accounting services, APEC's performance is generally strong compared with the rest of the world* (Figure 3.10). Five member economies have index scores that are less than the non-APEC average. This pattern is repeated in architectural services (Figure 3.11).

**Figure 3.10 OECD indicators of services policy in the accounting services sector (Professional Services Data), 2008.**



Source: OECD and authors' calculations.

**Figure 3.11 OECD indicators of services policy in the architectural services sector (Professional Services Data), 2008.**



Source: OECD and authors' calculations. Australia and New Zealand have index scores of zero.

**Box 3.5 Trade in architectural services**

Trade in architectural services has become increasingly important in recent years. Technological progress has made it possible for professionals and clients to deal directly across borders. It has also facilitated offshoring of particular parts of the design process. Architecture firms have followed their biggest clients by incorporating the international dimension into their corporate strategies.

Although it is difficult to measure the value of international trade in architectural services, indications are that there is potential for this sector to be a significant export earner in a number of economies. In 2005, for instance, the 108 largest US architectural firms earned \$3.8bn in fees from international work. The top 500 US design firms earned nearly \$120bn in international fees for the same year (Table 3.1).

**Table 3.1 International work by the 500 largest US design firms (2005).**

Region	Number of Firms	Revenue (US\$ million)
Europe	125	\$4,078.9
Asia/Australia	142	\$2,895.1
Canada	102	\$1,857.9
Middle East	102	\$1,423.2
Latin America	119	\$719.4
Africa	61	\$619.5

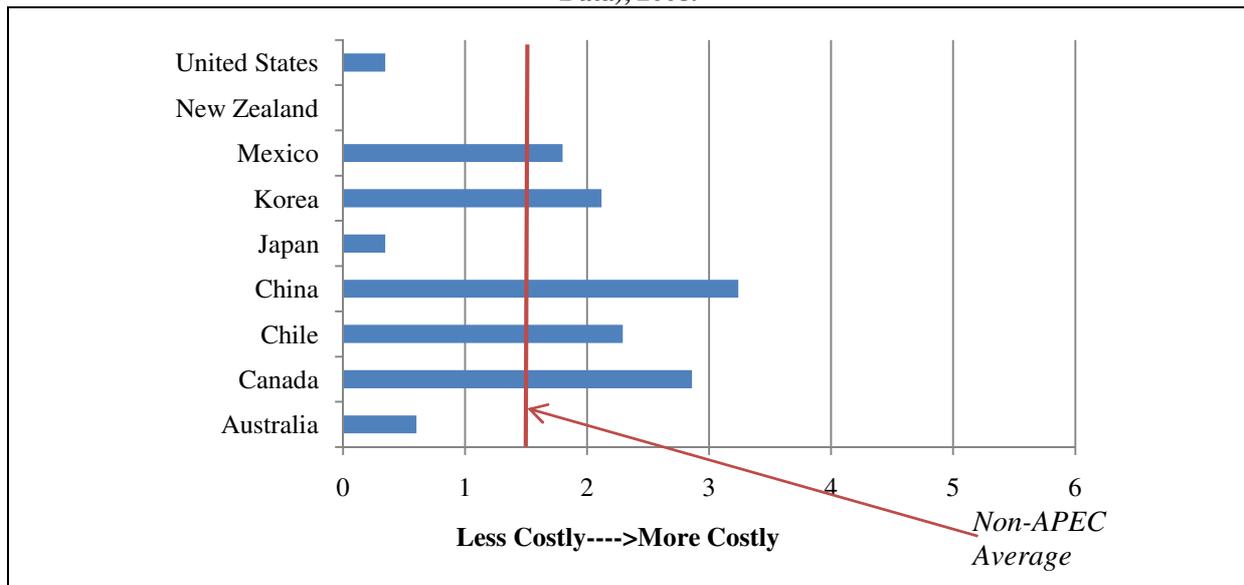
Source: WTO (2009).

Licensing issues loom large as the major policy area affecting the ability of architects to practice overseas. In many cases, firms choose to cooperate with local partners on major projects as one way of confronting the licensing challenge. APEC has been moving forward in this area through its Architect Framework. Economies can negotiate bilateral arrangements to fast-track the registration of architects from other APEC economies. One example is the agreement between New Zealand and Japan. It allows architects from one economy to obtain registration in the other economy subject to passing a test examining knowledge of economy-specific architectural processes.

Source: WTO (2009).

