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**FORMAL AND INFORMAL BARRIERS TO  
FOREIGN DIRECT INVESTMENT IN THE TELECOM SECTOR**

Ronald Hirshhorn, Hirshhorn Consulting, Canada

Working Paper 2008-07

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## Abstract

This study reviews previous efforts to measure foreign direct investment (FDI) restrictions and applies a new measure to assess the relative significance of Canada's restrictions on foreign investment in telecommunications. Following previous studies, a weighted average index is developed in which the weights reflect the relative significance of different restrictions. However, unlike recent measures of FDI barriers developed for the Organisation for Economic Co-operation and Development, which focus solely on the direct investment barriers incorporated in legislation, there is an attempt to also take account of informal barriers, including the barriers to entry erected by incumbent telecom carriers and the corporate and labour market practices of some countries that generally discourage investment by non-residents. While, in many industrial countries, controls on foreign investment have been eliminated, entry remains difficult because of the market advantages retained by incumbent telecommunications firms. In the measure developed in this study, a variety of market and policy indicators are used to take account of these informal barriers.

Consistent with previous studies, Canada is found to have among the highest barriers to inward FDI. Canada's index of FDI barriers, based on data covering 2003 to 2006, is higher than all other nine countries examined except Korea. The U.K. and the U.S. have the lowest barriers to FDI. Sub-indexes were constructed to measure: (1) restrictions affecting potential entrants to the market for fixed network services; (2) potential entrants to the market for mobile services; and (3) foreign enterprises and potential foreign investors. The general barriers to entry into fixed network and mobile telecom services are not significantly higher in Canada than other industrial countries, but discriminatory barriers are much higher, reflecting the fact that Canada is one of the few industrial countries to still limit foreign investment in telecommunications.

*Key words: FDI, foreign direct investment, foreign direct investment restrictions, telecommunications sector*

## Résumé

L'étude examine les efforts antérieurs déployés pour mesurer les obstacles à l'investissement direct étranger (IDE) et utilise une nouvelle méthode pour évaluer l'importance relative des obstacles canadiens à l'IDE dans le secteur des télécommunications. Comme dans des études antérieures, on crée un indice moyen pondéré où le poids attribué représente l'importance relative de divers obstacles. Cependant, contrairement aux récentes mesures des obstacles à l'IDE créées par l'Organisation de coopération et de développement économiques, qui ne prennent en compte que les obstacles à l'IDE de nature juridique, nous tentons également de tenir compte des obstacles officieux, comme les obstacles mis en place par les entreprises de télécommunication existantes et les pratiques d'affaires et de travail de certains pays qui ont un effet décourageant pour les non-résidents. Dans beaucoup de pays industrialisés, les obstacles à

l'IDE ont été éliminés, mais il reste difficile de pénétrer le marché en raison des avantages dont bénéficient les entreprises de télécommunication déjà implantées. L'indice créé dans la présente étude tient compte de divers indicateurs de marché et de politique pour refléter ces obstacles officiels.

Comme dans les études antérieures, on constate que le Canada fait partie de ceux ayant le plus d'obstacles à l'IDE entrant. L'indice des obstacles à l'IDE du Canada, selon les données de 2003 à 2006, est plus élevé que celui des neuf autres pays étudiés à l'exception de la Corée. Le R.-U. et les É.-U. ont le moins d'obstacles à l'IDE. Des indices secondaires ont été créés pour mesurer les restrictions touchant : 1. les nouveaux venus sur le marché des services de réseaux fixes; 2. les nouveaux venus sur le marché des services de réseaux mobiles; 3. les entreprises étrangères et les éventuels investisseurs étrangers. Les obstacles globaux à l'entrée sur les marchés des services de réseaux fixes ou mobiles ne sont pas significativement plus importants au Canada que dans les autres pays industrialisés, mais les obstacles discriminatoires sont beaucoup plus importants, ce qui signifie que le Canada est un des rares pays industrialisés qui limite encore l'investissement étranger dans le domaine des télécommunications.

*Mots clés : IED, l'investissement direct étranger, obstacles à l'investissement direct étranger, secteur des télécommunications*

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## **I. Introduction**

Foreign direct investment (FDI) has traditionally been severely restricted in the telecommunications sector. Countries subscribed to the view that basic telecommunications services are a “natural monopoly” and, hence, there are no benefits from allowing the entry of foreign-controlled firms. Over time, as technology and the economics of providing telecommunications services have changed, governments have relaxed regulations limiting competition and, at the same time, lowered the barriers to foreign entry. The process of liberalization has been furthered through international negotiations. The relaxation of market access restrictions in services including telecommunications is a major feature of many bilateral and regional agreements and of international agreements negotiated through the World Trade Organization, APEC and the OECD.

While, over the past two decades, there has been a clear trend towards reducing barriers to investment in telecommunications, progress has been uneven. Although Canada is one of only a small number of industrial countries that still directly limits foreign investment in telecommunication services, a number of countries indirectly restrict investment through screening requirements, public ownership of the incumbent, and other measures. To assess the relative significance of the explicit controls Canada still has in place and to estimate the potential gains from new international initiatives to further liberalize telecommunications services, comprehensive measures of existing FDI barriers are needed.

This study reviews efforts to measure FDI restrictions and assesses the relative significance of Canada’s restrictions on foreign investment in telecommunications using a new index and more recent data than employed in past studies. The next section provides a framework for identifying and classifying formal and informal investment barriers in the telecommunications sector. Section III looks at previous studies in which there has been an attempt to quantify the barriers to inward FDI in this sector. A new index of FDI barriers is developed in Section IV. This is then applied to assess how Canada’s formal and informal barriers to telecom FDI compare with the restrictions in Australia, Finland, France, Germany, Italy, South Korea, Japan, the U.K. and the U.S.



## II. Formal and Informal FDI Barriers in the Telecommunications Sector

There is no universally accepted taxonomy of FDI barriers in the service sector. At a minimum, it is necessary to take account of restrictions that discriminate against foreign firms, as in a recent OECD study of FDI restrictions by Stephen Golub (2003). The most obvious discriminatory barrier consists of investment restrictions such as Canada imposes on foreign ownership of facilities-based telecommunications carriers. Alternatively, countries may restrict foreign acquisitions or FDI more generally through the application of screening and approval procedures. Australia, for example, requires foreign investors to obtain prior approval for investment in the telecommunications sector.

Discriminatory barriers also include restrictions on the nationality or residency of corporate directors; regulations that prevent affiliates from bringing in foreign managers or specialists; and operational restrictions that may involve, for example, limitations on foreign-controlled firms' investment activities or their use of imported inputs.

Golub does not attempt to cover the full range of formal and informal factors impeding FDI flows, confining his study instead to discriminatory measures that constitute "FDI barriers per se."<sup>1</sup> A broader framework is required if the purpose is not simply to identify violations of national treatment but rather to take account of all measures that distort international capital flows. Hardin and Holmes (1997, p.33) note the potential importance of these resource allocation impacts:

Barriers to FDI may distort international patterns and modes of service trade. They may also distort allocation of capital between different economies, between foreign and domestic investment, between different sectors, and between portfolio and direct investment. As a result, services cost more than they need to and assets may not be used in the most productive way. The effects may flow through the economy through a variety of channels, such as higher prices, less consumer choice, lower capital stock and lower productivity.

If the resource allocation impacts of FDI barriers are the focus of interest, Hardin and Holmes then argue (p. 33) that:

The classification system should provide information which helps make the task of assessing resource allocation implications easier. It should highlight the key characteristics of the barriers which will determine their size and impact.

The General Agreement on Trade in Services (GATS), which came into effect in January 1995, sets out a broad framework for classifying impediments to various forms of service delivery. Under GATS, impediments consist of measures that both limit *market access* and violate countries' obligations to provide *national treatment*. Applying this framework, FDI barriers include a range of measures that affect entry into an industry – e.g. measures that limit the number of providers or the total value of transactions or require specific types of legal entity – but apply equally to domestic and foreign investors.

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<sup>1</sup> Golub (2003), p.90.

Market access limitations are prominent in the telecommunications sector where the main services have traditionally been seen to have natural monopoly characteristics and the preference has often been to rely on state-owned monopolies. While all OECD countries have used regulatory policies to address anti-competitive behaviour, these have generally been problematic and ended up creating new barriers to market access. Warren (2001a, p. 73)) observes that the lack of effective regulation to ensure fair network interconnection is “one of the most important constraints on new entrants into telecommunications service markets.” He goes on (p. 73) to note:

Almost all new telecommunications services require some form of access to the existing network. Often this network is controlled by a dominant carrier, which may also be competing with a new entrant in a final product market. The scope for predatory pricing, vertical foreclosure and other anti-competitive practices is potentially extensive. This problem is exacerbated when the dominant carrier is also the industry regulator, a situation still common in countries where a postal and telecommunications ministry is both the regulator and the service provider. In markets where effective competition regulation is not apparent, such behaviour can be an effective impediment to market access.

Telecommunications markets are evolving in response to the rapid development and diffusion of new technologies. The nature of telecommunications provision is being transformed by developments such as the rapid growth of mobile services, the integration of fixed and mobile voice services, the introduction of Voice over Internet Protocol (VOIP) services, the growth in mobile virtual network operators (MVNOs) and the spread of Wi-Fi technology. To understand whether and to what extent there are problems of market access in telecommunications, it is necessary to assess how well the government is promoting competition in market segments that are highly contestable and enforcing pro-competitive regulation in markets where contestability is still low.

In non-contestable or weakly contestable segments, market access depends on rules that facilitate interconnection and, also, that allow new entrants reasonable access to the essential facilities of the incumbent’s network. Impediments to market entry exist where regulators have not been able to enforce network access charges that are non-discriminatory and cost-based. They also exist where regulators have been unsuccessful in implementing an “unbundling” policy that requires the incumbent to sell network components (such as the local loop) independently, so new entrants need only purchase the network resources they require.

In his examination of impediments to trade and investment in telecommunications services, Warren attempts to identify all contraventions of market access and national treatment. His definition of these two impediments, which differs slightly from GATS,<sup>2</sup> is as follows:

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<sup>2</sup> Under GATS, impediments are only treated as violations of national treatment when they impact on foreign enterprises that have been established. Limitations on the participation of foreign capital in a sector are classified as impediments to market access.

