



# Restrictions on Trade in Professional Services

## Staff Research Paper

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The views expressed in this paper are those of the staff involved and do not necessarily reflect those of the Productivity Commission. Appropriate citation in indicated overleaf.

August 2000

ISBN 1 74037 010 4



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**An appropriate citation for this paper is:**

Nguyen-Hong, D. 2000, *Restrictions on Trade in Professional Services*, Productivity Commission Staff Research Paper, AusInfo, Canberra, August.

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# Preface

This paper is part of the Commission's research into barriers to trade in services, being undertaken in a collaborative project with the University of Adelaide and the Australian National University. The paper focuses on restrictions affecting trade in professional services, namely legal, accountancy, architectural and engineering services.

The paper was written by Duc Nguyen-Hong under direction of Philippa Dee. The paper has benefited from comments by Richard Snape, Lynne Williams and Tony Warren. The author also thanks Tom Nankivell, Greg McGuire and Kaleeswaran Kalirajan for the assistance to the project. The author is also grateful to Alison Airey of the Department of Foreign Affairs and Trade, and Rachel Thompson of the OECD for assistance in collection of information on professional services.

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# Abbreviations

| | |
|---|---|
| APEC | Asia Pacific Economic Cooperation |
| DBE | Domestic barriers to establishment |
| EBIT | Earnings before interest and taxes |
| EU | European Union |
| FBE | Foreign barriers to establishment |
| FBO | Foreign barriers to ongoing operations |
| GATS | General Agreement on Trade in Services |
| ILSAC | International Legal Services Advisory Council |
| MFN | Most favoured nation |
| OECD | Organisation for Economic Cooperation and Development |
| PC | Productivity Commission |
| TRI | Trade restrictiveness index |
| USA | United States of America |
| WTO | World Trade Organisation |

# Summary

Professional services are an integral part of the production of merchandise goods and other services. Among other things, legal and accountancy services play major roles in ensuring effective market transactions and management control of firms in modern economies. Architectural and engineering services are essential in the creation of the built environment. Engineering services are also vital in creating new production processes. It is therefore important that these services are provided efficiently.

Professional services embody intellectual and technical inputs acquired through relatively high standards of education and training. In most economies, provision of these services is by individual professionals and small firms.

Professional services are also traded internationally. This has taken place mainly through firms establishing a 'commercial presence' in foreign countries and by professionals travelling overseas. More recently, advanced communication technology has given rise to cross-border trade in certain services, such as blueprints and designs.

Most economies impose several restrictions on domestic and foreign providers of professional services. While these restrictions often have objectives such as ensuring service quality, they can also limit trade and activity in professional services. To date there has not been much work assessing and quantifying them on a cross-country basis. The degree to which barriers restrict trade and the impact they may have on the professional sector are thus unclear.

The focus of this study is on quantifying restrictions affecting trade in legal, accountancy, architectural and engineering services. It first develops a trade restrictiveness index measure, which shows the height of the barriers applying to domestic and foreign supply of professional services in a range of economies. It then develops estimates of the effects of restrictions in an econometric analysis of engineering service firms' price-cost margins.

*Index framework*

Most WTO and APEC member economies operate an array of policies restricting trade and competition in professional services. The major restrictions include:

- nationality or citizenship requirements as conditions to provide services;
- residency conditions requiring service providers to establish a presence in the host economy;
- restrictions on form of establishment, such as prohibiting incorporated business structures;
- restrictions on partnership and investment by foreign professionals and non-professional investors;
- lack of recognition of foreign qualifications; and
- anti-competitive regulations limiting fees, advertising and the scope of practices.

A trade restrictiveness index provides a useful framework to assess the degree of restrictiveness of various policies. A restrictiveness index has the advantage of providing an alternative measure of restrictions when an estimate of the price impact cannot be readily obtained. By quantifying restrictions through a restrictiveness index, it is also possible to undertake further analysis to determine the effects of restrictions on service providers.

Several studies have applied an index approach to measure restrictions on services (see Findlay and Warren 2000). A restrictiveness index combines different forms of restrictions into a summary value to facilitate comparison of different regulatory regimes. Economies with a higher overall score have more restrictive trading regimes than economies with a lower score.

The indexes incorporate detailed information on the number and type of restrictions and the extent that restrictions are applied in each economy. Each restriction category receives a score, ranging from 0 as least restrictive to 1 as most restrictive. Each restriction category also has a weighting which reflects an assessment of the economic significance of the restriction on trade and activity.

*Foreign* and *domestic* indexes of restrictions have been separately compiled to show the degree of restrictiveness for each economy. The *foreign* index measures the restrictions facing foreign service providers in seeking to provide services in the local market, including those measures that discriminate against them. The *domestic* index quantifies the restrictions affecting domestic service providers, including those policies that target only domestic producers. Both indexes include restrictions that are non-discriminatory between foreign and domestic suppliers. The difference

between the foreign and domestic index is a measure of the discrimination against foreigners.

The foreign and domestic indexes also distinguish between *barriers to establishment* and *barriers to ongoing operations*. Barriers to establishment constitute restrictions on entry, and hence can be viewed as restrictions on the movement of capital or labour. Barriers to ongoing operations represent restrictions on the provision of services once the capital or labour is established.

### *Index results*

In this paper, restrictiveness indexes are compiled on a common basis for legal, accountancy, architectural and engineering services. The indexes cover 34 economies (29 economies for legal services) in the Asia Pacific, European and American regions.

The foreign index results indicate that legal and accountancy services are the most restricted professions. This is generally the case in European, APEC and American economies, notwithstanding some recent reforms. In contrast, engineering and architectural services are the least restricted professional services in many economies.

The most restricted economies for the four professions are Indonesia, Malaysia, Austria, Mexico and Turkey. The most open markets are Finland and the Netherlands.

Compilation of the foreign index also reveals the following.

- Nationality requirements are most extensive in legal services and, to a lesser degree, in accountancy services. There are only a few such requirements in engineering and architectural services.
- Residency requirements are common in accountancy services, but vary in scope between economies.
- Legal and accountancy services are also subject to a combination of measures restricting multi-disciplinary practices and ownership and investment. Restrictions on multi-disciplinary practices have had the effect of preventing partnerships between accountants and lawyers in common law jurisdictions.
- A variety of approaches has been adopted in relation to the recognition of foreign qualifications and licences. A large number of economies have adopted a case-by-case (discretionary) assessment of qualifications. Stringent local retraining requirements exist in legal and accountancy services in many economies. Mutual recognition agreements are few and largely reflect regional

trading agreements. Engineering services, and to a lesser extent architectural services, are industries in which several economies have not imposed foreign licence and qualification requirements.

The domestic index results indicate similar patterns to those of the foreign index. In most economies, domestic entry conditions for professionals require, at a minimum, the attainment of tertiary education (university degree or equivalent). Other important features are as follows.

- Legal and accountancy services are frequently reserved to specific providers. Court representation and statutory audits are the most common activities reserved to lawyers and accountants.
- Restrictions on fee setting and advertising are most common in legal and accountancy services.

### *Effects of restrictions on engineering services*

Restrictions on professional services, by reducing trade and competition in the market, are likely to affect the price and cost of providing services. Empirical studies of professional services in certain economies suggest that restrictions tend to raise prices. Quantitative measures of price and cost effects would provide an indication of the extent to which restrictions affect trade and activity in professional services.

Because service firms in many professions are not incorporated, this makes it difficult to obtain firm-level data on key performance measures, such as prices and costs, with which to measure the effects of trade restrictions.

The company data available for this study has nevertheless allowed an analysis of the effects of restrictions on engineering service firms, using price-cost margins as the measure of performance. Using price-cost margins is less ideal than examining the effects of restrictions on prices and unit costs separately. In particular, some cost-raising effects of restrictions will not be revealed by looking at price-cost margins data alone. This means that the impact estimates derived in this study are likely to represent minimum estimates.

The analysis examines the effects of trade restrictions on the price-cost margins of firms, while correcting for industry- and firm-specific influences on firm performance. The cross-sectional estimation covers 84 engineering service companies in 20 economies. It analyses the effects of:

- foreign barriers to establishment;
- foreign barriers to ongoing operations; and

- domestic barriers to establishment.

The estimation finds that foreign barriers to establishment and ongoing operations are significant and positive determinants of the price-cost margins of engineering service firms. The results suggest that restrictions on foreign supply of engineering services tend to allow firms in the domestic market to raise their prices above costs.

Using these econometric results, restrictions on foreign supply of engineering services (as measured by the foreign index) are estimated to raise the price of engineering services from between 1 and 15 per cent in the 20 economies studied. Foreign barriers to establishment play a significant role in raising prices in a large number of economies. Foreign barriers to ongoing operations tend to have smaller impacts.

Austria, Mexico, Malaysia, Indonesia, and Germany face highest price impacts, with these varying from 10 to 15 per cent. Other economies have price increases well below 10 per cent.

The low to moderate price impacts reflect the open trading environment for engineering services in many economies. The results suggest that removal of restrictions can still achieve further reductions in prices, especially in economies in which substantial barriers to trade in engineering services remain.

Domestic barriers to establishment are found to have a negative influence on the price-cost margins of engineering firms. This result and the nature of these restrictions suggest they are likely to have the effect of raising the costs of engineering services. These costs stem from qualification requirements, compulsory membership of professional bodies, and to a lesser extent, restrictions on incorporation.

Estimates of the cost impact of domestic barriers to establishment range from 1 to 7 per cent for the 20 economies examined. Although the estimated cost increases are small for most economies, they show that trade restrictions can have significant cost impacts in particular economies.

# 1 Introduction

An important outcome of the General Agreement on Trade in Services (GATS) in 1994 was the inclusion of professional services — including legal, accountancy, architectural and engineering services — within the framework of multilateral trading rules. Through the Agreement, World Trade Organisation (WTO) member economies have identified their policies affecting trade in professional services and also made specific commitments to create a more open trading environment. While the GATS has brought barriers to trade in professional services within multilateral disciplines, the scope of the Agreement is limited and many barriers remain.

All WTO and APEC economies currently operate a mixture of policies affecting trade in legal, accountancy, architectural and engineering services. Restrictions on professional services are often considered necessary to maintain standards, ensure the quality of services and the integrity of service providers, and to protect consumers. While this is reflected in regulations applying to individual professionals as well as to firms providing the services, the extent to which these regulations restrict trade and affect service providers is often not transparent or readily observable.

Restrictions on trade in professional services have the potential to affect the supply of such services in fundamental ways. Restrictions can limit competition and lead to higher prices of services in the protected sector without providing offsetting benefits in terms of higher quality or other consumer benefits. Other restrictions can increase the cost of supplying the service, but may provide some level of benefit to consumers. The effects of restrictions will depend on how they are applied in practice. This needs to be appropriately measured and, where possible, quantified.

Recognising the importance of restrictions affecting trade in professional services, various international fora have sought to improve transparency and pursue multilateral efforts to create a more open trading regime. WTO member economies have recently agreed to the creation of disciplines on domestic regulations affecting the recognition of qualifications and standards in the accountancy sector, with the aim of developing disciplines for other professional services sectors (WTO 1998a). International organisations, including the WTO, the OECD and APEC, have also sought to compile information on measures affecting trade in professional services.

These efforts have shed light on the regulatory regimes governing professional services in many economies.

As with other services, the basis for evaluating the degree of protection afforded professional services is not immediately clear, not least because professional services are subject to regulations, rather than tariffs levied on goods at the border. The restrictions can affect services delivered via commercial presence (for example, through foreign direct investment) or by regulating the movement of people when close interaction between suppliers and users is required. The diverse forms of restrictions on professional services also present an analytical challenge in assessing and measuring the degree of restrictiveness of different regulatory systems in various economies.

This study develops two approaches to quantify the restrictions on trade in professional services:

- a trade restrictiveness index measure for legal, accountancy, architectural and engineering services, based on information on restrictions for a range of economies; and
- an estimate of the price (and cost) impact of restrictions on engineering service firms.

Chapter 2 explains the restrictiveness index methodology which is used to measure restrictions in professional services. Chapter 3 discusses the results obtained from applying the methodology to a range of economies. Chapter 4 uses the index results to estimate the impact of restrictions on engineering service firms. The analysis is undertaken by econometric estimation of a relationship between trade restrictions (as measured by the trade restrictiveness index) and engineering service firm profitability.

# 2 Index framework

## 2.1 Introduction

A diverse range of restrictive measures affects international trade in professional services. The type of restrictions and the way they operate in practice vary across economies.

An index approach is a useful way to assess the degree of restrictiveness of various economies when price or quantity measures are not available. A restrictiveness index quantifies various restrictions into a summary measure to facilitate cross-country comparison. It can provide insights into the extent to which barriers apply to foreign and domestic service providers, and the ways in which they affect service trade.

The next section briefly looks at the features of legal, accountancy, architectural and engineering services. It then develops a trade restrictiveness index for quantifying the restrictions affecting these professions.

## 2.2 Some features of professional services

Professional services play an important role in the operation of modern economies. For example, accountancy services are important for management control of enterprises and the implementation of prudential and financial regulatory measures. Legal services underpin the effective relations and transactions between buyers and sellers. Architectural and engineering services are critical to the creation of modern physical structures and technological production processes. Government policies which limit trade in professional services can have significant implications for the efficient supply of such services and the production of goods and services in the economy.

The main characteristic of professional services is the supply of human capital acquired through high standards of education and training. High labour intensity is a feature of professional firms.

Professionals are also characterised by 'ethical' behaviour, personal accountability and moral and financial independence (OECD 1995). Legal, accountancy, architectural and engineering services are professions in which licensing and qualification requirements usually determine entry and professional practice.

Professional services can be supplied as services to producers or to consumers. Legal, accountancy, architectural and engineering services may be provided by individual professionals, by professional firms, through in-house activities of private firms, or by the public sector.

Limited statistics are available for this study on the characteristics of these professional services in various economies. Statistics on these services are often combined with those of other business services or other sectors. Where they are reported, the statistics are likely to underestimate the true economic importance of these professions.

An indicator of the size of professional services is the sector's contribution to the Gross Domestic Product (GDP) of the economy. As a percentage of GDP, the value added of these four professional services is about 2.4 per cent for Canada,[1] less than 2 per cent for Malaysia,[2] and 1.8 per cent for Singapore.[3] In the United States, the value added of legal services is about 1.7 per cent of GDP, but data are not available for other professional service sub-sectors.[4]

In Australia, the industry gross product of the four professions accounts for 2 per cent of GDP (see table 2.1). Legal and accountancy services are much larger than engineering and architectural services in terms of industry product and employment. Qualified employees and partners account for over half of employment in accountancy and consulting engineering services. Half of total expenses are labour costs. Legal services have the highest operating profit margin.

Professional services cover a diverse range of activities. Legal services broadly include advisory and representation services, legal documentation and certification services, and other legal advisory and information services. The scope of legal practice covers domestic law, home country law and third country law, and

1 Data are from 1997. This group includes accounting and legal services, and architectural, engineering, scientific and technical services (WTO 1999).

2 This includes services provided by accountants, architects, doctors, engineers, lawyers and surveyors (Sirat 1999).

3 Data are from 1997. The professional services include legal activities, accounting, auditing and booking, consultant engineering services, architectural, quantity surveying, building and appraisal services, and other engineering, architectural and technical services (Singapore Department of Statistics 1999).

4 Data are from 1996 (US Bureau of Economic Analysis 1997).

international law. Foreign legal firms or consultants may be permitted to practice only home country and international law, but not domestic law (see below). The activities of accounting firms encompass accounting and auditing services, merger audits, insolvency services, and recently expanded activities, such as investment services and management consulting. Architectural firms provide blueprints and designs for buildings and other structures, while engineering firms engage in planning, design, construction and management services for building structures, installations, civil engineering works and industrial process. The types of activities provided by these professions can vary between economies (WTO 1998b, 1998c and 1998d).

The mode of private practice differs between professions. In many economies, legal services are provided by individual professionals or by small firms, while the large firms are confined to a limited number of developed, common law economies. Architectural and engineering services are predominantly provided by small firms. Small-scale businesses also predominate in accountancy services, but provision is by firms and partnerships, rather than by individuals. The largest accountancy firms are the 'Big Five', which have worldwide networks of local firms and referral of services and clients between economies.[5] This reflects the difficulty of transferring professionals between economies as a result of pervasive domestic regulation on the accountancy profession (WTO 1998b).

Table 2.1 **Key statistics on professional services, Australia**

| | *Legal services* | *Accountancy services* | *Architectural services* | *Consulting engineering services* |
|---|---|---|---|---|
| | *1995-96* | *1995-96* | *1992-93*[a] | *1995-96* |
| Number of practices | 9 796 | 8 389 | 4 409 | 5 514 |
| Number of employees | 67 494 | 66 792 | 18 581 | 30 736 |
| - Qualified employees and partners (% of total employees) | 41 | 56 | na | 57 |
| Labour costs in total expenses (%) | 49 | 56 | 50 | 45 |
| Operating profit margin (%) | 32 | 19 | 10 | 11 |
| Industry gross product[b] ($m) | 4 111 | 3 592 | 574 | 1 698 |
| - Per cent of GDP | 0.8 | 0.7 | 0.1 | 0.3 |

**na** not available. **a** Latest data available. **b** Industry gross product is value of sales less selected expenses. Data on value added are not available.

*Sources:* ABS 1997a, 1997b, 1993, and own estimates.

[5] The 'Big Five' firms are Arthur Andersen, Deloitte Touche Tohmatsu, Ernst & Young International, KPMG International, and PriceWaterhouseCoopers.

Differences in institutions and professional practices are of particular importance in some professions. The practice of law and the role of lawyers differ between economies depending on the legal system and traditions that are followed, and also reflect differences in legal education and training. In accountancy services, many economies have recently integrated international accounting standards into domestic standards (WTO 1998b). National differences in professional practices appear to be less pronounced for architectural and engineering services.[6]

The supply of professional services is predominantly through commercial presence and movement of professionals between economies. The development of advanced communication technology has given rise to cross-border trade in certain services, such as blueprints and designs (WTO 1998c). The lack of statistics on professional service trade, however, makes a comprehensive assessment of the economic importance of the sector difficult.

## 2.3 Measuring restrictions on trade in professional services

Little work has been undertaken to quantify restrictions on professional services. However, a number of studies have used restrictiveness indexes to quantify restrictions on foreign direct investment and other services (Hoekman 1997, Hardin and Holmes 1997, McGuire and Schuele 1999 and McGuire et al. 1999). The OECD (1997a) has also conducted a pilot study of accountancy services in four OECD countries using a restrictiveness index methodology. This section sets out the coverage and methodology of the restrictiveness index used in this study.

