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Non-Tariff Barriers and the Telecommunications Sector

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Sherry M Stephenson

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Abstract

This paper discusses the nature, importance, and measurement of non-tariff barriers (NTBs) in services trade with particular reference to telecommunications services. It is shown that although more effectively addressed for the telecom sector at the multilateral level than for other service sectors, NTBs are still widespread and would appear to have a large potential for restricting trade in services. The paper reviews the scope and classification of non-tariff barriers to services trade and sets out an alternative typology for their classification, highlighting the fact that NTBs may be either government-imposed, may result from non-competitive market structures, or from the absence of appropriate regulation. The latter is shown to constitute one of the most important sources of NTBs in network industries, such as telecommunications services. Attempts by the relevant literature to measure NTBs in telecommunications are summarized and their usefulness in identifying “appropriate” policy mixes is commented. Lastly, the paper probes the question of whether existing multilateral and regional instruments and agreements are adequate to deal with the non-tariff phenomenon in the telecom sector in its several dimensions.

Zusammenfassung

Dieses Papier behandelt das Wesen, die Bedeutung und die Messung nicht-tarifärer Handelsbeschränkungen (NTBs) im Dienstleistungshandel, unter besonderer Berücksichtigung der Telekommunikationsdienstleistungen. Es zeigt, dass NTBs, obwohl sie in der Telekommunikation auf der multilateralen Ebene wirksamer angegangen wurden als in anderen Dienstleistungsbereichen, noch immer weit verbreitet sind und den Dienstleistungshandel potentiell stark beeinträchtigen. Das Papier beschreibt die Erscheinungsformen und die Klassifikation nicht-tarifärer Handelsschranken im Dienstleistungshandel. Es stellt ein alternatives Klassifikationsschema vor, das von der Beobachtung ausgeht, dass NTBs entweder von Regierungen eingeführt sein können, oder auf monopolistischen Marktstrukturen basieren, oder Ergebnis unzureichender Regulierungen sind. Gezeigt wird, dass der letztgenannte Tatbestand eine der wichtigsten Quellen von NTBs in Netzwerkindustrien, wie der Telekommunikation, ist. Das Papier gibt einen Überblick über die Literatur zur Messung nicht-tarifärer Handelsschranken in der Telekommunikation und kommentiert ihre Brauchbarkeit für die Entwicklung

geeigneter „policy mixes“. Schließlich wird geprüft, ob die existierenden multilateralen und regionalen Instrumente und Vereinbarungen ausreichend sind, um mit dem vielschichtigen Problem der nicht-tarifären Hemmnisse im Telekommunikationssektor umzugehen.

JEL Classification: F02, F13, L96

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I. Introduction

Given the nature of services, non-tariff barriers are extremely important, as they constitute the overwhelming majority of restrictions on the ability of foreign service suppliers to provide services to third markets. Such barriers are formally present in national economies in the form of laws, regulations, administrative decrees, and other legal instruments that affect the ability of a service supplier to carry out a given transaction. However, they are also present informally in national economies in the form of anti-competitive behavior of firms that serves to restrict competition through monopoly practices and other restrictive practices. This reality makes non-tariff barriers in the services area not only vital to understand and try to measure, but also increases the difficulty of doing so through the complexity of the measures involved.

Over the past few years a considerable amount of analysis has been undertaken to examine the nature of non-tariff barriers in services, but very little work has been directed at attempting to measure quantitatively the extent and the impact of such barriers. In fact, a comprehensive typology of non-tariff barriers in the services area, similar to those that exist for goods, has not yet been developed. This is partly because of the broad and complex nature of the non-tariff barriers in the services area that overlap with policies and practices traditionally assumed to be within the purview of competition policy and law. An additional complicating factor is that for those non-tariff measures that may be canvassed in the services area (through the schedules of the WTO General Agreement on Trade in Services), it is difficult to distinguish if these are applied in a discriminatory or in a nondiscriminatory manner.

The purpose of the present study is to discuss the nature, importance, and measurement of non-tariff barriers in the service area with particular reference to the sector of telecommunications. It briefly reviews the problem of non-tariff barriers in services and the ways in which these have been classified by trade policy analysts, as well as for the purpose of services negotiations. It then discusses the market structure in the telecom sector and summarizes recent efforts to quantify non-tariff barriers affecting telecommunications. Lastly, it probes the question of whether existing multilateral and regional instruments and agreements are adequate to deal with the non-tariff phenomenon in the telecom sector in its several dimensions.

II. Scope of Non-Tariff Barriers to Trade in Services

A defining characteristic of services is that, for most services, production and consumption must be simultaneous, since they cannot be produced and then stored for later consumption. This requires that producers and consumers interact either directly or via a communications medium for the service to be rendered. For many services, however, such interaction is not technically feasible, unless some proximity between producer and consumer is present. In an international trade context, this implies that either the service producer or consumer must change location for the transaction to go forward, requiring that not only cross-border transactions, but also foreign direct investment and movement of labor be allowed as forms of delivery.

International services transactions have been defined to encompass four modes of supply or delivery (under the WTO GATS terminology), including the three just mentioned as well as consumption abroad. Any policy that impedes services producers and consumers interacting through any of these four modes is considered an impediment to trade. The vast majority of these impediments come in the form of non-tariff barriers (NTBs) inside national borders, reflecting the difficulties inherent in imposing tariffs directly upon either the service consumer or the service supplier as they interact across borders. In services industries, where products are usually intangible and non-storable, it is the providers of services rather than services *per se* that are usually the object of regulation and/or other forms of discriminatory actions.

A key problem is that the range of NTBs that may be applied to services transactions is potentially infinite, especially if both border measures and internal measures are to be taken into account. Furthermore, the range of NTBs may continue to expand as governments continue to develop ingeniously new measures to shield domestic service producers from foreign competition.

Capturing the vast array of non-tariff barriers to services trade in a single operational definition is virtually impossible. These barriers may result from either explicit government action or from an imperfect market structure not adequately addressed by government regulation. In addition, while the right to regulate services is explicitly set out in the WTO GATS, and is a basic tenant to which all governments hold strongly, this is nonetheless an area subject at times to differing interpretations. In fact, a major source of controversy and ambiguity among governments in the non-tariff area is the large degree of difference in interpretation over what constitutes a legitimate government policy, and what constitutes a disguised trade restriction or non-tariff barrier. Many potential non-tariff measures are in fact legitimate trade policy

instruments (e.g., regulatory measures taken to protect the health of consumers and the environment). However, when these measures are applied with the intention to restrict or impede trade unnecessarily in order to protect domestic producers, they then pass into the category of non-tariff barriers. In theory it is only when a dispute resolution panel has confirmed that a contested measure acts to restrict trade that it should be included as a non-tariff barrier. To that point, the measure remains a legitimate — although possibly disputed — trade policy, and its inclusion in a non-tariff measure database would please one party but annoy the other.¹

The conditions under which regulations may be carried out in the most transparent and least trade-restrictive manner possible are still being defined and negotiated at the multilateral level. In the area of competition policy and law to counter anti-competitive private sector practices, there is no attempt being made to define multilaterally-agreed rules (other than what has been done in the telecommunications sector), and thus such laws and practices vary at the national level.

Non-tariff barriers are quite varied in their nature, their scope, and their impact. Some non-tariff barriers are horizontal in nature and affect all service sectors in an economy, being applied across the board. Other non-tariff barriers can be very specific and apply to particular services or industries, such as various forms of quotas or quantitative restrictions on particular types of transactions. Many non-tariff measures in the services area are qualitative rather than quantitative in nature, such as the application of competitiveness or economic needs tests, or equivalency determinations for foreign diplomas and/or qualifications of professional service providers. Some NTBs may be constituted by voluntary export restraints or trade-reducing measures, while others may include trade-expanding measures, such as export subsidies. Government procurement practices, carried out arbitrarily or in a discriminatory and non-transparent manner, likewise can constitute NTBs in the services area, as in the goods area. This is also the case for standards and technical regulations. Even exchange-rate, monetary, and fiscal policies may be considered to act as non-tariff barriers when they distort trade. As mentioned above, an additional complicating factor is that some non-tariff barriers are present in the form of nondiscriminatory regulations, equally applied to all service providers, while other regulations are applied in a discriminatory manner against foreign service suppliers, to impede their access to national markets.

1 This controversy has been alive for many years with the price-based measures taken to counter anti-dumping and subsidy practices for trade in goods which are legitimate trade policy instruments but which many governments feel are used with protectionist intent.

III. Typologies of Non-Tariff Barriers to Trade in Services

The most common method to categorize non-tariff barriers affecting services trade is the way that this has been done at the multilateral level in the context of the General Agreement on Trade in Services (GATS), that is as either market access restrictions or derogations from national treatment. Part III of the GATS explicitly introduces these concepts and sets them out as the basis for the scheduling of binding national commitments on services trade. Article XVI (1) obliges WTO members to grant market access to scheduled service sub-sectors, while Article XVI (2):(a)-(f) contains a list of finite measures considered to be limitations on market access.² Article XVII (1) defines national treatment as treatment no less favorable than that accorded to like domestic services and service providers, subject to the limitations and conditions set out in the national schedules of commitments. It does not, however, set out any typology of measures affecting services trade that would fall into this category.

As *Warren* and *Findlay* point out, the provisions on market access and national treatment are broader under the GATS than they are under the GATT.³ This is because the GATS provision on national treatment encompasses all policies that might discriminate between foreign and domestic service suppliers (both internal and border policies), whereas the GATT national treatment provision only extends to matters of domestic taxation and regulation. This means effectively that national treatment under the GATS encompasses both national treatment and market access as they are normally defined for trade in goods. The GATS provision on market access also goes further than traditional notions to encompass all policies that restrict access to a market.

The lack of specificity in the definition of the national treatment principle has led to confusion in the scheduling techniques and in the categorization of specific policies into limitations with respect to either market access or national treatment since the discriminatory elements of such measures are mixed together with the nondiscriminatory elements. The result is that it is currently very difficult to capture nondiscriminatory policies that have the effect of protecting local service suppliers. *Feketekuty* has suggested that all measures containing discriminatory elements be

2 These measures include the following: (i) limitations on the number of service suppliers; (ii) limitations on the total value of service transactions or assets; (iii) limitations on the total number of service operations; (iii) limitations on the total number of natural persons that may be employed in a particular service sector; (v) measures which restrict or require specific types of legal entity or joint venture; and (vi) limitations on the participation of foreign capital.