- *Market access* limitations include any regulatory impediments to market entry that favour an incumbent over a potential entrant (domestic or foreign).
- *National treatment limitations* involve impediments to market entry that favour residents over foreign service suppliers.

The barriers to entry that derive from the technological characteristics of basic telecom services significantly affect foreign (as well as domestic) investment and have important implications for resource allocation. For the purpose of identifying barriers with potentially significant resource allocation implications, Warren's approach is superior to one which focuses exclusively on barriers that discriminate against foreign enterprises and prospective foreign investors. It does not, however, provide a comprehensive framework for identifying formal and informal barriers to inward FDI. This can be seen from Table 1. While Golub and Hardin and Holmes focus on the discriminatory measures in Columns 1 and 3, Warren's approach incorporates the measures in the first 3 columns;<sup>3</sup> none of these studies, however, attempts to take account of the horizontal restrictions in Column 4.

**Table 1**                                      **Taxonomy of Formal and Informal FDI Barriers**

<b>Sectoral Investment Restrictions</b>		<b>Horizontal Investment Restrictions</b>	
<i>Applies to Foreign Investors</i>	<i>Applies to All Investors</i>	<i>Applies to Foreign Investors</i>	<i>Applies to All Investors</i>
For example: <ul style="list-style-type: none"> <li>▪ equity limits on FDI in sector</li> <li>▪ restrictions on nationality of board members in sector firms</li> </ul>	For example: <ul style="list-style-type: none"> <li>▪ laws and regulations affecting entry into industry</li> <li>▪ regulations affecting access to inputs</li> </ul>	For example: <ul style="list-style-type: none"> <li>▪ screening or prior approval requirements for foreign acquisitions</li> <li>▪ subsidies restricted to or favouring resident-owned enterprises</li> </ul>	For example: <ul style="list-style-type: none"> <li>▪ competition laws that facilitate corporate actions to ward off takeovers</li> <li>▪ corporate and labour market regulations that increase the difficulty of starting a business or reorganizing company operations</li> </ul>

Framework laws and regulations that depart from industrial country norms can discourage international investors and significantly distort international capital flows. The difficulty of including the impediments in Column 4 is that there is a large list of

<sup>3</sup> None of the studies take account of subsidies, which may be either biased against or tilted to favour foreign investors. Hardin and Holmes (1997, p.41) find that "evidence on the extent to which investment incentives affect resource allocation in practice is mixed, although most studies do conclude that the effects are likely to be small."

measures that affect a country's appeal to foreign investors and might qualify as a horizontal investment restriction. Under this category, one might, for example, include differences in corporate taxation, disparities in public services, gaps in competition law, and regulations that increase the cost of starting a business or the difficulty of terminating a business. Although, in most studies, the interest is in singling out *policy measures* that impede investment, institutional and corporate practices that discourage inward investment (and may be an indirect result of government policies) might also constitute horizontal barriers that merit attention. The potential importance of these horizontal barriers is recognized in a study by Rao and Ahmad (1996) that identifies a wide range of informal barriers that constrain FDI mainly by limiting merger and acquisition activity:

These include... the size and depth of the stock market in each country, tactical barriers to investment in corporate articles of incorporation, government and business linkages, business practices, financial and commercial linkages, use of antitrust, innovation and technology policies, the role of state-controlled enterprises, and so on.<sup>4</sup>

While a study of FDI barriers should not extend into an examination of all policies and policy-related factors influencing the decisions of international investors, it should give attention to those regulations and practices that significantly discourage foreign entry and might be construed as a partial substitute for direct foreign investment limits. For the purposes of this study, the relevant items can be identified by looking at the horizontal factors that foreign investors in general and telecommunications investors in particular have themselves singled out as significant investment obstacles. A good source for this information is the government reports on barriers to trade and investment – such as issued by U.S. Trade Representative pursuant to Section 1377 of the Omnibus Trade and Competitiveness Act of 1988 and by the European Commission (2006) with respect to U.S. barriers. In the OECD countries being examined, significant horizontal investment restrictions applying to all investors (i.e. the items to be included in Column 4 of Table 1) include:

- Aspects of Germany's takeover law, which allow companies, with stockholder and or board approval, to take action to ward off hostile takeovers.
- Italian labour regulations that rigidify labour markets and thereby prevent organizational change and discourage investment.
- The poor investment climate in Korea resulting from labour market inflexibilities and labour management disputes.
- Japanese institutional arrangements and corporate practices that deter foreign acquisitions, including: insufficient financial disclosure practices; cross-holdings of shares among companies within a business group; the low proportion of publicly traded stock relative to total capital in many companies; and exclusive buyer-supplier arrangements that limit competition from new entrants.

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<sup>4</sup> Rao and Ahmad (1996), p.177.

### III. Measuring FDI Barriers in Telecommunications

#### *Price Effects of FDI Barriers*

In modeling the impact of trade barriers, the main initial focus is on the price wedge resulting from the imposition of tariff and non-tariff barriers. Similarly, FDI barriers lead telecommunications prices in an economy to be higher than they would be if entry was open to the lowest cost world producers. The size of this price wedge will depend on the nature and stringency of the formal and informal barriers a country has in place. For example:

- *A limit on foreign ownership in the telecom sector* effectively results in a tax on the users of capital, which benefits domestic suppliers of capital to the sector who are able to earn higher returns. The impact on prices depends on the stringency of the ownership limit and the elasticity of the demand for imported capital in the sector (with more inelastic demand resulting in a larger impact).
- *A regulation preventing foreign investors from acquiring control of an existing telecom company* is likely to reduce the price existing owners can obtain from sale of the assets. The size of resulting wedge depends on the difference between asset prices with and without the restriction.
- *An operating restriction on foreign-controlled telecom firms* will increase costs for foreign investors. The more costly the requirements, the greater will be the impact on the supply of foreign capital and on the price of telecommunications services.

The price effects of foreign direct investment barriers will depend, as well, on the competitive conditions in a country's telecommunications markets. The disparity between domestic prices and the prices offered by low-cost foreign enterprises will be greater if domestic firms also face barriers to entry and competition in telecommunications markets is weak or nonexistent. In estimating the wedge in these circumstances, the relevant price comparison is not between prices offered by competitive foreign and domestic producers, but rather between supply prices of internationally competitive foreign producers and domestic monopolists or oligopolists (or regulated domestic monopolists or oligopolists).<sup>5</sup>

Where price effects can be estimated, researchers have an important indicator of the significance of barriers in an industry. In measuring barriers affecting goods trade, researchers often rely on price impact measures derived from comparing trade-restricted prices with prices in liberalized economies. As Deardorff and Stern (2004, pp. 14-15) note:

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<sup>5</sup> This is discussed in Bosworth, Findlay, Trewin and Warren (2001), pp.43-48.

...measurements... can be fairly straightforward in the case of goods, based either on their observed prices before and after they cross an international border or on the quantities that cross it. For example, one can often infer both the presence of an import barrier and its effect on price by simply comparing the price of a good inside a country to that outside, since in the absence of any barrier one would expect competitive market forces to cause these prices to be the same.

Such price comparisons would not be very informative in the telecommunications sector where differences in service prices may reflect the influence of a variety of factors besides the presence of trade and investment barriers. Even with full liberalization, telecom prices across jurisdictions are likely to diverge significantly due to differences in demand, wages, infrastructure and other costs. The price wedge associated with FDI investment barriers could conceivably be estimated by adjusting for the impact of all other factors affecting the price of telecommunications services. In practice, however, it is very difficult to ensure that unintended factors are not incorporated in estimations of the price effects of FDI barriers.

Therefore, instead of drawing inferences about the existence of FDI barriers and their importance from disparities in economic performance, researchers have mainly focused on developing direct measures that reflect the importance of different impediments to direct investment.<sup>6</sup> Measurement is an important first step in assessing the resource allocation implications of FDI barriers. In subsequent research, the derived measures can be used in econometric models to estimate the impact of FDI barriers on telecom prices and quantities and on economic welfare more generally.<sup>7</sup> The following subsections review various efforts to develop such direct measures of FDI barriers in the telecommunications sector.

### ***Frequency and Coverage Measures***

The first attempts to measure FDI and other non-tariff barriers in the service sector involved the development of frequency indexes based on information set out by countries in their WTO GATS schedules. Hoekman (1995) constructed frequency ratios by examining the number of commitments made by countries as part of the Uruguay Round negotiations completed in 1993-94. He aggregated countries' sector and sub-sector commitments using a three-part weighting system:

- Where a sector has been scheduled without any limitation on market access or national treatment, a weight of 1 is assigned.

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<sup>6</sup> One exception is OECD (1997) in which a price-based approach is used to quantify non-tariff barriers in telecommunications. The estimated departure from the price of international telephone calls, after adjusting for differences in quality of service, was used as an indicator of a country's regulatory and/or trade and investment barriers.

<sup>7</sup> For example, Trewin (2001) estimates the price impacts of trade and investment impediments in telecommunications and Warren (2001b) estimates the output impact. The economic gains from liberalization of telecommunications are estimated in Verikios and X.-G. Zhang (2004)

- Where a sector has been scheduled with some form of limitation on market access or national treatment, a weight of 0.5 is given.
- Where a mode of supply in a sector is referenced as “unbound,” indicating that no commitment has been made, a weight of 0 is allocated.

With 155 sectors and sub-sectors and 4 modes of supply,<sup>8</sup> the maximum possible score for each country is 620. A frequency ratio – or separate ratios for “market access” and “national treatment” – can be calculated by determining the weighted average number of commitments relative to the total number of possible commitments. Instead of the frequency ratio, where a higher score indicates a more liberalized regime, a restrictiveness ratio (1- frequency ratio) can be calculated to determine the extent to which a sector or an economy remains closed. Applying frequency indexes, the Pacific Economic Co-operation Council (PECC, 1995) found that, subsequent to GATS, only 23 percent of APEC service markets were completely open to foreign investors (i.e. to service delivery via establishment of commercial presence). The information in the GATS schedules has also been used to calculate coverage ratios that measure the share of the value of service production or trade that is subject to some restrictions.<sup>9</sup>

As Hardin and Holmes note, it may not be valid to assume, as Hoekman does, that the absence of a positive country commitment in the GATS schedules indicates the presence of a restriction. In addition, it is inappropriate to assign the same weight and importance to all restrictions. In the case of FDI (or, in GATS terminology “commercial presence”), the frequency ratios result from the aggregation of barriers of widely differing significance.