### Barriers included in the index

The trade restrictiveness index captures a wide range of policy measures which affect trade and activity in professional services. Restrictions can arise from legislation or regulations imposed either at national or sub-national levels of government. In professional services, restrictive measures can also be in the form of practices and conditions imposed by professional organisations under delegated authority from the government. Professional rules, combined with compulsory

[6] The lack of standardisation does not necessarily preclude trade in professional services. It means that commercial presence and the movement of people become the predominant modes of supply of such services (Chang et al. 1999). Foreign direct investment, partnership arrangements and hiring of local professionals are some of the ways in which international trade in professional services can occur.

membership of professional bodies, can also translate into conditions limiting trade and activity. In addition to restrictions specific to professional services, the index covers restrictions applicable to all sectors of the economy, such as those involving movement of people between economies.

The professional service indexes are designed to include only government-sanctioned measures. Professional rules, which are enforced through delegated government authority and compulsory membership of professional organisations, fall broadly within this category. Private practices that are not enforced by law are not covered. For example, a code of ethics may recommend fee scales, but if membership of professional bodies is not mandatory, the code would not be included. The lack of detailed information creates difficulties in assessing whether these private practices constitute barriers to trade, especially when the possibility of circumventing these rules exists.

Table 2.2 summarises the restriction categories used, while table 2.3 gives full details of the restrictiveness index. The most significant restrictions in professional services are as follows.

- Requirements on the form of establishment — restrictions on incorporation and other business structures. For example, professionals may be prohibited from incorporating, and hence may only practice in partnership or sole proprietorship. Restrictions on the legal form of businesses apply equally to both foreign and domestic service providers, but can limit the ability of foreign firms to establish branches and subsidiaries. In general, they can have the effect of preventing the development of large-scale professional firms.
- Foreign partnership restrictions — limitations on foreign firms and professionals seeking to enter into partnership or joint venture with local professionals. As partnership is a common mode of professional practice, prohibition on foreign partnership can be an important barrier to foreign entry and establishment in the domestic market. Partnership with local professionals also represents a way to enter the domestic market without the need to obtain a local licence. In certain cases, economies may require establishment through local partnership or joint venture.
- Ownership and investment restrictions — limitations on ownership and control of local firms by *foreign* professionals, and limitations on ownership and control of local firms by *non-professional* investors. The latter category applies to both domestic and foreign providers and usually requires owners of professional firms to be locally licensed or qualified.
- Nationality requirements — conditions to practice on the basis of nationality or citizenship. Nationality requirements differ in scope — ranging from restrictions on the use of a professional title but with practice being relatively free, to

comprehensive requirements to exclude foreign professionals from local practice. Nationality requirements may be applied with reciprocity or exemptions for certain economies.

- Residency and local presence requirements — obligations to be established or resident in the market where the service is provided. Residency requirements apply to individual professionals, while local presence requirements apply to professional firms. These requirements raise the costs of establishment and tend to have the effect of excluding cross-border trade in professional services.
- Licensing and accreditation of foreign professionals — licensing and qualification conditions that exclude foreign professionals by not recognising their foreign licence and qualifications. Foreign qualified professionals may be required to undertake full local retraining or pass stringent tests to practice. Recognition of foreign qualifications may involve a case-by-case assessment process in which discretion is exercised, or mutual recognition of qualifications between economies based on objective and technical criteria.
- Limitations on the scope of activities — regulations that reserve certain activities to the exclusive exercise of the profession or some groups within the profession. For example, regulations may provide accountants the exclusive right to perform audit services. Similarly, domestic lawyers may have sole rights to provide services relating to domestic law, while foreign lawyers may be limited to the practice of home country or international law. These regulations can have the effect of providing a monopoly position to the profession.
- Multi-disciplinary practices restrictions — regulations that restrict partnership or association between different professions or between particular groups within the profession.
- Fee and advertising restrictions — regulations that set limits or prohibit fee setting and advertising among professionals. These regulations typically reduce competition on the basis of price.

Restrictions on professional services are targeted at individual professionals and firms providing the services. Restrictions relevant to individual professionals are nationality and residency requirements as conditions to supply services. Barriers relevant to firms are, for example, restrictions on foreign direct investment and the form of establishment.

Restrictions on professional services reflect a number of objectives. Several regulations reflect concerns to ensure quality of services, maintain standards and integrity of service providers, and to protect consumers (box 2.1).

However, restrictions can reduce trade and competition in the market, and affect the price and quality of services. Recognising the restrictive nature of these measures, international fora, such as the OECD, have advanced alternative approaches to regulation of professional services. In 1998, WTO member economies also agreed to the creation of disciplines on domestic regulations in the accountancy sector.

The economic effects of particular restrictions on various occupations and professions have been studied for certain economies. These empirical studies suggest that restrictions tend to raise service prices (box 2.2). These studies, however, differ in the methodology and coverage of restrictions, and are also economy-specific.

Box 2.1 **Arguments for restrictions on professional services**

The OECD (1996 and 1997b) discussed several motivations underlying the application of specific types of restrictions in its member economies. For example:

- nationality requirements often have the justifications of providing reciprocity (as a trade negotiating tool), familiarity with local rules, and loyalty of professionals;
- residency requirements may help to ensure consumers' redress in the case of professional malpractice, adherence to professional association's disciplines, and proximity to consumers;
- restrictions on incorporation have the stated aims of limiting company type structures which can reduce personal liability of professionals and hence, their accountability when professional malpractice occurs;
- restrictions on non-professional ownership are advocated on the grounds that unlimited non-professional investment can undermine the independence of professionals — for example, a bank, as a shareholder of the auditing firm, may exercise influence over the audit of its financial statements;
- licensing and qualification requirements are to ensure standards of competence, performance and accountability; and
- fee and advertising restrictions are designed to limit competition which may lead to lower prices and reduced service quality.

The merits of using trade barriers to achieve such objectives have been questioned and alternative approaches to regulation of professions have also been called for (see for example OECD 1997b). The Third OECD Workshop on Professional Services (1997b) recommended removal of nationality, residency and partnership restrictions, review and relaxation of requirements on foreign investment in professional firms, freedom of firms to choose the form of establishment, and promotion of recognition of foreign qualifications and standards between member economies.

*Source:* OECD 1996 and 1997b.

## Box 2.2 **Effects of restrictions on professional services**

Past studies of regulations in various professions have tended to find that regulations lead to higher prices for services. Cox and Foster (1990) reviewed a number of studies that analyse the effects of regulations on various professions and occupations — such as accountants, lawyers, physicians, optometrists, dentists and pharmacists. In ten studies on price effects, licensing restrictions on advertising and commercial practice were shown to result in price increases of various ranges, between 4 per cent and 33 per cent. A more recent study (Kinoshita 2000) found that entry regulation in legal services in Japan (strict bar exam) has a price effect from 14 to 100 per cent.

Some evidence also indicates that removal of restrictions can lower service prices. Baker (1996) reported a fall in conveyancing fees of 17 per cent in New South Wales in the early 1990s resulting from opening up the legal market to non-lawyers with appropriate qualifications and the removal of fee scales and advertising restrictions. Domberger and Sherr (1995) found that the threat of competition, following government announcements to end lawyers' monopoly on conveyancing in England and Wales in 1984, led to a 33 per cent reduction in conveyancing fees.

Previous research also found the effects of restrictions in improving service quality to be ambiguous. Of the eleven studies on quality effects discussed in Cox and Foster (1990), only two found quality effects of regulations to be positive, while the rest reported quality effects to be neutral or negative. A recent study on State accountancy regulations in the United States detected no relationship between audit service quality and variations in strictness of regulations. Audit quality is related to firm size, suggesting that market forces, rather than regulation, are effective in addressing information asymmetry problems (Colbert and Murray 1999).

Some empirical work, however, suggests that market factors play the dominant role in the pricing of legal services (Lueck et al. 1995 and Rosen 1992). Lueck et al. (1995) reported results that showed regulations (such as the bar exam) to have no significant effects on price and incomes of the legal profession in the United States. In contrast, Bortolotti and Fiorentini (1998) found that entry restriction imposed by professional examination is effective in preserving monopoly rents in the accountancy market in Italy. The admission policy, which is administered by the professional body, is strongly influenced by market conditions and, in particular, past levels of professional incomes (rather than objective requirements to achieve high quality of services).

The studies on professional services have adopted various methods to analyse the effects of different types of regulations. Because of this, care should be exercised in drawing detailed conclusions. Nevertheless, the bulk of the literature indicates that restrictions can increase prices without offsetting benefits of improved quality.

Recent research in other service sectors has presented cross-country evidence of the price-raising effects of restrictions (Findlay and Warren 2000). In banking, telecommunication and maritime services, trade barriers — as measured by the trade restrictiveness index — have raised prices through restrictive effects on bank interest margins, telecommunication service output and trading margins. In sum, restrictions can significantly affect market competition and the efficient provision of such services.

## Assessing the degree of restrictiveness

Information on trade restrictions has been gathered from a number of sources. In addition to the GATS schedules, which are limited in their coverage of restrictions because of the positive listing approach, the main sources of information on restrictions are:

- *OECD Inventory of Measures Affecting Trade in Professional Services* (OECD 1996), which contains detailed coverage of regulations applying to engineering, architectural, legal and accountancy services in OECD countries;
- *WTO Questionnaire on Restrictions in the Accountancy Services Sector* (WTO 1996);
- *APEC Directory on Professional Services* (APEC 1999), which provides information on regulations affecting engineering, architectural and accountancy services in APEC economies; and
- *ILSAC's Legal Services Country Profiles*, which provides information on the legal services sector in Asia and Australia.

These sources of information may not be sufficiently comprehensive in the coverage of regulatory regimes in particular economies. To overcome this problem, information on restrictions has also been collected from Tradeport, APEC Individual Action Plans and WTO Trade Policy Reviews.

Not all forms of restrictions on professional services have been included in the index. Particular licensing requirements, for example in relation to minimum age, criminal record, professional indemnity insurance and code of ethics, are not included because the information sources vary in the coverage of these regulations. There is also a lack of information on output-oriented regulations that may be particularly relevant in some professions. Engineering and architectural services tend to be subject to output-oriented regulations, such as technical rules and standards (building and safety regulations), rather than conditions imposed on the professional service providers (OECD 1996).

### *Classifying restrictions on trade in professional services*

The index measurement attempts to identify and classify restrictions according to:

- the ways they affect foreign and domestic service providers; and
- whether they apply to establishment or to ongoing operations.

Barriers to trade in professional services affect foreign and domestic service providers differently. Some restrictions may discriminate against foreign providers,

while others apply equally to foreign and domestic providers, and there are measures affecting only domestic producers.

A *foreign* and a *domestic* index have been calculated separately for restrictions on professional services. The foreign index captures all relevant restrictions applying to foreign service providers, including those that discriminate against foreigners. The domestic index covers the restrictions that are relevant to domestic service providers, including those that affect only domestic providers. A non-discriminatory barrier would receive the same score in both indexes. The difference between the foreign and domestic index score is a measure of discrimination against foreigners.

Among other things, the foreign and domestic classification provides for separate treatment of licensing and accreditation requirements affecting foreign and domestic professionals. Licensing and accreditation requirements for foreign professionals reflect conditions giving rise to the lack of recognition of licence and qualifications already acquired by foreign professionals in their home country. The requirements for domestic professionals are regulations governing entry into the profession, such as requirements to undertake higher education, undergo practice or pass a final examination.

Restrictions on professional services can be further classified into two main groups:

- barriers to establishment — restrictions that prevent service providers from establishing or setting up a physical presence in the market (these can be viewed as restrictions on the movement of capital); and
- barriers to ongoing operations, which represent restrictions on provision of services once the capital is established.

Examples of barriers to establishment are restrictions on foreign partnership and foreign direct investment. Barriers to ongoing operations cover regulations that restrict price competition (fee scales and advertising regulations) and multi-disciplinary practices (see table 2.2).

Particular barriers can restrict trade in more than one mode of supply. For example, residency, nationality and licensing requirements can affect establishment, movement of persons and cross-border trade in professional services. These measures have been classified as barriers to establishment to take account of the costs they impose on professionals and firms seeking to establish and provide services.

*Determining the degree of restrictiveness*

A common trade restrictiveness index methodology is developed to facilitate comparison among the four professions, as well as across economies. The overall index score for a particular profession in an economy reflects the number of restrictions that are applied and the relative importance of those restrictions. The higher the overall index score, the more restrictive is the trading regime for that profession.

Table 2.2 **Restriction categories for foreign and domestic index**

| *Restriction categories* | *Relevant to foreign index* | *Weight* | *Relevant to domestic index* | *Weight* |
|---|---|---|---|---|
| **Barriers to establishment** | | | | |
| Form of establishment | Yes | 0.080 | Yes | 0.080 |
| Foreign partnership or joint venture | Yes | 0.080 | No | na |
| Investment and ownership by foreign professionals | Yes | 0.050 | No | na |
| Investment and ownership by non-professional investors | Yes | 0.050 | Yes | 0.050 |
| Nationality requirements | Yes | 0.135 | No | na |
| Residency and local presence requirements | Yes | 0.135 | No | na |
| Quotas/economic needs test | Yes | 0.100 | No | na |
| Licensing and accreditation of *foreign* professionals | Yes | 0.100 | No | na |
| Licensing and accreditation of *local* professionals | No | na | Yes | 0.05 |
| Permanent movement of people | Yes | 0.020 | No | na |
| **Barriers to ongoing operations** | | | | |
| Activities reserved by law to the profession | Yes | 0.050 | Yes | 0.050 |
| Multi-disciplinary practices | Yes | 0.050 | Yes | 0.050 |
| Advertising, marketing and solicitation | Yes | 0.050 | Yes | 0.050 |
| Fee setting | Yes | 0.050 | Yes | 0.050 |
| Licensing requirements on management | Yes | 0.020 | No | na |
| Other restrictions | Yes | 0.020 | No | na |
| Temporary movement of people | Yes | 0.010 | No | na |
| **Total weight** | | **1.000** | | **0.380** |

**na** not applicable.

Within each restriction category, a score is assigned to the particular trade measure operating in an economy. The score ranges from 0 as least restrictive to 1 as most restrictive. Each restriction category also receives a weighting which indicates the relative restrictiveness of that category on trade and activity. The higher the

weighting, the more restrictive a restriction category is considered to be, relative to other restriction categories.

The use of weights for different restriction categories is discussed in detail in Hardin and Holmes (1997), Claessens and Glaessner (1998), McGuire and Schuele (1999) and McGuire et al. (1999). The OECD (1997a) examined in detail the application of weights for accountancy services. A restriction category which is considered more restrictive has a greater weighting. For example, foreign direct investment restrictions are given a greater weighting than restrictions covering the temporary movement of people.

Nationality and residency requirements have been assigned the highest weights to take account of the comprehensive application of these requirements in some economies. In certain cases, nationality requirements are imposed without the need to use other restrictions, such as licensing requirements. According to the available information sources, some economies have indicated that in applying comprehensive nationality requirements, other requirements — notably, foreign direct investment, foreign partnership, licensing and accreditation of foreign professionals — are not applicable in the economies concerned.

Ownership and investment restrictions are of different forms in professional services. The available information sources reveal two kinds of restriction categories: restrictions limiting investment by *foreign* professionals and those limiting ownership by (foreign and domestic) *non-professional* investors. In the foreign index, the sum of the weights for these two restriction categories can be viewed as equivalent to the weight of a usual restriction on foreign direct investment (for example, in banking and maritime services).

The application of certain types of restrictions may involve discrimination across economies. Some economies exempt nationality requirements on the basis of most favoured nation (MFN) exemptions and reciprocity conditions. The MFN exemptions of nationality requirements tend to reflect regional trading characteristics, for example being offered as part of European Union (EU) membership. To take into account MFN exemptions, the score for the restriction is reduced by the proportion of the economies receiving MFN exemptions to the total number of economies examined. This issue is discussed in detail in McGuire and Schuele (1999). Some economies indicate a nationality requirement subject to reciprocity, but provide no additional information on the reciprocal arrangements or those economies receiving reciprocal treatment. To provide for this information deficiency, it is assumed that this type of restriction receives a score of 0.5.

In some professions, a number of economies have entered into agreements on mutual recognition of qualifications. In accountancy services, the EU has

established mutual recognition of qualifications based on aptitude tests, which have been implemented by several member economies. Mutual recognition agreements need to reflect objective and technical criteria in the assessment of foreign qualifications and licences. Economies with mutual recognition agreements, in effect, provide differential treatment towards other economies. Each economy's score for this restriction category is the average of the sub-scores for the different policies that an economy adopts towards other economies. Economies with mutual recognition based on objective and technical criteria are considered more liberal than economies that have not granted mutual recognition.

The restriction scores reflect the actual policies or regulations on professional services, as implemented by each economy. For example, the EU mutual recognition agreement may stipulate recognition of qualifications on the basis of aptitude tests, while member economy regulations may differ from the EU directive. Countries' responses to survey questionnaires usually indicate such variations in the regulatory systems adopted by economies.

## Some qualifications to the measurement methodology

A restrictiveness index provides a summary measure to quantify all relevant restrictions that can be identified by available information sources. The danger is that a higher score may simply reflect a greater availability of information rather than a more restrictive regime. This is a limitation with the approach, which this study has sought to ameliorate by using the best known sources of information on professional services available.

The determination of weights for restriction categories is inevitably subjective. Such weights are designed to reflect the economic significance of restrictions in professional services. The econometric analysis of price impacts in the next chapter estimates coefficients of different index groupings separately and, indirectly, the strength of the associated weights. This represents a 'test' of the weights used. However, the lack of in-sample variation for many restriction categories creates difficulties in estimating coefficients for all individual restriction categories and the strength of their weights.

Some restrictions included in the index may have a valid economic justification. In general, trade restrictions can reduce competition and increase costs and prices in a service market. However, they may also ensure the quality of services and protect consumers. The merits of each type of restriction depend on the balance between the costs and benefits of the restriction to society. In this aspect, the use of a trade restrictiveness index will help to identify the costs of government regulations. This would be relevant for an overall assessment of the merits of particular regulations.