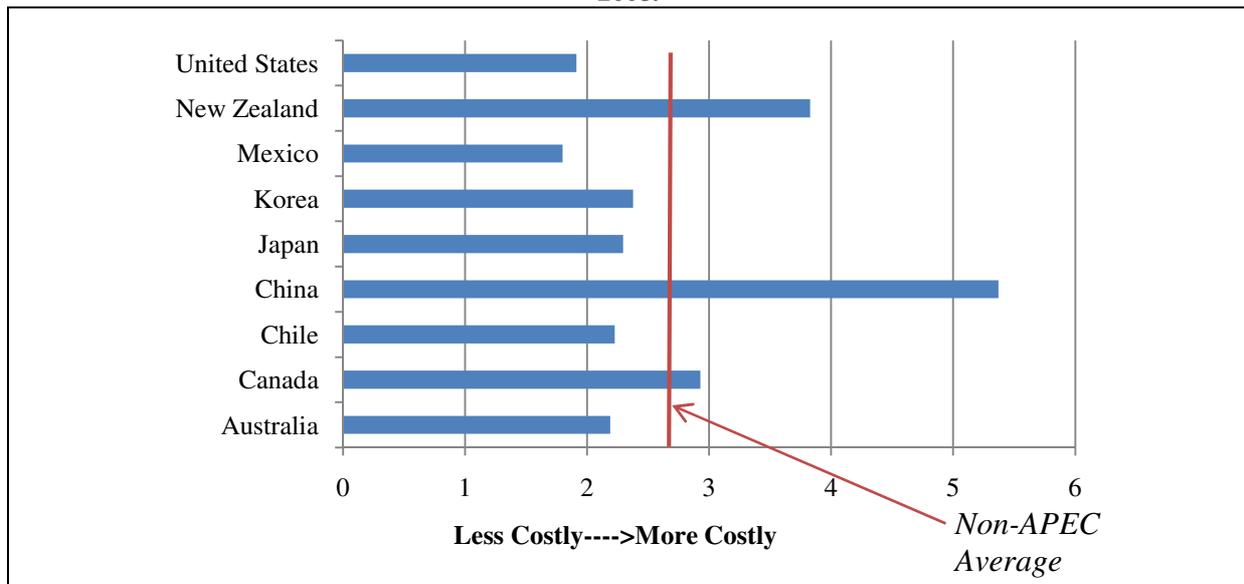
Four economies have lower scores than the rest of the world average in engineering services (Figure 3.12). The same is true of six economies in legal services (Figure 3.13). ***There are clearly significant economic gains that could be enjoyed from further integration of engineering services markets in the region.***

**Figure 3.12 OECD indicators of services policy in the engineering services sector (Professional Services Data), 2008.**



Source: OECD and authors' calculations. New Zealand has an index score of zero.

**Figure 3.13 OECD indicators of services policy in the legal services sector (Professional Services Data), 2008.**

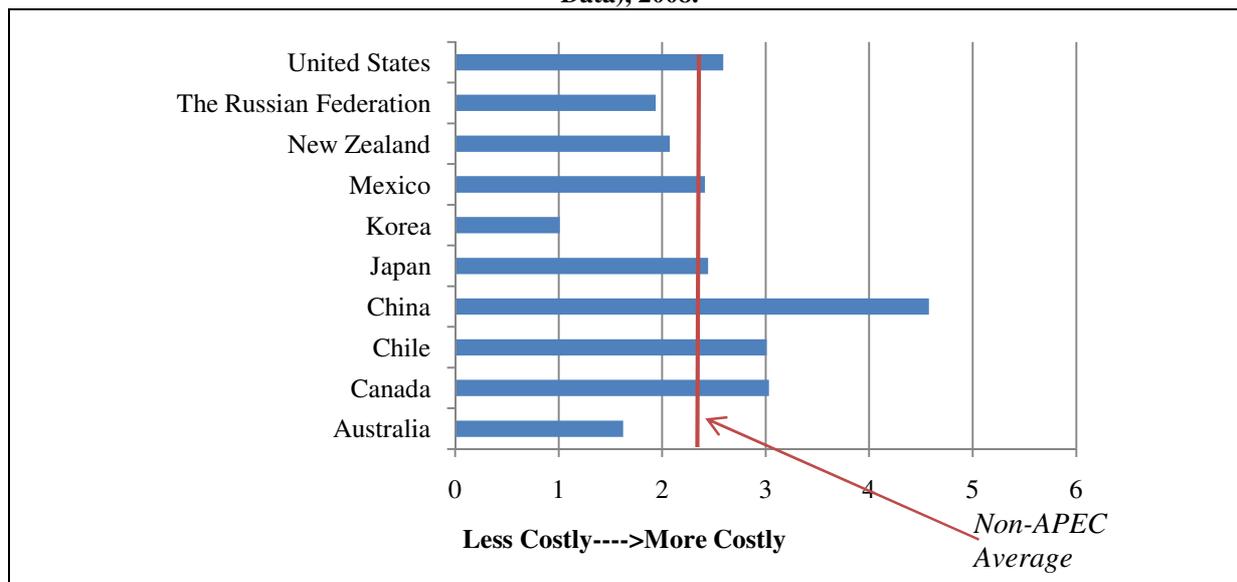


Source: OECD and authors' calculations.

**iv. Retail and distribution services**

The retail and distribution sector is particularly important for manufacturers and exporters of goods. It provides the crucial gateway linking them to international markets.

*Four of the APEC member economies for which data are available have more liberal policy stances than the non-APEC average, and a further two economies have very comparable scores. In the remaining economies, there is scope to reap additional economic gains through regulatory rationalization programs that reduce the overall level of policy-related trade costs.*

**Figure 3.14 OECD indicators of services policy in the retail/distribution services sector (Retail Services Data), 2008.**

Source: OECD and authors' calculations.

### **Box 3.6 Trade in distribution services**

Distribution typically accounts for a significant amount of economic activity: around 25-30% of all firms in the economy, and 15-20% of GDP and employment. Moreover, employment is skewed towards relatively low-skilled workers in the retail sector. Liberalization of the distribution sector can play an important role in promoting an efficient and vibrant market, which in turn brings a wider range of goods to consumers at lower prices.

China, for instance, has moved towards a situation in which foreign investment is common—perhaps 12 of the top 50 retailers worldwide operate in China—and competitors exert pressure on local incumbents to improve service and keep prices down.

The 1980s and 1990s also saw significant liberalization of the distribution sector in Korea, traditionally dominated by very small enterprises. The result has been an increase in the available range of retail outlets, with particular growth in convenience stores, discount houses, and supermarkets. Internet shopping has also been undergoing rapid growth, as new entrants introduce new technologies into the sector.