The restrictions affecting telecommunications services in Asian WTO member countries were examined by Low and Mattoo (1997). Although their research was qualitative, it points to the limitations of the GATS schedules as a main source of information on non-tariff barriers in telecommunications. While frequency-type measures based on the GATS schedules may be useful in gauging progress towards liberalization, they do not provide the information that is needed to assess the impact of FDI barriers and the gains from their removal.

### ***Extensions to Frequency Measures***

Marko (1998) builds on Hoekman’s methodology in a study of country commitments under the extended GATS negotiations on basic telecommunications that were successfully completed in February 1997. With these commitments, almost all countries agreed to principles designed to ensure access to infrastructures and to constrain anti-competitive behaviour by market incumbents. Applying the Hoekman approach, Marko

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<sup>8</sup> GATS classified barriers with respect to the following modes of supply: cross-border supply; consumption abroad; commercial presence; presence of a natural person.

<sup>9</sup> Such information has been provided, for example, in reports by the Australian Industry Commission. Hardin and Holmes (1997) point out that the value of the coverage ratio is generally overstated because trade via FDI is not included in calculating the value of services trade.

finds that approximately 58% of the basic telecommunications service market in the 69 WTO member countries was covered by either partial or full GATS commitments.

Marko's methodological contribution comes in a second measure that is calculated for a sub-group of 15 countries. Here, a five-point weighting system is used to take account of partial commitments by member countries. The weighting system applied to FDI restrictions is shown in Table 2. Most rankings did not change significantly, but Canada moved from tenth position to fifth position when partial rankings were taken into account. With the second approach, there was also a significantly wider dispersion in the scores of member countries.

**Table 2**                                      **Weighting System Used to Assess GATS Agreement on Basic Telecommunications Services**

<b>Limitations on Market Access</b>		<b>Limitations on National Treatment</b>	
<i>Restriction</i>	<i>Weight</i>	<i>Restriction</i>	<i>Weight</i>
None	1.00	None	1.00
Foreign equity allowed: greater than 50%	0.75	Restrictions on nationality of directors	0.75
Foreign equity allowed: less than 50%	0.50	All executives and managers must be citizens	0.50
Services exclusively provided	0.25	Conditional upon passage of Acts	0.25
Unbound- No commitment	0	Unbound – No commitment	0

**Source:** Marko (1998) Table 3.3.

In another attempt to transform the frequency measures into a more meaningful indicator of country barriers to service trade and investment, Hoekman (1995) constructs “tariff equivalents” to apply to the measures. From an examination of individual sectors, he develops a list of maximum tariff equivalents – with telecommunications, at 200 percent, having one of the highest maximum tariffs. He then applies these tariffs to his frequency measure of liberalization to derive tariff equivalent measures based on countries’ GATS offers. Thus, if the maximum tariff equivalent is 200 percent and a given country has a restrictiveness ratio of 0.8 in the sector, the tariff equivalent would be set at 160 percent. Using these estimates and the value of output by sector for a representative industrialized country, Hoekman is able to construct weighted average tariff-equivalents by sector and country.

The tariff equivalent measures are based solely on market access restrictions and do not take account of national treatment violations. Moreover, the tariff measures are not true



indicators of the restrictions' relative economic impacts. A 160 percent tariff measure for telecommunications, for example, means that market access restrictions are 1.6 times as frequent as they are in another sector with a tariff equivalent of 100; it does not mean that prices are 160 percent higher than they would be with liberalization. In addition, like Hoekman's frequency measures, the tariff equivalent measures do not take account of differences among various types of restrictions, including the distinction between barriers affecting different modes of supply. Hardin and Holmes (1997, p. 72) note the need to address this latter limitation:

It is... important to distinguish between barriers to FDI and barriers to the other modes of supply, as they are likely to operate through different channels and will need to be modeled in different ways. For example, a particular FDI restriction may be best treated as a tax on foreign investor profits, whereas restrictions on cross-border services trade may be better treated as a wedge between domestic and foreign service prices. Further, the links between cross-border trade restrictions and FDI restrictions cannot be analyzed if the two types are lumped together.

### ***Indexes of Discriminatory Barriers to FDI***

The shortcomings of the frequency measures have led to the development of indexes of sector and country barriers to FDI. In constructing such indexes, researchers have drawn on details about the nature of specific barriers, rather than relying on GATS schedules and assuming that unscheduled sectors are restricted. They have also attempted to appropriately reflect the differences between barriers. The studies not only separate FDI restrictions from impediments on other modes of services delivery, but also distinguish among FDI barriers of different size and economic significance.

Hardin and Holmes (1997) develop a list of the major barriers to FDI and assign a weight to each barrier based on their judgment as to its efficiency cost. The components of their index and the weights assigned to various restrictions are shown in Table 3. A maximum score of one would be achieved with a complete ban on foreign ownership or a combination of a partial ban and stringent approval, management and operational restrictions.

Table 3

Weights in Hardin and Holmes Index

Type Of Restriction	Weight
<i>Foreign equity Limits on all firms</i>	
No foreign equity permitted	1
less than 50 percent foreign equity permitted	0.5
more than 50 percent & less than 100 percent foreign equity permitted	0.25
<i>Foreign equity limits on existing firms, none on Greenfield</i>	
No foreign equity permitted	0.5
less than 50 percent foreign equity permitted	0.25
more than 50 percent & less than 100 percent foreign equity permitted	0.125
<i>Screening and Approval</i>	
Investor required to demonstrate net economic benefits	0.1
Approval unless contrary to national interest	0.075
Notification (pre or post)	0.05
<i>Control and management restrictions</i>	
All firms	0.2
Existing firms, none for <i>Greenfield</i>	0.1
<i>Input and operational restrictions</i>	
All firms	0.2
Existing firms, none for <i>Greenfield</i>	0.1

**Source:** Hardin and Holmes (1997), Table 5.1.

Applying their measure to data for 15 APEC countries over the period 1996-1998, Hardin and Holmes find that communications services (postal, courier, telecommunications and audio visual services) are subject to among the greatest FDI restrictions. Canada's FDI restrictiveness index for communications was lower than that for some countries, including China, Korea, Mexico and Indonesia, but higher than the index for the U.S., Japan, Hong Kong and Australia.

In more recent studies, Golub (2003) and Koyama and Golub (2006), apply a modified version of Hardin and Holmes' weighting system to measure FDI restrictions for OECD countries. The initial study covered the period 1998-2000, while the revised paper by Koyama and Golub updates the calculation to 2005 and extends the index to 13 non-member countries. A number of adjustments are applied to the weighting system in Figure 3: the first 2 categories are merged into one restriction on foreign equity holdings and this is broken down into smaller equity ranges; the weight on "screening and approval," which Golub (2003) judged to be low, is increased slightly; and control and management restrictions are divided into more detailed components (with separate weights introduced for restrictions applying to board members and to "movement of

people”).<sup>10</sup> In addition, state ownership is included as a restriction, since “government monopoly is in effect a *de facto* ban on FDI.”<sup>11</sup> The studies draw on a number of sources of information on FDI restrictions, including: the GATS schedules, the “reservations” list in the OECD Code of Liberalisation of Capital Movements, OECD Investment Policy Reviews, and reports by the European Union, the U.S. Trade Representative and the Japanese Ministry of Economy, Trade and Industry.

In the 2006 study, barriers to FDI are found to be higher in telecommunications than all other sectors except electricity, where the high degree of public ownership severely limits investment opportunities, and transport. Both studies find Canada’s restrictions on FDI in telecommunications to be among the highest in the OECD. In the revised index constructed by Koyama and Golub, Canada’s measure of telecom FDI restrictiveness is exceeded only by Australia’s. Among the 13 non-member countries included in the 2006 study,<sup>12</sup> the only one to have a higher telecom restrictiveness index than Canada is South Africa.

### ***Indexes of Discriminatory and Non-discriminatory Barriers to FDI***

The indexes developed by Warren (2001a), which focus solely on telecommunications, incorporate some important improvements. As noted above, they take account not only of discriminatory measures, or violations of national treatment, but also more general market access restrictions that affect both foreign and domestic investors. The indexes are constructed from information published by the International Telecommunications Union (ITU) pertaining to actual policies rather than being based on policy inferences drawn from commitments in trade negotiations. Along with information on policies, Warren incorporates data on pertinent economic variables. This information is used to construct restrictiveness indexes for cross-border trade and foreign direct investment and that capture both the market access and national treatment restrictions affecting these two modes of supply.

Three indexes are developed to measure restrictions on FDI in telecommunications:

- *Market Access (MA) – Investment/Fixed*: restrictions that affect all potential entrants (domestic and foreign) seeking to supply fixed network services.
- *Market Access (MA) – Investment/Mobile*: restrictions that affect all potential entrants (domestic and foreign) seeking to supply cellular mobile services.
- *National Treatment (NT) – Investment*: restrictions that discriminate against foreign investors or foreign-controlled telecommunications enterprises.

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<sup>10</sup> There are minor differences in methodology between the 2003 and 2006 studies. *Ex post* notification requirements for statistical and other purposes are treated as a restriction in the former but not the latter. Also, the weight assigned to partial state ownership is lower in the 2006 study.

<sup>11</sup> This is from Koyama and Golub (2006), p. 14. The restrictiveness scores for state ownership are: state monopoly, 1.0; privatization under way, 0.6; 90% or more state ownership, 0.4; 75% to 90% state ownership, 0.2; majority state ownership, 0.1.

<sup>12</sup> The 13 non-member countries are: Argentina, Brazil, Chile, Israel, Estonia, Latvia, Lithuania, Romania, Slovenia, China, India, Russia and South Africa.

Each index is based on a number of indicators, which are combined using weights that reflect a subjective assessment of their relative importance. The index components and weights are described in Figure 4.