Table 2.3 **Restrictiveness index for professional services**

| *Category weights* | *Specific score* | *Restriction category* |
|---|---|---|
| | | **BARRIERS TO ESTABLISHMENT** |
| 0.08 | | **Form of establishment** |
| | 1.00 | Prohibition on incorporation |
| | 0.50 | Some form of incorporation permitted |
| | 0.00 | No restrictions |
| 0.08 | | **Foreign partnership or joint venture** |
| | 1.00 | Prohibition on partnership with foreign professionals |
| | 0.50 | Partnership or joint venture with local professionals required |
| | 0.00 | No restrictions |
| 0.05 | | **Investment and ownership by foreign professionals** |
| | | Firms must be owned or controlled by *local* professionals. The score is inversely proportional to the maximum foreign equity participation permitted in a professional firm. For example, equity participation to a maximum of 75 per cent in an existing firm receives a score of 0.25. |
| | | **Investment and ownership by non-professional investors** |
| 0.05 | | Firms must be owned or controlled by professionals. The score is proportional to the non-professional equity participation permitted in a professional firm. For example, equity participation to a maximum of 75 per cent in an existing firm receives a score of 0.25. |
| 0.135 | | **Nationality or citizenship requirements** |
| | 1.00 | Nationality required to qualify or to practice |
| | 0.25 | Nationality required for use of professional title, but practice is relatively free |
| | 0.00 | No restrictions |
| 0.135 | | **Residency and local presence** |
| | 1.00 | Permanent or prior residency (more than 12 months) |
| | 0.75 | Less than 12 months prior residency |
| | 0.50 | Prior residency required for local training |
| | 0.25 | Domicile or representative office only |
| | 0.00 | No restrictions |
| 0.10 | | **Quotas or economic needs tests on the number of foreign professionals and firms** |
| | 1.00 | Quotas or economic needs tests |
| | 0.50 | Some restrictions apply |
| | 0.00 | No restrictions |

(continued next page)

Table 2.3 (continued)

| *Category weights* | *Specific score* | *Restriction category* |
|---|---|---|
| 0.10 | | **Licensing and accreditation of *foreign* professionals** |
| | 1.00 | Local retraining required for a full licence |
| | 0.75 | Local examination required in all cases |
| | 0.50 | Case-by-case assessment of foreign licence and qualifications |
| | 0.25 | Aptitude tests |
| | 0.00 | Foreign licence and qualifications sufficient to practice |
| 0.05 | | **Licensing and accreditation of *local* professionals**[a] |
| | 0.25 | Compulsory membership of professional association |
| | 0.25 | Professional examination |
| | 0.25 | Practical experience |
| | 0.25 | Higher education |
| 0.02 | | **Permanent movement of people** |
| | 1.00 | No entry of executives, senior managers or specialists |
| | 0.80 | Entry of up to 1 year |
| | 0.60 | Entry of up to 2 years |
| | 0.40 | Entry of up to 3 years |
| | 0.20 | Entry of up to 4 years |
| | 0.00 | Entry of up to 5 years or more |
| | | **BARRIERS TO ONGOING OPERATIONS** |
| 0.05 | | **Activities reserved by law to the profession** |
| | 1.00 | 4 core activities and over |
| | 0.75 | 3 core activities |
| | 0.50 | 2 core activities |
| | 0.25 | 1 core activity |
| | 0.00 | None |
| 0.05 | | **Multi-disciplinary practices** |
| | 1.00 | Prohibition on partnership or association with other professions |
| | 0.50 | Majority partnership required |
| | 0.00 | No restrictions |
| 0.05 | | **Advertising, marketing and solicitation** |
| | 1.00 | Prohibition of advertising, marketing and solicitation |
| | 0.50 | Restrictions apply to some groups or activities |
| | 0.00 | General legal requirements |

(continued next page)

Table 2.3 (continued)

| *Category weights* | *Specific score* | *Restriction category* |
|---|---|---|
| 0.05 | | **Fee setting** |
| | 1.00 | Minimum and maximum fees for all groups in the profession |
| | 0.50 | Restrictions apply to some groups or activities |
| | 0.00 | Setting fee freely |
| 0.02 | | **Licensing requirements on management** |
| | 1.00 | At least a majority of managers must be nationals or residents |
| | 0.50 | Directors and managers must be locally licensed |
| | 0.25 | Directors and managers must be domiciled |
| | 0.00 | No restrictions |
| 0.02 | | **Other restrictions**[a] |
| | 0.33 | Restrictions on hiring local professionals |
| | 0.33 | Restrictions on the use of firm's international names |
| | 0.33 | Government procurement — restrictions towards foreign suppliers |
| | 0.00 | No restrictions |
| 0.01 | | **Temporary movement of people** |
| | 1.00 | No temporary entry |
| | 0.75 | Temporary entry of up to 30 days |
| | 0.50 | Temporary entry of up to 60 days |
| | 0.25 | Temporary entry of up to 90 days |
| | 0.00 | Temporary entry over 90 days |
| **1.00** | | **FOREIGN INDEX**[b] |
| **0.38** | | **DOMESTIC INDEX**[b] |

**a** Addition categories. **b** Sum of individual weights for foreign and domestic restrictions. See also table 2.2.

# 3 Index results

## 3.1 Introduction

This chapter discusses the findings from the application of the restrictiveness index framework developed in the previous chapter. The comparison of restrictiveness for accountancy, architectural and engineering services covers 34 economies in the Asia Pacific, European, and American regions. The restrictiveness index for legal services has been compiled for 29 economies on the basis of the available information on restrictions.

## 3.2 Comparison among professions

The trade restrictiveness indexes have been developed on a common basis so as to compare the degree of restrictiveness across professions and countries. The foreign index measures the restrictions facing foreign service providers in seeking to establish and carry out activity in the local market. The domestic index quantifies the restrictions affecting the establishment and ongoing operations of domestic service providers.

### Foreign index

Table 3.1 summarises the foreign restrictiveness index scores for the four professions.

All the economies examined, including the developed economies, impose at least some types of restrictions on the four professions. The degree of restrictiveness varies significantly between accountancy and legal services, and engineering and architectural services.

Across the professions, the foreign restrictiveness indexes indicate that legal and accountancy services are more highly restricted than architectural and engineering services. In legal and accountancy services, most economies have foreign restrictiveness index scores of greater than 0.26, while many of them have index values greater than 0.45. In contrast, a large majority of economies score less than

0.26 for architectural and engineering services. The high scores for legal and accountancy services reflect the pervasive restrictions affecting these professions.

Table 3.1 **Summary of foreign restrictiveness index results**

| | *Restrictiveness scores from 0 to 0.25* | *Restrictiveness scores from 0.26 to 0.45* | *Restrictiveness scores greater than 0.45* |
|---|---|---|---|
| Legal services | Finland, Netherlands. | Australia, Belgium, Denmark, Greece, Hong Kong, India, Korea, Portugal, Singapore, Spain, Sweden, Thailand, United Kingdom. | Austria, Canada, France, Germany, Indonesia, Italy, Japan, Malaysia, Mexico, New Zealand, Philippines, Switzerland, Turkey, USA. |
| Accountancy services | Finland, Netherlands, United Kingdom. | Argentina, Australia, Belgium, Brazil, Canada, Chile, Denmark, France, Germany, Greece, Hong Kong, India, Italy, Japan, Luxembourg, Mexico, New Zealand, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, USA. | Austria, Indonesia, Korea, Malaysia, Philippines, Thailand. |
| Architectural services | Argentina, Australia, Brazil, Chile, Denmark, Finland, France, Germany, Hong Kong, India, Japan, Korea, Luxembourg, Netherlands, Singapore, South Africa, Sweden, Switzerland, Thailand, United Kingdom, USA. | Austria, Canada, Belgium, Greece, Indonesia, Italy, Malaysia, Mexico, New Zealand, Philippines, Portugal, Spain, Turkey. | |
| Engineering services | Argentina, Australia, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Greece, Hong Kong, India, Indonesia, Italy, Japan, Korea, Luxembourg, Malaysia, Netherlands, New Zealand, Philippines, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, USA. | Austria, Germany, Mexico, Portugal, Turkey. | |

**a** Refer to table 3.3 to 3.6 for a full list of results.

The index results also suggest that engineering services is the most open of the four professions, although the degree of restrictiveness between engineering and architectural services is not markedly different. Regulations on foreign professional

service providers are applied less frequently in engineering and architectural services.

The most liberal markets for legal, accountancy, architectural and engineering services are Finland and the Netherlands. These economies maintain few restrictive measures affecting foreign providers of professional services. In Finland, a foreign licence is usually sufficient to provide legal, accountancy, architectural and engineering services.

The most restricted markets for professional services are in Indonesia, Malaysia, Turkey, and Austria. These economies impose a number of barriers across the four professions, notably comprehensive nationality and residency requirements, and barriers on form of establishment and foreign direct investment.

Nationality requirements are most prevalent in legal services. Of the 29 economies examined for legal services, 15 economies impose nationality requirements to restrict local practice. Nationality requirements are also significant for accountancy services, being adopted by 10 out of 34 economies. Few nationality requirements are applied in architectural and engineering services.

Residency requirements tend to be extensive in accountancy services, with 20 economies having some form of these restrictions. Residency requirements range from a requirement to establish a representative office, to the more stringent requirement of permanent residency.

Restrictions on multi-disciplinary practices, incorporation, and ownership and investment by foreign professionals and non-professional investors are common in legal and accountancy services. This is especially the case in many common law countries, where restrictions on multi-disciplinary practices have prevented partnerships between accountants and lawyers.

The economies examined have adopted a variety of approaches to the recognition of foreign qualifications and licences. A large number of economies have followed the case by case assessment of foreign qualifications. Stringent local retraining requirements are common in legal services. In engineering services and to a lesser extent, architectural services, a number of economies do not impose foreign licence and qualification requirements. There are only a few formal mutual recognition agreements in these four professions.

## Domestic index

Table 3.2 shows a summary of the domestic index scores for the four professions. The domestic index scores for professional services range from 0.00 to 0.33.

Table 3.2 **Summary of domestic restrictiveness index results**

| | *Restrictiveness scores from 0 to 0.09* | *Restrictiveness scores from 0.1 to 0.19* | *Restrictiveness scores greater than 0.19* |
|---|---|---|---|
| Legal services | Finland, Hong Kong, India, Singapore. | Denmark, Greece, Indonesia, Italy, Korea, Malaysia, Netherlands, New Zealand, Philippines, Sweden, Thailand, United Kingdom. | Australia, Austria, Belgium, Canada, France, Germany, Japan, Mexico, Portugal, Spain, Switzerland, Turkey, USA. |
| Accountancy services | Chile, Finland, Indonesia, Malaysia, South Africa, Switzerland, Turkey. | Argentina, Australia, Greece, Italy, Luxembourg, Mexico, Netherlands, Singapore, Sweden, Thailand, United Kingdom. | Austria, Belgium, Brazil, Canada, Denmark, France, Germany, Hong Kong, India, Japan, Korea, New Zealand, Philippines, Portugal, Spain, USA. |
| Architectural services | Argentina, Australia, Brazil, Chile, Denmark, Finland, Greece, Hong Kong, India, Indonesia, Japan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Philippines, Singapore, South Africa, Sweden, Switzerland, Thailand, United Kingdom | Belgium, France, Germany Italy, Portugal, Spain, Turkey, USA. | Austria, Canada. |
| Engineering services | Argentina, Australia, Belgium, Brazil, Chile, Denmark, Finland, France, Greece, Hong Kong, India, Indonesia, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Philippines, Singapore, South Africa, Sweden, Switzerland, Thailand, United Kingdom. | Canada, Italy, Japan, Turkey, Portugal, Spain, Turkey, USA. | Austria, Germany. |

**a** Refer to table 3.3 to 3.6 for a full list of results.

The domestic index scores are lower than foreign index scores. This is because the foreign index captures several restriction categories involving direct discrimination against foreign service providers. The domestic index includes those measures that apply to domestic and foreign service providers equally and those that are only relevant to domestic providers. An example of the latter restriction category is local (domestic) licensing and accreditation requirements (see chapter 2).

As with the restrictions on foreigners, domestic regulations are more extensive in legal and accountancy services than architectural and engineering services.

Regulation of architectural and engineering services, however, tends to reflect technical regulations, norms, and standards requirements rather than restrictions imposed on service providers (OECD 1996).

Across the four professions, the available information indicates that most economies have imposed qualification requirements as conditions for entry into the profession. The minimum qualification requirement is the attainment of a university degree or other post secondary education. Requirements of practical experience (training), professional examination, and compulsory membership of professional bodies are more widespread in legal and accountancy services. In a large number of countries, professional bodies perform the licensing role, which is established either by law or delegated government authority.

Anti-competitive regulations are most common in legal and accountancy services. Restrictions on advertising and fee setting are frequent in these services to prevent competition on the basis of prices and costs. Lawyers are also exclusive providers of legal services in most economies.

## 3.3 Engineering services

Engineering services tend to be relatively liberal. Restrictiveness index values for engineering services are shown in figure 3.1.

A number of economies maintain relatively few restrictions on engineering services, as reflected in both the foreign and domestic index measures. The most liberal markets are Belgium, Denmark, Finland, France and the United Kingdom.

The foreign index indicates that the most restricted markets are Austria, Turkey, Portugal and Mexico. These economies maintain several restrictions across the four professions, including engineering services.

The domestic index scores mostly reflect restrictions in developed economies. Austria, Germany, Italy, Portugal, Spain, and Turkey have the highest domestic index scores.

The difference between a foreign and domestic index is a measure of discrimination against foreign service providers. Indonesia, Austria, Portugal, Turkey, Brazil, Mexico and New Zealand have relatively high discrimination against foreign providers of engineering services.

## Asia Pacific economies

*Foreign index*

Engineering services in the Asia Pacific region tend to be relatively open. No foreign index score in the Asia Pacific region exceeds 0.25. Indonesia and Malaysia have the highest values in this region. They require foreign engineering firms to form joint ventures with local engineering firms and apply economic needs tests on the number of engineers admitted to practice.

New Zealand restricts engineering services to engineering professionals who are resident and registered in New Zealand. In Japan, engineering service fees are regulated and certain engineering activities are reserved to the engineering profession. The Philippines has a nationality requirement for engineering services.

A number of economies achieve very low foreign index scores. These include Australia, Hong Kong, India, Korea, Singapore and Thailand. Notably, Thailand limits foreign direct investment in local engineering firms to a maximum of 49 per cent.

*Domestic index*

Japan is the only economy in the region with a domestic index value greater than 0.1. As noted above, Japan regulates fees and reserves certain activities to the engineering profession.

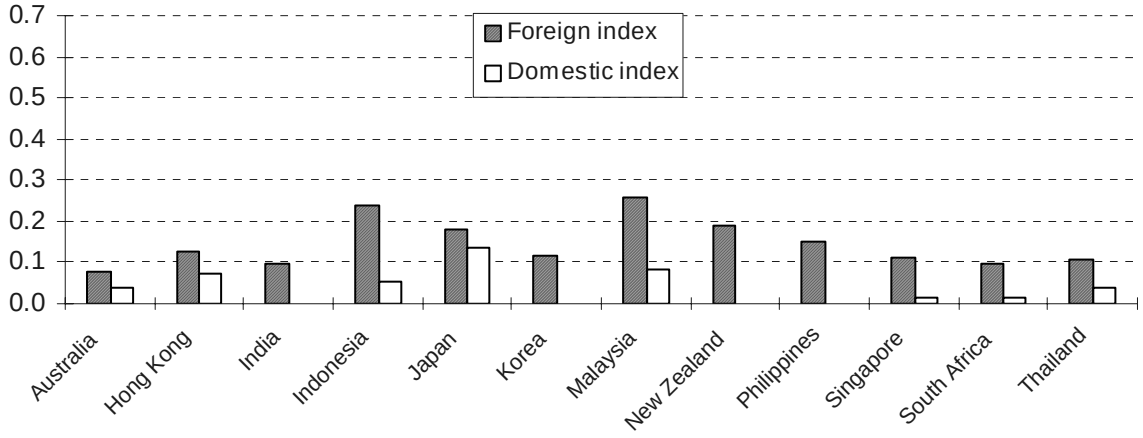
## European economies

*Foreign index*

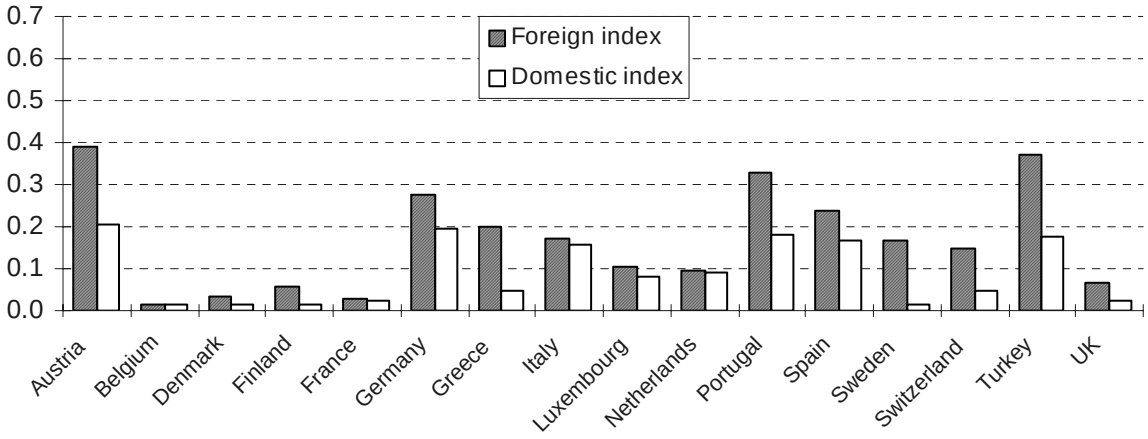
The most restricted markets in Europe are Austria, Turkey and Portugal, followed by Germany and Spain. In Austria and Turkey, the most common restrictions are nationality requirements, controls on the form of establishment, and the reserve of exclusive rights to exercise certain engineering activities. Portugal applies a residency requirement and prohibits incorporation. Germany restricts multi-disciplinary practices, and regulates engineering service fees and advertising. Spain reserves activities of engineering services and also restricts fees.