3 *T Warren* and *C Findlay*, 'How Significant Are the Barriers? Measuring Impediments to Trade in Services,' paper presented at the World Services Congress, Atlanta, November 1999.

scheduled under the national treatment category, leaving the residual nondiscriminatory regulatory measures that limit service transactions or output to be scheduled under the market access category.⁴ *Warren and Findlay* would make this distinction even more explicit in the following manner:

- market access would mean nondiscrimination between incumbents in a particular market and possible entrants (domestic or foreign). For example, a legislated monopoly would be considered a market access limitation; while
- national treatment would mean nondiscrimination between domestic and foreign service suppliers.⁵

An alternative approach to categorize non-tariff barriers to trade in services has been suggested by *Hoekman and Primo Braga*.⁶ This approach departs from the market access and national treatment considerations and focuses on the specific measures that constitute restrictions to the provision of a service. Four categories are identified:

- quotas, local content and prohibitions
- price-based measures
- standards, licensing and procurement
- discriminatory access to distribution networks

Of the above categories, quotas are used to place numerical limits on the size or value of a given service transactions. These could include restrictions on the number of providers of a service, the amount of equity permitted for foreign investment, the value of a given service transaction, the number of authorized service firms in a given activity, or the number of branches or distribution outlets allowed, among others.⁷ In the case of

4 *G Feketekuty*, 'Assessing and Improving the Architecture of GATS,' *GATS 2000: New Directions in Services Trade Liberalization*, ed. *P Sauv e and R M Stern* (Washington DC: Brookings Institution Press, 2000).

5 *T Warren and C Findlay* (eds), *Impediments to Trade in Services* (London: Routledge Studies, 2000), 4.

6 *B M Hoekman and C Primo Braga*, 'Protection and Trade in Services,' Policy Research Working Paper 1747, The World Bank, April 1997.

7 Article XVI of the GATS on "Market Access" provides a listing of six measures that constitute a finite universe of those restrictions of a quantitative nature that can be scheduled against market access commitments for service sectors. See Footnote Two.

international trade in air transportation services, the various bilateral air service agreements (ASAs) specify, among other capacity restrictions, which airlines may fly on a given route in a given time period.⁸ More stringent restrictions would simply prohibit the provision of the service by an international service provider (e.g., transportation of goods within a country and basic telecommunications services). Local content restrictions apply when foreign service firms are required to produce a certain amount of their output through local sourcing of inputs (for example, in telecoms the requirement to include the services of the local or national carrier for a certain percentage of sales).

Price-based measures applied to services trade include both tariff-type barriers and non-tariff barriers such as price controls and explicit or implicit subsidies. “Tariffs” are used primarily to affect trade that occurs via the cross-border movement of natural persons, taking the form of visa fees and entry or exit taxes, or discriminatory airline landing fees and port taxes. In most countries such “tariffs” are low, with quantitative restrictions and immigration policies constituting the primary means of restricting market access. Price controls, on the other hand, involve price-setting or price-approval by government agencies. Such controls are usually implemented in air transportation, financial services, and telecommunications. Price controls as well as implicit or explicit subsidies used to support specific industries — e.g., construction, communications and transport — are also likely to deter foreign provision of services, particularly in the cases where local presence via foreign direct investment is required.

“Technical” standards, certification or licensing and government procurement and sourcing policies may also be designed to discriminate in favor of domestic service providers. For instance, the licensing regime that affects trade in professional services often acts to restrict entry into the industry, be it by domestic or foreign persons. In the services context, the primary standards-type restrictions affecting internationally-traded services relate to the sector of professional services through the non-recognition of imported services or services procured abroad (e.g., diplomas obtained in foreign education or training programs), as well as the non-recognition of the equivalency of the certification or professional qualifications of foreign service providers. Alternatively, there may be discriminatory standards imposed upon foreign service providers that are more stringent or more costly to meet than those affecting domestic providers of similar services. Finally, discrimination in government procurement is particularly important in

8 ASAs regulate international trade in air transportation services and the cargo sharing arrangements administered by the United Nations Conference on Trade and Development (UNCTAD) Liner Code.

services as government contracts often comprise a large share of the market for a number of services.

The fourth category, discriminatory access to distribution networks, is relevant to those services that are produced and supplied through “networks”. This type of restriction is particularly relevant for the three main infrastructure services supplied through networks, namely telecommunications, transport services, and financial services. It is also relevant for distribution services. For these service sectors, such a restriction has perhaps the potentially most profound economic impact of all of the barriers to trade in services due to the presence of “network externalities”.⁹

In conclusion, with respect to the typology of non-tariff barriers in the services area, no one agreed approach or categorization exists. This problem is made more complex by the current confusion in the techniques used for scheduling GATS commitments and the inability of most typologies to take into account not only explicit government measures, but imperfections in market structures.

Given their wide scope, a very general but quite comprehensive alternative typology of non-tariff barriers to trade in services might be set out as follows. This typology highlights the fact that although many of these NTBs are government-imposed, other NTBs that may arise in service sectors characterized by networks, result from non-competitive market structures or the absence of appropriate regulation. The latter type of NTBs is discussed more extensively in Section IV of the present study.

- I. Government-imposed or generated NTBs
 - A. Quantitative measures
 - (e.g., quotas; local content; prohibitions)
 - i) Discriminatory
 - ii) Nondiscriminatory
 - B. Qualitative measures
 - (e.g., competitiveness tests; economic needs tests; type of legal entity)
 - C. Procurement practices

9 A more detailed analysis of these network externalities and what they imply for the provision of such services and the possibility of creating non-tariff barriers is undertaken in Section III below.

- D. Standards and licensing
 - i) Technical standards for services
 - ii) Licensing practices for professional service providers
- E. Subsidies
- II. Market structure imperfections giving rise to NTBs when regulation is lacking or inadequate
 - A. Discriminatory access to distribution networks
 - B. Predatory pricing practices
 - C. Vertical restraints and foreclosure
 - D. Other anti-competitive practices

IV. Market Structure Considerations Relevant to the Telecommunications Sector

Certain economic characteristics of the telecom sector described in this section often result in a market structure with various forms of imperfections which governments attempt to address through regulatory policies. Ironically, the regulatory policies designed to address various forms of anti-competitive behavior may themselves in turn create informal non-tariff barriers to services trade, either because they are inappropriately designed, inadequately enforced, or contain discriminatory elements whose purpose is to continue to protect the incumbent supplier partially, as will be seen below.

A large potential for natural monopoly exists in the telecommunications sector. Large sunk non-redeployable costs incurred by network operators imply that these firms may have declining long-run average cost curves. Such a form of the cost curve will result in natural monopoly in those segments of the industries in which demand is limited compared to the minimum efficient scale of production.¹⁰ Due to the vertical and horizontal links present in the telecommunications industry, the existence of a monopoly over a link in the network is likely to constitute a bottleneck in the production

10 For an extensive discussion of the market structure and characteristics of the telecom sector and their implications for economic policy making and analysis, see *P Cowhey* and *M M Klimenko*, 'The WTO Agreement and Telecommunication Policy Reforms,' Report for the World Bank, Graduate School of International Relations and Pacific Studies, UC San Diego, draft March 1999.

process. Services provided by the bottleneck facility would include network components that are only available from the incumbent and that are needed by other carriers to provide services, but are prohibitively expensive to replicate. This becomes of paramount importance, since the monopolist will then have the power to foreclose any firm by denying access to such services. Exclusive control over supply at any stage of production or over the supply of an essential input may also be due to rights conferred by the government or some other form of government facilitating action.¹¹

At first glance, it would appear straightforward that a network operator, irrespective of the degree of its monopoly power over some part of the network, should be willing to interconnect with operators “upstream” or “downstream”. As long as two networks provide complementary components, the combination of which creates end-to-end services, each network should find it profitable to interconnect with the other. Thus, when two networks are vertically related, interconnection is mutually profitable and the exclusion of rivals is not consistent with profit maximizing behavior.

Networks can be both horizontally related, however, as well as vertically related, placing networks in potential competition with each other. For example, two networks may both offer local service, or one network may offer fixed local service while the other offers mobile service. In this case, each network has every reason to compete to try and prevent the other from bringing its product or services to consumers. If a network finds it possible, it will try to squeeze the other out of business or at least marginalize it.¹² Two networks may also be simultaneously in horizontal competition for subscribers but vertically related for calls that go across networks, since such calls are comprised of an origination component in one network and a termination component in another network. In this situation, a network operator also has the incentive to try and foreclose an opponent network, and will use high interconnection fees in order to do so. Market power of an incumbent monopolist can also be expressed as well through the imposition of discriminatory prices for final services that vary with the threat of competition, thereby tapping protected markets to subsidize production of competitive markets. Alternatively, an incumbent carrier can refuse to interconnect with fledging networks, by simply denying them access to its large customer base or by making its technology incompatible with that of its rivals.¹³

11 *A Mattoo*, ‘Dealing with Monopolies and State Enterprises: WTO Rules for Goods and Services,’ Working Paper TISD 98-01, World Trade Organization, 1998.

12 Control of the bottleneck facilities offers the incumbent an opportunity to engage in a “price squeeze” of the rival carrier by pricing the essential inputs higher than it implicitly charges itself.

13 *N Economides*, ‘The Economics of Networks,’ *International Journal of Industrial Organization* 14/6 (October 1996).

As reported by *Economides*, significant reductions in costs have contributed and will contribute to the transformation toward fragmented ownership in the telecommunications sector both in the United States and abroad.¹⁴ These cost reductions have transformed the telecommunications industry in many countries from a natural monopoly to an oligopoly. In most cases, a monopolist incumbent remains in the provision of basic telecommunications services, while the monopoly of the last link closest to home has been (or is being) eliminated. For example, the fact that technological change now allows for joint transmission of digital signals of various communications services has made telephone lines and cable lines substitute products.

V. Non-Tariff Barriers in the Telecommunications Sector Arising From Market Structure Considerations

Non-tariff barriers to trade in telecom services may result from the lack of appropriate regulation to counter the imperfections in the market structure specific to the telecom sector described above, or from differing regulatory responses across countries. Non-tariff barriers to the supply of telecom services resulting from market structure considerations arise from an inadequate government response to the market power exerted by the monopolistic (or oligopolistic) supplier(s) of an essential telecom service.¹⁵ The scope for predatory pricing, vertical foreclosure, and other anti-competitive practices is extensive in the case of incumbent monopolists.¹⁶ In the case of an unregulated market, as shown in the previous section, a monopolistic supplier of an essential facility can prevent market access to either local or international suppliers of complementary or substitute telecom services.¹⁷

14 *N Economides*, 'Principles of Interconnection: A Response to "Regulation of Access to Vertically-Integrated Natural Monopolies",' submitted to the New Zealand Ministry of Commerce, Stern School of Business, New York University, 1995.

15 These barriers are different from those explicitly imposed by governments in the form of discriminatory quantitative restrictions (as discussed in Sections I and II), or from other types of government policies such as procurement practices, subsidies, and standards and licensing requirements.