**Table 4**                      **Indexes for Measuring FDI Restriction in Telecommunications**

Index	Components	Component Weight within Index
<b>MA – Investment/Fixed</b>	Number of competitors (1 to maximum of 3) in market for fixed services.	3
	Policy towards competition in markets for fixed network services: local, domestic long distance, international data and leased lines. (Score of 1 for each market segment with full competition).	2
	Fraction of incumbent that is privatized (0.0 -1.0)	1
<b>MA – Investment/Mobile</b>	Number of competitors (1 to maximum of 3) in market for mobile services.	3
	Policy towards competition in markets for mobile services (Score of 1 for full competition).	2
	Fraction of incumbent that is privatized (0.0 - 1.0)	1
<b>NT – Investment</b>	Percentage of foreign investment allowed in competitive carriers	

**Source:** Warren (2001a) pp. 77-79.

The weighted average measures constructed from the components in table 4 indicate a country's degree of openness to foreign direct investment. The calculated ratios can be readily transformed into restrictiveness indexes (where maximum the degree of restriction is 100) by the operation:  $100 - R \times 100$ . Warren calculates unweighted average scores across all the indexes (including those applying to trade) to derive overall restrictiveness indicators that can be used to compare the 136 countries in his database.

The separate indexes that go into the construction of the overall restrictiveness index for telecommunications are published by the Australian Government Productivity

Commission.<sup>13</sup> Scores are calculated relative to a maximum score of 1 for both trade and FDI restrictiveness. The FDI scores for the countries of interest are shown in Table 5.

**Table 5** **Australian Productivity Commission**  
**FDI Restrictiveness Index for Telecommunications**

Country	Market Access			NT – Investment	FDI Restrictiveness Index
	<i>Fixed</i>	<i>Mobile</i>	<i>Total</i>		
<b>Australia</b>	.0222	.0222	.0445	.0000	.0445
<b>Canada</b>	.0067	.0333	.0400	.1020	.1420
<b>Finland</b>	.0000	.0000	.0000	.0000	.0000
<b>France</b>	.0250	.0250	.0500	.1600	.2100
<b>Germany</b>	.0247	.0247	.0493	.0000	.0493
<b>Italy</b>	.0851	.0518	.1369	.0000	.1369
<b>Japan</b>	.0218	.0218	.0436	.0000	.0436
<b>South Korea</b>	.0907	.0573	.1480	.1340	.2820
<b>U.K.</b>	.0000	.0000	.0000	.0000	.0000
<b>U.S.</b>	.0000	.0000	.0000	.0000	.0000

**Source:** From data published online by the Australian Government Productivity Commission based on Warren (2001a).

Among the countries in the Table, Canada ranks third in FDI restrictiveness, behind South Korea and France. According to these results, a number of countries (U.S., U.K., and Finland) have virtually no barriers to FDI. Discriminatory barriers are shown to be quite modest, which is partly because Warren's index only takes account of limitations on foreign investment in competitive carriers. Due to data limitations, the measure excludes restrictions on foreign investment in incumbent carriers (as in Australia).

Warren identifies two shortcomings of his approach. First, there is a lack of information on the degree of effective competition within markets. The measures do not shed light on

<sup>13</sup> These are available at: <http://www.pc.gov.au/research/rm/servicesrestriction/index.html>

whether incumbent carriers are abusing their dominant position and thereby reducing the competitive benefits from liberalization. His second and related concern is that the heaviest weighted indicator based on number of carriers makes no allowance for differences in market size. While the presence of three operators is taken to indicate a competitive market, fewer carriers may suffice in a very small market and more carriers may be needed to ensure healthy competition in very large markets.

The limited information incorporated in Warren's measure of discriminatory barriers is another shortcoming. The study does not include the same detail on violations to national treatment as in the reports by Hardin and Holmes and Golub. In addition, with the rapid changes that have taken place in the telecommunications sector, the 1998 ITU Report on which the Australian restrictiveness index is based is now out of date. The restrictiveness indexes made available on the Australian government website and widely used in studies of trade and investment barriers do not reflect the current situation within world telecommunications markets.

#### **IV. A New Measure of FDI Barriers in Telecommunications**

In this section, we seek to address the shortcomings in previous measures of FDI barriers in telecommunications. New indicators are developed modeled on Warren's approach but incorporating the following changes:

- A variety of market and policy indicators are assessed to gain an improved picture of competition and barriers to entry within telecommunications markets.
- Discrimination against foreign investors and foreign enterprises is measured using a broad set of indicators (as in Golub and Hardin and Holmes).
- A measure of horizontal investment restrictions applying to all investors is added to satisfy those who are looking for a more comprehensive measure that includes the various types of formal and informal barriers identified in Table 1.
- The measures are constructed from more recent data from the ITU, the OECD and other sources.

Following Warren, separate indexes were constructed to cover restrictions that affect all potential entrants to the market for fixed network services (MA-Investment/Fixed); all potential entrants to the market for mobile services (MA-Investment/Mobile); and solely foreign enterprises and potential foreign investors in telecommunications. The first two indicators were both based on sub-indexes relating to: (i) entry barriers in telecommunications markets; (ii) policies affecting competition in telecommunications; and (iii) more general impediments to investment in the relevant economy. The latter indicator, which attempts to capture horizontal investment restrictions, is based on reports by the U.S. Trade Representative and World Bank data pertaining to the difficulties of starting a business. The MA- Investment indexes were constructed by calculating the weighted average of these three sub-indexes. As in Warren (2001a), the highest weight (3) was attached to market indicators of impediments in telecommunications markets, the next highest weight (2) to telecom policy indicators, and the lowest weight (1) to less proximate indicators relating here to the general investment environment. The measures were constructed using the data in the Appendix, which pertain approximately to the period 2003-2006 (although in few cases, less recent information was utilized). More specifically, the three main indexes were constructed as follows:

##### **A. MA-Investment/Fixed**

###### **1. Entry/Competition Indicators (*weight: 3*)**

This indicator is the average of two measures:

- Access line market share of new entrants (*Table A1*)
- Long distance market share of new entrants (*Table A2*)

In each case, performance relative to the leading country was calculated and the results were then inverted so that leading country had a score of 0 and impediments in other countries ranged upwards to a maximum of 100.

## 2. Telecom Policy Indicators (*weight: 2*)

This indicator is the average of four measures:

- Policy towards competition (*Table A4*)

As in Warren (2001a), the index was constructed from ITU data on market liberalization in the five sectors that form the core of fixed network services: local, domestic, long distance, international, data and leased lines. Scores are 0 for full competition; 0.5 for partial competition; and 1 for a monopoly. The total score for each country was transformed into an index.

- Carrier Number Portability and Pre-selection (*Table A5*)

An initial score of 0.5 is given for local number portability. Carrier pre-selection scores are 0.25 for long distance and international; and 0.25 for local. Index is: 1 minus initial score times 100.

- Policy/Regulatory Weakness (*Tables A12 and A13*)

In those countries where concerns about the market power of the incumbent reflect regulatory weaknesses a score of 0.25 is given. Where there is concern about a lack of transparency in rule-making and regulation (i.e. Korea), 0.25 has been added to the score. An additional 0.25 points have been given where inadequacies in takeover law have been identified (i.e. Germany). The total score for each country was transformed into an index.

- Local Loop Unbundling (*Table A6*)

The initial score is calculated by assessing the degree of unbundling relative to the country with the highest unbundling ratio. For example, Italy's degree of unbundling relative to the leading country, Japan, is .169. The index is 1 minus this score times 100.

## 3. General Impediments (*weight: 1*)

This indicator is the average of three measures:

- Government Ownership of Incumbents (*Table A8*)

The index reports the degree of government ownership of the main fixed-line operator. No points are given for government participation in regional/local incumbents.

- Difficulty of Starting a Business (*Table A9*)

The index is based on the country's overall ranking in the World Bank's measure for difficulty of starting a business. The score was calculated as follows:

<b>World Bank Ranking</b>	<b>Index No.</b>
1-5	0
6-20	25
21-50	50
51-75	75
76+	100



- Problematic Corporate and/or Labour Market Rules/Practices (*Table A13*)

A score of .50 is provided where corporate (or institutional) rules and practices discourage mergers and takeovers. Where labour market rules and conditions hinder operations, a score of 0.25 is provided. The resulting scores are multiplied by 100 to obtain the index number for each country.

## **B. MA-Investment/Mobile**

### **1. Entry/Competition Indicator** (*weight: 3*)

This indicator was constructed from data on the market share of the top 2 firms in the cellular mobile market (*Table A3*). The market share data were converted into scores ranging to 100 and these were transformed into index numbers based on an index of 0 for the country in which the top 2 firms have the lowest market share.

### **2. Telecom Policy Indicators** (*weight: 2*)

This indicator is the average of three measures:

- Policy towards competition (*Table A4*)

The index is based on ITU data on the degree of market liberalization in the mobile service market. As above, scores are 0 for full competition; 0.5 for partial competition; and 1 for a monopoly. The score for each country was calculated as an index.

- Carrier Number Portability and Pre-selection (*Table A5*)

An initial score of 0.5 is given for mobile number portability. Another 0.5 is given if pre-selection for fixed to mobile calls has been implemented. Index is: 1 minus initial score times 100.

- Policy/Regulatory Weakness

The index is the same as above for MA-Investment/Fixed.

### **3. General Impediments** (*weight: 1*)

This index is the same as calculated for MA- Investment/Fixed.

## **C. NT Investment**

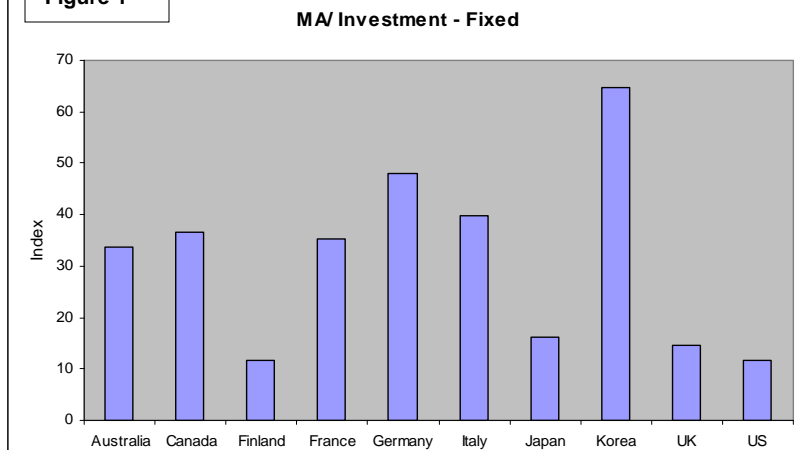
This index, which is mainly based on Hardin and Holmes (1997), is described in Table 6. One departure from this earlier study is that, following the suggestion in Golub (2003), the scores for “screening and approval” have been slightly raised. In addition, two “other impediments” that have been singled out as a concern for foreign telecom firms have been included in the list. Scores were calculated using the information in Tables A10, A11, A12 and A13.