Japan has traditionally been relatively open to foreign distribution operators, but domestic regulations designed to protect small stores hampered both foreign entrants and larger incumbents. These restrictions were relaxed gradually through the 1990s, leading to an expansion in the number of large-scale stores. There has also been an increase in competition, leading to lower prices, wider choice, and better service for consumers.

Source: Scollay (2003).

### C. CONSOLIDATION: POLICIES AFFECTING SERVICES TRADE IN THE ASIA-PACIFIC

There are considerable difficulties involved in measuring service sector policies in APEC. The principal sources, such as the OECD PMR databases, provide only limited coverage of APEC member economies. Data are generally available for half or less of the overall membership of APEC. Conclusions need to be interpreted with caution, therefore, and should not be extrapolated to those member economies for which data are lacking.

In broad terms, *APEC member economies' performance is quite heterogeneous*. Some member economies have regulatory policies that are consistently less cost-burdensome than the non-APEC average. Others appear to have policy settings that are associated with higher levels of trade costs. In both cases, there is considerable scope for promoting the economic gains associated with increased services trade. As the previous section of this report showed, those gains can be substantial. They cover static welfare improvements, increased trade flows, and faster economic growth.

On a sectoral basis, *APEC's performance is particularly strong in telecommunications, road transport, and in some professional services sectors* (accounting and architecture). Telecommunications and transport represent important backbone services. Strong performance in these areas is important not only as an end in itself, but also as a means of promoting trade in other goods and services sector. Telecommunications, in particular, is vital to facilitating services offshoring, which can have significant economic benefits for sending and receiving economies alike.

## 4. DETERMINANTS OF CROSS-BORDER TRADE IN SERVICES IN APEC

### A. THE GRAVITY MODEL OF TRADE

*We use the gravity model of bilateral trade to investigate the determinants of trade in services in greater depth.* The gravity model has previously been used in the services context (e.g., Kimura and Lee, 2004). The model controls for a range of influences on bilateral trade, such as the size of each economy, and the level of trade costs between them. Data are taken from standard sources. Appendix 1 (Technical Annex) contains an in-depth discussion of the model, data, and regression results.

Due to the relatively small number of economy pairs for which data are available, we use a global model covering all available data points, rather than focusing on APEC trade only. However, our results apply to APEC economies just as they do to the rest of the sample.

The main value added of our approach is two-fold.

First, *our focus is on the regulatory determinants of services trade*, in addition to geographical and historical features that are commonly included in trade models. We focus on the level of regulatory restrictiveness, rather than heterogeneity (e.g., Kox et al., 2004). In addition, we use a range of regulatory measures rather than relying on one only, such as the OECD PMRs that have been used extensively in previous work. Our approach allows us to demonstrate that regulation is an important determinant of the observed pattern of international trade in services, for the reason that it contributes substantially to the overall level of trade transaction costs in services sectors.

Second, we use *sectorally disaggregated data* on trade in services from a new database (the Trade in Services Database, TSD version 4, produced by Francois et al., 2009). This approach enables us to look for possible heterogeneity across sectors in terms of their responsiveness to policy changes. It has the added advantage of making it possible to use a wider range of policy data, i.e. sector-specific measures of regulation whenever possible. We can therefore provide greater detail on the relationship between services policies and trade than has been possible previously.

### Box 4.1: The Gravity Model of Bilateral Trade

The gravity model is the workhorse of applied international trade analysis. Since its first applications in the early 1960s, it has been used in thousands of published papers, for academic research as well as policy analysis. According to Leamer and Levinsohn (1995), the gravity model has provided “some of the clearest and most robust empirical findings in economics”.

By analogy with Newton’s theory of gravity, the gravity model of trade postulates that the trade flow between two economies—like an economic force of attraction—is larger for bigger economies (higher GDP), and smaller for economies that are further away (higher trade costs). Subsequent work, such as the research the models used in this report, has shown that the gravity model can be given rigorous theoretical underpinnings in microeconomics. It provides a sound and widely-used basis for assessing the extent to which different trade cost factors impact bilateral trade.

Compared with goods, services have received scant attention in the gravity literature. This is due in part to the difficulty of obtaining reliable data on bilateral trade flows. There have been a number of important contributions, however. The first was Kimura and Lee (2004), who demonstrated that services trade responds to many of the same basic determinants as goods trade. A number of authors have previously used the OECD’s PMR indicators in gravity work on the impacts of regulatory measures or regulatory heterogeneity on services trade. Examples include: Kox and Lejour (2005), Walsh (2006), Kox and Nordas (2007, 2009), and Schweltnus (2007). However, these applications have largely focused on European economies due to the lack of available data for other economies, a problem that is alleviated by the dataset used in this report.

The version of the gravity model used in this paper is close to the widely-accepted “gravity with gravitas” model of Anderson and Van Wincoop (2003, 2004). Due to limitations on the types of data available to measure services policies, it is not possible to use an identical specification to theirs. However, test results using a baseline model without measures of regulatory performance suggest that any differences in results are likely to be minor. Our approach represents the best trade-off between analytical rigor and empirical feasibility. Future work can overcome the problems experienced here by developing bilateral (economy-pair) measures of services policies; these data are currently unavailable, however.

Source: Shepherd et al. (2010), and authors.

## B. SUMMARY OF EMPIRICAL RESULTS AND INTERPRETATION

This section presents our empirical results using the gravity model. We proceed in a summary, and non-technical way. Full technical details of the model specification, data, and econometric results are available in Appendix 1 (Technical Annex). Our model is run on a cross-section of data only, i.e. for one year depending on availability of the policy data.