16 This problem is exacerbated when the dominant carrier is also the industry regulator. This situation is still quite frequently found in countries where a Ministry of Telecommunications is both the regulator and the service provider.

17 In a network of networks, the market power of the network operators will depend on the relative sizes of the "competing" operators. In an unregulated network of networks, strategic inequality results in higher prices for end-to-end final services and reduced consumers' satisfaction. The lowest price for end-to-end services occur when the competing local networks have the same strategic power. *Economides*, 'Principles of Interconnection.'

In addition, when the threat of contestability of a market comes from foreign suppliers, local suppliers are likely to collude to foreclose the market. For instance, when foreign suppliers are forced to rely on local distributors, because of either local regulation or economies of scale considerations, local suppliers are likely to engage in vertical arrangements.

The network structure of the telecommunications industry makes assessment of the contestability of each stage in the production process and the potential impact of the strategic behavior of the incumbent(s) crucial elements in determining the need for and type of regulation to be imposed. When regulation is inadequate or absent, then welfare-decreasing behavior of the market participants is likely to emanate. The objective of government policy should be to promote competition in those market segments that are highly contestable — such as distribution services — and to provide a mix of liberalization and pro-competitive regulation in those markets where the degree of contestability is low, such as basic services. For instance, if economies of scale force foreign sellers to rely on local distributors, then trade liberalization is not enough, and there would seem to be a case for application of pro-competitive regulation to prevent discrimination.¹⁸ Putting into effect the appropriate regulations to bring about a pro-competitive regulatory environment is the key for policy, although this might mean a different type of regulation in various market segments, depending upon the market structure in question.¹⁹

Rules of interconnection are the core of the problem of anti-competitive behavior in the telecommunications market. Interconnectivity is essential for promoting “universal access” and thus reaping the benefits of network externalities (i.e. economies of scale in demand). Regulatory responses should define adequate terms and prices of interconnection in order to prevent the anti-competitive behavior of dominant operators. The lack of appropriate or adequate remedies by governments to these practices to ensure fair network interconnection constitutes a non-tariff barrier.

Three interconnection principles are critical for the promotion of nondiscriminatory telecom markets. These are:

18 *Mattoo*.

19 For example, where an advantage arises from vertical integration, as in the distribution of internet services for instance, then enforcing nondiscriminatory access for all suppliers might be a sub-optimal instrument for achieving competition, since it prevents gains from vertical integration to be realized.

- i. mandatory interconnection of networks
- ii. no discrimination across network operators for the same service
- iii. pricing rules involving reciprocity, unbundling and imputation of interconnection charges²⁰

Other non-tariff restrictions to trade may be created through the government's incorporation of discriminatory practices into the regulatory framework designed to remedy such dominant market behavior. Examples of discriminatory regulatory rules would be legal limitations on network access, through, for example, the prevention of callback operators or internet service providers from leasing local network circuits.²¹

Diversity in the various forms of regulatory responses to market imperfections in the telecom sector across countries may also serve to inhibit free trade. For instance, in some countries interconnection policies may be less discriminatory than in others. In this case, the former will benefit from more efficient telecommunications markets at the expense of the later. Differences in regulations may be found in the ways that universal service obligations are spelled out by governments, or in the terms of interconnection, the licensing criteria, and/or the procedures set out for regulators. A key issue in this respect is the extent to which harmonization of national regulations should be pursued. Some economists hold the position that the efficiency principle underlying free trade should provide a rationale for differences in national regulations, and that harmonization of these would remove many of the gains to be had from trade. Others argue, however, that since regulatory differences stem from differing responses to potential non-tariff barriers, then greater regulatory "rapprochement" could be viewed as the reduction of such barriers. As for other regulated services, this makes it important in the context of negotiations to liberalize trade in telecommunications services, that not only explicit

20 Reciprocal pricing requires that all networks charge the same amount to terminate calls coming from other networks. An "unbundling" policy requires the dominant network operator to sell network components independently of each other, so that rival networks are not forced to buy services they do not need. Imputation rules are designed to eliminate any markup on services components sold to competing firms over and above the implicit charges for internal use — and should tend to equalize prices charged by direct competitors. *Economides, Lupomo and Woroch* demonstrate that the adequate combination of these principles reduces many of the incentives of network operators to exercise their market power. See *N Economides et al., 'Regulatory Pricing Rules to Neutralize Network Dominance,' Industrial and Corporate Change 5/4 (1996)*.

21 Rapid technological changes are making many of these governmental regulatory restrictions on local circuits less and less effective. Consequently, many restrictions simply cannot be enforced, and governments must resort to different means (such as bans on the advertisement of callback services).

barriers to trade be the object of negotiation but also “implicit” or indirect barriers to trade in the form of regulatory practices.

The first multilateral attempt to negotiate a common set of pro-competitive regulatory rules was carried out in the context of the GATS negotiations on Basic Telecoms in 1997 in the form of the WTO Reference Paper. This major achievement enshrined for the first time the principle that regulatory reform should be an important component of services trade liberalization. As *Cowhey* and *Klimenko* write, the government’s obligations to create effective interconnection rules plus the need to separate the regulator from the operator are at the core of the principles that, according to the authors, have fundamentally changed the “international regime” governing telecommunications.²²

VI. Databases on Non-Tariff Barriers to Trade in Services

There have been very few systematic attempts to collect comprehensive information on barriers to services trade beyond the periodic reviews conducted by national trade negotiators. The two existing sources of information on measures affecting services trade — the WTO GATS schedules and the UNCTAD MAST database described below — are incomplete and contain measures of a legal nature only. No comprehensive database on NTBs yet exists for the services sector. As a consequence, very few studies have identified or been able to analyze the barriers to services trade that exist or have attempted to assess the impact of these barriers on economic outcomes.

A good deal of information of a legal nature on NTBs in the services sector can be found in the GATS national schedules of service commitments. These schedules provide information on measures affecting services trade as related to market access and national treatment, albeit with the lack of clarity discussed above in terms of scheduling techniques. As the GATS schedules are set out both by service sector and by mode of service supply, it is possible to identify and distinguish the non-tariff restrictions limiting commercial presence or foreign direct investment (mode 3) as well as those limiting the provision of cross-border telecom services, for example (mode 1). Limitations on the former range from the total exclusion of foreign investors from the

²² See *Cowhey* and *Klimenko*, ‘The WTO Agreement and Telecommunication Policy Reform.’ The authors discuss the international significance of the WTO Reference Paper and how it provides a fundamental change in the “international regime” governing telecommunications. See Section VII below for a more detailed description of the Reference Paper.

entire market or from certain types of telecom activities to equity ceilings in various market segments such as basic telephony. Non-tariff restrictions in the form of limitations to the right of non-establishment or cross-border supply affect the ability of a firm to operate in a third market without having a commercial presence. Many developing WTO members have scheduled requirements that oblige foreign telecom suppliers to establish a local presence before being able to provide certain telecom services.

However, the information contained in the GATS schedules is very uneven (more sectors have been scheduled by developed WTO members) and incomplete (many service sectors have not been included in these schedules) and thus suffers from serious limitations, including the following:

- i. Commitments contained in the national schedules are voluntary, and therefore do not comprise any information on measures or sectors which have been left unbound or which have not been included in the schedules; thus the information in the national schedules is far from complete and many sectors have not been included at all.²³
- ii. The information included in the GATS schedules does not necessarily correspond to actual measures affecting services trade because governments are allowed to schedule commitments that are more restrictive than what they do in actual practice (see GATS Articles XVI through XXI).
- iii. There is no way to gauge the relative restrictiveness of measures contained in GATS schedules.
- iv. GATS schedules do not provide information on procurement practices, and very little information is contained in the schedules on standards and licensing requirements or on subsidy practices.

The UNCTAD has developed a database containing Measures Affecting Trade in Services (or MAST), which has drawn primarily on the information contained in the GATS schedules and put it into electronic format. This database on services is to be a companion to the United Nations Conference on Trade and Development (UNCTAD)

²³ Among the sectors that have been included in the GATS national schedules, the telecom sector is the one that is the most strongly represented in terms of number of commitments. This is particularly so since the completion of the negotiations on Basic Telecommunications in February 1997, which resulted in the Fourth Protocol to the GATS. Thus, information on measures affecting telecom activities is relatively more abundant than for other service sectors, for around half of the current WTO membership.

TRAINS database on non-tariff measures affecting tradable goods, as described in Annex I. The information it contains is of a legal nature and is set out by: (i) the country that applies the measure, (ii) the services sector or sub-sector affected by the measure as defined by the GATS classification listing based on the UN Central Product Classification (CPC), (iii) the mode of supply affected, and (iv) the type of measure used (see Annex II). At the time of writing, the database contains more than 6000 records from 90 WTO members on national laws and regulations affecting trade in services.

The objective of the MAST is to cover all measures and service sectors, with an identification of the law or regulation involved. However, there are major gaps in country coverage. The database also suffers from the same weaknesses as the GATS schedules, that is the lack of clarity as between discriminatory and nondiscriminatory measures of a quantitative nature affecting market access, and the fact that some of the information may not correspond to the actual level of application of a measure. Thus the UNCTAD MAST database, although a valuable step forward, is not yet a complete or totally reliable source of information on non-tariff barriers of a legal nature in the services area.

A very useful source of information on non-tariff barriers in the services area for a limited number of countries are the annexes of non-conforming measures attached to the North American Free Trade Agreement (NAFTA) and to some of the NAFTA-type free trade agreements that have been negotiated at the sub-regional level. As parties to these agreements have followed a “negative listing” approach to services liberalization, all measures impeding access to services markets of members are understood to be liberalized other than those specifically listed in the annexes (the so-called “list or lose” obligation). Moreover, these measures must be listed at their level of application, along with a corresponding reference to the law or regulation on which they are based. NAFTA-type agreements also differentiate between discriminatory quantitative restrictions and nondiscriminatory ones in the annexes. Thus these agreements constitute a mirror of all of the remaining restrictions to services trade among the parties.

Annex III summarizes the reservations or non-conforming measures in the telecom area contained in the annexes to NAFTA, as an example of what type of information this source can provide. However, the NAFTA annexes may not necessarily capture all of the restrictions or non-tariff barriers to services that may be in place vis-à-vis non-parties to the agreement. It is presumed that much of the liberalization for services trade agreed upon by countries in NAFTA and NAFTA-type agreements is actually applied to

third countries on a multilateral, MFN basis, even though this is not an obligation.²⁴ This is particularly evident when it is remembered that the GATS allows members to schedule measures for service sectors that are more restrictive than what a country does in practice or what its laws or regulations would provide.