Figure 3.1 **Restrictiveness index for engineering services**

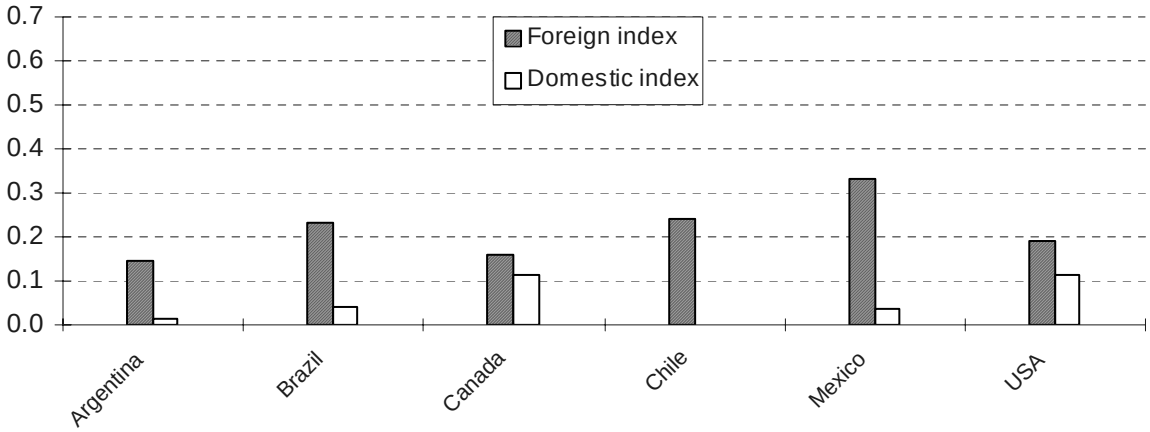
*Asia Pacific economies*




*European economies and Turkey*




*Selected American economies*



Greece, Italy, Sweden, and Switzerland obtained moderate scores. Greece has a nationality requirement for engineering services. Italy prohibits incorporation and regulates fees. Sweden does not require a local licence to practice, but requires that engineering partners and firms be resident. Switzerland adopts case-by-case assessment of foreign qualifications and requires residency for practical training.

Belgium, Denmark, Finland, France, Luxembourg, the Netherlands and the United Kingdom are the most open markets for engineering services in this region. These economies have few establishment and operational requirements other than those on the movement of people.

### *Domestic index*

A number of European economies have high domestic index scores. They are Austria, Germany, Portugal, Spain, and Italy. The most common regulations reserve certain engineering activities, and restrict incorporation and fee setting.

## American economies

### *Foreign index*

Mexico has the highest index score in this region, reflecting a nationality requirement subject to reciprocity, economic needs tests on the number of engineers admitted to practice, and a requirement of joint venture between foreign and local firms.

Brazil, Chile and the United States achieve relatively high scores. Brazil reportedly has a complex and lengthy process for recognition of foreign qualifications (USITC 1997) and requires establishment through a specific legal entity with foreign minority control. In Chile, foreign engineers must establish permanent residency. In the United States, regulations restrict non-professional investment and provide exclusive rights to the engineering profession to exercise certain activities.

Argentina and Canada achieve the lowest scores in this region. Argentina requires local retraining. Canada has residency requirements in several provinces, but also operates a temporary licensing system to facilitate entry of foreign professionals.

*Domestic index*

The domestic index scores reflect regulations in the United States and Canada which apply to domestic and foreign firms equally. In these economies, certain activities are reserved to the engineering profession.

## 3.4 Architectural services

Index scores for architectural services tend to be slightly higher than those for engineering services for most economies examined, but significantly lower than for accountancy and legal services. Index values for architectural services are shown in figure 3.2.

The foreign index scores show a number of economies with a high degree of restrictiveness. They are Indonesia, Malaysia, New Zealand, the Philippines, Austria, Belgium, Greece, Italy, Portugal, Spain, Turkey, Canada and Mexico.

In contrast, several economies are open in architectural services. Denmark, Finland and the Netherlands adopt few restrictions on providers of architectural services.

Economies with high foreign index scores also tend to have a high degree of discrimination against foreign architectural providers. Indonesia, Malaysia, New Zealand, the Philippines, Greece, Portugal and Mexico fall within this category.

### Asia Pacific economies

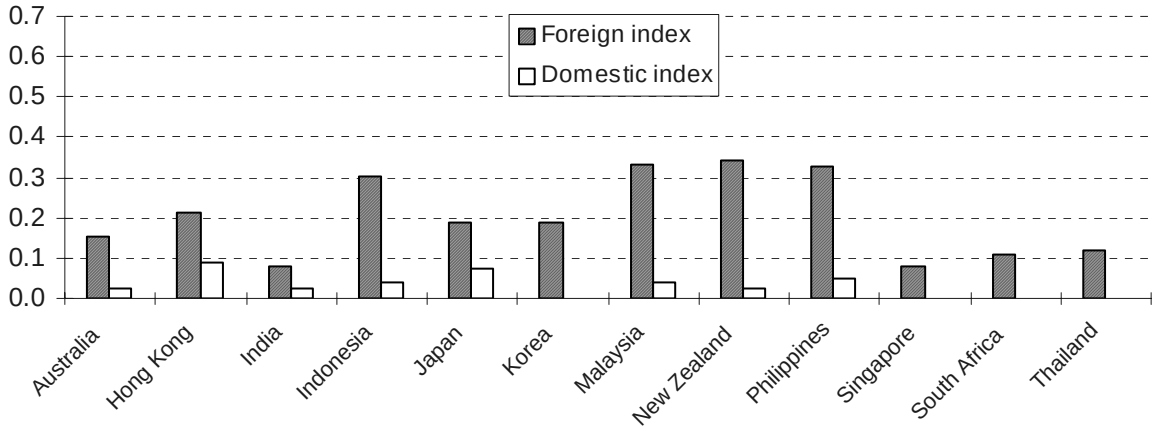
*Foreign index*

The most restricted markets in this region are New Zealand, Indonesia, Malaysia and the Philippines. The index scores for these economies reflect residency requirements for New Zealand and the Philippines, a nationality requirement for the Philippines, and establishment through joint venture for Indonesia and Malaysia.

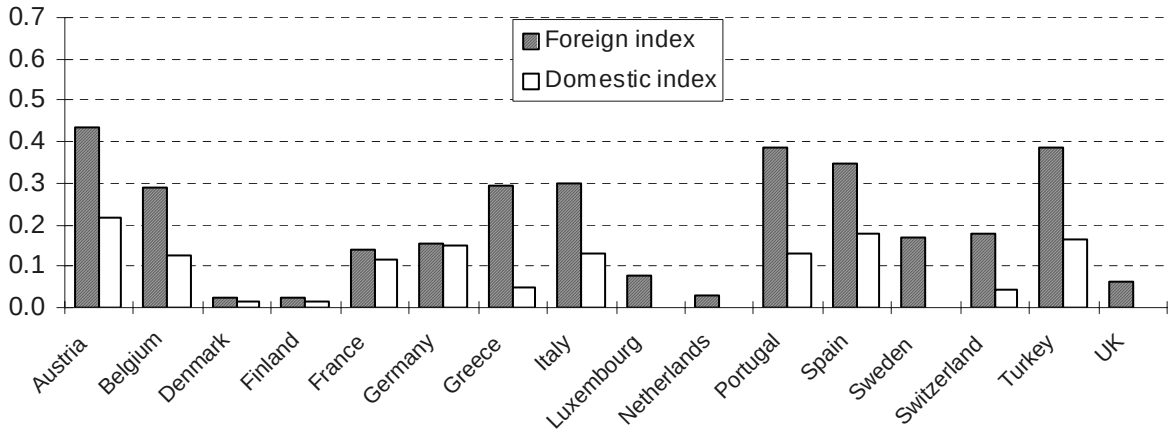
Hong Kong, Japan, Korea and Australia are moderately restricted markets. There is a residency requirement for local training in Hong Kong and Australia, applied with discretion in some cases. In Japan, regulations exist to reserve certain activities and restrict service fees. Korea requires business to be jointly conducted by local registered architects and requires a professional examination as a condition to local practice.

Figure 3.2 **Restrictiveness index for architectural services**

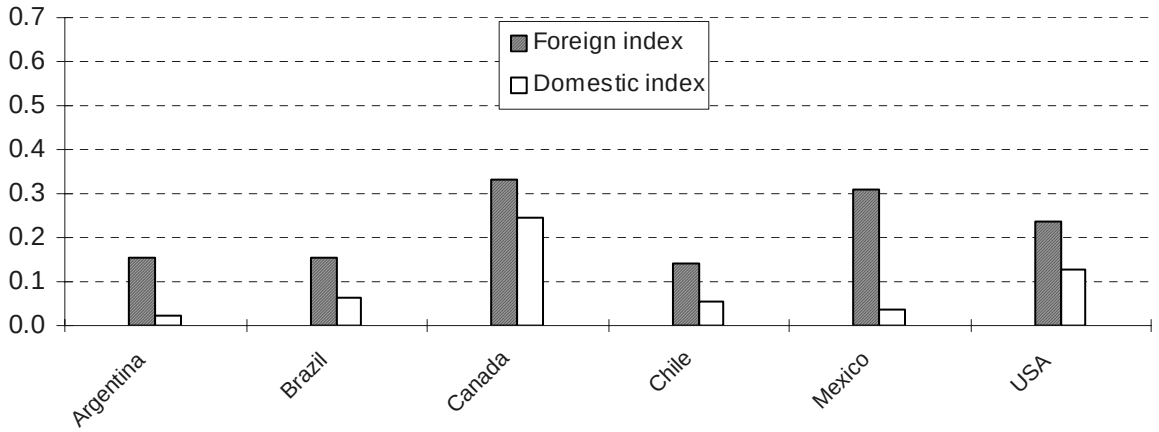
*Asia Pacific economies*




*European economies and Turkey*




*Selected American economies*



India, Singapore, South Africa and Thailand are the least restricted economies. India and Thailand impose limits on foreign direct investment in architectural services. Singapore and South Africa apply a residency requirement.

### *Domestic index*

In Japan and Hong Kong, some restrictions are applied to foreign and domestic architects equally. These reflect regulations reserving the rights of architects to provide certain activities.

## European economies

### *Foreign index*

The most restricted economies in Europe are Austria, Italy, Portugal, Spain, Switzerland and Turkey. Austria and Turkey maintain nationality requirements with exemptions for architects with European nationality, prohibit foreign partnership, and limit foreign direct investment. Greece adopts nationality and local presence requirements. The most common restrictions in Italy, Portugal and Spain are residency requirements and prohibition of incorporation of architectural firms.

Belgium, France, Germany, Sweden, Switzerland are moderately restricted markets. A residency requirement applies in Belgium, Sweden and Switzerland. In France, foreign and non-professional investment is subject to limitations. In Germany, regulations restrict multi-disciplinary practices, fee setting and advertising.

The most open markets in Europe are Denmark, Finland, Luxembourg, the Netherlands and the United Kingdom.

### *Domestic index*

Germany, Italy, Portugal, Spain, and Turkey have the highest scores for the domestic index. This reflects restrictions on fee setting and incorporation of architectural firms.

### American economies

*Foreign index*

The most restricted economies in this region are Canada, Mexico and the United States. Canada restricts the form of establishment to partnership or sole proprietorship, and limits ownership and investment to locally licensed architects. While there are provincial differences in the recognition of foreign qualifications, a temporary (renewable) licensing of foreign architects (based on home country qualifications) facilitates entry. Mexico imposes a nationality requirement subject to reciprocity and case-by-case assessment of foreign architectural qualifications. The United States restricts investment by non-professional investors.

Argentina, Brazil and Chile are the most open markets. Argentina requires local training and recognition of professional qualifications. Chile and Brazil require foreign architects to form partnerships with local architects.

*Domestic index*

Canada and the United States have high domestic index scores in this region. Regulations in these economies reflect limitations on incorporation and non-professional investment, and the reservation of certain activities to professional architects.

## 3.5 Accountancy services

Restrictions on accountancy services are extensive. Figure 3.3 shows index scores for the economies examined.

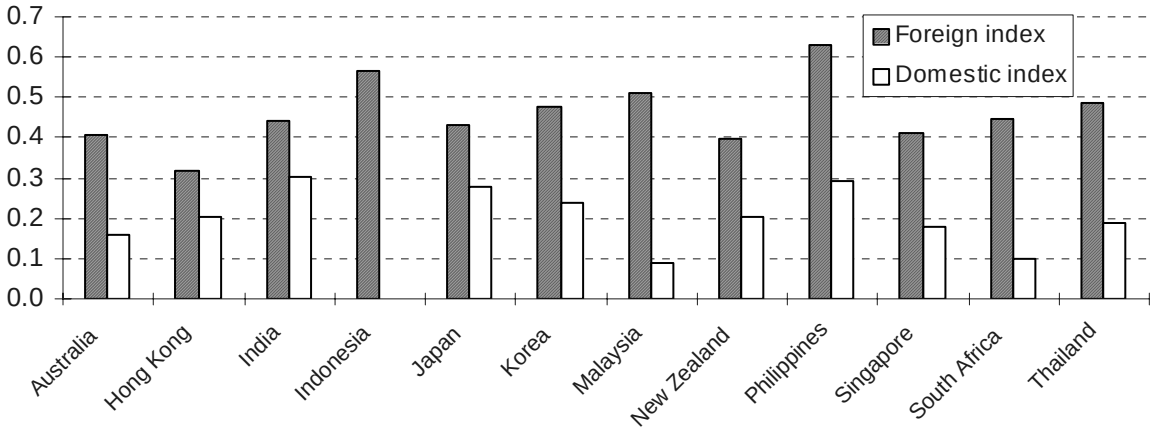
The most common restrictions in accountancy services are:

- residency requirements;
- nationality requirements;
- restrictions on multi-disciplinary practices; and
- restrictions on foreign and non-professional investment.

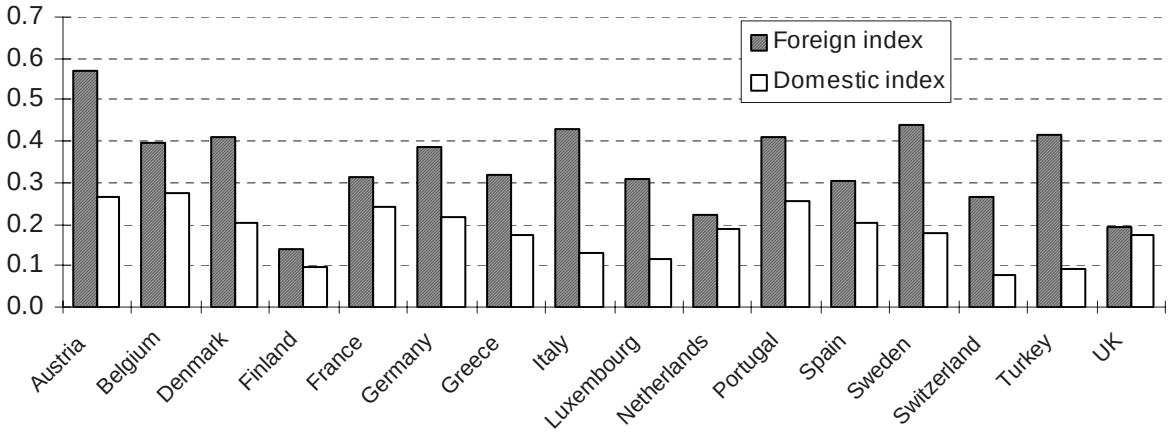
The foreign index scores range from 0.14 to 0.63. Indonesia, the Philippines and Austria are the most restricted economies for accountancy services. These economies also provide the most discrimination against foreign accounting suppliers. Finland and the United Kingdom display the lowest scores.

Figure 3.3 **Restrictiveness index for accountancy services**

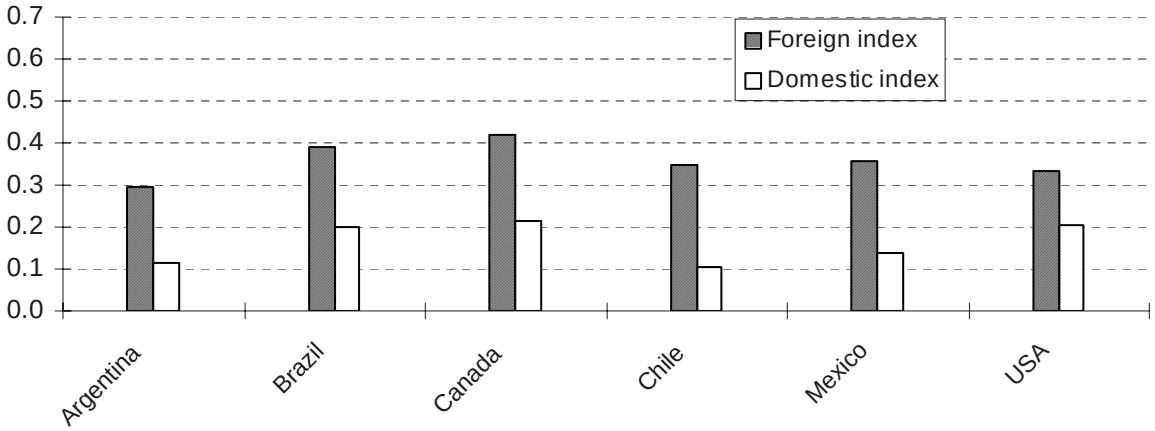
*Asia Pacific economies*




*European economies and Turkey*




*Selected American economies*



The domestic index scores range from 0.08 to 0.31. All the economies reviewed have adopted at least some restrictions affecting domestic providers of accountancy services.

## Asia Pacific economies

### *Foreign index*

The most restricted economies in the Asia Pacific region are Indonesia and the Philippines, followed by Malaysia. In Indonesia and the Philippines, the most common restrictions are nationality and residency requirements, partnership and investment restrictions, economic need tests, and lack of recognition of foreign qualifications. Malaysia limits foreign partnerships and investment, and requires residency and local examination.

Other highly restricted economies are Australia, India, Japan, Korea, New Zealand, Singapore, South Africa and Thailand. In Australia, restrictions on residency, multi-disciplinary practices, and non-professional investment apply. The most common restrictions in India, Japan, and Korea are requirements on foreign partnership, investment, fee setting, advertising, and reserve of activities to accountants. New Zealand restricts incorporation and non-professional investment in accounting firms, and applies an economic needs test. Singapore prohibits incorporation and requires residency. South Korea restricts non-professional investment and requires residency. Thailand limits foreign partnerships and investment, and also enforces a nationality requirement.

Hong Kong achieves moderate scores, reflecting restrictions on residency, multi-disciplinary practices, and recognition of foreign qualifications.