Our first set of results uses aggregate trade data, i.e. for the services sector as a whole. For the moment, we do not distinguish among the various sectors. We use two different measures of service sector regulation to examine the impact of policy on trade in services: the OECD’s overall PMR indicator, and the same organization’s overall ETCR indicator. Our model

includes these measures for the importing economy only, since we are interested in assessing their potential role as barriers to exports from other economies.

For both variables, we find that ***reducing the restrictiveness of service sector regulation can provide a major boost to services trade***. As an example, improving Korea's PMR performance by 0.4 index points, or around 20%, could increase its trade by over 50%. This example assumes unilateral reform by Korea, i.e. that multilateral trade policies remain constant. If other economies were to reform simultaneously, the gains would likely be smaller due to general equilibrium reallocations. The possibility of a virtuous cycle—more services trade leads to less restrictive regulation, which leads to more services trade—could also reduce this figure substantially.<sup>7</sup> Nonetheless, the point remains that changes in regulation have the potential to exert a powerful influence on the observed pattern of international trade in services.

Another significant result is that ***membership of an RTA/FTA is strongly associated with increased trade flows in services***. Again, a virtuous cycle dynamic can be expected to reduce the size of the effect we find here. But as a rough order of magnitude, our results suggest that economies that are members of an RTA/FTA trade perhaps twice as much as those that are not.

How important is policy as a determinant of services trade flows, as compared with other factors? The strongest determinant of trade patterns is exporter and importer market size. But policy factors also play an important role. Removing all policy variables from the gravity model noticeably reduces its explanatory power: around 6% less of the observed variation in trade flows is accounted for by the model without policy variables (PMR, RTA/FTA dummy, and APEC dummy). That number is noticeably higher than the reduction in explanatory power that takes place when geographical and historical variables are excluded from the model. In other words, ***policy appears to be a significant source of trade transaction costs in the services domain, and is probably more important than “natural” trade costs such as distance***. Policymakers therefore have a major role to play in helping reduce policy-related transaction costs, and thereby facilitate trade in services.

For sector-by-sector analysis, we use the restrictiveness indices developed by the Australian Productivity Commission. Our regressions cover the following sectors: finance, communication, transport, trade, and construction. These are the only sectors for which specialized restrictiveness indices and sectoral trade data are available. As for the OECD data, these indices are subject to numerous caveats in terms of interpretation (see pp.14-15 and Box 3.2 above).

Again, we find that there is ***considerable scope for less restrictive service sector regulations to boost trade on a sectoral basis***. The effect is particularly strong in the transport, trade (retail/distribution), and finance sectors. It is noticeably weaker in construction and telecommunication. The reason for this is probably that telecommunication already has a relatively open policy regime in many economies—at least as regards pure cross-border

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<sup>7</sup> This kind of virtuous cycle dynamic can create problems in econometric estimation of the gravity model. However, we have also estimated the model using data on policies in 1998 rather than 2003—the next latest available year—in an effort to limit this issue. Results hold up well, although as suggested in the text the estimated policy coefficient is slightly smaller in absolute value than in the main specification. These findings indicate that the basic results discussed in the text should be considered as relatively robust to a virtuous cycle dynamic between trade and policy.

trade. Construction, on the other hand, can only be conducted to a very limited extent through GATS Modes 1-2, and relies heavily on Mode 3 and Mode 4 for practical reasons of proximity. As a result, restrictions on pure cross-border trade would tend to matter less in this sector.

Again, these effects are both economically and statistically significant. A simple “what if” experiment in the sector with the strongest impact of regulation (transport) is to decrease the restrictiveness of regulation in the maritime sector in Australia by 0.1 points on the index scale, or a change of around 23% in Australia’s baseline score. Such a policy change would be associated with an impact effect of an over 40% increase in trade. Again, general equilibrium reallocations and a virtuous cycle dynamic could reduce this number substantially.

Even in the sector with the weakest link between regulation and trade (telecom), the effect is still important. Improving Indonesia’s performance by 0.1 index points, or around 13% of its baseline score, could increase bilateral trade by around 8%. Results are subject to the same limitations mentioned above.

## 5. CONCLUSION AND POLICY IMPLICATIONS

Services represent the lion's share of economic activity in most advanced economies. International trade in services is becoming correspondingly more important as a means of cross-border exchange. The Asia-Pacific is no stranger to these developments, although the degree of involvement in services trade varies considerably across economies. On an overall basis, ***the growth of trade in services in the Asia-Pacific has closely tracked developments in the world economy***. Sectors such as transport and other business services are particularly important within the region.

***Lowering the transaction costs of international trade in services can produce major economic benefits***. Lower trade costs lead to increased efficiency in individual services sectors through specialization by comparative advantage. They also promote the growth of high productivity firms, which tends to boost overall sectoral productivity. Some trade costs, such as those related to geographical distance or cultural differences, are relatively difficult to compress. But others are related to entry barriers and ongoing cost burdens imposed by regulatory measures that can be directly influenced by policymakers. There is significant scope for policymakers to boost services trade in the region by reducing policy-related trade costs through well-targeted and efficient regulatory interventions. Quantitative evidence suggests that policy-related trade costs are probably more important as determinants of trade flows than are "natural" trade barriers such as distance.

***Services trade also has significant spillover effects to other parts of the economy***. Efficient provision of backbone services such as transport, retail/distribution, and telecommunications makes domestic manufacturers more productive, and tends to boost merchandise exports. In addition, a large proportion of services trade takes place via GATS Mode III (foreign affiliate sales), which means that services trade also generates technology and productivity spillovers through foreign direct investment.