Partly as a result of this lack of comprehensive and comparable information on NTBs in goods and services, most studies dealing with non-tariff barriers either examine these barriers with respect to goods only, or with respect to services only. An exception to this compartmentalized approach is a recent study by the PECC (Pacific Economic Cooperation Council) in which NTBs are examined for both goods and services in the Asia Pacific region.²⁵

VII. Measurement of Non-Tariff Barriers in the Telecommunications Sector

As can be discerned from the previous section, non-tariff barriers affecting telecommunications services are notoriously wide-ranging as well as difficult to identify and measure. They include both explicit barriers and implicit types of regulatory policies and practices. It is difficult to translate non-tariff barriers in services into tariff equivalents. This point is reinforced by *Hoekman* and *Messerlin* when they write that this may be the case not only for economic reasons but also because governments have relied on regulations to govern services for so long that they do not perceive them as carrying economic costs or constituting impediments and therefore are skeptical in accepting such estimates.²⁶ As a consequence, there are few studies that have attempted to quantify the economic importance and impact of barriers that exist in the services sector, although such work is beginning. For those that have done so, the estimated

24 One reason for this is that it is inherently extremely difficult for signatories to a sub-regional agreement to change their laws and regulations in order to provide for two different types of treatment — more favorable treatment to members and less favorable or liberal access to non-members. Although this is possible when certain conditions set out in GATS Article V are fulfilled, it is nonetheless complicated to do so in practice due to the legal nature of measures affecting service providers. There are few examples in the services area (other than certain measures in place in Mexico affecting financial services) where a party to NAFTA applies more favorable treatment in practice to other NAFTA members than to third parties. For a review and analysis of the requirements of GATS Article V, see *S Stephenson*, 'Regional Agreements on Services and Multilateral Disciplines: Interpreting and Applying GATS Article V' paper presented at the world Services Congress, Atlanta, November 1999.

25 Pacific Economic Cooperation Council, 'Non-Tariff Barriers to Trade in Goods and Services,' study prepared for the APEC Business Advisory Council, 2000.

26 *B Hoekman* and *P A Messerlin*, 'Liberalizing Trade in Services: From Reciprocal Negotiation to Domestic Regulatory Reform,' paper presented at the World Services Congress, Atlanta, November 1999, page 6.

costs of non-tariff protection in the services area are as high and frequently higher than those for goods, with *ad valorem* tariff equivalents ranging between 50 to 100 percent for large sectors and much higher rates for more restricted sectors.²⁷ Consequently this is an important area for applied work.

The economic importance of non-tariff barriers for goods has traditionally been measured in two ways: through the use of frequency-type indexes or through the estimation of tariff-equivalent measures of protection. Frequency-type measures show the existence of NTBs across products, indicating the pervasiveness of such barriers and the products in which they are most heavily concentrated. Frequency ratios alone can be misleading as they provide no information on which an economic analysis of their effects can proceed. The mere existence of an NTB relates nothing about its degree of trade restrictiveness or its impact on prices, productions, or consumption decisions. However, quantifying the price effects of NTBs is often very challenging. The most successful methodologies for estimating NTBs for goods have involved some sort of price comparison to infer the tariff equivalent of the non-tariff barrier, and must be derived from industry-specific information. Aggregate, economy-wide estimates of the incidence of NTBs and their effects are for all purposes impossible to obtain, and Deardorff and *Stern* have recommended that estimates of NTBs should be done at the most disaggregated levels possible.²⁸

Estimating the economic impact of NTBs in services is even more challenging than in goods due to the regulatory and highly opaque nature of the barriers impeding services trade and their wide-ranging nature that encompasses any policy impeding service producers and consumers from interacting, including through foreign direct investment, the movement of labor, or cross-border trade. An approach to the measurement of NTBs in services trade that has recently been developed involves the following:

27 *Hoekman and Messerlin*, 7. Two interesting general equilibrium studies have been carried out estimating the cost of overall protection of services (for those sectors with available and usable data) for Egypt and Tunisia. The removal of these NTBs in the main service sectors was estimated to result in a net welfare gain of 1.2 percent of GDP for Egypt and 0.96 percent of GDP for Tunisia. See *A Galal*, 'Towards More Efficient Telecommunications Services in Egypt,' Policy Viewpoint No. 2, Egyptian Center for Economic Studies, Cairo, January 1998; *D Konan and K E Maskus*, 'Service Liberalization in WTO 2000: A Computable General Equilibrium Model of Tunisia,' study prepared for the Ministry of International Investment, Government of Tunisia, 1999.

28 See the discussion in the report by the Pacific Economic Cooperation Council, 'Non-Tariff Barriers to Trade in Goods and Services,' Sections 3 and 4.

- taking available qualitative information on the discriminatory barriers affecting services trade in a given service sector and transforming this information into a frequency-type index
- attempting to weight the frequency-type indexes by the economic significance of discriminatory policies
- assessing the impact of the policies, as measured by the frequency indexes, against differences in domestic prices or domestic quantities, with the effect of other factors explaining these differences taken into account²⁹

The available literature has followed two basic approaches to measuring the economic impact of NTBs in services: (i) the quantity-impact approach and (ii) the price-impact approach.³⁰ The former approach makes use of penetration models to estimate the quantity wedge existing between actual and benchmark (fully competitive) consumption volumes.³¹ Decomposition of the quantity wedge into its different components allows for the identification of the attributes and/or policies that constitute impediments to consumption. The price-impact approach follows a similar logic as does the quantity-impact approach, in that the former uses frontier models in order to estimate the price wedge existing between the observed price of a service and the “efficient”(fully competitive) price of the service.³² As before, the impact of trade-impeding policies is assessed by further decomposing the price wedge.

A. Construction of frequency-type indexes

Pioneering work by *Hoekman* constitutes the first attempt to develop frequency indexes for NTBs in services trade using the information on barriers to trade set out by countries

29 A discussion of the ways in which various researchers have tried to measure the magnitude of non-tariff barriers to trade for services in general as well as in specific service sectors is found in a recent book by *Findlay* and *Warren*, *Impediments to Trade in Services*, Chapter 1.

30 Examples of partial equilibrium models following quantity- or price-impact approaches are presented below. For a review of general equilibrium models applied to trade in services see *D Brown* and *R Stern*, ‘Measurement and Modeling of the Economic Effects of Trade and Investment Barriers in Services,’ Discussion Paper No. 453, RSIE, University of Michigan, 2000.

31 See *T Warren*, ‘The Impact on Output of Impediments to Trade and Investment in Telecommunications Services,’ *Impediments to Trade in Services*, eds *C Findlay* and *T Warren* (London: Routledge Studies, 2000), 87. Studies of this type focus on consumption rather than trading volumes due mainly to a lack of data.

32 See *R Trewin*, ‘A Price-Impact Measure of Impediments to Trade in Telecommunications Services,’ *Impediments to Trade in Services*, eds *C Findlay* and *T Warren* (London: Routledge Studies, 2000), 115.

in their WTO GATS schedules.³³ *Hoekman* developed a three-category weighting method as a means of assessing the extent of GATS commitments.

- allocation of a weight of 1 where a sector has been scheduled without any accompanying limitation on market access or national treatment, that is fully liberalized and bound
- allocation of a weight of 0.5 where a sector has been scheduled with some form of limitation or restriction on market access or national treatment
- allocation of a weight of 0 where a reference of “unbound” has been placed next to a sector/mode of supply, as this indicates no commitment of any type

Hoekman used these measures to quantify the extent of GATS commitments. On the frequency-type basis, the higher the number, the more commitments made. A subsequent study by the Pacific Economic Cooperation Council used this methodology in inverse fashion to highlight the number of commitments that have not been made by GATS members (the greater the number, the more restricted the economy for services trade).³⁴ Another subsequent study evaluating services commitments by countries of the western hemisphere was carried out by *Stephenson* using the *Hoekman* methodology.³⁵ It showed that the liberalizing content of the commitments in the telecom, as in other services sectors, was quite low (that is, the percentage given by the ratio between the number of commitments with no limitations attached and the total number of possible commitments).

Low and *Mattoo* have carried out a more qualitative-type of study of the telecommunications commitments in the GATS schedules of Asian WTO members.³⁶ They have attempted to evaluate the relative importance of limitations on foreign direct investment by governments, as well as the degree of competition allowed in fixed networks, as set out in the GATS commitments. They find that although most countries maintain some ceiling on equity participation in telecom activities, this is less important than previously thought in determining the extent of actual or potential competition in a

33 *B Hoekman*, ‘Assessing the General Agreement on Trade in Services,’ *The Uruguay Round and the Developing Economies*, eds *W Martin* and *L A Winters*, World Bank Discussion Paper 307 (Washington DC: World Bank, 1995).

34 Pacific Economic Cooperation Council, *Survey of Impediments to Trade and Investment in the APEC Region* (Singapore: APEC Secretariat, 1995).

35 *S Stephenson*, ‘Evaluation of Service Commitments under GATS for countries of the Western Hemisphere,’ OAS Trade Unit Studies, 2001.

36 *P Low* and *A Mattoo*, ‘Reform in Basic Telecommunications and the WTO Negotiations: The Asian Experience,’ WTO Working Paper No. ERAD 9801, 1997.

market. The conclusion to be drawn from this analysis is an interesting one: analyzing the GATS schedules to obtain frequency-type measures of liberalization, in the absence of relevant information on market structure and operation, will not necessarily convey accurate information about the competitiveness and robustness of a country's telecom market. The reason for this, as explained by *Low* and *Mattoo*, is the impossibility of drawing a simple relation between market structure and the behavior of established suppliers in the market, or between foreign ownership and the degree of competition. This would suggest that reliance on the GATS schedules alone for the assessment of the restrictiveness of non-tariff measures affecting telecom is an incomplete and possibly deceptive source to use.

Since the early work of *Hoekman*, the content of the GATS schedules on telecommunications has been significantly expanded with the successful conclusion of the extended negotiations on Basic Telecommunications in February 1997. An analysis of these more recent commitments has been carried out by *Marko*, who calculates a frequency measure of the telecommunications impediments for each country submitting a schedule to the Fourth Protocol based on the *Hoekman* methodology.³⁷ *Marko* finds that approximately 58 percent of the basic telecommunications services market in all of these countries is now covered by either partial or full GATS commitments.