### *Domestic index*

A number of economies in the Asia Pacific region maintain measures affecting domestic service providers. India, Japan and the Philippines have the highest domestic index scores. The most common regulations in the region are restrictions on non-professional investment, multi-disciplinary practices, fee setting and advertising, and reserve of certain activities to accountants.

## European economies

*Foreign index*

Several European economies have high foreign index scores. High levels of restrictions are found largely in Austria, Belgium, Denmark, Germany, Italy, Portugal, Sweden and Turkey. The most common requirements are nationality requirements and restrictions on multi-disciplinary practices and non-professional ownership.

France, Greece, Luxembourg, Spain and Switzerland obtained moderate scores. This generally reflects restrictions on investment, multi-disciplinary practices and advertising.

The most open economies in this region are Finland, the Netherlands and the United Kingdom. Common restrictions in the Netherlands and the United Kingdom are non-discriminatory restrictions on non-professional ownership and advertising.

*Domestic index*

European economies adopt a number of restrictions which affect local service providers. The highest domestic index scores are Austria, Belgium, France, Germany, Portugal and Spain. The regulations affecting the domestic index were discussed in the previous section.

## American economies

*Foreign index*

The American economies studied also have a high degree of restrictiveness. The most common restrictions in Canada, Brazil, and the United States are residency requirements and restrictions on non-professional investment. Mexico requires nationality subject to reciprocity and imposes quotas on the number of foreign accountants. Argentina and Chile typically require foreign accountants to establish residency.

*Domestic index*

Canada, Brazil and the United States have the highest domestic index scores. In these economies, restrictions tend to apply to incorporation, non-professional investment and multi-disciplinary practices.

The lower domestic index scores for Argentina and Chile reflect mainly regulations providing accountants exclusive rights to exercise certain activities.

## 3.6 Legal services

Restrictions affecting legal services are widespread in the 29 economies examined. This is the case in both developed and developing economies. Restrictiveness index scores for legal services are shown in figure 3.4.

Legal services tend to have high restrictiveness index values for most economies. Half of the economies have restrictiveness index scores above 0.45.

In various economies, legal services are subject to a combination of restrictions. The most common restrictions are nationality and residency requirements, restrictions on incorporation, partnerships and multi-disciplinary practices, qualification requirements, reserve of certain activities, and restrictions on fee setting and advertising.

Foreign lawyers are frequently permitted to practice in restricted activities, such as home country and international law, or as foreign legal consultants, while the practice of local law is reserved to domestic lawyers. In other cases, restricted practice is not even permitted because of comprehensive nationality requirements, or has to be subject to full local retraining.

Finland is the most open market in legal services. In Finland and Sweden, no licence is required to provide legal services, except when legal practitioners seek to use the title of 'Advocate'.

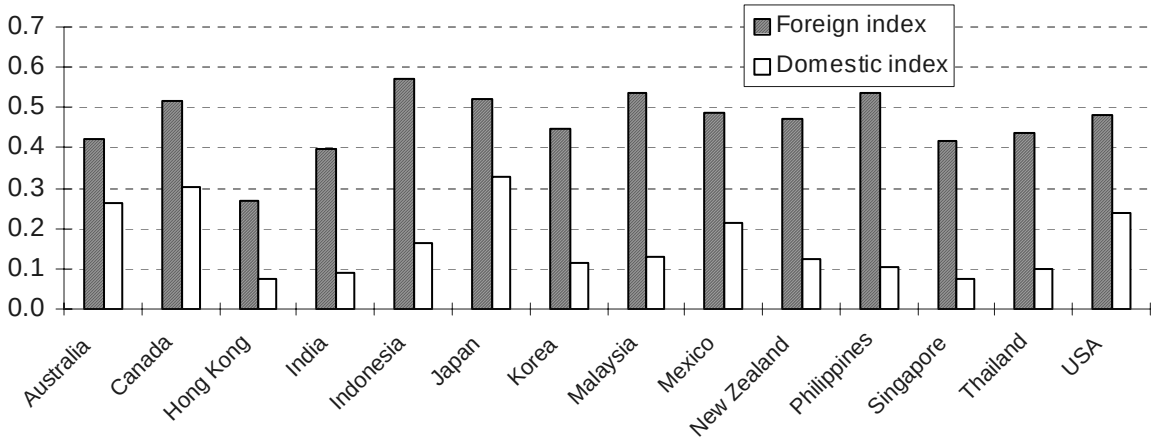
### Asia Pacific and American economies

*Foreign index*

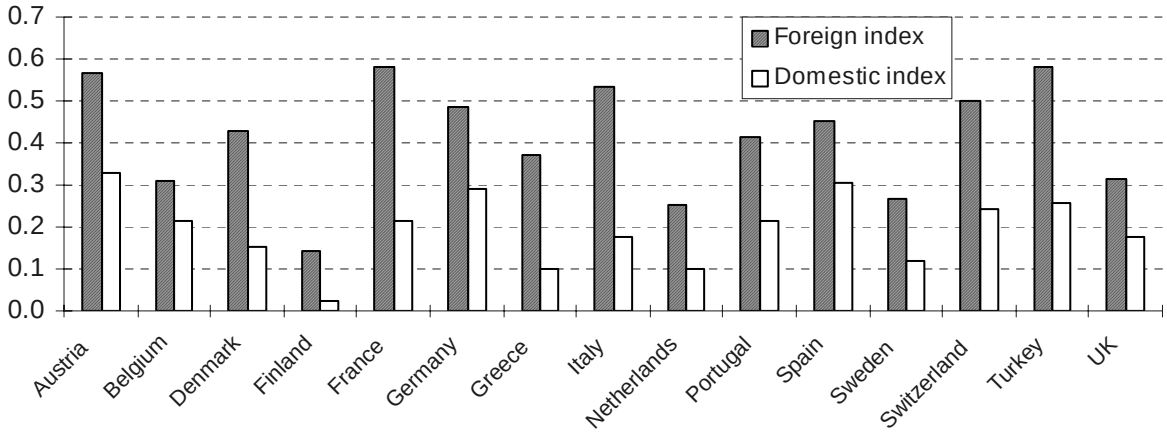
The most restricted markets in this region are Indonesia, Malaysia, and the Philippines. Common restrictions are nationality and residency requirements, and restrictions on form of establishment and partnership.

Figure 3.4 **Restrictiveness index for legal services**

*Selected Asia Pacific and American economies*




*European economies and Turkey*




Other highly restricted economies are Canada, Japan, Korea, Mexico, New Zealand, Thailand and the United States, followed by Australia, India, Singapore. Restrictions are usually imposed on the form of establishment, foreign partnership and on the basis of nationality.

Hong Kong is the most liberal market in this region. However, it also restricts foreign partnership, requires residency and reserves certain activities to lawyers.

In recent years, some Asia Pacific economies have implemented reform of specific regulations on legal services. Korea has abolished price fixing arrangements and relaxed advertising restrictions for legal services, although the passing rate for entry into the profession is still very low (3 per cent annually) (KBA 1999). In 1999, Singapore announced the relaxation of restrictions to allow joint ventures between foreign and local law firms.

*Domestic index*

Australia, Canada, Japan and the United States have the highest domestic index scores in this region. This generally reflects restrictions on form of establishment, fee setting and advertising. The legal profession in these countries tends to be reserved by law to certain activities.

Indonesia and Mexico have moderate indexes. Restrictions in these countries are limitations on ownership and investment by non-professional investors, restrictions on form of establishment, and reserve of certain activities to lawyers.

The remaining economies have low domestic scores. This group includes Hong Kong, India, Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand. Lawyers tend to have exclusive rights to exercise certain activities in these economies.

## European economies

*Foreign index*

Austria, France, Germany, Italy, Switzerland and Turkey are the most restricted markets in this region, followed by Denmark, Portugal and Spain. The important restrictions are nationality requirements, restrictions on partnership and form of establishment, and qualification requirements.

Belgium, Greece, Sweden, the Netherlands and the United Kingdom have moderate scores. Belgium has fee and advertising regulations. Greece applies a nationality requirement. In Sweden and the Netherlands, restrictions on foreign partnership apply. The United Kingdom has removed restrictions on advertising and also introduced more competition between solicitors and barristers by allowing solicitors to represent in courts. However, multi-disciplinary practices between professions remain prohibited.

Finland is the least restricted market. Its index score reflects mainly the requirement of residency.

Important changes to regulation of legal services in the European region have been proposed. Among several things, the 1998 Establishment Directive of the European Union provides for an aptitude test in recognition of lawyer qualifications and permits joint practices or partnership by lawyers within the EU (CCBE 1999). The Directive has not yet been implemented because of a challenge by Luxembourg (ILSAC 1999).

*Domestic index*

Austria, Belgium, France, Germany, Portugal, Spain, Switzerland and Turkey obtained the highest domestic index scores, reflecting regulations on fee setting, incorporation and reserve of certain activities to lawyers.

The remaining economies — Denmark, Finland, Greece, Italy, the Netherlands, Sweden and the United Kingdom — have low domestic index scores. Restrictions on incorporation and fee setting are relatively common among these economies.

Table 3.3 **Restrictiveness indexes for engineering services[ab]**

score

| *Economy* | *Domestic* | | | *Foreign* | | |
|---|---|---|---|---|---|---|
| | *Establishment* | *Ongoing operations* | *Total* | *Establishment* | *Ongoing operations* | *Total* |
| Argentina | 0.01 | - | 0.01 | 0.14 | 0.01 | 0.15 |
| Australia | 0.04 | - | 0.04 | 0.05 | 0.02 | 0.08 |
| Austria | 0.12 | 0.09 | 0.20 | 0.28 | 0.12 | 0.39 |
| Belgium | 0.01 | - | 0.01 | 0.01 | 0.01 | 0.02 |
| Brazil | 0.04 | - | 0.04 | 0.22 | 0.02 | 0.23 |
| Canada | 0.05 | 0.06 | 0.11 | 0.08 | 0.08 | 0.16 |
| Chile | - | - | - | 0.23 | 0.01 | 0.24 |
| Denmark | 0.01 | - | 0.01 | 0.01 | 0.03 | 0.04 |
| Finland | 0.01 | - | 0.01 | 0.04 | 0.02 | 0.06 |
| France | 0.01 | 0.01 | 0.03 | 0.01 | 0.02 | 0.03 |
| Germany | 0.05 | 0.15 | 0.20 | 0.11 | 0.17 | 0.28 |
| Greece | - | 0.05 | 0.05 | 0.14 | 0.06 | 0.20 |
| Hong Kong | 0.04 | 0.04 | 0.08 | 0.08 | 0.05 | 0.13 |
| India | - | - | - | 0.09 | 0.01 | 0.10 |
| Indonesia | 0.05 | - | 0.05 | 0.23 | 0.01 | 0.24 |
| Italy | 0.08 | 0.08 | 0.16 | 0.09 | 0.08 | 0.17 |
| Japan | 0.04 | 0.10 | 0.14 | 0.07 | 0.11 | 0.18 |
| Korea | - | - | - | 0.11 | 0.01 | 0.12 |
| Luxembourg | 0.08 | - | 0.08 | 0.09 | 0.02 | 0.11 |
| Malaysia | 0.08 | 0.01 | 0.08 | 0.24 | 0.02 | 0.26 |
| Mexico | 0.04 | - | 0.04 | 0.32 | 0.01 | 0.33 |
| Netherlands | 0.09 | - | 0.09 | 0.09 | 0.01 | 0.10 |
| New Zealand | - | - | - | 0.18 | 0.01 | 0.19 |
| Philippines | - | - | - | 0.14 | 0.01 | 0.15 |
| Portugal | 0.08 | 0.10 | 0.18 | 0.22 | 0.11 | 0.33 |
| Singapore | 0.01 | - | 0.01 | 0.11 | 0.01 | 0.11 |
| South Africa | 0.01 | - | 0.01 | 0.09 | 0.01 | 0.10 |
| Spain | 0.07 | 0.10 | 0.17 | 0.12 | 0.12 | 0.24 |
| Sweden | 0.01 | - | 0.01 | 0.14 | 0.03 | 0.17 |
| Switzerland | 0.03 | 0.03 | 0.05 | 0.11 | 0.04 | 0.15 |
| Thailand | 0.04 | - | 0.04 | 0.10 | 0.01 | 0.11 |
| Turkey | 0.08 | 0.10 | 0.18 | 0.26 | 0.11 | 0.37 |
| United Kingdom | 0.03 | - | 0.03 | 0.06 | 0.01 | 0.07 |
| USA | 0.06 | 0.05 | 0.12 | 0.12 | 0.07 | 0.19 |

- Nil. **a** Figures may not add up to total due to rounding. **b** The restrictiveness index scores range from 0 to 1. The higher the score, the greater are the restrictions for an economy.

Table 3.4 **Restrictiveness indexes for architectural services[ab]**

score

| *Economy* | *Domestic* | | | *Foreign* | | |
|---|---|---|---|---|---|---|
| | *Establishment* | *Ongoing operations* | *Total* | *Establishment* | *Ongoing operations* | *Total* |
| Argentina | 0.03 | - | 0.03 | 0.15 | 0.01 | 0.16 |
| Australia | 0.03 | - | 0.03 | 0.14 | 0.01 | 0.15 |
| Austria | 0.12 | 0.10 | 0.22 | 0.31 | 0.13 | 0.44 |
| Belgium | 0.04 | 0.09 | 0.13 | 0.20 | 0.10 | 0.29 |
| Brazil | 0.07 | - | 0.07 | 0.14 | 0.02 | 0.16 |
| Canada | 0.18 | 0.07 | 0.25 | 0.26 | 0.07 | 0.33 |
| Chile | 0.05 | - | 0.05 | 0.14 | - | 0.14 |
| Denmark | 0.01 | - | 0.01 | 0.02 | - | 0.02 |
| Finland | 0.01 | - | 0.01 | 0.02 | - | 0.02 |
| France | 0.10 | 0.01 | 0.12 | 0.11 | 0.03 | 0.14 |
| Germany | 0.03 | 0.13 | 0.15 | 0.02 | 0.13 | 0.15 |
| Greece | - | 0.05 | 0.05 | 0.22 | 0.07 | 0.29 |
| Hong Kong | 0.05 | 0.04 | 0.09 | 0.18 | 0.04 | 0.22 |
| India | 0.02 | - | 0.02 | 0.07 | 0.01 | 0.08 |
| Indonesia | 0.04 | - | 0.04 | 0.30 | - | 0.30 |
| Italy | 0.08 | 0.05 | 0.13 | 0.24 | 0.06 | 0.30 |
| Japan | - | 0.08 | 0.08 | 0.09 | 0.09 | 0.19 |
| Korea | - | - | - | 0.15 | 0.03 | 0.19 |
| Luxembourg | - | - | - | 0.02 | 0.06 | 0.08 |
| Malaysia | 0.04 | - | 0.04 | 0.33 | - | 0.33 |
| Mexico | 0.04 | - | 0.04 | 0.30 | 0.01 | 0.31 |
| Netherlands | - | - | - | 0.02 | 0.01 | 0.03 |
| New Zealand | 0.03 | - | 0.03 | 0.30 | 0.05 | 0.34 |
| Philippines | - | 0.05 | 0.05 | 0.27 | 0.06 | 0.33 |
| Portugal | 0.08 | 0.05 | 0.13 | 0.30 | 0.08 | 0.39 |
| Singapore | - | - | - | 0.02 | 0.06 | 0.08 |
| South Africa | - | - | - | 0.04 | 0.07 | 0.11 |
| Spain | 0.08 | 0.10 | 0.18 | 0.24 | 0.11 | 0.35 |
| Sweden | - | - | - | 0.15 | 0.02 | 0.17 |
| Switzerland | 0.03 | 0.02 | 0.04 | 0.16 | 0.02 | 0.18 |
| Thailand | - | - | - | 0.05 | - | 0.12 |
| Turkey | 0.07 | 0.10 | 0.17 | 0.33 | 0.06 | 0.39 |
| United Kingdom | - | - | - | 0.02 | 0.05 | 0.07 |
| USA | 0.09 | 0.04 | 0.13 | 0.16 | - | 0.23 |

- Nil. **a** Figures may not add up to total due to rounding. **b** The restrictiveness index scores range from 0 to 1. The higher the score, the greater are the restrictions for an economy.

Table 3.5 **Restrictiveness indexes for accountancy services[ab]**

score

| *Economy* | *Domestic* | | | *Foreign* | | |
|---|---|---|---|---|---|---|
| | *Establishment* | *Ongoing operations* | *Total* | *Establishment* | *Ongoing operations* | *Total* |
| Argentina | 0.01 | 0.10 | 0.11 | 0.19 | 0.11 | 0.29 |
| Australia | 0.11 | 0.05 | 0.16 | 0.34 | 0.07 | 0.41 |
| Austria | 0.12 | 0.15 | 0.27 | 0.39 | 0.18 | 0.57 |
| Belgium | 0.09 | 0.10 | 0.19 | 0.12 | 0.10 | 0.22 |
| Brazil | 0.05 | 0.15 | 0.20 | 0.24 | 0.15 | 0.39 |
| Canada | 0.17 | 0.05 | 0.22 | 0.36 | 0.06 | 0.42 |
| Chile | 0.05 | 0.05 | 0.10 | 0.28 | 0.07 | 0.35 |
| Denmark | 0.13 | 0.08 | 0.20 | 0.31 | 0.10 | 0.41 |
| Finland | 0.07 | 0.03 | 0.10 | 0.10 | 0.04 | 0.14 |
| France | 0.12 | 0.13 | 0.24 | 0.17 | 0.14 | 0.31 |
| Germany | 0.12 | 0.10 | 0.22 | 0.27 | 0.12 | 0.39 |
| Greece | 0.10 | 0.08 | 0.18 | 0.24 | 0.08 | 0.32 |
| Hong Kong | 0.07 | 0.13 | 0.20 | 0.18 | 0.14 | 0.32 |
| India | 0.13 | 0.18 | 0.31 | 0.26 | 0.18 | 0.44 |
| Indonesia | - | - | - | 0.55 | 0.01 | 0.55 |
| Italy | 0.12 | 0.01 | 0.13 | 0.41 | 0.02 | 0.43 |
| Japan | 0.13 | 0.15 | 0.28 | 0.26 | 0.17 | 0.43 |
| Korea | 0.08 | 0.16 | 0.24 | 0.31 | 0.17 | 0.48 |
| Luxembourg | 0.07 | 0.05 | 0.12 | 0.25 | 0.06 | 0.31 |
| Malaysia | 0.04 | 0.05 | 0.09 | 0.46 | 0.06 | 0.51 |
| Mexico | 0.05 | 0.09 | 0.14 | 0.26 | 0.10 | 0.36 |
| Netherlands | 0.12 | 0.08 | 0.19 | 0.13 | 0.09 | 0.22 |
| New Zealand | 0.18 | 0.03 | 0.21 | 0.35 | 0.04 | 0.39 |
| Philippines | 0.12 | 0.18 | 0.29 | 0.44 | 0.19 | 0.63 |
| Portugal | 0.13 | 0.13 | 0.26 | 0.28 | 0.13 | 0.41 |
| Singapore | 0.08 | 0.10 | 0.18 | 0.28 | 0.13 | 0.41 |
| South Africa | 0.05 | 0.05 | 0.10 | 0.39 | 0.06 | 0.44 |
| Spain | 0.10 | 0.10 | 0.20 | 0.20 | 0.11 | 0.31 |
| Sweden | 0.13 | 0.05 | 0.18 | 0.36 | 0.08 | 0.44 |
| Switzerland | - | 0.08 | 0.08 | 0.16 | 0.10 | 0.27 |
| Thailand | 0.08 | 0.11 | 0.19 | 0.35 | 0.14 | 0.49 |
| Turkey | 0.04 | 0.05 | 0.09 | 0.29 | 0.13 | 0.41 |
| United Kingdom | 0.08 | 0.10 | 0.18 | 0.09 | 0.11 | 0.19 |
| USA | 0.13 | 0.08 | 0.20 | 0.23 | 0.10 | 0.33 |

- Nil. **a** Figures may not add up to total due to rounding. **b** The restrictiveness index scores range from 0 to 1. The higher the score, the greater are the restrictions for an economy.