**Table 6 NT Investment: Coefficients on FDI Restrictions***(Maximum is 1.0)*

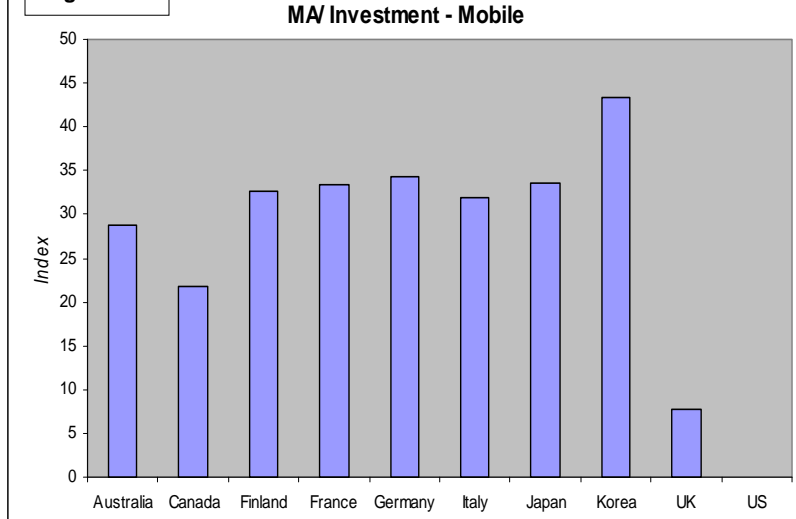
Type Of Restriction	Scores
<b><i>Foreign equity Limits on all firms</i></b>	
No foreign equity allowed	1
0-49% foreign equity allowed	0.5
50-99% foreign equity allowed	0.25
<b><i>Foreign equity Limits on existing firms</i></b>	
No foreign equity allowed	0.5
0-49% foreign equity allowed	0.25
50-99% foreign equity allowed	0.125
<b><i>Screening and Approval</i></b>	
Investor required to demonstrate net economic benefits	0.2
Approval unless contrary to national interest	0.1
Notification (pre or post)	0.05
<b><i>Control and management restrictions</i></b>	
All firms	0.2
Existing firms	0.1
<b><i>Other Impediments</i></b>	
Corporate practices discouraging outside investment	0.2
Development and promotion of homegrown standards	0.2

**Source:** Adapted from Hardin and Holmes (1997).

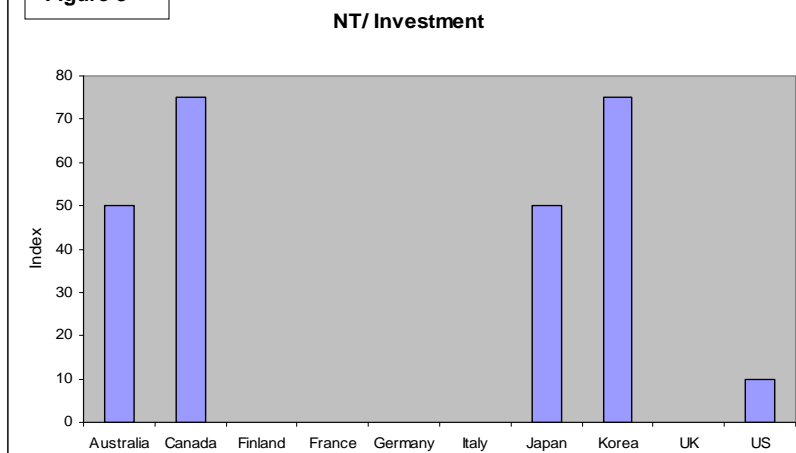
The resulting indexes are displayed in Figures 1, 2 and 3. In all three charts, the U.S. and U.K. emerge as the countries with the lowest barriers and Korea stands out because of its comparatively high barriers to FDI. Canada doesn't rank badly in terms of market access, but its discriminatory barriers are above those of all other countries, except Korea.

**Figure 1**

Along with the U.K. and the U.S., Finland and Japan benefit from significant competition in voice telephone services. Japan has been particularly active in promoting competition through local loop unbundling. On the other hand, difficulties in addressing the market power of incumbent carriers have contributed to higher barriers in Australia, France and Germany. The policy environment in some countries (Australia, Canada, Germany and Korea) has also been affected by the absence of pre-selection for local calls.

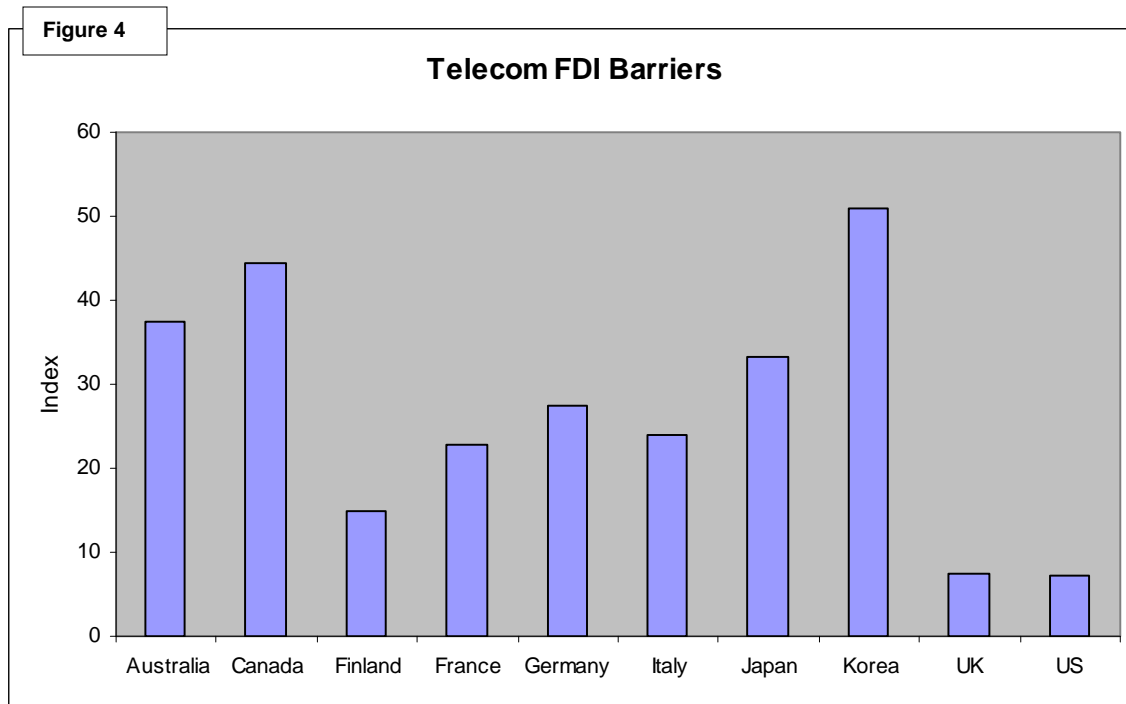
**Figure 2**

While competition in the mobile services market is most robust in the U.S. and U.K, Canada's performance compares favourably with Australia and the EU countries. Policy-related barriers were higher due to Canada's failure to implement wireless number portability by 2006. The lack of fixed-to-mobile pre-selection affected the ratings of Japan and Korea. The scores incorporate impediments due to the market power of incumbents (Australia, France, Germany and Japan), a lack of regulatory transparency (Korea) and problematic labour market (Italy, Korea) and corporate (Japan) regulations and practices.

**Figure 3**

Restrictions targeted at foreign investors and the activities of foreign enterprises are much higher in Canada and Korea than other countries. While the EU countries have eliminated all discriminatory measures, foreign investors continue to face significant impediments in Australia and Japan. The U.S. does not directly limit telecom investment, but conditions imposed as a result of national security reviews have raised costs for foreign firms (Graham and Marchick, 2006).

Combining the three indexes by calculating an unweighted average score for each country results in the index of FDI barriers depicted in Figure 4. FDI barriers in Canada are second-highest among the ten countries. Investment barriers are lowest in the U.K., U.S. and Finland. Canada's investment impediments are much higher than those of the most liberalized countries, but also well above the restrictions in France, Germany, Italy and even Japan.



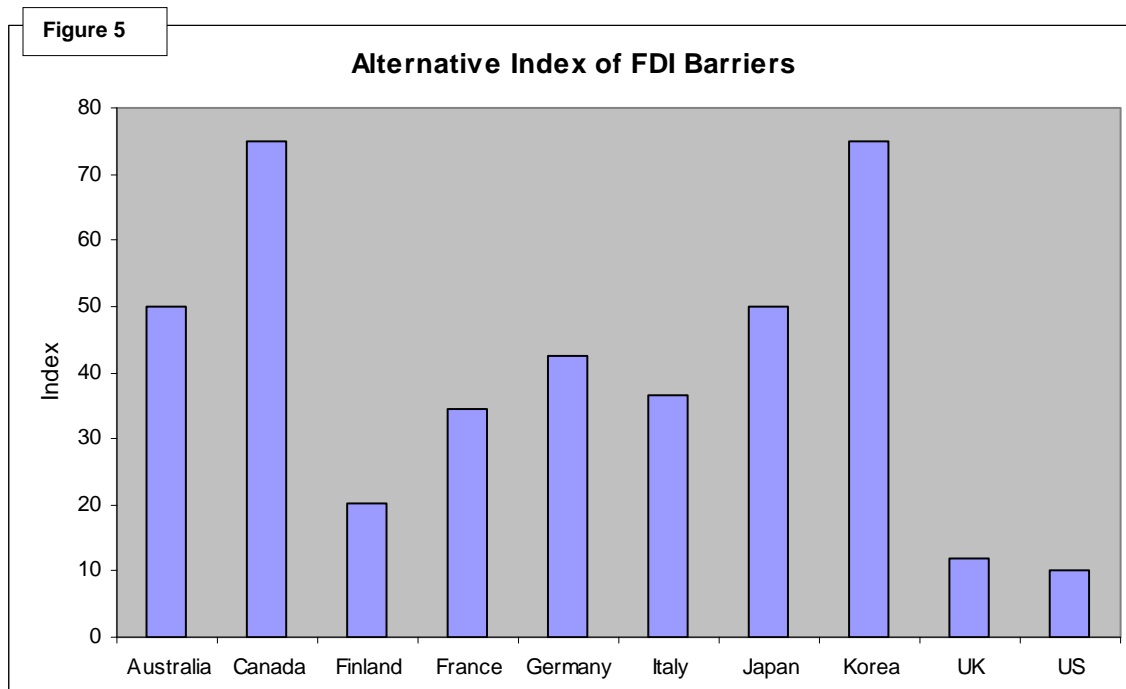
The simple averaging of the three component measures is not the most appropriate approach for constructing an index of telecom FDI barriers. First, it does not allow for the differences in the size and importance of fixed network and mobile services. Mobile services are growing rapidly, but, in most countries (and especially the U.S., U.K and Canada), they are still a less important source of revenue than fixed network services. In the ten countries of interest, mobile services account, on average, for just over 40% of telecommunications revenues.<sup>14</sup>