Although a very useful beginning, there are many limitations to this early methodology for developing frequency-type indexes. First, due to the positive-list approach adopted for the GATS, the information contained in the schedules is of limited coverage as countries only schedule information in those service sectors they agree will be completely or partially bound by the agreement. Unbound industries are assumed to be closed, but this may not always be the case. Many developing countries were skeptical of participation in the negotiations or simply did not have available the detail required for the complex scheduling process and so left many industries unbound. However, some of these sectors may be quite open. In addition, anecdotal evidence suggests that nations with liberal policies may have left some services unbound so as to maintain leverage for future market-access negotiations (the ongoing GATS 2000 negotiations). Also, as mentioned earlier, the information in the schedules may not reflect actual practice, and restrictions may have been scheduled when in fact the practice is liberal. Second, this methodology does not distinguish between barriers in terms of their impact on the economy. Minor access impediments, such as notification requirements, receive the same weighting as a complete prohibition on entry, making any judgment on the

37 *M Marko*, 'An Evaluation of the Basic Telecommunications Services Agreement,' CIES Policy discussion Paper 98/09, Centre for International Economic Studies, University of Adelaide, 1998.

relative liberalizing content or the relative restrictiveness of a given services regime impossible.³⁸ Finally, as discussed above, reliance on the GATS schedules to obtain frequency-type measures of liberalization, in the absence of relevant information on market structure and operation, will not necessarily convey accurate information about the competitiveness and efficiency of a country's telecom market.

B. Construction of a set of policy indexes for the telecom sector

Moving beyond the GATS schedules, *Warren* used a 1997 survey by the International Telecommunications Union (ITU) to construct a set of policy indexes for 136 countries, taking into account actual market structure and behavior indicators.³⁹ These data have the distinct advantage of being drawn from a survey of actual policies, rather than inferring these policies from commitments made in trade negotiations. The information used to construct these indexes is found in a recent report by the ITU.⁴⁰

In constructing these indexes, *Warren* incorporates not only data on economic policy but also on economic variables, including a count of the number of firms actually competing in a market. *Warren* makes an attempt to weight the data as well by a subjective assessment of the economic importance of various issues. The indexes have been constructed to incorporate the distinctions drawn in the GATS context between limitations on market access (MA) and national treatment (NT), as well as the distinction between two modes of supply, cross-border trade and foreign direct investment. Table 1 reproduces the five separate market-based indexes constructed by *Warren*.

38 These limitations are discussed in the study by the Pacific Economic Cooperation Council, 'Non-Tariff Barriers to Trade in Goods and Services.'

39 *T Warren*, 'The Identification of Impediments to Trade and Investment in Telecommunications Services,' *Impediments to Trade in Services*, eds *C Findlay* and *T Warren* (London: Routledge Studies, 2000).

40 ITU, *Report on Telecommunication Reform* (Geneva: ITU, 1998). The information from the report that is used to construct the indexes includes: ownership of the incumbent; ownership of other carriers; degree of foreign ownership allowed; degree of market liberalization in twelve sectors of the telecom industry (local, long distance, international data, telex, leased lines, cellular analogue, cellular digital, paging, cable TV, fixed satellite, and mobile satellite); competitive legislation; leased line and resale policies; callback services.

Table 1: Policy Indexes for Measuring Openness in the Supply of Telecom Services

Index*	Type of Policy Captured
MA/Trade	Policies that discriminate against all potential entrants (domestic and international) seeking to supply cross-border telecommunications services.
MA/Invest (fixed)	Policies that discriminate against all potential entrants (domestic and international) seeking to supply fixed network services via investment in the country at issue.
MA/Invest (mobile)	Policies that discriminate against all potential entrants (domestic or international) seeking to supply cellular mobile services via investment in the country at issue.
NT/Trade	Policies that discriminate against potential foreign entrants seeking to supply cross-border telecommunications services.
NT/Invest	Policies that discriminate against potential foreign entrants seeking to supply fixed or mobile telecommunication services via investment in the country at issue.

*The greater the scores for each of these indexes, the more open to services trade and investment the country at issue is considered to be.

Sources: T Warren, 'The Identification of Impediments to Trade and Investment in Telecommunications Services,' *Impediments to Trade in Services*, eds C Findlay and T Warren (London: Routledge Studies, 2000); T Warren, 'The Impact on Output of Impediments to Trade and investment in Telecommunications Services,' *Impediments to Trade in Services*, eds C Findlay and T Warren (London: Routledge Studies, 2000).

The indexes report the degree of openness in the supply of telecommunications services. Restrictiveness indexes are readily obtained via the following transformation: $100 - \text{index} \times 100$. In this case, the higher the score the greater the degree to which an industry is restricted. The maximum degree of restriction is 100. The development of these indexes for the top twenty services trading nations shows a great deal of variation in the degree of restrictiveness they have in place vis-à-vis trade in telecommunications services, ranging from zero for the United Kingdom to over 80 for Turkey and China. Six of the 20 countries fall above the index level of 40, while seven countries show a restrictiveness index of below 10 (the US, the UK, Germany, Japan, the Netherlands, and Australia).⁴¹

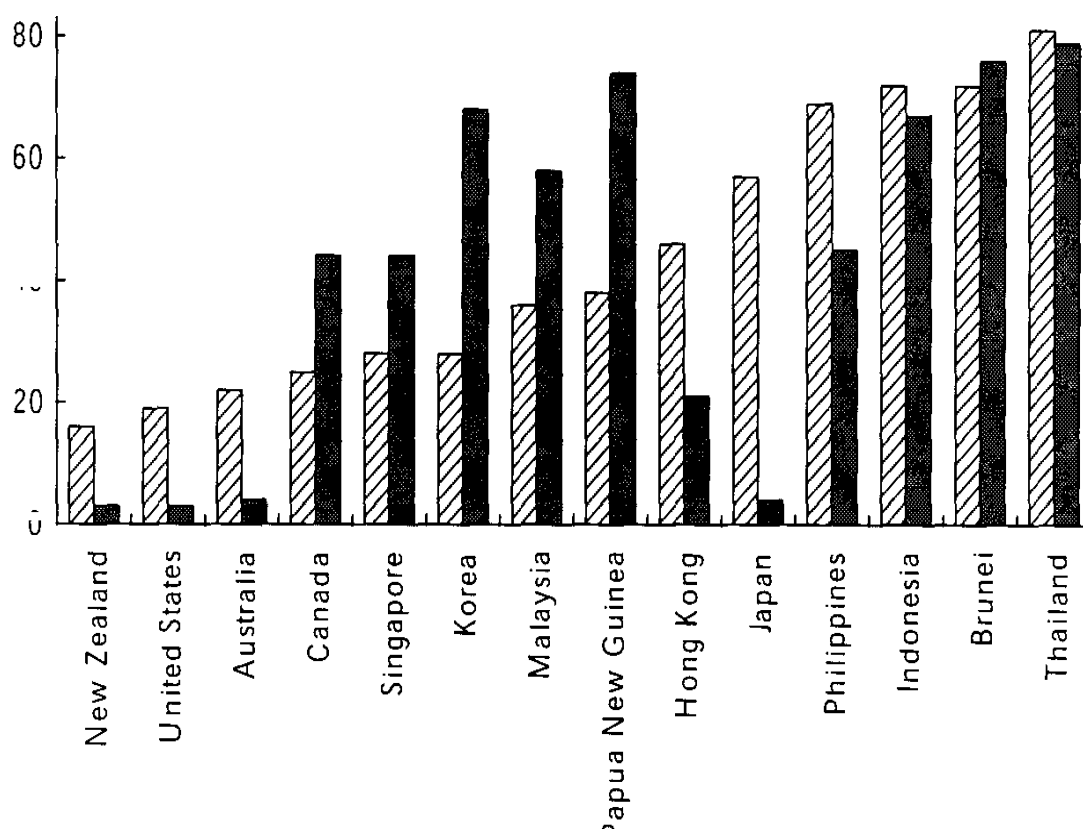
Warren identifies two important limitations of the indexes. First, they lack any competition policy dimension. Without such a dimension, it becomes impossible to assess the degree of market power exercised by dominant network operators, for instance. As shown in the previous section, this problem constitutes one of the main non-tariff barriers to trade in the telecommunications sector. Second, the indexes do not take account of the relative size of the markets. The presence of three operators is taken

41 Four other smaller trading countries are shown to be among the ten most liberal telecom markets in the world and include Finland, Denmark, New Zealand, and Chile. See Warren, 'The Identification of Impediments to Trade and Investment in Telecommunications Services,' 81.

to be the indication for a competitive market. However, the presence of two carriers in a small market may be sufficient to achieve highly competitive markets, while for larger markets two operators may prove insufficient.

Despite the above limitations, useful insights can be obtained from comparing the ITU and GATS-based indexes of restrictiveness. Figure 1 is replicated from *Warren's* study. The figure plots the equally-weighted average of the five ITU-based indexes against the GATS-based index for selected Asia Pacific nations.

Figure 1: GATS and ITU-Based Indexes of Restrictiveness to Trade in Telecommunications Services for Selected Asia-Pacific Economies



Note: The higher the score, the greater the degree to which an industry is restricted. The maximum score is 100 percent.

Sources: ITU-based indexes: T Warren, 'The Identification of Impediments to Trade and Investment in Telecommunications Services,' *Impediments to Trade in Services*, eds C Findlay and T Warren (London: Routledge Studies, 2000); GATS-based indexes: M Marko, 'An Evaluation of the Basic Telecommunications Services Agreement,' CIES Policy discussion Paper 98/09, Centre for International Economic Studies, University of Adelaide, 1998.

The GATS-based index drawn from work by *Marko* is obtained as 100 minus the number of commitments in telecommunications (without exceptions) that a country has

made in its GATS schedules as a percentage of the total number of commitments it could have made.⁴² As with ITU-based indexes, 100 denotes the maximum degree of restriction.

A salient feature of the figure is the fact that there is little degree of correlation between the average ITU index and the GATS index for many of the 20 countries shown. *Warren* reports a Pearson correlation coefficient of 0.64 between the two indexes. This indicates that although GATS-based indexes do provide an indication of relative policy, they are far from being an accurate reflection. The more legalistic nature of the information in the GATS schedules would not seem to reflect well the actual operating conditions in telecom markets which are more closely represented by the ITU-based indexes that take into account aspects of the competitive environment rather than legislative measures. The high degree of variability of the correlations between the GATS-based measure and each of the individual ITU-based indexes may shed some light on the remaining factors that help explain such divergence. *Warren* reports a degree of co-relationship between the GATS-based measure and the ITU-based MA/Trade, NT/Trade and NT/FDI indexes, but very little relationship with the MA/Invest indexes. This seems to suggest that the GATS-based measure is more likely to capture legal rather than economic conditions, in line with the type of legal measures that are scheduled under the GATS. The more economic conditions captured by the ITU-based average measure can of course be varied and of different nature. It is possible to hypothesize then that probably part of the strategic behavior of dominant network operators is being captured by this measure, despite the lack of a competition policy dimension in ITU-based measures. A multivariate analysis would prove useful at this point.