Table 3.6 **Restrictiveness indexes for legal services[ab]**

score

| *Economy* | *Domestic* | | | *Foreign* | | |
|---|---|---|---|---|---|---|
| | *Establishment* | *Ongoing operations* | *Total* | *Establishment* | *Ongoing operations* | *Total* |
| Argentina | ne | ne | ne | ne | ne | ne |
| Australia | 0.09 | 0.18 | 0.27 | 0.23 | 0.19 | 0.42 |
| Austria | 0.18 | 0.15 | 0.33 | 0.38 | 0.19 | 0.57 |
| Belgium | 0.05 | 0.16 | 0.21 | 0.14 | 0.17 | 0.31 |
| Brazil | ne | ne | ne | ne | ne | ne |
| Canada | 0.18 | 0.13 | 0.31 | 0.38 | 0.14 | 0.52 |
| Chile | ne | ne | ne | ne | ne | ne |
| Denmark | 0.09 | 0.06 | 0.15 | 0.29 | 0.14 | 0.43 |
| Finland | 0.03 | - | 0.03 | 0.12 | 0.03 | 0.14 |
| France | 0.14 | 0.08 | 0.22 | 0.48 | 0.11 | 0.58 |
| Germany | 0.18 | 0.11 | 0.29 | 0.37 | 0.12 | 0.49 |
| Greece | 0.05 | 0.05 | 0.10 | 0.31 | 0.06 | 0.37 |
| Hong Kong | 0.03 | 0.05 | 0.08 | 0.20 | 0.07 | 0.27 |
| India | 0.04 | 0.05 | 0.09 | 0.34 | 0.06 | 0.40 |
| Indonesia | 0.12 | 0.05 | 0.17 | 0.50 | 0.07 | 0.57 |
| Italy | 0.05 | 0.13 | 0.18 | 0.38 | 0.15 | 0.54 |
| Japan | 0.13 | 0.20 | 0.33 | 0.30 | 0.22 | 0.52 |
| Korea | 0.05 | 0.06 | 0.11 | 0.37 | 0.07 | 0.44 |
| Luxembourg | ne | ne | ne | ne | ne | ne |
| Malaysia | 0.04 | 0.09 | 0.13 | 0.45 | 0.09 | 0.54 |
| Mexico | 0.14 | 0.08 | 0.22 | 0.40 | 0.09 | 0.49 |
| Netherlands | 0.05 | 0.05 | 0.10 | 0.20 | 0.06 | 0.25 |
| New Zealand | 0.04 | 0.09 | 0.13 | 0.38 | 0.10 | 0.47 |
| Philippines | 0.07 | 0.04 | 0.10 | 0.49 | 0.05 | 0.54 |
| Portugal | 0.06 | 0.15 | 0.21 | 0.25 | 0.16 | 0.41 |
| Singapore | 0.03 | 0.05 | 0.08 | 0.34 | 0.07 | 0.42 |
| South Africa | ne | ne | ne | ne | ne | ne |
| Spain | 0.16 | 0.15 | 0.31 | 0.27 | 0.18 | 0.45 |
| Sweden | 0.12 | 0.03 | 0.12 | 0.24 | 0.03 | 0.27 |
| Switzerland | 0.12 | 0.13 | 0.24 | 0.36 | 0.15 | 0.50 |
| Thailand | 0.05 | 0.05 | 0.10 | 0.37 | 0.06 | 0.43 |
| Turkey | 0.12 | 0.14 | 0.26 | 0.41 | 0.17 | 0.58 |
| United Kingdom | 0.05 | 0.13 | 0.18 | 0.18 | 0.14 | 0.31 |
| USA | 0.12 | 0.13 | 0.24 | 0.35 | 0.13 | 0.48 |

- Nil. **ne** not estimated because information is not available. **a** Figures may not add up to total due to rounding. **b** The restrictiveness index scores range from 0 to 1. The higher the score, the greater are the restrictions for an economy.

# 4 Impacts of restrictions on engineering services

## 4.1 Introduction

This chapter provides a quantitative assessment of the effects of restrictions on professional services. The analysis focuses on estimating possible influences of restrictions on the price-cost margins of engineering service firms.

The methodology used here involves a cross-sectional, econometric estimation of engineering firm price-cost margins in 20 economies. The analysis incorporates industry- and firm-specific influences on firm performance to isolate the effects of restrictions. The estimated relationship between restrictions and firm price-cost margins provides an indication of whether restrictions have effects on prices and/or costs of services under different restriction regimes.

Engineering services are subject to fewer restrictive measures compared to other professions, such as accountancy and legal services, although restrictions on engineering services vary in type and extent between countries (chapter 3). Engineering firms provide planning, design, construction and management services for building structures, installations, civil engineering works, and industrial processes. The bulk of engineering services is supplied through commercial presence or the movement of people, although cross-border trade has tended to rise with the development of advanced communications technology (WTO 1998c).

The availability of data on professional services has largely determined the approach, and the choice of professional services sub-sector, to measure the impacts of restrictions. Engineering services is the only sub-sector for which detailed company data are available for a large number of countries. Difficulties in gathering cross-country price, cost and quantity data also necessitated the use of the price-cost margins from accounting data sources as a performance measure of the effects of restrictions on professional services.

The chapter begins by discussing possible effects of restrictions on the price-cost margins and complications which arise from using this approach. It then outlines the theoretical framework for the analysis of firm price-cost margins and data

issues. The last section discusses the results and provides tentative estimates of the impacts of restrictions for 20 economies.

## 4.2 Using price-cost margins data to estimate effects of restrictions

In general, restrictions to trade in services can have the following effects:

- they can protect incumbent firms from competition and thus allow those firms to expand their price-cost margins (rent-creating); and/or
- they can directly raise business costs (cost-creating).

Measuring these effects ideally would require separate data on price-cost margins and unit costs for firms operating in different economies. The sum of the higher price-cost margins directly attributed to rent-creating restrictions and the absolute value of higher costs created by other restrictions would give a measure of the economic costs of the restrictions.

However, data on unit costs, prices and quantities are not available to this study. This has necessitated the use of alternative performance measures and methods to estimate effects of restrictions.

The analysis in this chapter focuses on possible influences of restrictions on price-cost margins of firms. Increases in price-cost margins might be interpreted as evidence of the rent-creating effects of restrictions, while reductions in price-cost margins might be interpreted as indirect evidence of possible cost-creating effects of restrictions.

However, using price-cost margins data alone to measure the effects of restrictions give rise to particular complications.

- In the case of cost-creating restrictions, price-cost margins data will reflect not only the higher costs created by the restrictions, but also the higher prices that could follow as businesses seek to pass on as much of the higher costs as the market will bear. These 'second round' price increases would dilute the impact of the direct cost increases in the price-cost margins data. Consequently, particular restrictions could have significant effects on prices or costs that would not show up in price-cost margins data.[1]

[1] Firms' abilities to pass costs on will depend on factors such as the elasticity of demand for the product as a whole, and the level of product differentiation and competition in the market place (and hence the extent to which firms' existing prices reflect monopolistic pricing strategies). If the firm were already pricing at monopoly levels, and the costs created by the restrictions fed into

- In the case of rent-creating restrictions, price-cost margins data will reflect not only the initial rise in prices, but also any subsequent increase in the costs of firms. Higher costs could result from higher wages being paid to professional employees in existing firms and/or new domestic firms that enter the market. This would dilute the initial rent-creating effect in price-cost margins data.
- Restrictions may be both rent-creating and cost-creating, so there is a risk that their price- and cost-raising effects may cancel each other out to some extent in studies using price-cost margins data alone.[2] For example, consider an economy that applies rent-creating restrictions, which directly push price-cost margins up by 5 per cent, and cost-creating restrictions that directly push costs up by 3 per cent. In this case, the total effects of the restrictions would be 8 percent but the net impact of these restrictions on price-cost margins would be just 2 per cent.[3]

These complications have important implications for studies that use price-cost margins alone to study the effects of restrictions. They highlight the desirability of using additional cost data to separate the rent-creating and cost-creating effects of restrictions. They also point to the desirability of augmenting the results with other judgments or information — that would give a view of the likely level of rent dilution or cost pass-on[4] reflected in the price-cost margins data — to help assess the effects of restrictions on prices, costs and efficiency.

With these matters in mind, this study has used a model to analyse the effects of trade restrictions on price-cost margins. The model is developed in the next two sections. The results, and their interpretation, are discussed in the final section.

fixed costs (rather than marginal costs), the profit-maximising strategy for the firm would be to absorb the full cost increase. The greater the level of competition in the industry, and the lower the price elasticity of demand for the product, the greater the proportion of costs that would be passed on.

2 This problem does not arise in studies that use data on unit costs as well. This is because the rent-creating effects of restrictions on firms' price-cost margins could be estimated by adjusting the observed change in the price-cost margins to take into account the cost-creating effects of the restrictions on the cost element of the margin.

3 For clarity, this example assumes that there is no pass-on of costs reflected in the price-cost margins.

4 To judge the potential for cost pass-on, indicators of firms' own-price elasticity of demand would be required. In the absence of direct information on this, indirect indicators may include things like the level of market segmentation and the level of competition, as well as the general price elasticity of demand or, were that not available, the availability of close substitutes for the product in question. Another matter to be considered is the timing of when cost increases occurred — the more recent increases, the less likely that they will have been fully passed on.

## 4.3 Modelling firm profitability and restrictions

This empirical analysis adopts a model of firm profitability to examine the influences of restrictions on price-cost margins of engineering firms. In general, firm profits could be higher than normal because of factors that restrict competition in an industry as well as factors that are specific to the firm.

Firm profitability can be modelled at the industry or firm level. Traditional empirical work has generally focused on industry characteristics — industry concentration and barriers to entry — to explain profitability. Prices may be raised above costs in industries where there are barriers to entry or because high concentration is conducive to collusion among firms. Barriers to entry are important factors, as when they are absent, new entrants could also compete away the above-normal profits resulting from high market concentration. Results of these industry studies suggest that concentration has a positive effect on profitability, but the effect is less when barriers to entry are also taken into account (see Martin 1993).

The industry approach has been recast to account for firm-specific influences on performance. Firm-level studies emphasise a combination of industry- and firm-specific characteristics as determinants of firm profits. An important consideration is firm-level product differentiation. In differentiated markets, firms may possess competitive advantages because of special product attributes or technologies that other firms are not able to duplicate and thereby compete away the rents. Product differentiation introduces different product characteristics and prices, and influences the extent of competition from substitutes to the firm's products or services.

Firm profitability could also be affected by other market advantages of the firm. It has been argued that a positive relation between concentration and profitability at the industry level, as found by the early studies, largely reflects efficiencies of firms with high market shares at the firm level (Demsetz 1973). Under this interpretation, firms that have lower costs and better products grow to be larger than other firms, and hence, have higher market shares and higher profits. These firms attract consumers through lower prices and better products, and large market shares and profitability are indicators of their success. In another interpretation, market shares — as measures of firms' control of the market — are an indication of the firms' own market power. Firms with high market shares could engage in strategic conduct to forestall small rivals and new entrants (Shepherd 1972). These arguments have pointed to the importance of firm characteristics, such as market shares, in explaining firm profitability.

Subsequent empirical studies have found that market share is positively related to profitability, but there is also a residual positive effect of concentration. Firm profitability could result from barriers to entry and the joint exercise of market

power (collusion), as well as from its own advantages and market power. Although the relative importance of industry- and firm-specific effects in explaining profitability is subject to debate, surveys of the literature have concluded that it is not possible to rule out these industry- and firm-specific effects on an *a priori* basis. Market performance appears to result from a combination of industry- and firm-specific effects and profit studies would need to include all relevant variables (Hay and Morris 1991 and Martin 1993).

Mueller (1986) provides a model of firm profitability which incorporates industry- and firm-specific influences on firm performance. Firm profitability is a function of its market share, market concentration, the extent of product differentiation and other factors. The analysis in this chapter extends this framework of firm profitability to allow for the effects of trade restrictions on competition and engineering firm performance.

Estimating firm profitability on a cross-country basis raises some empirical issues. The performance of firms in a particular economy depends on factors that are observable, as well as on economy-specific factors that are not observable and, hence, are not accounted for in the estimation. Moulton (1986) suggests that when explanatory variables are drawn from a population with grouped structures, such as economies, a single stage cross-country estimation could lead to correlation of estimation errors since unobservable economy-specific behaviour generates group effects on firms in that economy. In addition, inclusion of economy-specific variables that do not provide for variation among firms magnifies this problem. It is thus important to test for possible group effects in cross-country estimations and adopt alternative estimation procedures if estimation bias is present.

The following analysis adopts a single stage estimation using a cross-sectional dataset of engineering firms in 20 economies. Alternative specifications (fixed and random effects models) are also used to test for the presence of unobserved economy-specific effects (discussed below). For example, Kalirajan et al. (1999) provides an application of a fixed effects model in a two-stage procedure in which economy- and firm-specific variables are estimated separately.

## Model specification

In Mueller's model, firms maximise profits in a situation of possible collusive behaviour. The firm's maximum profit-to-sales ratio thus depends on both the firm's perceived elasticity of demand — which depends in turn on its market share and the substitutability of its products with those of other firms — and the degree of collusion among firms. The substitutability of products depends on the extent of product differentiation in the market. The degree of collusion depends on the extent

of market concentration. Incorporating industry concentration and product differentiation into the model gives a reduced form equation in which concentration and product differentiation affect firm profitability with interaction terms.

This analysis extends Mueller's framework by modelling the effects of trade restrictions on competition via the collusion-concentration relationship. Concentration affects the extent of actual competition in an industry while trade restrictions affect the extent of potential competition. Following Mueller, this study also incorporates additional variables to control for other possible effects on profitability, such as diversification and firm size.

The reduced form model for engineering services thus has the following form:

$$\begin{aligned} PCM_{ij} = {} & \beta_0 + \beta_1 m_{ij} + \beta_2 (1 - m_{ij}) C_j + \beta_3 (1 - m_{ij}) C_j^2 + \beta_4 (1 - m_{ij}) TRI_j + \beta_5 m_{ij} RD_j \\ & + \beta_6 m_{ij} RD_j^2 + \beta_7 m_{ij} RD_j^3 + \beta_8 \ln(G_{ij}) + \beta_9 \ln(Div_{ij}) + \beta_{10} Size_{ij} \\ & + \beta_{11} Size_{ij}^2 + \beta_{12} K_{ij} \end{aligned} \qquad (1)$$

where

| | |
|---|---|
| $PCM_{ij}$ | price-cost margin of engineering firm *i* in economy *j*; |
| $m_{ij}$ | market share of engineering firm *i* in economy *j*; |
| $C_j$ | concentration level of engineering services in economy *j*; |
| $TRI_j$ | restrictiveness index of engineering services in economy *j*; |
| $RD_j$ | research and development of engineering services in economy *j*; |
| $G_{ij}$ | recent growth in sales of engineering firm *i* in economy *j*; |
| $Div_{ij}$ | diversification index of engineering firm *i* in economy *j*; |
| $Size_{ij}$ | absolute firm size of engineering firm *i* in economy *j*; |
| $K_{ij}$ | cost of capital of engineering firm *i* in economy *j*; |

These variables are expected to affect the price-cost margins of engineering firms as follows.

The market share variable ($m_{ij}$) is a measure of the relative market advantages of the firm that are derived from higher product quality and/or lower costs (Mueller 1986).

The output of a firm is directly related to the quality of the product and its costs. If a firm has higher product quality or lower costs, it is expected to achieve greater sales relative to the sales of other firms and higher price-cost margins. Martin (1993) suggests that low-cost firms obtain efficiency rent only if they operate at full capacity. But if excess capacity is present, low-cost firms may restrict output and keep prices at levels that allow high-cost firms to survive. In this case, low-cost firms earn economic profit which reflects the exercise of market power.

The concentration variable ($C_j$) represents the extent of actual competition in engineering services in an economy. The higher the level of concentration, the lower the degree of competition in an industry and the greater the opportunity for firms within an existing industry to collude to increase profits. Collusion could lead to output restrictions and price increases among firms. In estimating the effects of concentration, a linear specification is unlikely to be appropriate. While rising concentration facilitates collusion to some degree over some initial range, further increases in concentration could result in proportionally greater collusion (S-shaped curve). Above certain concentration thresholds, the benefits from collusion could far outweigh the rewards for individual firms from not cooperating. To provide for this non-linear relation, the concentration variable is entered in a quadratic form.

The trade restrictiveness index ($TRI_j$) measures the absence of potential competition in engineering services in an economy. The index quantifies the barriers facing foreign and domestic providers of engineering services. The higher is the index, the more foreign and domestic providers are prevented from entering and operating in the market. Subsequently, incumbent firms face less competition from potential entrants into the market. The lack of potential competition could lead to higher price-cost margins for engineering services.