Second, it may be wrong to suggest, as this approach does, that, low “market access” barriers can mitigate the impact of high “national treatment” barriers and vice versa. Averaging the two indexes is reasonable if the effect of market access and national treatment restrictions is to impose added costs on investors and given increases in the two indexes represent approximately equivalent cost burdens. But, if a country's stringent foreign ownership controls effectively limit foreign participation in network services, the situation facing potential foreign investors isn't helped by the existence of a competitive market for local, long distance and other fixed network services. Similarly, there is no

<sup>14</sup> This is an unweighted average of the percentages for each country. It is based on 2003 data published in OECD (2005).

compensating benefit from low foreign ownership restrictions, if foreign investment is effectively discouraged by the high entry barriers created by incumbent telecommunications firms.<sup>15</sup> In these situations, the most appropriate measure of FDI barriers may be the most stringent restriction, not the average of the market access and national treatment impediments.

Figure 5 displays the results of an alternative measure that attempts to address these points. Here, the restrictiveness indexes for fixed and mobile services have been combined using weights that reflect their respective average market shares.<sup>16</sup> Then, the FDI measure has been constructed by taking the highest of each country's national treatment index or newly developed market access index.



In this alternative measure, Canada matches Korea in having the highest barriers to FDI in telecommunications. The general story, however, is largely the same as depicted in Figure 4. Australia and Japan again fall into the next group of countries with a somewhat less restrictive environment, and they are followed by France, Germany and Italy. Finland has lower barriers than these other EU countries and, as with the index described in Figure 4, the U.K and U.S. emerge as the countries with the lowest restrictions on inward telecom investment.

These results differ in some respects from the findings of Warren (2001), Golub (2003) and Koyama and Golub (2006). In these studies, Canada and Korea are found to have among the highest telecom FDI barriers within industrialized countries, but they share

<sup>15</sup> In this situation, however, there is the possibility for foreign takeovers of incumbent carriers.

<sup>16</sup> Fixed network services have been weighted by .594 and mobile services by .406.

this distinction with other economies. Of the ten countries in Figure 5, Golub ranks Japan as first in terms of the size of its FDI barriers, Warren ranks Korea first and France second, and Koyama and Golub assign the highest restrictiveness score to Australia. These differences are partly attributable to outdated data used in the earlier studies. Both Japan and France have implemented significant regulatory reforms in recent years that are not reflected in the measures constructed by Warren and Golub. Although there are some significant “general impediments” to investing in Japan, entry barriers in the telecom sector are not high by comparison to other industrialized countries.

The different results are also due to differences in methodology and coverage. Since the two OECD studies focus on discriminatory barriers, their results are most appropriately compared with the NT/Investment indexes in Figure 3. These studies apply slightly different weights to various ownership and operating restrictions than used in the NT/Investment calculations. The main difference, however, is that the OECD measures incorporate the effect of state ownership, although this does not truly constitute a departure from national treatment. This raises the restrictiveness measure for Australia relative to Canada and Korea, the countries whose telecom investment barriers rank second and third in the Koyama and Golub study.

In all studies, the UK and the US emerge as having the lowest barriers to telecom FDI. Our analysis suggests, however, that the barriers are not trivial, as indicated by Warren (Table 5), and, in the U.S., there are some restrictions targeting foreign investors that need to be taken into account.

## V. Conclusions

A comprehensive measure of the restrictions on inward FDI in telecommunications should take account of not only the direct investment barriers incorporated in legislation, but also the barriers to entry erected by incumbent telecom carriers and the corporate and labour market practices that generally discourage investment by non-residents. While there has been a trend towards liberalization and the elimination of investment controls in telecommunications, in many industrial countries, significant informal barriers remain. In particular, regulators have had difficulties developing and enforcing regulations that level the playing field between incumbent telecommunications firms and new foreign and domestic entrants.

In recent efforts to measure FDI barriers in telecommunications, researchers have attempted to compare countries using a weighted average index, in which the weights reflect the relative significance of different restrictions. This approach has been used to measure restrictions that apply solely to foreign investors and it has been applied in the construction of broader measures that take account of both discriminatory barriers and market access restrictions affecting both domestic and foreign entrants. The new indexes developed in this paper build on these latter efforts to more completely measure the restrictions on inward FDI in telecommunications. A variety of market and policy indicators are used to gauge the ease of entry into telecommunications service markets and, in addition, effort is made to take account of the horizontal barriers that confront foreign investors in telecommunications as well as other sectors.

Not surprisingly, since it is one of the few industrial countries that still limit inward FDI in telecommunications, Canada emerges as having one of the most restrictive environments among OECD countries. This result holds for both discriminatory measures and broader measures of the combined formal and informal barriers to telecommunications FDI. In the measures developed for this study, Canada and Korea stand out as having the highest barriers among the ten countries examined, while the U.K., the U.S. and, to a lesser extent, Finland emerge as having the most liberal environments. The general barriers to entry into fixed network and mobile telecom services are not significantly higher in Canada than other industrial countries, but, because of its high discriminatory barriers, Canada ranks at or near the top in the overall measures of FDI restrictions. Canada is second to Korea, if the overall index is developed as an unweighted average of the main sub-indexes. But, if the overall index is constructed to allow for the likelihood that low market access barriers will not mitigate the impact of high discriminatory barriers, then, Canada ties with Korea as having the highest barriers among the ten OECD countries under study.

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## APPENDIX A

**Table A 1: Access Line Market Share of New Entrants, 2003**

	Percentage Of Access Lines
<b>Australia</b>	11
<b>Canada<sup>1</sup></b>	4.8
<b>Finland</b>	n.a
<b>France</b>	n.a
<b>Germany</b>	1.1
<b>Italy</b>	0.1
<b>Japan</b>	n.a
<b>Korea</b>	13.9
<b>United Kingdom</b>	16.9
<b>United States</b>	14.7

**Notes:** <sup>1</sup> 2002 data

**Source:** OECD, *Communications Outlook, 2005*

**Table A 2: Long Distance Market Share  
of New Entrants, 2003**

	<b>National</b> <i>Share of switched minutes, percentage</i>	<b>International</b> <i>Share of minutes of international. traffic, percentage</i>
<b>Australia</b>	35	48.0
<b>Canada</b>	34.1 <sup>1</sup>	50.8 <sup>1</sup>
<b>Finland</b>	62.0 <sup>2</sup>	66.0 <sup>2</sup>
<b>France</b>	38.2	n.a.
<b>Germany</b>	39.8	59.7
<b>Italy</b>	n.a	61.6
<b>Japan</b>	48.0	61.6 <sup>1</sup>
<b>Korea</b>	23.0	60.3
<b>United Kingdom</b>	46.4	64
<b>United States</b>	68.8	67.9 <sup>3</sup>

**Notes:** <sup>1</sup> 2002 data

<sup>2</sup> Data refer to non-incumbents market share for 2004 as estimated by EU based on partial data.

<sup>3</sup> Based on revenue

**Source:** OECD, Communications Outlook, 2005

EU, European Electronic Communications Regulation and Markets, 2005

**Table A 3: Cellular Mobile Competition**

	<b>Market Share, 2003</b>		<b>HHI, 2004</b>
	<i>Leading Firm %</i>	<i>Top 2 Firms %</i>	
<b>Australia</b>	46.6	77.2	
<b>Canada</b>	36.9	65.2	2800 <sup>2</sup>
<b>Finland</b>	51.4	80.1	4632
<b>France</b>	48.8	84.1	
<b>Germany</b>	40.6	78.7	3196
<b>Italy</b>	46.1	82.5	
<b>Japan</b>	53.9	73.5	
<b>Korea</b>	54.4	85.5	
<b>United Kingdom</b>	24.5	48.4	2308
<b>United States</b>	23.6	37.5	2450 <sup>1</sup>

**Notes:** HHI refers to the Herfindahl-Hirschman Index, a popular measure of market concentration. The value of the HHI reflects both the number of competitors and the distribution of their market shares. When a single firm is the sole supplier in the relevant market, the HHI attains its maximum value of 10,000. As the structure of the market becomes more atomistic, the HHI approaches 0.

<sup>1</sup> The U.S. index is the weighted average value of the HHIs for individual "Economic Areas," (EA) with weights based on EA population.

<sup>2</sup> The Canadian index was calculated using national data. The HHI in some of the major provincial markets is well above the national figure. Estimated provincial HHIs for Ontario, Quebec B.C. and Alberta respectively are: 3654; 3749, 4304 and 4872.

**Sources:** Market Share data are from OECD, *Communications Outlook, 2005*.  
HHI numbers for EU countries are from FCC WT Docket No 06-17, which is at:  
[http://www.gsiconsulting.com/pdf/FCCWirelessAnnual%20Report9\\_30\\_05.pdf](http://www.gsiconsulting.com/pdf/FCCWirelessAnnual%20Report9_30_05.pdf)

HHI number for Canada has been calculated from data in CRTC, *Status of Competition in Canadian Telecommunications Markets*, October 2005.