C. Estimation of quantity-impact measures for the telecom sector

In order to assess the economic impact of his results, *Warren* makes use of penetration models to quantify the impact of limits on competition upon fixed network services and mobile telephony consumption.⁴³ Restrictions on competition are modeled by a simple count of the number of operators (fixed and mobile) and by the inclusion of the openness indexes just described. Fixed network services consumption is measured in

42 *Marko*.

43 *Warren*, 'The Impact on Output of Impediments to Trade and Investment in Telecommunications Services.'

terms of the number of mainlines per hundred persons and mobile telephony services consumption is measured in terms of cellular mobile subscribers per 100 inhabitants. These variables are drawn from an ITU database for the period 1988-97 on the 20 largest services trading nations. The policy variables used are drawn from the ITU's 1999 survey and provide data for 1997. As this variable concerns one year, the same values are applied over the whole period of data, implicitly assuming that the policy regimes in each country were the same over the period 1988-97.

Warren shows that liberal policies, particularly investment policies, increase both fixed and mobile network penetration. Other policies such as restrictions on callback, leased lines and resale decrease fixed network penetration, although the relationships are not significant. Non-policy factors such as significant unmet demand, household density, and network quality (for fixed networks) and average income and population levels (for mobile networks) are also shown to affect network penetration, however the relationships are also non-significant.

Table 2 reproduces *Warren's* estimations of the quantity-impacts for the 20 countries resulting from market access restrictions and national treatment restrictions on investment.⁴⁴ The data reveal a varied picture of the impact on network penetration of barriers to investment, even among the developed economies. Countries such as Australia and Japan, which maintain very minor barriers to investment, are predicted to see only small percentage increases in network penetration as a consequence of complete liberalization. The major beneficiaries of reform are the more closed economies, particularly the developing economies.

44 Tariff-equivalents are also obtained for each country. However, as noted by *Warren*, the use of an unsatisfactory proxy for the price elasticity of demand renders such estimates unreliable. *Warren*, 'The Impact on Output of Impediments to Trade and Investment in Telecommunications Services,' 100.

Table 2: Quantity Impacts of Market Access and National Treatment Restrictions on Investment

Country	MA restrictions Fixed networks	NT restrictions Fixed networks	MA restrictions Mobil networks
United States	0.0%	0.0%	0.0%
United Kingdom	0.0%	0.0%	0.0%
France	0.9%	5.1%	1.8%
Germany	0.9%	0.0%	1.6%
Italy	3.4%	0.0%	4.4%
Japan	0.7%	0.0%	1.1%
Netherlands	0.6%	0.0%	1.1%
Spain	6.1%	0.0%	7.5%
Belgium	0.6%	3.0%	1.2%
Luxembourg	0.8%	0.0%	2.2%
Austria	3.5%	0.0%	2.2%
Canada	0.3%	3.5%	2.8%
Switzerland	3.3%	0.0%	5.1%
Korea	5.5%	7.0%	9.4%
China	110%	267%	115%
Turkey	29%	18.9%	63%
Singapore	4.8%	2.8%	2.9%
Sweden	2.4%	0.0%	2.2%
Australia	0.8%	0.0%	1.8%

Source: T Warren, 'The Impact on Output of Impediments to Trade and Investment in Telecommunications Services,' *Impediments to Trade in Services*, eds C Findlay and T Warren (London: Routledge Studies, 2000), 99.

D. Estimation of price-impact measures for the telecom sector

Trewin follows a price-impact approach to estimate the price-wedge or technical inefficiency arising from impediments to trade in telecommunications services.⁴⁵ Tariff equivalents are deduced from a decomposition of the price wedge. Prices of telecommunications services are explained (estimated) in terms of output and input measures, as well as others related to policies and quality.

Using a time series of ITU-based data over the period 1982-92 on 37 countries, Trewin shows that telecommunications policy impediments, measured via the aggregate frequency indexes of either *Marko* or *Warren*, add to the cost of telecommunications in high-income countries (those with GDP greater than \$5000 prior to 1982).⁴⁶ High-income countries appear to be more capital-intensive and dynamic than low-income countries, which appears to be mainly a 'cost-plus', labor-intensive, and static system.

45 *Trewin*. For a critical discussion on the existence of technical inefficiency, see page 115.

46 *Marko; Warren*, 'The Identification of Impediments to Trade and Investment in Telecommunications Services.'

Trewin suggests that these last aspects could be reflecting policies in terms of pricing, labor arrangements, and competition.

Interesting results arise from the estimation of a particular model specification including *Marko's* policy index.⁴⁷ Note that, similar to *Warren*, as the policy index concerns only one year the model implicitly assumes that the policy regimes in each country were the same over the period 1982-92.⁴⁸ Table 3, reproduced from *Warren*, shows that the average efficiency of the high-income countries is over three times better than that of the low-income countries.⁴⁹ There is also more variation within the low-income countries. In the high-income set, Luxembourg is close to full technical efficiency. More interestingly, the estimated policy coefficient for the high-income group is close to one, or full technical efficiency, which suggests that there is approximately a one-to-one relationship between the tariff equivalent and the policy variable. This implies that nearly the whole of the price wedge estimated for each high-income country is explained by the *Marko* frequency measure.

The impact models just summarized were shown to be particularly useful in isolating the economic impact of different policies affecting trade in (telecommunications) services. However, two important additional contributions of these models can be identified. First, they provide a data-based approach to determining relevant weights for different policy measures. For instance, the results obtained by *Warren* and Trewin seem to suggest that a policy mix that gives lower weights to legal-type policies and higher weights to economic-type policies is likely to have a greater impact in developing countries than a policy focusing exclusively on legal aspects. The second important additional contribution of these models is that they provide a means for identifying non-policy impediments to trade, such as market power. For example, once a specification of the cost function is determined in Trewin's model, this could be used to specify a price relationship that could be estimated to test for aspects such as rent seeking.

47 See *Marko*. Trewin estimates a double log form function with the policy index entered as $(1 + \text{policy})$, so that the tariff equivalent equals $100[\exp(1 + \text{policy})^{\beta-1}]$.

48 *Warren*, 'The Impact on Output of Impediments to Trade and Investment in Telecommunications Services.'

49 *Warren*, 'The Impact on Output of Impediments to Trade and Investment in Telecommunications Services.'

Table 3: Technical Efficiency, Revised Marko Policy Variable and Quality Indicators, 1992

Low income	Technical efficiency	High income	Technical efficiency
Chile	3.82	Australia	1.67
China	6.31	Austria	1.31
Hungary	2.61	Belgium	1.55
Iceland	1.16	Canada	1.34
Indonesia	11.96	Denmark	1.43
Ireland	3.22	Finland	1.24
Malaysia	4.31	France	1.74
Mexico	15.41	Germany	1.66
PNG	7.75	Greece	1.11
Philippines	3.06	Hong Kong	1.44
Poland	2.30	Italy	1.71
Thailand	5.25	Japan	1.21
Turkey	4.07	Korea	1.98
		Luxembourg	1.03
		Netherlands	1.43
		New Zealand	1.83
		Norway	1.75
		Portugal	2.08
		Singapore	1.57
		Spain	1.75
		Sweden	1.40
		Switzerland	1.42
		United Kingdom	1.67
		United States	1.48
Mean	5.48	Mean	1.54

Source: R Trewin, 'A Price-Impact Measure of Impediments to Trade in Telecommunications Services,' *Impediments to Trade in Services*, eds C Findlay and T Warren (London: Routledge Studies, 2000), 112.

Analogously, a quantity relationship in *Warren's* model could be used to test for the existence of oligopolistic output. Furthermore, noticing that price and quantity are simultaneously determined, both models could be used to test for both quantity and price hypotheses.

VIII. Do Multilateral Disciplines Provide an Effective Curb on NTBs in the Telecom Sector?

An equally interesting question to the examination of the existence of NTBs in the telecom sector is to ask whether or to what extent existing multilateral disciplines provide at present effective restraints or curbs on various practices that give rise to NTBs. This section discusses this question with respect to four types of potential NTBs:

monopoly and other anti-competitive practices, standards and licensing requirements, government procurement, and subsidies.

A. Monopoly and other anti-competitive practices

The GATS contains two articles that introduce competition provisions within its scope, namely Article VIII on “Monopolies and Exclusive Service Suppliers” and Article IX on “Business Practices”.⁵⁰ Both articles, however, are weak, although in different ways, and *Mattoo* has even written that what GATS Article VIII covers may be less important than what it excludes.⁵¹ Its disciplines cover only government-sponsored or state-owned monopolies and exclude the behavior of dominant suppliers who are often found in the telecom sector. Natural monopolies and those that exist without government action are outside the scope of the article. Moreover, the article only relates to the supply of the monopoly service and not to purchases so that the purchases by enterprises of services to produce services, or the purchase of services to produce goods are excluded from the scope of the article. The article only applies to those service sectors that have been scheduled by WTO members where obligations have been voluntarily undertaken. In addition, ironically, one of the most egregious practices for price discrimination in the telecommunications sector, namely the international accounting rate system, was left out of the scope of Article VIII through an agreement by WTO members to not open this issue until the GATS 2000 round of service negotiations.

With respect to Article IX on restrictive business practices, its scope is wider as it deals with “certain business practices of service suppliers, other than those falling under Article VIII that may restrain competition and thereby restrict trade in services”. However, as *Mattoo* writes, its obligations are very limited and concern only consultation and information sharing.⁵² No dispute resolution path is possible for a WTO member under this article.

As the above disciplines were perceived as weak, alternative disciplines have been developed for the telecommunications sector, which has two additional sets of rules to those above: (i) the Annex on Telecommunications to the GATS and (ii) the Reference

50 See *M A Warner*, ‘Exploring the GATS Implications of Integrating Competition Policy Disciplines into the WTO,’ paper presented at the World Services Congress, Atlanta, 1999.

51 *Mattoo*.

52 *Mattoo*.

Paper (discussed above).⁵³ *Mattoo* writes that the first can be seen as a response to the role of telecommunications as a medium of transporting other services, and the second as an attempt to counter specific difficulties for achieving liberalization in the telecom sector due to the presence of network externalities.⁵⁴ The Annex contains the obligation for WTO members to ensure that other service suppliers are allowed reasonable and nondiscriminatory access to — and use of — public telecom transport networks and services in order to supply any service that has been scheduled. The Annex applies to all national telecom operators regardless of whether they are monopolists, oligopolists or competitors.