Both the concentration and the restrictiveness index variables affect firm profitability with the interaction term ($1-m_{ij}$). This is because, in Mueller's model, there is an interaction between the degree of collusion and the firm's perceived elasticity of demand.

The research and development variable and market share as the interaction term ($m_{ij}RD_j$) represent firm-level product differentiation among engineering firms. Product differentiation reduces the firm's sensitivity to competition from substitute products and services and creates a potential for the firm to achieve higher profits. Research and development (R&D) is one means by which product differentiation can be achieved, and is of particular importance to engineering firms. Engineering services involve the supply of specialised and technical knowledge to other economic activities, and R&D expenditures provide an indication of the technical complexity of services provided. However, R&D could involve higher cost and risky investment and the firm might not be able to appropriate the benefits of R&D

because of imitation. A third-degree polynomial form provides for these non-linear influences of R&D.

The sales growth variable ($G_{ij}$) represents a control factor for the possible effects of disequilibrium on engineering firm profitability. For example, when demand growth outstrips supply in an industry, firms could earn short-run above-normal profits. Empirical tests suggest that recent sales growth tends to be positively correlated with profitability (Schmalensee 1989). There is a strong link between the demand for engineering services and the business cycle. Engineering services take an upstream position in the construction and production process and are closely integrated with physical construction activity (WTO 1998c). The measure of growth is the natural log of the company's recent growth rate in sales.

The diversification variable ($Div_{ij}$) controls for possible influences of diversification on engineering firm performance. Engineering firms engage in different types of engineering services and unrelated activities. Several hypotheses suggest a positive relation between diversification and profitability through effects such as economies of scope and avoidance of capital market imperfections. The empirical evidence of the effects of diversification is rather mixed (see Hay and Morris 1991). While diversification may improve firm profits, its benefits depend on the profitability of the types of activities and the industries the firm has diversified into. As a firm becomes more diversified, the effects of further diversification on profits are likely to be less. A log form for firm diversification can capture its non-linear influence on firm profit.

The size variable ($Size_{ij}$) provides for possible influences on profitability that are associated with firms having large absolute size.[5] Large firms may possess the ability to extract benefits from the political system that may not be available to small firms. However, large firms may experience inefficiencies from greater internal control, information loss and other problems that are associated with large size. Certain empirical studies have found a positive relationship between firm size and profitability, but other studies have reported negative effects (Mueller 1986). A quadratic specification can capture both positive and negative effects of absolute firm size on firm performance.

The cost of capital variable ($K_{ij}$) accounts for variations in the price-cost margin that reflect the normal returns to capital. The price-cost margin is revenue less variable costs over revenue, or alternatively, economic profit plus cost of capital over revenue. To analyse the determinants of economic profit, it is necessary to use an additional variable to proxy the ratio of the cost of capital to revenue (Waterson

[5] Absolute firm size should be distinguished from relative firm size, or market share, which measures the firm's size relative to size of the industry.

1984). The cost of capital over revenue has a linear form, as suggested by the definition of the price-cost margin. The higher the cost of capital, the more the firm would need to earn to compensate owners of the firm for the investment.

## Data sources and issues

The cross-sectional estimation covers 84 engineering service companies in 20 economies, including Australia. The main source of data on engineering service firms is Disclosure's *Worldscope Database* (Disclosure 1999). This database provides standardised accounting information of publicly listed companies across countries and has been used to study the effects of restrictions on bank margins (Kalirajan et al. 1999). Other information sources are official statistics on industry turnover and number of engineering service firms, and the International Monetary Fund data on interest rates and inflation rates (IMF 1999).

The estimated data are from 1996. This corresponds closely with the key information source on engineering services restrictions for the economies in the sample — the *OECD Inventory of Measures affecting Trade in Professional Services* (OECD 1996). The *APEC Directory on Professional Services* contains information on restrictions as of 1999, but its coverage is generally limited to economies outside the sample.

The use of company accounting data to estimate the effects of restrictions has some limitations. The US Standard Industrial Classification in the database initially identifies a list of 350 companies with engineering service activities. However, several of these companies operate in a number of overseas markets, or engage in activities unrelated to engineering services (for example, manufacturing). Since company financial statements are reported on a consolidated basis, the financial performance of these companies is likely to reflect both domestic and overseas factors (including restrictions in economies where their overseas operations are based), and also related and unrelated activities. These influences are difficult to account for, and inclusion of companies with these characteristics may result in bias in the estimated relationship.

To overcome these data deficiencies, using geographic and product line sales data, 'engineering service' companies with overseas and unrelated sales greater than 40 per cent of total company sales are excluded from the sample. As this appears to be an arbitrary cut off point, the ratio of foreign sales to total sales was regressed against firm profits to test for any possible effects. Foreign sales did not have significant effects on company profits.

*Dependent variable*

The dependent variable is the margin between price and variable cost. Since revenue less variable costs represents net cash receipts, the price-cost margin can be computed from company accounting data as:

$$PCM_{ij} = \frac{EBIT + d_a}{Revenue} \qquad (2)$$

where *EBIT* is earnings before interest and taxes and $d_a$ is accounting depreciation (depreciation, amortisation and depletion). It is necessary to add accounting depreciation back into EBIT to arrive at an earning measure before accounting depreciation.

The use of the price-cost margin avoids problems associated with accounting measures of profits. Accounting rates of returns (on assets or equity) are based on historical cost accounting of capital and accounting rates of depreciation that would provide unreliable guides to the market value of assets. Price-cost margins studies take into account difficulties in measuring the cost of capital and economic profit by including a measure of capital as an independent variable in the estimation. The next section explains the calculation of the capital cost variable from the available company data on engineering services.

The companies in the sample include those making a profit as well as those making a loss.

*Explanatory variables*

Market share is measured as the ratio of company's revenue to total engineering service industry turnover. The data used to calculate market share and concentration variables are from the Worldscope database and official statistics on industry turnover and the number of firms. As the coverage of companies in the Worldscope database is limited for several countries, it is not possible to calculate these variables solely from this database.

The degree of cooperation amongst firms depends on the number of firms or the level of concentration in the industry. The higher the number of firms in an industry, the harder it is for collusion to take place. Common measures of concentration are the 4-firm concentration ratio or the Herfindahl index. The 4-firm concentration ratio measures the proportion of market sales accounted for by the largest four firms, and the Herfindahl index is the sum of squared market shares for all firms in the industry. The usefulness of these concentration measures depends on drawing relevant market boundaries for engineering services. The limited coverage

of companies in the Worldscope database did not facilitate calculation of 4-firm concentration ratio or the Herfindahl index. To overcome the data deficiency, official statistics on the number of engineering firms was obtained to give a measure of concentration. The concentration variable is calculated as 1/N, where N stands for the number of engineering service firms in an economy.

The index of product differentiation can be measured by several indicators, such as advertising expenditures, patents and R&D expenditures (see Mueller 1986). Advertising expenditures influence consumers' perception of products, while patents or R&D expenditures indicate the technical complexity of the products provided. Advertising expenditures are particularly important for consumer goods while patents and R&D expenditures are more relevant in the case of producer goods. All these indicators could be used to measure product differentiation. In the absence of data on advertising expenditures and patents, this study uses the *company*'s R&D expenditures over sales revenue as the measure of product differentiation.

The effects of restrictions on a firm's price-cost margin are likely to differ depending on the nature and extent of the restrictions. While certain restrictions may elevate prices and improve profit margins, others may increase business cost and reduce profits. It is also possible that they may all work in the same direction, raising or lowering profit to different degrees. These possibilities suggest that different components of the restrictiveness index should be entered separately into the estimating equation. The index components included separately are:

- foreign barriers to establishment (FBE);
- foreign barriers to ongoing operations (FBO); and
- domestic barriers to establishment (DBE).

The estimation does not test for possible effects of domestic barriers to ongoing operations (DBO). This reflects a lack of in-sample variation for the DBO index component — only four economies maintain domestic barriers to ongoing operations of firms (see table 3.3). Chapter 2 explains the approach involved in deriving the restrictiveness index and chapter 3 discussed the restrictions on engineering services.

The sales growth variable is measured as the ratio of company's sales in 1996 to company's sales in 1995. A one-year period growth rate is used to focus on the performance of engineering firms at a particular stage of the business cycle.

Engineering service companies provide a number of related activities, for example both mechanical and electrical engineering services, while some also engage in unrelated activities. The extent of diversification is approximated by the Herfindahl

index of diversification — the sum of squared product segment revenue shares. Declining index values imply greater diversification (and a negative coefficient estimate if there is a positive relation between diversification and profitability).

The proxy variables for the absolute size of the company are the number of employees and company sales (in US currency). The number of employees is probably a better measure of firm size as high labour intensity is a characteristic of engineering services. The Worldscope database does not distinguish between full-time and part-time employees, but official data indicate most employment in engineering services is full-time (9 out of 10 employees in European economies) (Eurostat 1998).

The opportunity cost of capital is the return that shareholders expect to receive from alternative uses of the investment funds in a competitive environment. The cost of capital measure would need to reflect economic depreciation (or appreciation) in the market value of the firm's assets. The market capitalisation of a company (*Mkt Cap*) indicates the market value of its assets, and the change in market value between the beginning and end of the period reflects economic depreciation (Fallon 1993 and Steering Committee 1996). The government bond rate (adjusted for the rate of inflation) provides an approximation to the real rate of return (*RoR*) in each economy. Thus, the cost of capital over sales revenue can be measured (on the right hand side of the estimated equation) as:

$$K_{ij} = \frac{rK_m + dK_m}{pq} = \frac{(RoR \times Mkt\ Cap_{1995}) - (Mkt\ Cap_{1996} - Mkt\ Cap_{1995})}{Revenue} \qquad (3)$$

The market capitalisation value at the beginning of the period is measured at the nearest financial year ending 1995, and the value at the end of the period is measured at the nearest financial year ending 1996. If the change in market value of the firm is negative (positive), it shows economic depreciation (capital gains). The Worldscope database contains information on companies' market capitalisation. Data on interest rates and inflation rates are from the IMF (1999).

Table 4.1 presents summary data on 84 engineering service firms.

## 4.4 Results

### Estimation technique

Equation 1 is estimated using ordinary least squares on a cross-sectional dataset of engineering firms in 20 economies. But with cross-country (and panel) data, the

linear model could lead to correlation of estimation errors with the regressors, and hence biased coefficient estimates, since unobservable economy-specific factors that are not accounted for in the regression could generate group effects on firms within an economy. The results of the linear model should be tested for the presence of group effects to help determine the choice of an appropriate estimation technique.

Table 4.1 **Summary data for 84 companies**[a]

| *Economies* | *Firms* | $PCM_{ij}$ | $m_{ij}$ | $C_j$[b] | $RD_{ij}$[b] | $G_{ij}$ | $Div_{ij}$ | *Size*[c] | $K_{ij}$ |
|---|---|---|---|---|---|---|---|---|---|
| | *(No)* | *(Ratio)* | *(Ratio)* | *(Ratio)* | *(Ratio)* | *(Ratio)* | *(Ratio)* | *(Ratio)* | *(Ratio)* |
| Australia | 1 | 0.08 | 0.09 | 2E-04 | 7E-03 | 0.84 | 0.58 | 517 | 0.06 |
| Austria | 2 | 0.15 | 0.11 | 0.001 | 2E-02 | 1.63 | 0.48 | 11665 | 0.03 |
| Belgium | 1 | 0.04 | 0.09 | 0.010 | 0.000 | 1.03 | 0.29 | 10267 | 0.11 |
| Canada | 1 | 0.07 | 0.11 | 2E-04 | 0.000 | 1.13 | 0.91 | 6000 | 0.01 |
| Denmark | 4 | 0.09 | 0.08 | 2E-04 | 8E-05 | 1.23 | 0.81 | 2578 | -0.02 |
| Finland | 1 | 0.11 | 0.06 | 0.005 | 0.000 | 1.08 | 0.37 | 542 | 0.05 |
| France | 2 | 0.07 | 0.03 | 5E-05 | 3E-04 | 1.18 | 0.36 | 5063 | 0.05 |
| Germany | 2 | 0.11 | 0.01 | 3E-04 | 3E-04 | 1.32 | 0.85 | 877 | 0.09 |
| Hong Kong | 2 | 0.19 | 0.09 | 0.004 | 0.000 | 1.32 | 0.51 | 1451 | 0.01 |
| Indonesia | 1 | 0.18 | 0.11 | 0.016 | 0.000 | 1.33 | 0.23 | 2500 | 0.01 |
| Japan | 7 | 0.08 | 0.02 | 2E-05 | 4E-03 | 1.06 | 0.60 | 1596 | -0.03 |
| Malaysia | 10 | 0.15 | 0.06 | 0.030 | 0.000 | 1.27 | 0.52 | 1781 | 0.04 |
| Mexico | 1 | 0.13 | 0.06 | 0.003 | 0.000 | 0.93 | 0.25 | 189 | -0.16 |
| Netherlands | 2 | 0.05 | 0.06 | 0.004 | 3E-05 | 0.97 | 0.45 | 3735 | 0.02 |
| Singapore | 4 | 0.15 | 0.03 | 0.001 | 0.000 | 1.21 | 0.44 | 198 | 0.08 |
| South Africa | 1 | 0.03 | 0.03 | 0.004 | 0.000 | 1.16 | 0.62 | 340 | 0.08 |
| Spain | 2 | 0.06 | 0.03 | 0.007 | 2E-05 | 0.92 | 0.63 | 199 | 0.01 |
| Sweden | 5 | 0.10 | 0.04 | 1E-04 | 2E-04 | 1.05 | 0.53 | 1299 | -0.04 |
| UK | 15 | 0.04 | 0.02 | 0.001 | 1E-03 | 1.14 | 0.52 | 1046 | 0.01 |
| USA | 20 | 0.07 | 0.01 | 2E-05 | 7E-03 | 1.19 | 0.66 | 2617 | 0.04 |

**a** Refer to the above section for explanation of the variables and table 3.3 for restrictiveness indexes. **b** The term E used in this column denotes a scientific notation that represents the value of the number before the E being multiplied by 10 to the power of the number after the E. For example 1.20E-05 = 1.20 * $10^{-5}$. **c** Number of employees.

*Source:* Data Disclosure (1999), Australian Bureau of Statistics (1997a), Eurostat (1998), (Hong Kong) Census and Statistics Department (1998), (Japan) Statistics Bureau (1998), (Malaysia) Department of Statistics (1998), (Singapore) Department of Statistics (1999), U.S. Bureau of the Census (1997), and TradePort (1998).

The fixed or random effects models may be superior to the simple linear model when unobservable economy-specific effects are important. In a fixed effects model, unobservable economy-specific effects are assumed to be fixed parameters and the estimates would therefore be conditional on the estimated values of these parameters in the sample. The appropriate estimation technique involves ordinary least square regressions with economy-specific dummy variables. In a random effects model, unobservable economy-specific effects are assumed to be randomly

distributed across economies as if these were drawn from a much larger population of economies. The economy-specific effects are thus assumed not to be correlated with other explanatory variables in the equation. The appropriate estimation technique for the random effects specification is generalised least squares.

Estimations using the fixed and random effects specifications were also carried out to determine the appropriate technique for the present study. Two tests are available to help decide on the choice of technique. A simple F-test can be used to test the null hypothesis that there are no fixed effects in the data. Rejection of the test would suggest that OLS results are spurious and biased. Similarly, the Breusch and Pagan test helps to verify whether random effects are present in the data (Greene 1990). For example, a large value of the Breusch and Pagan statistic would argue in favour of the random effects (or fixed effects) specification against the simple linear model.

These tests suggest that the linear regression model is more appropriate to this study. The F-statistic ($n_1 = 19$ and $n_2 = 54$) is 0.36, which indicates that the null hypothesis of no fixed effects cannot be rejected at either the 5 per cent or the 1 per cent significance level (critical values from the F distribution are 1.8 and 2.2, respectively). The Breusch and Pagan test gives a Lagrange multiplier statistic of 2.58, which is not significant at the 5 per cent or 1 per cent level for a chi-squared distribution with one degree of freedom (critical values are 3.8 and 6.6, respectively). Thus, the evidence does not favour a random effects specification over the linear model.

Table 4.2 shows OLS estimation results for the variables that are significant. The following section discusses the results and implications of the findings.

## Findings and implications

The regression analysis finds that several firm-specific factors and the restrictiveness indexes significantly influence the price-cost margins of engineering service firms.

### *Firm and industry factors*

Firms' market shares have a positive and significant influence on profitability. Several studies provide empirical evidence of the positive relation between market share and firm profits (see for example, Schmalensee 1989). An explanation for this relation is that market shares can reflect productive differences among firms (Mueller 1986). Another view sometimes held is that such correlations could reflect the exercise of market power by larger firms. Rather, it also depends on existing and

potential competition — for example whether there are alternative sources of supply and substitute products, and the possibility of entrants in response to price rises. In any case, engineering companies in the sample tend to have low market shares (see table 4.1).

The estimation also finds a significant relationship between product differentiation, as measured by R&D expenditures, and firm profitability. R&D appears to have a non-linear relationship with profitability — increasing R&D may first lower profits, then affect profits positively, and lower profits eventually. The coefficients on R&D variables are large since the ratio of R&D to sales is very small.

Table 4.2 **Regressions including the trade restrictiveness index**

| *Variables* | *Variable specification* | *Coefficient estimate* | *t-statistic* |
|---|---|---|---|
| Market share | $m_i$ | 0.49[a] | 3.03 |
| Foreign barriers to establishment | $(1-m_i)FBE$ | 0.37[a] | 3.36 |
| Foreign barriers to ongoing operations | $(1-m_i)FBO$ | 0.26[c] | 1.39 |
| Domestic barriers to establishment | $(1-m_i)DBE$ | -0.55[b] | -1.70 |
| Product differentiation | $m_iRD$ | -194[b] | -1.97 |
| | $m_iRD^2$ | 6652[b] | 1.79 |
| | $m_iRD^3$ | -42474[b] | -1.85 |
| Sales growth | Ln(Growth) | 0.16[a] | 4.50 |
| Diversification | Ln(Diversif) | -0.04[b] | -2.16 |
| Cost of capital | Cap | 0.13[b] | 2.24 |
| R-square adjusted: 0.37 | | | |

**a** Coefficient estimates are significant at the 1 per cent level. **b** Coefficient estimates are significant at the 5 per cent level. **c** Coefficient estimates are significant at the 10 per cent level.