**Table A 4: Policy Environment**

	Local Services	Long Distance	Internat.	Data	Leased Lines	Internet Services	Mobile
<b>Australia</b>	C	C	C	C	C	C	C
<b>Canada</b>	C	C	C	C	C	C	C
<b>Finland<sup>1</sup></b>	C	C	C	C	C	C	P
<b>France</b>	C	C	C	C	C	C	C
<b>Germany</b>	C	C	C	C	C	C	C
<b>Italy</b>	C	C	C	C	C	C	C
<b>Japan</b>	C	C	C	C	C	C	C
<b>Korea</b>	C	C	C	C	C	C	C
<b>United Kingdom</b>	C	C	C	C	P	C	C
<b>United States</b>	C	C	C	C	C	C	C

**Notes:** C= competition, M = monopoly; P = partial competition.  
<sup>1</sup> 2004 data

**Source:** ITU, *Trends in Telecommunications Reform 2006*

**Table A 5: Carrier Number Portability and Carrier Pre-selection**

	<b>Number Portability</b>	<b>Pre-Selection</b>
<b>Australia</b>	Local number and non-geographic number portability available. Mobile number portability available.	Implemented, including fixed to mobile calls, but not available for local calls.
<b>Canada</b>	Local number portability (LNP) implemented in major centres. Incumbent carriers required to implement LNP in smaller centres upon request by competitive local exchange carriers. Portability of toll free numbers implemented. Wireless number portability is to be implemented, with the main carriers required to comply by March 14, 2007.	implemented for long distance and international calls.
<b>Finland</b>	Mobile number portability was introduced in July 2003. Fixed network number portability shall be widened also to nationwide universal access numbers in March 2005.	Implemented for long distance and international calls.
<b>France</b>	Implemented for fixed geographic, non geographic areas and mobile number portability in 2003.	Implemented for long distance and international calls. Carrier selection and pre-selection introduced for fixed to mobile calls from 17 November 2001. From 1 January 2002 carrier selection and pre-selection introduced for local calls.
<b>Germany</b>	Implemented for fixed geographic areas and for non-geographic numbers. Mobile number portability came into effect in November 2002.	Implemented for long distance and international calls and for fixed-mobile calls. Carrier pre-selection has been available since July 2003 and carrier selection (call-by-call) was implemented in April 2003).
<b>Italy</b>	Geographic number portability introduced within the local area only. Non-geographic portability restricted to toll free, shared cost, and premium services. Mobile number portability introduced including porting numbers from 2G to 3G services.	Implemented for all geographic calls.
<b>Japan</b>	Number portability for PSTN and ISDN numbers to be provided from 2001. Geographic portability within the same numbering area is not an obligation but is provided by telecommunication carriers. Mobile number portability has been under	Implemented for all geographic calls in May 2001.

	examination since November 2003 and it was concluded in April 2004 that it should be introduced as early as possible in FY 2006.	
<b>Korea</b>	The decision to adopt number portability was taken in January 2001 for local calls and toll-free services. Since 2003 number portability has been introduced on a step-by-step basis. Seoul had number portability in August 2004. A decision to adopt mobile number portability was taken in February 2002. This is being implemented first for 2G during 2004 and will be completed by January 2005.	Implemented for national long distance.
<b>United Kingdom</b>	Geographic and non-geographic portability implemented including mobile number portability from 1999.	Interim carrier pre-selection using autodiallers was withdrawn at the end of 2001. Switched based pre-selection.
<b>United States</b>	Local number portability and non-geographic portability implemented. Wireless carriers in the largest Metropolitan Statistical Areas were required to implement local number portability from November 2003. This included mobile to mobile and fixed to mobile number portability. In May 2004 wireless carriers were required to implement number portability in smaller markets across the country.	Implemented for all geographic calls.

**Sources:** OECD, Communications Outlook, 2005.  
CRTC Telecom Decision CRTC 2005-72.

**Table A 6: Local Loop Unbundling, 2003**

	<b>Number of Main Lines</b> <i>(000's)</i>	<b>Number of Unbundled Lines</b> <i>(000's)</i>	<b>Unbundled Ratio</b>
<b>Australia</b>	10,965.0	5.0 <sup>1</sup>	.05%
<b>Canada</b>	20,612.0	380.8 <sup>1</sup>	1.9%
<b>Finland</b>	2,567.6	72.3	2.8%
<b>France</b>	33,807.2	273.3	.8%
<b>Germany</b>	54,233.0	1349.8	2.5%
<b>Italy</b>	26,596.0	538.8	2.0%
<b>Japan</b>	60,219.0	7,108.0	11.8
<b>Korea</b>	25,127.6	0.7	.003%
<b>United Kingdom</b>	33,550.0	300.0	.9%
<b>United States</b>	183,042.0	21.3	.01%

**Notes:** <sup>1</sup> Data are for 2002

**Sources:** The number of main lines comes from ITU database.  
The number of unbundled lines comes from OECD, *Communications Outlook, 2005*



**Table A 7: Telecommunications Regulation**

	Interconnection Regulation			Regulator
	<i>Interconnection Charges<sup>1</sup></i>	<i>Local Loop Unbundling</i>	<i>Dispute Resolution</i>	
<b>Australia</b>	C	C	C	Australian Communications and Media Authority; Australian Competition and Consumer Commission
<b>Canada</b>	R	R	R	CRTC
<b>Finland</b>	R	R	R	Finnish Communications Regulatory Commission
<b>France</b>	R	R	R	Autorité de Régulation des Communications Electroniques et des Postes
<b>Germany</b>	R	R	R	Regulatory Authority for Telecommunications and Posts
<b>Italy</b>	R	R	R	Autorità per la Garanzie nelle Comunicazioni
<b>Japan</b>	M	M	R	Ministry of Internal Affairs and Communications; Telecommunications Business Dispute Settlement Commission
<b>Korea</b>	M,R	M	R	Ministry of Information and Communication; Korea Communications Commission
<b>United Kingdom</b>	R	R	R	Office of Communications
<b>United States</b>	R, State Public Utilities Commission	R	R, State Public Utilities Commission	Federal Communications Commission

**Notes:** M = Ministry; R = Regulator; C = Competition Authority.

<sup>1</sup> Authority responsible for authorization of interconnection charges of operators with significant market power.

**Sources:** OECD, Working Party on Telecommunication and Information Service Policies, *Telecommunication Regulatory Institutional Structures and Responsibilities*, 2006.

**Table A 8: Status of Main Fixed-line Operators**

	<b>Operator</b>	<b>Status</b>
<b>Australia</b>	Telstra	State ownership: 50.1%
<b>Canada</b>	Bell Canada Telus MTS Aliant SaskTel	Privatized Privatized Privatized Privatized Prov. of Saskatchewan: 100%
<b>Finland</b>	TeliaSonera AB  ElisaCom Oy	Finnish gov.: 13.7%; Swedish gov.: 45.3%  City of Helsinki: 0.68% Finnish gov.: 0.65%
<b>France</b>	France Télécom	State ownership: 34.9%
<b>Germany</b>	01051 Telecom Arcor AG Colt Telecom Deutsche Telekom	Privatized Privatized Privatized State ownership: 17%
<b>Italy</b>	Telecom Italia	Privatized
<b>Japan</b>	NTT East Corp NTT West Corp	Privatized Privatized
<b>Korea</b>	Korea Telecom	Privatized
<b>United Kingdom</b>	British Telecommunications  Kingston Communications	Privatized  Kingston-upon-Hull City Council: 30.6%
<b>United States</b>	All fixed-line operators	Privatized

*Sources:* ITU database and company websites.

**Table A 9: Impediments to Starting a Business**

	<b>Procedures to Start up and Operate a Commercial Enterprise</b>		<b>Rank in World Bank Database<sup>3</sup></b>
	<i>No. of Days<sup>2</sup></i>	<i>Procedures<sup>1</sup></i>	
<b>Australia</b>	2	2	2
<b>Canada</b>	2	3	1
<b>Finland</b>	3	14	18
<b>France</b>	7	8	12
<b>Germany</b>	9	24	66
<b>Italy</b>	9	13	52
<b>Japan</b>	8	23	18
<b>Korea</b>	12	22	116
<b>United Kingdom</b>	6	18	9
<b>United States</b>	5	5	3

**Notes:** The information is based on limited liability companies with up to 50 employees within a month of commencing operation that are located in the country's most populous city.

<sup>1</sup> Procedures include both pre- and post-incorporation procedures required to operate a business.

<sup>2</sup> Time refers to the median duration that incorporation lawyers report is necessary to complete a procedure.

<sup>3</sup> The rank is based on World Bank overall rankings for "starting a business," which also takes account of the cost of each procedure and the minimum capital required to start a business calculated as a percentage of income per capita.

**Source:** The World Bank, Doing Business. <http://www.doingbusiness.org/>

**Table A 10: Foreign Ownership Restrictions in the Telecommunications Sector**

COUNTRY	RESTRICTIONS
<b>Australia</b>	<ul style="list-style-type: none"> <li>Aggregate foreign ownership of Telstra (which was partially privatized through the sale of 49.9% of its equity) is restricted to 35% of the privatized equity. Individual foreign investors may hold no more than 5% of the privatized equity. Telestra's chair and the majority of its directors must be Australian citizens and its head office, base of operations and place of incorporation must remain in Australia.</li> <li>Prior approval is required for foreign involvement in the establishment of new entrants or foreign investment in existing businesses in the telecommunications sector.</li> </ul>
<b>Canada</b>	<ul style="list-style-type: none"> <li>For facilities-based carriers, holdings by non-Canadians are limited to 20% of the voting shares and 80% of the board must be Canadian citizens. Foreigners may own no more than 33.3% of the voting shares of an investment company holding shares in such carriers. A foreign company may accumulate a 46.7% equity share in a Canadian telecommunications company by directly owning 20% and acquiring a 33.3% stake in voting shares of the company that holds the remaining 80% voting shares, provided the foreign company does not exercise control.</li> </ul>
<b>Finland</b>	No foreign ownership restrictions
<b>France</b>	No foreign ownership restrictions
<b>Germany</b>	No foreign ownership restrictions
<b>Italy</b>	No foreign ownership restrictions
<b>Japan</b>	<ul style="list-style-type: none"> <li>There are nor restrictions on foreign individuals and corporations investing in the incumbent telecommunications operators in Japan. However, foreign capital participation, direct and indirect, in NTT Corp. that holds all the shares of Nippon Telegraph and Telephone (NTT) East Corp. and NTT West Corp.. is restricted to less than one-third.</li> <li>Prior notification is required by non-residents investing in facilities-based carriers.</li> </ul>
<b>South Korea</b>	<ul style="list-style-type: none"> <li>Foreign governments, foreigners or domestic corporations with over 15% of their stock held by a foreign government or foreigners cannot hold more than 49% of the shares issued by a facilities-based operator in Korea.</li> </ul>
<b>United Kingdom</b>	No foreign ownership restrictions
<b>United Sates</b>	<ul style="list-style-type: none"> <li>The Telecommunications Act allows the FCC to deny a wireless license to a corporation with indirect foreign ownership exceeding 25%, if such ownership is determined not to be in the public interest.</li> <li>Foreigners in aggregate may not hold more than 20% ownership in the Communications Satellite Corporation.</li> </ul>