The Reference Paper goes further than does the Annex in ensuring that pro-competitive regulation will be adopted in the telecom sector by those WTO members having adopted it. The Reference Paper is a remarkable document and the first of its kind, containing disciplines on the pricing and availability of access of “essential telecom facilities”, and going well beyond Article VIII and the Annex with disciplines related to interconnection and competition safeguards, as well as transparency and dispute resolution provisions.⁵⁵ Unlike Article VIII, those disciplines apply regardless of whether the services in question are supplied by a monopoly or through competition. In addition, the interconnection and competition safeguards contained in the Reference Paper deepen the nondiscriminatory disciplines contained in Article VIII and the Annex. Interconnection safeguards oblige major suppliers to provide interconnection on nondiscriminatory, transparent and reasonable terms, conditions and rates; of a quality no less favorable than that provided to all other suppliers of like services, including their own affiliates; at cost-oriented rates; in a timely fashion; sufficiently unbundled so that a supplier need not pay for network components or facilities it does not require; and at any technically feasible point in the network.

Competition safeguards oblige members to prevent a major supplier from abusing control over information or from engaging in anti-competitive cross-subsidization. *Mattoo* notes that certain disciplines against cross-subsidization can already be read in

53 Despite these additional efforts, important NTBs still remain in the telecoms sector. In the context of international telecommunications, for instance, the prevailing accounting rate system for compensating a foreign telecommunications supplier for forwarding incoming international calls constitutes an important source of trade distortions. The ITU has estimated that revenues of the accounting rate system can add up to approximately 40 percent of national telecommunications revenues for developing countries. This seems to be a good reason for the unwillingness of these countries to reduce trade barriers to telecommunications services.

54 *Mattoo*.

55 For a detailed discussion of the Reference Paper, see *Cowhey and Klimenko; Mattoo; WTO, Electronic Commerce and the Role of the WTO: Special Study* (WTO, 1998).

Article VIII (2); however, there the discipline is curtailed by reference to a member's territory and commitments.⁵⁶

As mentioned in Section III above, these disciplines go a long way towards providing a pro-competitive environment in the telecom sector for those WTO members having accepted the Reference Paper (60 in total — less than half of the membership but representing the major suppliers of international telecom services). For those governments having agreed to put the principles of the Reference Paper into practice, they should provide a strong counterpart to the lack of adequate regulatory measures to counter anti-competitive practices by telecom operators, which should in turn serve to lessen considerably the potential for these to act as non-tariff barriers.

B. Standards and licensing requirements

Article VI of the GATS on “Domestic Regulation” specifies that disciplines will be developed to ensure that “measures relating to qualification requirements and procedures, technical standards and licensing requirements do not constitute unnecessary barriers to trade in services”. Such disciplines must aim to ensure that such requirements are based on objective and transparent criteria, such as competence and the ability to supply the service; are not more burdensome than necessary to ensure the quality of the service; and in the case of licensing procedures, are not in themselves a restriction on the supply of the service.

The negotiation of more comprehensive disciplines on domestic regulation has been cited to be as important to services trade liberalization as the removal of explicit market access barriers.⁵⁷ Several economists have argued for the need for a broad-based and comprehensive approach to regulatory reform and trade liberalization in order to reduce the dispersion in the protection across sectors as well as in the incentives for foreign investment. However, the negotiations on Article VI (4) disciplines have progressed very slowly. Members of the GATS Working Party on Domestic Regulation have agreed on four basic criteria to be examined and elaborated for these disciplines (necessity, transparency, equivalence, and international standards). To date, the Working Party has focused its discussions primarily on necessity (e.g., the requirement

⁵⁶ *Mattoo*.

⁵⁷ See *G Feketekuty and C Barfield, 'Regulatory Reform and Trade Liberalization in Services,' GATS 2000: New Directions in Services Trade Liberalization*, eds P Sauvé and R Stern (Washington DC: Brookings Institution Press, 2000); *Hoekman and Messerlin*.

that the nondiscriminatory domestic regulations addressed by GATS Article VI (4) should be no more trade-restrictive than necessary) and transparency.⁵⁸ However, it would seem that WTO members are proceeding with great caution, as the definition of parameters for the scope and form of action that governments may take to regulate their service industries is a very sensitive issue. Thus, for the time being, multilateral disciplines to ensure that standards, technical regulations, and licensing requirements do not constitute NTBs in the services area are not well developed

GATS Article VII on “Recognition” could serve as a complement to the disciplines on domestic regulation (although some economists feel that it rather serves as a substitute) to promote trade liberalization by encouraging the elaboration of recognition agreements for the “equivalency of education or experience obtained, requirements met, or licenses or certifications granted in a particular country”. However, this provision is hortatory in the GATS and it has been little used. In the trade-off between the development of stronger horizontal disciplines of a general nature and more specific equivalency agreements based on mutual recognition, WTO members have opted for the former course of action.⁵⁹ It is interesting to note that although many of the sub-regional agreements on services trade in the western hemisphere contain stronger provisions for the conclusion of recognition agreements, it has still not proved possible to realize much forward movement in this area. This is most likely due to the difficulty of elaborating recognition agreements between countries with considerable diversity in their educational systems, legal systems, and regulatory systems, as well as the differences in levels of economic development.⁶⁰

Although very few recognition agreements have been concluded in the services area, one wide-ranging mutual recognition agreement (MRA) with a potential impact on services trade in the telecom area has recently been developed in the western hemisphere by the Inter-American Telecommunications Commission (CITEL), the regional body dealing with telecom standards and development under the auspices of the OAS. This MRA on Telecommunications Equipment provides for the recognition of

58 *D Honeck*, ‘Transparency Issues and the WTO Working Party on Domestic Regulation,’ paper presented at the OECD Workshop on Regulatory Reform and the Multilateral Trading System: Insights from Country Experience, Paris, 7-8 December 2000.

59 *K Nicolaidis* and *J P Trachtman*, ‘From Policed Regulation to Managed Recognition: Mapping the Boundary in GATS,’ paper presented at the World Services Congress in Atlanta (1999) and printed in *P Sauve* and *R Stern* (eds), *GATS 2000: New Directions in Services Trade Liberalization* (Brookings, 2000).

60 See *S Stephenson*, ‘Deeper Integration in Services trade in the Western Hemisphere: Domestic Regulation and Mutual Recognition,’ paper presented at the OECD Workshop on Regulatory Reform and the Multilateral Trading System: Insights from Country Experience, Paris, 7-8 September 2000.

the equivalency of the standards involved in the production of various types of telecommunications equipment. It was finalized in March 1999 and adopted by OAS governments, and is now in the process of ratification by countries in the western hemisphere. Adherence to this MRA would be an important step in ensuring greater consistency in the certification of telecommunications equipment across the Americas.⁶¹ CITELE is also working on the development of a region-wide MRA for the provision of value-added services in telecom.

C. Government procurement

Although the GATS includes an article on “Government Procurement” which foresees the development of disciplines on procurement in the services area (Article XIII), such disciplines have not yet been developed after several years of discussion. Thus there is no effective curb at present on procurement practices and their potential to act as NTBs in the telecom area or other service sectors. The plurilateral Government Procurement Agreement (GPA), and the recently-developed disciplines on transparency for procurement apply to both goods and services. However, the GPA is not a part of the Uruguay Round legal texts, its adherence is voluntary, and few WTO members (and only one developing country) have chosen to sign on.

Procurement is very important in economic terms, given that purchases by governments typically represent between 10 and 15 percent of GNP.⁶² *Evenett* and *Hoekman* have argued against the need to develop procurement disciplines for services, preferring to concentrate multilateral efforts on removing market access barriers and promoting market contestability.⁶³ *Low*, *Mattoo*, and *Subramanian* have supported the idea of developing general procurement disciplines for services, but recognize that this would be a complex process, given the already existing discriminatory approach that has been adopted for listing procurement commitments under the GPA.⁶⁴ They write that the effectiveness of the type of disciplines that might be developed within the GATS context would depend upon their scope, their level of application, whether or not

61 See information on CITELE and its activities at the website of the Summit of the Americas process, available at <http://www.summit-americas.org/hemisture.htm#c>.

62 *P Low et al.*, ‘Government Procurement in Services,’ *World Competition* 20 (1996), 5-26.

63 *S J Evenett* and *B Hoekman*, ‘Government Procurement of Services: Assessing the Case for Multilateral Disciplines,’ paper presented at the World Services Congress, Atlanta, 1999. Their contention is that procurement discrimination will have little impact on the efficiency of resource allocation in the long run if barriers to entry are reduced and/or removed.

64 *Low et al.*

national treatment is accepted as a general obligation for all sectors, and, critically, on how the MFN obligation is defined.

D. Subsidies

The GATS Article XV on “Subsidies”, like that on procurement, does not contain disciplines but rather sets out the agreement of WTO members to enter into negotiations to develop “the necessary multilateral disciplines to avoid such trade-distortive effects”. Such negotiations have not yet resulted in the elaboration of such disciplines with respect to services, and the process may well be characterized as a difficult one. Although there is evidence that subsidization does take place in certain service sectors, the lack of available data makes it difficult to determine the extent and economic impact of these practices. Some economists have expressed pessimism over the possibility for such negotiations actually to materialize in concrete disciplines and emphasize the difficulty of transposing the concepts contained in the WTO Agreement on Subsidies and Countervailing Measures with respect to goods to the services area.⁶⁵ A recent joint submission by Argentina and Hong Kong China to the GATS negotiations lays useful ground in proposing criteria for the identification of subsidies in the services area. Nonetheless, it would appear that agreement on this issue is far away, and at the present time there are no multilateral disciplines governing the use of subsidies for services.

Only through the general provisions set out in GATS — namely most-favored-nation (MFN) treatment and national treatment (NT) — are subsidies for services disciplined in the multilateral context. Under the MFN clause, a WTO member offering investment incentives to attract investment from abroad (mode 3 of supply) would be required not to discriminate between other members’ service suppliers. Similarly, national treatment requires governments providing subsidies to domestic services suppliers to make an equivalent subsidy available to foreign service providers operating in the country. In the later case, however, members have included in their commitments limitations to national treatment applying to certain subsidies practices, which restrict the applicability of such clause.

65 See *G Gauthier et al.*, ‘Deja Vu or New Beginnings for Safeguards and Subsidies Rules in Services Trade,’ *GATS 2000: New Directions in Services Trade Liberalization*, ed. *P Sauvé and R M Stern* (Washington DC: Brookings Institution Press, 2000).

VIII. Conclusion

Non-tariff barriers in the telecom sector are vast, complex, and cover several types of government action and regulatory intervention, as well as often the lack of appropriate intervention and regulatory disciplines. Although more effectively addressed for the telecom sector at the multilateral level than for other service sectors, they are still widespread and would appear to have a great potential for restricting trade in services.