***There is huge scope for services trade to grow in the future***. Although services are a large share of GDP in most economies, services trade accounts for a much smaller percentage of sector value added than does goods trade. Part of the reason for this anomaly lies in the fact that the cost of trading services is much higher than the cost of trading goods. In an age of globalization and rapid technological change, this conclusion may seem counter-intuitive. But it is backed up by recent empirical evidence (Miroudot et al., Forthcoming). To some extent, it may reflect relatively high levels of policy restrictiveness in services sectors. As a result, ***the gains from reform in services markets may be even greater than those for goods***.

***Our findings are reinforced by gravity model results***. The model shows that more restrictive policies, as measured by the OECD and the Australian Productivity Commission, tend to hold back trade. This is true of aggregate services trade flows, and also at the sectoral level. Sectors such as transport, retail/distribution, and finance are particularly sensitive to regulatory restrictiveness. These are the same sectors that play a strong role into the production of other goods and services in the economy—as well as other exports—which suggests that the gains from reform in this area could be very large.

This report has shown that ***policymakers have a major role to play in facilitating trade in services in the APEC region***. Performance varies substantially across sectors and economies,

but on an overall level, the latest World Bank data suggest that the Asia-Pacific may have a relatively restrictive trade in services environment compared with other regions. It will be important to continue to deepen our understanding of any policy measures that might create undue and unintended trade costs.

Concretely, this report's findings are suggestive of a number of implications for policymakers:

- **Trade facilitation for services**—i.e., reducing the transaction costs affecting international services trade—should be an important part of overall liberalization and economic integration efforts.
- Given the complexity of the regulatory arrangements affecting services trade, it is important for policymakers to take a **holistic approach to reform**. Economy-wide measures, as well as sector-specific ones, need to be considered, and complement each other.
- **Backbone services sectors** such as transport, retail/distribution, and telecommunications should receive particular attention as part of a balanced reform package, since they have the greatest potential to generate economy-wide spillovers.

This report has provided an overall account of the importance of services in the APEC economy, as well as the observed pattern of trade within the region and its determinants, focusing on trade-related policies. It has highlighted the fact that some trade transaction costs are linked to regulatory measures, and can be reduced through action by policymakers. However, it is outside its scope to identify and prescribe particular policy measures that could be implemented by member economies. The characteristics of sectors and individual member economies differ in each case.

Future work in this area could perhaps take a leaf from the APEC trade facilitation playbook. The idea would be to identify sets of concrete policy steps that economies can, if they wish, commit to implement in order to reduce trade costs in services markets. Actions could be organized around the two main types of trade costs in this area, i.e. those that tend to restrict market entry, and those that add to the cost burden facing current operators. They could be cross-cutting or horizontal in scope, or sector-specific. Future sector-specific studies could be a useful way of identifying a range of measures that could be implemented. Extending the Services Action Plan (2009) in this direction could be an important step in helping expand and spread the benefits from increased trade in services within the region.

There are also important ways in which future work on services can interact with policy moves in other areas. Trade facilitation, including logistics performance and supply chain connectivity, is an example. Improving service sector performance in logistics, transport, and distribution can be an important part of broader efforts to reduce trade transaction costs across the region. There is major scope for policymakers to facilitate this process by identifying priority outcomes and putting in place programs of activities designed to progress towards them.

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## 7. APPENDIX 1: TECHNICAL ANNEX

This section provides additional detail on the gravity model and estimation results discussed in the main text. It draws heavily on the technical annex to Shepherd et al. (2010).

### A. SPECIFICATION OF THE GRAVITY MODEL

The starting point for the analysis is a gravity model based on standard theories of international trade (Anderson & Van Wincoop 2003, 2004).<sup>8</sup> It takes the following form:

$$(1) \log(X_{ij}^k) = \log(E_j^k) + \log(Y_i^k) - \log(Y^k) + (1 - s) \log(t_{ij}^k) - (1 - \sigma) \log(P_j^k) \\ - (1 - s) \log(\Pi_i^k) + e_{ij}$$

where:  $X_{ij}$  is exports from economy  $i$  to economy  $j$  in sector  $k$ ;  $E_j$  is sectoral expenditure in economy  $j$ ;  $Y_i$  is sectoral production in economy  $i$ ;  $t_{ij}^k$  is bilateral trade costs;  $s$  is the intra-sectoral elasticity of substitution (between varieties within a sector); and  $e_{ij}$  is a random error term satisfying standard assumptions. The  $P_j^k$  and  $\Pi_i^k$  terms represent multilateral resistance, i.e. the fact that trade patterns are determined by the level of bilateral trade costs relative to trade costs elsewhere in the world. Inward multilateral resistance  $(P_j^k)^{(1-s)} = \sum_{i=1}^N (\Pi_i^k)^{(s-1)} w_i (t_{ij}^k)^{(1-s)}$  captures the dependence of economy  $j$ 's imports on trade costs across all suppliers. Outward multilateral resistance  $(\Pi_i^k)^{(1-s)} = \sum_{j=1}^N (P_j^k)^{(s-1)} w_j (t_{ij}^k)^{(1-s)}$  captures the dependence of economy  $i$ 's exports on trade costs across all destination markets. The  $w$  terms are weights equivalent to each economy's share in global output or expenditure.

Ideally, empirical work based on equation (1) should fully account for multilateral resistance, for example by using fixed effects. This is not possible in the present case, however, since the analysis is focused on data that vary by exporting economy but not across importers for a given exporter. Indicators of multimodal transport performance would be perfectly collinear with exporter fixed effects, and the model therefore could not be estimated.