Market concentration, however, does not have a significant influence on firm profits. This could reflect the crude proxy for concentration used in this study. The relation between concentration and profitability is statistically weak in cross-section studies, and the estimated effect is usually small (Schmalensee 1989). Mueller (1986), however, reported a significant, but negative, relationship between the 4-firms concentration ratio and profitability.

Most control variables have significant effects on firm profitability. Recent sales growth has a positive and highly significant influence on firm profits, which may indicate a strong link between financial performance of engineering firms and general economic conditions. The diversification of activities is positively related to firm profits, suggesting that engineering service firms engaging in more than one

activity are likely to achieve higher profit rates. The cost of capital has a positive influence on firm profits, a finding consistent with prior expectation.

The variable for absolute firm size, however, does not have a significant effect on firm profitability. Although the estimation separately includes the number of employees and company sales variables as measures of absolute firm size, no statistical relation is found. Mueller (1986) reported an insignificant relationship between absolute firm size and firm profit rates.

### *Trade restrictiveness index*

The trade restrictiveness indexes are significant determinants of engineering firm profitability. The econometric results indicate that restrictions have different effects on the price-cost margins, depending on the nature of restrictions applying to engineering service firms.

Foreign barriers to establishment are a positive and highly significant determinant of price-cost margins. The coefficient estimate, combined with the interaction term ($1\text{-}m_i$), indicates that a maximum FBE index value of 0.75 will lead to an increase in the price-cost margin of up to 0.37.

Foreign barriers to ongoing operation also contribute positively to the price-cost margins of engineering service firms. However, the estimated relationship is not strongly significant, as indicated by a low t-statistic for its coefficient estimate.

Foreign barriers to establishment are the most important forms of restrictions in engineering services, and cover nationality, residency, recognition of foreign licences and qualifications, partnership, form of establishment and investment restrictions. These restrictions directly limit foreign supply of engineering services by restricting the number of foreign engineers to local practice and investment flows. The effects of these barriers are expected to be rent-creating and would raise the price of engineering services.

Most of the restrictions covered by the foreign barriers to ongoing operations grouping are the reservation of certain activities to the engineering profession, fee setting regulations, licensing restrictions on management and the temporary movement of people. These restrictions are also likely to increase service prices. Regulations that reserve certain activities to the profession and restrict fee setting could limit competition in the market and raise rent. Licensing restrictions on management and temporary movement of people might impose some ongoing costs on foreign suppliers of engineering services. The effects of these restrictions are expected to primarily rent-creating.

A possibility canvassed in section 4.1 is that rent-creating restrictions might also increase business costs through higher wages being paid to professional employees. The lack of labour cost data creates difficulties in examining this possibility in detail. In Australia, official statistics show that the number of working proprietors and partners comprise 2 per cent of the employment in consultant engineering services, compared with a 26 per cent employment ratio for employee engineers (ABS 1997a). If some of the rents lead to higher wages and salaries, some dilution of price-cost margins could occur. If so, the estimated impact of the above restrictions on engineering firms is likely to be understated.

The analysis finds a negative and significant relationship between domestic barriers to establishment and price-cost margins, suggesting that these restrictions tend to reduce company profits. This result, and the nature of the restrictions affecting domestic barriers to entry, suggest that these restrictions may lead to cost increases for engineering services. This interpretation is judged more plausible than the alternative explanation that these barriers reduce price-cost margins by reducing prices.

For the economies in the sample, domestic barriers to establishment represent mostly local licensing and qualification requirements, and in a few cases, limits on the form of establishment and non-professional investment.

Local licensing and qualification requirements are requirements to attain high education, undergo further training and practice, pass professional exams, or become a member of professional bodies. By imposing stringent standard requirements, these restrictions could have the effect of restricting domestic entry and supply of engineering services and raising the cost of becoming an engineering professional.[6] Consequently, firms that employ these professionals may face higher costs in the form of higher wage payments.

Other domestic barriers to establishment might also have cost-creating effects. Limitations on incorporation and non-professional ownership can raise costs by preventing economies of scale (such as the ability to spread managerial and financial overheads) and limiting access to non-professional capital and management ideas to improve service quality and innovation.

That said, the full extent to which domestic barriers to establishment generate higher costs cannot be determined from the data used here as there is a possibility

[6] In theory, costs could be raised in two ways. Qualification requirements might restrict the number of engineers in the market, creating rents for engineers and increasing costs for firms. Alternatively, qualification requirements could raise the costs of becoming an engineer but not limit the number of them. The lack of information makes it hard to determine which of these effects is more important for engineering services.

that some of the net costs directly created by the restrictions may have been passed-on to consumers in the form of higher prices.

## 4.5 Impacts of restrictions on engineering services

The econometric estimation in the previous section identifies and separates various industry- and firm-specific influences on firm profitability. The econometric results suggest two kinds of effects on engineering service firms. Foreign barriers to establishment and ongoing operations lead to price increases, whereas domestic barriers to establishment result in cost increases for engineering services.

### Calculating impacts of restrictions

This section develops measures of the price and cost effects to engineering services in selected economies of the restrictions to trade in their economy.

Computing these measures for each economy requires:

- the coefficient estimates on the restrictiveness index components;
- the scores of the index components derived for each of the 20 economies in chapter 3; and
- data on revenue, variable costs and market shares, evaluated at their sample means.

#### *Price impact*

The price impacts measure the extent to which the rent-creating restrictions raise service prices above costs.

$$\text{Let } X = (1-m)TRI \tag{4}$$

where *TRI* represents either the *FBE* or *FBO* index values and *m* is evaluated at the sample mean of firms' market shares in a given economy.

From equation (1), the absolute increase in price-cost margin resulting from the FBE or FBO indexes is given by:

$$\frac{p-v}{p} - \frac{p_o - v_o}{p_o} = \beta X \tag{5}$$

where $(p_o - v_o)/p_o$ is the price-cost margin in the absence of restrictions. Equation (5) can be rewritten as:

$$\left(1-\frac{v}{p}\right)-\left(1-\frac{v_o}{p_o}\right)=\frac{v_o p - v p_o}{p_o p}=\beta X \qquad (6)$$

Suppose that $v_o = v$. Then we have:

$$\left(\frac{p-p_o}{p_o}\right)\frac{v}{p}=\beta X \qquad (7)$$

The price impact (in percentage terms) is given by:

$$\left(\frac{p-p_o}{p_o}\right)100=\left(\frac{p}{v}\beta X\right)100 \qquad (8)$$

where: $\frac{p}{v}=\frac{pq}{vq}=\frac{Revenue}{(Revenue-EBIT-d_a)}$

Thus, the price impact of restrictions can be estimated for a given economy by using foreign barriers to establishment and ongoing operations indexes, the coefficient estimates, and the sample mean of firms' market share, sales revenue, EBIT and accounting depreciation.

The above price measure is derived by making the simplifying assumption that variable costs per unit remain the same before and after the imposition of restrictions. However, if the rent-creating restrictions also raise cost curves, then the dilution of price-cost margin data means that this price measure understates the full effect of the restrictions.

### *Cost impact*

Domestic barriers to establishment have a negative relationship with price-cost margins. The nature of these barriers suggests that they raise the costs of engineering firms. A measure of the cost impact would show the increases in costs associated with these restrictions.

$$\text{Let } X=(1-m)DBE \qquad (9)$$

where DBE represents the index value for domestic barriers to establishment. Using equation (6), the reduction in price-cost margins accounted for by domestic barriers to establishment is:

$$\frac{v_o p - v p_o}{p_o p} = -\beta X \tag{10}$$

Suppose that $p_o = p$. Then we have:

$$v_o - v = -p\beta X \tag{11}$$

Thus, the increase in variable costs per unit accounted for by restrictions becomes:

$$v - v_o = p\beta X \tag{12}$$

and variable costs per unit in the absence of restrictions are:

$$v_o = v - p\beta X \tag{13}$$

Using (12) and (13), the cost impact of restrictions (in percentage terms) is measured as:

$$\begin{aligned}\left(\frac{v - v_o}{v_o}\right)100 &= \left(\frac{p\beta X}{v - p\beta X}\right)100 \\ &= \left(\frac{pq\beta X}{vq - pq\,\beta X}\right)100\end{aligned} \tag{14}$$

The cost impact can be estimated for a given economy by using the DBE index values, the coefficient estimate, and the sample mean of market shares, revenue ($pq$), and variable costs ($vq = Revenue - EBIT - d_a$).

## Impacts for 20 economies

Table 4.3 shows estimates of the total impacts of restrictions on engineering service firms in 20 economies. The price impacts are estimates of the price increases resulting from foreign barriers to establishment and ongoing operations, respectively. The sum of these price impacts represents the total price impact for each economy of all barriers applying to foreign service providers. The cost impact is an estimate of the increase in costs associated with domestic barriers to establishment. Reflecting the potential for rent-dilution or cost pass-ons in the source data (see above), these measures can be interpreted as minimum impact measures.

Tables 4.4 to 4.6 show the contribution of various restriction categories to the price and cost impacts of the respective index components. The estimate for each

restriction category is found by applying its index value and the above formula for price and cost impacts (equations 8 and 14).

### *Price impact*

The total price impacts of restrictions on engineering services vary between economies — ranging from 1 to 15 per cent. These low to moderate price impacts reflect the relatively open trading environment for engineering services in many economies.

The price impacts for Austria, Mexico, Malaysia, Indonesia and Germany exceed 10 per cent. With the exception of Germany, the price impacts for these economies result mainly from foreign barriers to establishment.

Table 4.3 **Impacts of restrictions for 20 economies**
per cent

| | *Price impact* | | | *Cost impact* |
|---|---|---|---|---|
| | *Foreign barriers to establishment* | *Foreign barriers to ongoing operations* | *All foreign barriers*[a] | *Domestic barriers to establishment* |
| Austria | 11.1 | 3.5 | 14.5 | 6.8 |
| Mexico | 13.9 | 0.2 | 14.2 | 1.9 |
| Malaysia | 11.3 | 0.7 | 12.0 | 5.3 |
| Indonesia | 9.9 | 0.3 | 10.2 | 3.2 |
| Germany | 4.7 | 5.5 | 10.2 | 2.9 |
| Spain | 5.1 | 3.7 | 8.7 | 3.9 |
| USA | 5.1 | 2.2 | 7.4 | 3.8 |
| Sweden | 5.9 | 0.9 | 6.8 | 0.7 |
| Japan | 3.1 | 3.4 | 6.6 | 2.2 |
| Canada | 3.1 | 2.2 | 5.3 | 2.7 |
| Singapore | 4.9 | 0.2 | 5.0 | 0.8 |
| Hong Kong | 3.6 | 1.5 | 5.1 | 2.3 |
| South Africa | 3.5 | 0.2 | 3.7 | 0.7 |
| Netherlands | 3.5 | 0.2 | 3.7 | 5.2 |
| Australia | 2.1 | 0.7 | 2.8 | 2.1 |
| United Kingdom | 2.3 | 0.2 | 2.5 | 1.4 |
| Finland | 1.8 | 0.5 | 2.3 | 0.7 |
| Denmark | 0.3 | 0.8 | 1.1 | 0.7 |
| France | 0.3 | 0.6 | 0.9 | 0.7 |
| Belgium | 0.3 | 0.2 | 0.5 | 0.7 |

[a] The price impact for all foreign barriers is the sum of the price impacts for foreign barriers to establishment and ongoing operations, respectively.

Spain, the United States, Sweden, Japan, Canada, Singapore and Hong Kong have rather low price impacts, ranging from 5 to 9 per cent. Foreign barriers to establishment also have important price-raising effects in these economies.

South Africa, the Netherlands, Australia, the United Kingdom, Finland, Denmark, France, and Belgium are the most open markets for engineering services. The price impacts for these economies are very low, generally below 5 per cent.

### *Cost impact*

Cost impacts provide an indication of the cost effects of restrictions on domestic engineering firms. The cost impacts are relatively small, ranging from 1 to 7 per cent for 20 economies studied.

Austria, Malaysia and the Netherlands have highest cost impacts (between 5 to 7 per cent). This reflects domestic qualification requirements and restrictions on incorporation and non-professional investment.

All remaining economies have cost impacts below 5 per cent. Qualification requirements are most common in these economies. Compulsory membership of professional bodies is also present in a number of cases.

Table 4.4 **Price impact, by foreign barriers to establishment**[a]

per cent

| | *Form of establish-ment* | *Foreign partnership* | *Investment by foreign professionals* | *Investment by non-professional investors* | *Licensing of foreign professionals* | *Quotas/ economic needs test* | *Nationality* | *Residency* | *Movement of people – permanent* | *Foreign barriers to establish-ment* |
|---|---|---|---|---|---|---|---|---|---|---|
| Austria | 1.6 | 1.4 | 1.0 | 1.0 | 1.3 | 2.0 | 2.4 | - | 0.3 | 11.1 |
| Mexico | - | 1.7 | - | - | 1.7 | 4.3 | 5.6 | - | 0.5 | 13.9 |
| Malaysia | 1.9 | 1.9 | 1.6 | 1.6 | 1.9 | 2.4 | - | - | - | 11.3 |
| Indonesia | 1.7 | 1.7 | - | - | 1.7 | 4.3 | - | - | 0.3 | 9.9 |
| Germany | - | - | - | 0.4 | 1.7 | 2.2 | - | - | 0.3 | 4.7 |
| Spain | 1.7 | - | - | - | 1.7 | - | - | 1.4 | 0.3 | 5.1 |
| USA | - | - | - | 2.1 | 1.7 | - | - | 1.3 | - | 5.1 |
| Sweden | - | 3.4 | 2.1 | - | - | - | - | - | 0.3 | 5.9 |
| Japan | - | - | - | - | 1.7 | - | - | 1.4 | - | 3.1 |
| Canada | - | 0.5 | - | - | 2.3 | - | - | - | 0.3 | 3.1 |
| Singapore | - | - | - | - | 1.8 | - | - | 3.1 | - | 4.9 |
| Hong Kong | - | - | - | - | 1.8 | - | - | 1.8 | - | 3.6 |
| South Africa | - | - | - | - | 3.2 | - | - | - | 0.3 | 3.5 |
| Netherlands | 3.1 | - | - | - | - | - | - | - | 0.3 | 3.5 |
| Australia | - | - | - | - | - | 2.0 | - | - | 0.2 | 2.1 |
| United Kingdom | - | - | - | - | - | 2.0 | - | - | 0.3 | 2.3 |
| Finland | - | - | - | - | - | - | - | 1.4 | 0.3 | 1.8 |
| Denmark | - | - | - | - | - | - | - | - | 0.3 | 0.3 |
| France | - | - | - | - | - | - | - | - | 0.3 | 0.3 |
| Belgium | - | - | - | - | - | - | - | - | 0.3 | 0.3 |

**a** The price impact for each restriction category is found by using equation 8 for each foreign barrier to establishment.

Table 4.5 **Price impact, by foreign barriers to ongoing operations**[a]

per cent

| | *Activities reserved by law to the profession* | *Multi-disciplinary practices* | *Fee setting* | *Advertising, marketing and solicitation* | *Licensing restrictions on management* | *Other restrictions* | *Movement of people - Temporary* | *Foreign barriers to ongoing operations* |
|---|---|---|---|---|---|---|---|---|
| Austria | 1.5 | 1.8 | 0.5 | - | 0.6 | - | 0.2 | 3.5 |
| Mexico | - | 4.2 | - | - | - | - | 0.2 | 0.2 |
| Malaysia | 0.2 | - | - | - | - | 0.2 | 0.3 | 0.7 |
| Indonesia | - | - | - | - | - | - | 0.3 | 0.3 |
| Germany | - | - | 1.6 | 1.6 | 0.3 | - | 0.2 | 5.5 |
| Spain | 1.6 | - | 1.6 | - | 0.3 | - | 0.2 | 3.7 |
| USA | 1.6 | - | 0.1 | - | 0.3 | - | 0.2 | 2.2 |
| Sweden | - | - | - | - | 0.6 | - | 0.2 | 0.9 |
| Japan | 1.6 | - | 1.6 | - | - | - | 0.2 | 3.4 |
| Canada | 1.4 | - | - | - | 0.3 | - | 0.1 | 2.2 |
| Singapore | - | - | - | - | - | - | 0.2 | 0.2 |
| Hong Kong | 1.2 | - | - | - | - | - | 0.2 | 1.5 |
| South Africa | - | - | - | - | - | - | 0.2 | 0.2 |
| Netherlands | - | - | - | - | - | - | 0.2 | 0.2 |
| Australia | - | - | - | - | 0.4 | - | 0.2 | 0.7 |
| United Kingdom | - | - | - | - | - | - | 0.2 | 0.2 |
| Finland | - | - | - | - | 0.3 | - | 0.2 | 0.5 |
| Denmark | - | - | - | - | 0.6 | - | 0.2 | 0.8 |
| France | - | - | 0.4 | - | - | - | 0.2 | 0.6 |
| Belgium | - | - | - | - | - | - | 0.2 | 0.2 |

**a** The price impact for each restriction category is found by applying equation 8 for each foreign barrier to ongoing operations.

Table 4.6 **Cost impact, by domestic barriers to establishment[a]**

per cent

| | *Form of establishment* | *Investment by non-professional investors* | *Licensing and accreditation of domestic professionals* | *Domestic barriers to establishment* |
|---|---|---|---|---|
| Austria | 2.3 | 1.5 | 2.9 | 6.8 |
| Mexico | - | - | 1.9 | 1.9 |
| Malaysia | 2.7 | - | 2.6 | 5.3 |
| Indonesia | 2.5 | - | 0.8 | 3.2 |
| Germany | - | 0.6 | 2.3 | 2.9 |
| Spain | 2.4 | - | 1.5 | 3.9 |
| USA | - | 3.0 | 0.8 | 3.8 |
| Sweden | - | - | 0.7 | 0.7 |
| Japan | - | - | 2.2 | 2.2 |
| Canada | - | - | 2.7 | 2.7 |
| Singapore | - | - | 0.8 | 0.8 |
| Hong Kong | - | - | 2.3 | 2.3 |
| South Africa | - | - | 0.7 | 0.7 |
| Netherlands | 4.5 | - | 0.7 | 5.2 |
| Australia | - | - | 2.1 | 2.1 |
| United Kingdom | - | - | 1.4 | 1.4 |
| Finland | - | - | 0.7 | 0.7 |
| Denmark | - | - | 0.7 | 0.7 |
| France | - | - | 0.7 | 0.7 |
| Belgium | - | - | 0.7 | 0.7 |

**a** The cost impact for each restriction category is found by applying equation 14 for each domestic barrier to establishment.

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