The present study has suggested a typology of barriers to trade in services, and reviewed existing data sources as well as attempts to measure the importance and extent of such barriers. Such work is still at the fairly early stage, given the previous lack of data. This study makes the point that frequency indexes based on information of a legal nature alone, such as that found in the GATS schedules, are inadequate to explain the degree of competition or openness in telecom markets without further modeling techniques that incorporate policies in place and actual market structure (as opposed to a mere count of GATS schedules). However, for many countries for which different types of indexes or models have been developed, results are quite divergent. Much more sector-specific work of a more comprehensive nature, developing modeling techniques that encompass both legal indicators and economic indicators, needs to be carried out in order to have a better idea of the impact of NTBs for telecom and other services.

A related issue arising from the models on NTBs summarized in this study is that the economic impact of the different policies is a function of the specific characteristics of the market in which they are applied. For instance, market access restrictions applied horizontally to all sectors are likely to be less beneficial, the more contestable the markets are. Alternatively, some specific discriminatory policies, such as allowance for vertical integration, may improve welfare in those markets that are less contestable. This conclusion has wide implications for multilateral negotiations. It suggests that in order to reduce barriers to services trade, competition policy and regulatory issues need be addressed more fully within the GATS framework, so that both explicit and implicit barriers are taken into account. The development of the Annex on Telecommunication to the GATS as well as the Reference Paper has gone a long way in addressing these issues. However, more than half of the WTO members have still not adopted this document. To a great extent, the Reference Paper has shown that the focus of negotiators should be directed to contestable markets and not be limited to market access barriers. To achieve contestable markets all trade barriers, whether they are due

to direct government intervention or due to market structure imperfections, must be subject to negotiations.⁶⁶

In the discretionary regulatory context, the question of when a restriction is considered to be unduly restrictive of trade, and thus classified as an NTB, becomes of paramount importance. The fact that at present there are either no disciplines or very weak multilateral disciplines to address the use of measures such as economic needs tests, procurement practices, standards and licensing, and subsidies makes this issue even more critical. Only the decisions of dispute resolution bodies can provide a final judgment on this usually highly sensitive question. Further development of adequate tools for modeling and understanding the economic impact of NTBs is likely to give these panels more consensual criteria for resolving disputes.

66 I am grateful to *Jan Krancke* for pointing out this issue while commenting on this paper at the conference ‘Trade, Investment and Competition Policies in the Global Economy: The Case of the International Telecommunications Regime’, organized by the Hamburg Institute of International Economics and the Istituto Affari Internazionali.

ANNEX I: UNCTAD TRAINS Database of Non-Tariff Barriers to Trade in Goods

The only source of comparable and fairly comprehensive data on non-tariff barriers on goods at the present time is the UNCTAD TRAINS database (Trade Analysis and Information System) on Trade Control Measures, maintained on the basis of the classification system of non-tariff measures (NTMs) set out below. Data are collected for both tariff and non-tariff measures and include information for 80 countries for the period 1980-1997.

Apart from the lack of consensus over UNCTAD's classification system,⁶⁷ the other key drawback with TRAINS database is the reliance on countries to report their own NTMs. There is no way of ensuring a uniform level of reporting across countries, particularly since the data are not verified. In addition, there have been suggestions that many of the measures included are out of date and have not been removed. Moreover, there is little information contained in the categories on monopolistic measures, technical regulations, and miscellaneous measures such as public procurement and marketable permits. The data provided are, therefore, incomplete and an approximation to the real situation, which makes it difficult to use by researchers and policymakers.

UNCTAD Classification System for Non-Tariff Measures (used in the TRAINS Database)

1. Price control measures
 - administrative pricing
 - voluntary export price restraint
 - variable charges
 - antidumping measures
 - countervailing measures
2. Finance control measures
 - advance payment requirements
 - multiple exchange rates
 - restrictive official foreign exchange allocation
 - regulation concerning terms of payment for imports
 - transfer delays
3. Automatic licensing measures
 - automatic license
 - import monitoring
 - surrender requirement
4. Quantity control measures
 - non-automatic licensing

⁶⁷ For a detailed discussion on the different classification systems of non-tariff barriers to trade in goods, see Pacific Economic Cooperation Council, 'Non-Tariff Barriers to Trade in Goods and Services.'

- quotas
 - import prohibitions
 - export restraint arrangements
 - enterprise-specific restrictions
5. Monopolistic measures
- single channel for imports
 - compulsory national services
6. Technical measures
- technical regulations
 - pre-shipment formalities
 - special customs formalities
 - obligation to return used products
7. Miscellaneous measures for sensitive product categories
- marketable permits
 - public procurement
 - voluntary instruments
 - product liability
 - subsidies

From among the broad list UNCTAD also defines a set of core non-tariff barriers which are thought to be the most common and restrictive measures. These are also those measures for which it is relatively easier to find data. They comprise the majority of measures in categories 1, 2, and 4 above, as follows:

- Quality control measures (excluding tariff quotas and enterprise-specific restrictions)
- Finance control measures (excluding regulations concerning terms of payment and transfer delays/queuing)
- Price control measures

ANNEX II: GATS-Based Categories of Measures Affecting Services Trade Included in UNCTAD MAST Database⁶⁸

- Measures affecting market access
 - a. Limitations on the number of providers
 - b. Limitations on the total value of service transactions or assets
 - c. Limitations on the total number of service operations
 - d. Limitations on the total number of persons that may be employed in a sector
 - e. Measures which restrict or require specific types of legal entity or joint venture
 - f. Limitations on the participation of foreign capital
 - g. Other measures affecting market access
- Measures affecting national treatment
 - a. Discriminatory taxes
 - b. Discriminatory incentives/subsidies
 - c. Government procurement policies
 - d. Local content requirements
 - e. Nationality, citizenship or residence requirements
 - f. Other measures affecting national treatment
- Measures affecting MFN treatment
 - a. Integration agreements, as stated in GATS Article V
 - b. Reciprocity requirements
 - c. Bilateral agreements
 - d. Other measures affecting MFN treatment
- Non-discriminatory measures, as stated in GATS Article VI
 - a. Licensing procedures
 - b. Technical standards
 - c. Recognition of qualifications
 - d. Other measures related to GATS Article VI

68 Drawn from Warren and Findlay, *Impediments to Trade in Services*.

Non-conforming Measures (NTBs) applicable to the Telecommunications sector maintained by NAFTA member countries

Country	Sector/Subsector	Type of Reservation	Mode of Supply	Description of Reservation
Reservations for existing measures and liberalization commitments				
Canada	All Sectors	National Treatment Performance Requirements Senior Management and Boards of Directors Local Presence	Investment	Limitations on acquisition of private, privatized and federally incorporated corporations Residency requirement for ownership and the granting of export and import permits
Mexico	All Sectors	National Treatment	Investment	Limitations to foreign ownership of corporations and of land and water in restricted zones Economic impact assessment requirement of foreign investment in restricted activities Nationality requirement for participating in a microindustry enterprise
	Communications/Entertainment services (Broadcasting, Multipoint Distribution Systems and Cable Television)	National Treatment Performance Requirements	Cross-Border Services and Investment	Concession requirement for commercial broadcasting or cable television provision. Authorization requirement for broadcast or cable distribution of imported radio or television programming Restrictions to the use Spanish language and Mexican nationals in television and radio programming and Spanish language for advertising
	Communications/Entertainment services (Cable Television)	National Treatment Local Presence	Cross-Border Services and Investment	Ownership interest restrictions. Concession requirement for construction and/or operation
	Communications/Enhanced or Value-Added Services	National Treatment Local Presence	Cross-Border Services and Investment	Permit and local presence requirement; restriction to the cross-border provision of videotext and enhanced packet switching services. Ownership interest restriction for videotext or enhanced packet switching services
	Communications/Transportation and Telecommunications	National Treatment	Investment	Restrictions to foreign governments and foreign state enterprises to invest in Mexican Transportation and Telecommunication enterprises
USA	Communications/Telecommunications (Enhanced or Value-Added Services)	National Treatment	Investment	Information requirement for service providers obtaining voluntary Recognized Private Operating Agency certification from U.S. Department of State for purposes of negotiating operating agreements with other governments
Reservations for future measures				
Canada	Communications/Telecommunications Transport Networks and Services, Radiocommunications and Submarine Cables	National Treatment Most-Favored-Nation Treatment Senior Management and Boards of Directors Local Presence	Cross-Border Services and Investment	Reserves the right to adopt or maintain measures relating to investment to providers other than those of value-added services whose telecom facilities are leased from providers of public telecommunications transport networks
Mexico	Communications/Entertainment Services, Distribution Services	National Treatment Most-Favored-Nation Treatment Local Presence Senior Management and Boards of Directors	Cross-Border Services and Investment	Reserves the right to adopt or maintain any measure relating to investment in, or provision of, broadcasting, multipoint distribution systems, uninterrupted music and high-definition television services
	Communications/Telecommunications	National Treatment Most-Favored-Nation Treatment Local Presence	Cross-Border Services and Investment	Reserves the right to adopt or maintain any measure relating to investment in, or provision of, air traffic control, aeronautical meteorology, aeronautical telecommunications, and other telecommunications services relating to air navigation services
	Communications/Telecommunications Transport Services	National Treatment Most-Favored-Nation Treatment Local Presence	Cross-Border Services and Investment	Reserves the right to adopt or maintain any measure relating to investment in, or provision of, telecommunications transport networks and telecommunications transport services
	Communications and Transportation/Postal Services, Telecommunications and Railroads	National Treatment Most-Favored-Nation Treatment Local Presence	Cross-Border Services	Reserves the right to adopt or maintain any measure related to the provision of postal services, telegraph services, radiotelegraphy services, satellite telecommunications services, and railroad services
USA	All Sectors	National Treatment Most-Favored-Nation Treatment	Investment	Reserves the right to adopt or maintain any measure relating to residency requirements for the ownership by investors of Canada, or their investments, of oceanfront land
	Communications/Cable Television	National Treatment Most-Favored-Nation Treatment	Investment	Reserves the right to adopt or maintain any measure that accords equivalent treatment to persons of any country that limits ownership by persons of the US in an enterprise engaged in the operation of a cable television system in that country
	Communications/Telecommunications Transport Networks and Services and Radiocommunications	National Treatment Most-Favored-Nation Treatment Local Presence Senior Management and Boards of Directors	Cross-Border Services and Investment	Reserves the right to adopt or maintain any measure relating to investment in, or provision of, telecommunications transport networks, telecommunications transport services or radiocommunications

Note: The Schedule of a Party sets out the reservations taken by that Party with respect to existing measures that do not conform with obligations imposed by: National Treatment, Most-Favored-Nation Treatment, Local Presence, Performance Requirements, or Senior Management and Boards of Directors.

Source: Annex I and II, North American Free Trade Agreement, Minister of Supply and Services Canada 1993, Canada Communication Group-Publishing.

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