A second-best estimation option is to use fixed effects to account for inward multilateral resistance, and random effects for outward multilateral resistance (equation 2).<sup>9</sup> The random effects specification puts more structure on the data than fixed effects, since it assumes that outward multilateral resistance can be adequately summarized by a random variable that follows a normal distribution; a fixed effects specification allows for unconstrained variation. The mixed effects model with fixed effects by importer and random effects by exporter

<sup>8</sup> In addition to the variables listed here, early gravity models often included per capita GDP as an additional regressor. We exclude it because recent gravity theories do not provide any sound basis for including it. Current best practice, as reflected in a variety of peer-reviewed journal articles, is to include aggregate GDP only. For examples, see: Anderson & Van Wincoop (2003, 2004); Chaney (2008); and Helpman et al. (2008).

<sup>9</sup> In additional results available on request, we show that fixed effects formulations produce generally similar results to those reported here. However, it is necessary to average policy variables across the exporting and importing economies. This makes results much harder to interpret in a policy sense.

represents an acceptable compromise in this case between research objectives and empirical rigor.

$$(2) \log(X_{ij}^k) = r_j + \log(Y_j^k) + f_i - \log(Y^k) + (1 - s) \log(t_{ij}^k) + e_{ij}$$

$$r \sim N(0, v)$$

The final part of the model is the trade costs function  $t$ . Our specification (3) includes a measure of services sector regulation taken from two OECD databases (PMR and ETCR), and the Australian Productivity Commission's database of trade restrictiveness indices. The variable "regulation" is equal to each of these variables sequentially. We include regulation for the importing economy only, since they are the measures that are most likely to act as barriers to trade.

$$(3) \log(t_{ij}) = b_1 \text{Regulation}_j + b_2 \log(\text{distance}_{ij}) + b_3 \text{APEC}_{ij} + b_4 \text{border}_{ij} \\ + b_5 \text{language}_{ij} + b_6 \text{colony}_{ij} + b_7 \text{RTA}_{ij}$$

The trade costs function also includes standard gravity model control variables such as distance (a proxy for trade costs), tariffs, colonial links, common language, and membership in a regional trade agreement or free trade agreement (RTA/FTA).

To estimate the model, we substitute equation (3) into equation (2) and proceed using the GLS (random effects) estimator. At the present time, we estimate the equation in a pure, cross-section context, i.e. for one year only.

The presence of zeros in the bilateral trade matrix (over one third of all observations) means that we need to adjust the export data by adding a small positive number (0.001) prior to taking the logarithm. Due to the complexity of this mixed effects model, we have not yet extended it to consider alternative estimators such as Poisson (Santos Silva and Tenreyro, 2006).

## B. DATA SOURCES

For the most part, the gravity modeling work presented here uses standard data sources. Table A.1 provides a full summary.

Export data are taken from the Trade in Services Database (TSD; Francois et al., 2009). This source combines data from a variety of sources and uses mirroring techniques to produce the most complete dataset currently available on bilateral services trade. We use two versions of the database. The first includes an aggregate variable capturing total services exports between each economy pair. The second uses a sectoral disaggregation that follows the GTAP scheme commonly used in general equilibrium modeling.

As noted above, the model includes policy variables taken from the OECD (PMR and ETCR indicators), and the Australian Productivity Commission (services trade restrictiveness indices). As an additional policy variable, we also include a dummy variable equal to unity when the exporter and importer are both APEC member economies. We also include a dummy variable equal to unity when the exporter and importer are both members of the same RTA/FTA (data sourced from Miroudot et al., forthcoming). The model also includes standard gravity model controls such as the distance between economies, colonial history,

and common language. All such variables come from CEPII's distance database (<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>).

Table A.1 Gravity model data and sources.

Variable	Description	Year	Source
APEC	Dummy variable equal to unity if both economies are APEC member economies.	n/a	n/a
Architecture	Trade restrictiveness index for foreign companies in architectural services.	2000	Australian Productivity Commission
Banking	Trade restrictiveness index for foreign companies in banking services.	2000	Australian Productivity Commission
Colony	Dummy variable equal to unity if one economy was once a colony of the other.	n/a	CEPII.
Common Border	Dummy variable equal to unity for economies that share a common land border.	n/a	CEPII.
Common Language	Dummy variable equal to unity for economies that share a language spoken by more than 9% of the population.	n/a	CEPII.
Distance	Great circle distance between the main cities of economies $i$ and $j$ , weighted by internal distance	n/a	CEPII.
Distribution	Trade restrictiveness index for foreign companies in retail/distribution services.	2000	Australian Productivity Commission
ETCR	Overall index of regulation in the energy, communication, and transport sectors.	1975-2007	OECD
Exports	Total and GTAP sectoral exports of services from economy $i$ to economy $j$ .	1992-2006	Trade in Services Database.
GDP	Real GDP in USD.	1992-2006	World Development Indicators.
Maritime	Trade restrictiveness index for foreign companies in maritime services.	2000	Australian Productivity Commission
PMR	Overall index of product market regulation.	1993, 1998, 2003, 2008	OECD
RTA	Dummy variable equal to unity for economies that are members of an RTA/FTA.	n/a	Miroudot et al. (2010)
Telecom	Trade restrictiveness index for foreign companies in telecom services.	2000	Australian Productivity Commission

Source: Authors.