**Sources:** ITU website and OECD, *Communications Outlook 2005*.

Table A 11:

## General Foreign Investment Requirements

Country	Requirements
<b>Australia</b>	<ul style="list-style-type: none"> <li>Prior approval is required for: (1) acquisitions of substantial interests in existing Australian businesses, the value of whose assets exceeds A\$50 million; (2) proposals to establish new businesses involving a total investment of A\$10 million or more; and (3) takeovers of offshore companies whose Australian subsidiaries or assets exceed A\$50 million.<sup>1</sup> The Foreign Investment Review Board (FIRB) under the Australian Government Department of Treasury examines investment proposals and advises the Government on whether these are consistent with government policy.</li> </ul>
<b>Canada</b>	<ul style="list-style-type: none"> <li>The <i>Investment Canada Act</i> requires the review of: (1) acquisition of control of a Canadian business with assets of C\$265 million or more (for 2006) by investors in WTO countries; and (2) the acquisition of a Canadian business with assets at a lower threshold (\$5 million for direct acquisitions and \$50 million for indirect acquisitions) in the case of certain sensitive sectors (i.e. uranium production, certain financial services, transportation services), or where both the buyer and seller are not from countries or entities that are members of the WTO.</li> <li>Notification is required for foreign acquisitions of Canadian businesses with assets below the threshold and for greenfield investment that are not subject to review.</li> <li>Companies that are structured as mutual fund trusts must operate "primarily for the benefit" of Canadians, which has been taken to mean that no more than 49% of the trust's units may be held by non-residents of Canada.</li> <li>The Canada Business Corporations Act requires, for most federally-incorporated corporations, that 25% of directors be resident Canadians.</li> </ul>
<b>Finland</b>	<ul style="list-style-type: none"> <li>As a general rule, 100% foreign ownership is recognized in most sectors and there is no discrimination against foreign companies in favor of local companies. Non-European Economic Area investors must apply for a license to invest in a number of monitored industries, including national security-related sectors, banking and insurance, mining, travel agencies, and restaurants.</li> </ul>
<b>France</b>	<ul style="list-style-type: none"> <li>There are no screening or prior approval requirements for foreign investment, except in a number of sensitive sectors (defense, public safety, nuclear energy, etc.). In addition, France applies reciprocity requirements to non-EU investments in a number of sectors.</li> </ul>
<b>Germany</b>	<ul style="list-style-type: none"> <li>Notification is only required for foreign investment that leads to over 25% ownership of firms engaged in the production of armaments and cryptology technology used for government communication.</li> </ul>
<b>Italy</b>	<ul style="list-style-type: none"> <li>There are no notification requirements and no prohibitions on foreign investment, except in certain defense-related industries such as aircraft manufacturing. However, the government can veto mergers and acquisitions involving foreign investors for "reasons essential to the national economy" or if the foreign investor's home country applies restrictions against Italian investors.</li> </ul>

<b>Japan</b>	<ul style="list-style-type: none"> <li>Under the <i>Foreign Exchange and Foreign Trade Law</i>, foreigners establishing a subsidiary or acquiring a Japanese company or 10% or more of the shares of a listed company must provide notification, generally after the transaction. If the investment is seen to raise security issues or other concerns, an inquiry will be launched.</li> </ul>
<b>South Korea</b>	<ul style="list-style-type: none"> <li>Korea uses a negative list system, which means that a business is open to foreign investment unless it is otherwise restricted. The Korean government has gradually liberalized its regime and 1029 of 1129 classified sectors are now fully open to foreign investment. In addition to telecommunications, foreign ownership limits exist for sectors such as fishing, cattle farming energy transmission and air transport (below 50%); and cable and satellite broadcasting (below 33%).</li> <li>Foreign investors intending to acquire a Korean company must file a report with the government.</li> </ul>
<b>United Kingdom</b>	<ul style="list-style-type: none"> <li>The government can block foreign acquisitions that are determined not to be in the public interest (under the Industry Act 1975) and force divestments, but generally do not exercise any discriminatory controls over foreign takeovers.</li> <li>Limits exist in some privatized companies on the amount of voting shares an individual or group may own</li> </ul>
<b>United States</b>	<ul style="list-style-type: none"> <li>The U.S. has no screening process for foreign direct investment. Exceptions to non-discriminatory treatment have been made primarily to protect the national interest and have been applied to sectors such as air and water transport, nuclear energy and telecommunications. To receive financial assistance under some programs (such as the Advanced Technology program) companies must invest in R&amp;D and manufacturing in the U.S. and be incorporated in the U.S. or a country that affords comparable opportunities to U.S. companies.</li> <li>Under the Exon-Florio Amendment of the Omnibus Trade Act of 1988, the President can suspend or prohibit foreign acquisitions, mergers and takeovers in the U.S. on national security grounds. The Committee on Foreign Investments in the United States (CFIUS) reviews notified transactions and may initiate a review where there has been no notification during a three-year period after the completion of the transaction.</li> </ul>

**Note:** <sup>1</sup> All new Greenfield U.S. investments in Australia are exempted from review. The threshold for screening most U.S. acquisitions of Australian companies was raised from A\$50 million to A\$800 million.

**Sources:** Country websites; U.S. Trade Representative, *2006 National Trade Estimate Report on Foreign Trade Barriers*; APEC Committee on Trade and Investment, *Guide to the Investment Regimes of the APEC Member Economies*, 2003.

**Table A 12: Informal Barriers to FDI in Telecommunications**

	Identified Barriers	
	Policy/Regulatory Weakness	Discriminatory Policy/Practice
<b>Australia</b>	<p>Telstra has tried to minimize the scope of safeguards intended to ensure that competitors have fair access to key parts of its network.</p> <p>Telstra applies a high, nationally averaged rate, on local loop thereby making it more difficult for new entrants to compete against the firm in local voice and data markets.</p>	
<b>Canada</b>		<p>Foreign investment restrictions, which prevent foreign companies from operating much of their own telecommunications facilities, also deny foreign providers the regulatory-related advantages available to facilities-based carriers (e.g. access to unbundled network elements).</p>
<b>France</b>	<p>France Télécom's high rates to competitors for connection to its network have been a concern. In addition, the authorities have voiced concerns about FT's predatory pricing of its retail broadband services.</p>	
<b>Germany</b>	<p>New entrants have faced difficulty competing against Deutsche Telekom, which has substantial market power and is a near-monopoly in local loop and broadband connections. Competitive carriers have long sought access to combinations of high-capacity trunk lines and lower-capacity end-user links.</p>	
<b>Japan</b>	<p>Japanese laws do not prevent NTT regional carriers from imposing high and onerous conditions on their competitors for interconnection.</p> <p>There are concerns that Japan's universal fund mechanism is not</p>	

	<p>"competitively neutral" and favours NTT regional carriers in high-cost areas.</p> <p>New entrants to Japan's telecommunications market have complained about the high access rates charged by NTT DocMo, the dominant wireless service provider. To ensure a level playing field for new entrants, reforms are also needed in other areas (e.g. allowing "roaming" on incumbent networks at reasonable rates, ensuring sufficient access to towers and tower sites).</p>	
<b>Korea</b>	A lack of transparency in rule-making and regulation has been cited as a problem by foreign investors in the telecommunications sector.	
<b>U.S.</b>		<p>The European Commission finds that, despite gradual improvements, foreign-owned firms have faced access barriers, particularly in the satellite sector (due to lengthy proceedings, conditionality of market access and <i>de facto</i> reciprocity-based procedures) and the mobile sector (e.g. investment restrictions, lengthy and burdensome proceedings and protectionist attitudes in certain Congressional circles).</p>

**Sources:** U.S. Trade Representative, *2006 National Trade Estimate Report on Foreign Trade Barriers*;  
U.S. Trade Representative, "Results of the 2006 Section 1377 Review of Telecommunications Trade Agreements."

European Commission, *United States Barriers to Trade and Investment: report for 2005*.



**Table A 13: Informal Barriers to FDI in Some OECD Countries**

Country	Barrier		
	Policy/Regulatory Weakness	Problematic Corp. or Labour Mkt. Practice	Discriminatory Policy/Practice
<b>Germany</b>	Under Germany's takeover law, companies can take action to ward off hostile takeovers, following the approval of stockholders or the supervisory board.		
<b>Italy</b>		In analyses and surveys, Italy's excessive bureaucracy, inadequate infrastructure and rigid labor market are frequently cited as disincentives for foreign investment.	
<b>Japan</b>		Japan's low ranking among OECD countries in terms of inward direct investment as a proportion of output is partly the result of a number of problematic corporate practices and market rules, including: insufficient financial disclosure practices; cross-holding of shares among companies belonging to the same business grouping (keiretsu); the low proportion of publicly traded common stock relative to total capital in many companies; and exclusive buyer-supplier networks and alliances among some keiretsu, which limit competition from new entrants. Tax rules limit the use of modern merger techniques.	Foreign acquisition of Japanese firms is inhibited by conservative attitudes towards outside investors. The scarcity of qualified lawyers, auditors and accountants also discourages cross-border mergers and acquisitions.
<b>Korea</b>		Labour market inflexibility, labour-management disputes, and insufficient regulatory transparency hinder investment.	The Korean government is alleged to encourage the development and selection of homegrown "Korea-only" technology standards.

**Sources:** U.S. Trade Representative, 2006 National Trade Estimate Report on Foreign Trade Barriers; APEC Committee on Trade and Investment; Heritage Foundation/Wall Street Journal, 2006. Index of Economic Freedom.