### C. EMPIRICAL RESULTS USING AGGREGATE TRADE FLOWS

We first present results for a baseline model excluding policy variables. We compare fixed effects and mixed effects specifications. The fixed effects model is completely consistent with theory, whereas the mixed effects model imposes more structure on the inward multilateral resistance term. This added restriction may lead to some differences in estimation results. If they are small, however, then the use of a mixed effects model—which is advantageous in terms of policy analysis—is appropriate.

Indeed, baseline results in the first two columns of Table A.2 show that there is very little difference between the fixed effects and mixed effects results. Both reflect common results from the gravity literature, including a GDP coefficient of approximately unity in column 2, and a distance coefficient of around -1 in both cases; both coefficients are highly statistically significant. Similarly, historical connections tend to boost trade, in line with the previous literature. A common border has no statistically significant effect on trade, perhaps indicating that geographical contiguity is less important for pure cross-border trade in services than it is for goods. Nonetheless, the importance of the distance coefficient suggests that measures designed to reduce transport costs and improve infrastructure and network connectivity are likely to boost trade in services as well as in goods.

Some coefficients are slightly different between the fixed effects and mixed effects models. But the differences are never statistically significant. This finding suggests that the mixed effects model appropriately captures multilateral resistance, and that the additional structure imposed on the data does not lead to serious bias in the results.

**Table A.2 Gravity model results using aggregate trade flows (total exports, 2005 or 2003).**

	(1)	(2)	(3)	(4)
	Total Trade	Total Trade	Total Trade	Total Trade
<b>PMR</b>			<b>-1.464***</b> <b>(0.000)</b>	
<b>ETCR</b>				<b>-0.971***</b> <b>(0.000)</b>
APEC	-0.536 (0.166)	-0.512* (0.092)	-0.740* (0.062)	-0.951** (0.015)
RTA	0.545 (0.159)	0.989*** (0.000)	1.221*** (0.001)	0.807* (0.056)
Log(GDP)		1.100*** (0.000)	1.271*** (0.000)	1.043*** (0.000)
Log (Distance)	-1.445*** (0.000)	-1.276*** (0.000)	-1.516*** (0.000)	-1.394*** (0.000)
Border	-0.422 (0.300)	-0.256 (0.392)	-0.325 (0.449)	-0.667* (0.069)
Colony	2.099*** (0.000)	2.120*** (0.000)	2.079*** (0.000)	1.315*** (0.000)
Language	0.570*** (0.003)	0.608*** (0.000)	0.760*** (0.001)	1.154*** (0.000)
Constant	-1.885 (0.341)	-20.902*** (0.000)	-20.341*** (0.000)	-15.187*** (0.000)
Observations	6714	6301	3239	3317
R2	0.697	0.597	0.616	0.669
Fixed Effects	Exporter Importer	Exporter	Exporter	Exporter
Random Effects		Importer	Importer	Importer

Source: Authors. Columns 1-2 are estimated by OLS with robust standard errors. Columns 3-4 are estimated by mixed effects with robust standard errors. Statistical significance is indicated by: \* (10%), \*\* (5%), and \*\*\* (1%). P-values are in parentheses beneath the parameter estimates.

The two remaining columns of Table A.2 present regression results using total trade flows, and general indicators of an economy's regulatory stance. We find that the PMR and ETCR indicators both have economically and statistically significant (1%) impacts on trade. As an example, improving Korea's PMR performance by 0.4 points, or around 20%, could increase bilateral trade by over 50% on an impact basis, before accounting for general equilibrium reallocation effects. If other economies were to reform at the same time, this figure could fall substantially due to changes in multilateral resistance.

The possibility of a virtuous cycle—more services trade leads to less restrictive regulation, which leads to more services trade—could also reduce this figure substantially. However, additional results (available on request) confirm that the endogeneity bias in this case is only minor in practice. We repeat the regressions in the last two columns of Table A.2 using lagged values of the two policy variables, from 1998 and 2000 respectively; i.e., five year lags. The estimated coefficients are slightly smaller in both cases, which is consistent with a virtuous cycle dynamic. However, they remain statistically significant. The possibility of a virtuous cycle should therefore not be interpreted as calling into question the main results presented above.

Another important result from a policy point of view is that regional trade agreements tend to be strongly trade promoting. The RTA dummy variable has a positive sign in all regressions, and is statistically significant in all except the fixed effects specification. This result lines up well with previous work highlighting the importance of regional integration for trade in services (Park and Park, 2010).

One surprising result from Table A.2 is that the APEC dummy variable always has a negative coefficient, which is statistically significant in two cases. On its face, this finding would tend to suggest that there is much that member economies can do to improve intra-regional trade in services. However, this result needs to be nuanced in light of the sectoral findings below, which paint a significantly different picture of APEC's impacts on trade flows in services.

How important is policy as a determinant of services trade flows, as compared with other trade cost factors? To examine this issue, we re-estimate the baseline model excluding different sets of variables, and then compare explanatory power across the different specifications. In all cases, we retain the basic mixed effects specification, i.e. fixed effects by exporter and random effects by importer. First (Table A.3 column 1) we drop importer market size (GDP). Results suggest that market size on its own accounts for around 10% of the observed variation in bilateral trade. Next (column 2) we remove all three policy variables, i.e. the PMR indicator, and the RTA and APEC dummies. Removing all policy variables from the gravity model noticeably reduces its explanatory power: around 6% less of the observed variation in trade flows is accounted for by the model without policy variables. That number is noticeably higher than the reduction in explanatory power that takes place when geographical and historical variables are excluded from the model (column 3, 3%). In other words, policy appears to be a significant source of trade transaction costs in the services domain, and is perhaps even more important than "natural" trade costs such as distance. Policymakers therefore have a major role to play in helping reduce policy-related transaction costs, and facilitate trade in services.

**Table A.3 Gravity model results using aggregate trade flows (total exports, 2005 or 2003), excluding selected variables.**

	(1)	(2)	(3)
	Total Trade	Total Trade	Total Trade
<b>PMR</b>	<b>-1.807***</b> <b>(0.000)</b>		<b>-1.134***</b> <b>(0.000)</b>
APEC	1.064** (0.024)		-0.249 (0.518)
RTA	1.381*** (0.000)		2.440*** (0.000)
Log(GDP)		1.025*** (0.000)	1.230*** (0.000)
Log (Distance)	-1.087*** (0.000)	-1.382*** (0.000)	
Border	0.148 (0.741)	0.263 (0.481)	
Colony	3.350*** (0.000)	2.232*** (0.000)	
Language	1.027*** (0.000)	0.730*** (0.000)	
Constant	9.087*** (0.000)	-18.166*** (0.000)	-33.143*** (0.000)
Observations	3239	5812	3357
R2	0.518	0.557	0.583
Fixed Effects	Exporter	Exporter	Exporter
Random Effects	Importer	Importer	Importer

Source: Authors. All models are estimated by mixed effects with robust standard errors. Statistical significance is indicated by: \* (10%), \*\* (5%), and \*\*\* (1%). P-values are in parentheses beneath the parameter estimates.

#### D. EMPIRICAL RESULTS USING SECTORAL TRADE FLOWS

Table A.4 presents results using sector-specific regressions. In this case, we use measures of sectoral regulatory restrictiveness from the Australian Productivity Commission. This approach is preferable to using general measures such as the PMR and ETCR indicators, since it allows for the possibility of different regulatory stances and impacts across sectors. We consider five sectors, drawn from the commonly-used GTAP aggregation scheme: finance, communication, transport, trade (retail/distribution), and construction.

In all five columns, conventional gravity variables such as distance and GDP have the expected signs, magnitudes, and significance levels. Geographical and historical controls are only intermittently significant, and sometimes have unusual signs. This tends to indicate that such factors have different effects on trade in services than goods. It makes sense, for instance, that geographical contiguity is important for construction services, but much less so for electronically transmitted services such as finance and telecommunications.

In terms of policy, we find two important results. The first is that more restrictive sectoral policies tend to hold back trade. The effect is particularly strong in the transport, trade (distribution), and finance sectors. It is somewhat weaker in construction and telecommunication. The reason for this is probably that telecommunications already has a relatively open policy regime in many economies—at least as regards pure cross-border

trade. Construction, on the other hand, can only be conducted to a very limited extent through GATS Modes 1-2, and requires heavily on Mode 3 and Mode 4 for practical reasons of proximity. As a result, restrictions on pure cross-border trade would tend to matter less in this sector.

Again, these effects are both economically and statistically significant. A simple counterfactual experiment in the sector with the strongest impact of regulation (transport) is to decrease the restrictiveness of regulation in the maritime sector in Australia by 0.1 points on the index scale, or a change of around 23% in Australia's baseline score. Such a policy change would be associated with an impact effect of an over 40% increase in trade. Again, general equilibrium reallocations and a virtuous cycle dynamic could reduce this number substantially.

Table A.4 Gravity model results using sectoral trade flows (exports, 2000).

	(1)	(2)	(3)	(4)	(5)
	Finance	Communic.	Transport	Trade	Construction
<b>Banking</b>	<b>-2.150**</b> (0.025)				
<b>Telecom</b>		<b>-0.822*</b> (0.065)			
<b>Maritime</b>			<b>-4.784***</b> (0.000)		
<b>Distribution</b>				<b>-2.778*</b> (0.052)	
<b>Architecture</b>					<b>-1.454*</b> (0.094)
APEC	1.776*** (0.006)	4.052*** (0.000)	1.390*** (0.000)	n/a	3.798*** (0.000)
RTA	0.237 (0.589)	0.176 (0.584)	-1.608*** (0.000)	-0.671* (0.081)	-0.539 (0.246)
Log(GDP)	1.049*** (0.000)	0.772*** (0.000)	1.224*** (0.000)	1.331*** (0.000)	0.935*** (0.000)
Log(Dist.)	-1.048*** (0.000)	-1.207*** (0.000)	-2.091*** (0.000)	-1.298*** (0.000)	-1.036*** (0.000)
Border	-0.075 (0.915)	0.492 (0.296)	-1.242** (0.016)	0.288 (0.565)	2.639*** (0.002)
Colony	0.252 (0.629)	0.148 (0.702)	0.158 (0.777)	1.335** (0.021)	-0.488 (0.394)
Language	1.373*** (0.001)	-0.115 (0.708)	0.211 (0.570)	-0.720 (0.314)	-1.686*** (0.002)
Constant	-27.743*** (0.000)	-17.433*** (0.000)	-18.216*** (0.000)	-29.977*** (0.000)	-23.641*** (0.000)
Observations	1130	1674	1235	472	1075
R2	0.474	0.509	0.566	0.639	0.432
Fixed Effects	Exporter	Exporter	Exporter	Exporter	Exporter
Random					
Effects	Importer	Importer	Importer	Importer	Importer

Source: Authors. All models are estimated by mixed effects with robust standard errors. Statistical significance is indicated by: \* (10%), \*\* (5%), and \*\*\* (1%). P-values are in parentheses beneath the parameter estimates.