
Downloaded from: http://researchonline.lshtm.ac.uk/10063/

Usage Guidelines

Please refer to usage guidelines at http://researchonline.lshtm.ac.uk/policies.html or alternatively contact researchonline@lshtm.ac.uk.

Available under license: Copyright the publishers
Measuring the globalization of health services: a possible index of openness of country health sectors to trade

RICHARD SMITH

Health Economics, Policy and Law / Volume 1 / Issue 04 / October 2006, pp 323 - 342
DOI: 10.1017/S1744133106005019, Published online: 13 October 2006

Link to this article: http://journals.cambridge.org/abstract_S1744133106005019

How to cite this article:
doi:10.1017/S1744133106005019

Request Permissions : Click here
Measuring the globalization of health services: a possible index of openness of country health sectors to trade

RICHARD SMITH*
Health Economics Group, School of Medicine, Health Policy and Practice, University of East Anglia, Norwich, UK

Abstract: Globalization is a key challenge facing health policy-makers. A significant aspect of this is trade in health services. However, little is currently known about how trade in health services will affect the health of populations and national economies. A key determinant of the impact of trade in health services will be the general economic and trade context of the country concerned. One specific aspect of this is the ‘openness’ of a country’s health sector to trade; yet there is little, if anything, currently known about the most appropriate methods to assess openness of the health sector.

This paper outlines current methodologies used to measure openness in other sectors, and explores their applicability to measuring openness of the health sector. The paper suggests that the ‘Trade Restrictiveness Index’ (TRI) approach appears to offer the most fruitful way to construct an index of openness for the health sector. The TRI is the latest in the different methods applied to measuring openness more generally, and has recently been applied to other service sectors – although not, as yet, to health. This methodology, and issues involved in adapting it for measuring openness in health services trade, is therefore outlined in more detail.

Introduction
Globalization is a key challenge facing health policy makers (Yach and Bettcher, 1998a, 1998b). Whilst effects on health from, for example, cross-border flows of infectious diseases are important aspects of globalization, a significant challenge concerns the globalization of the health sector itself: direct trade in health-related goods, services, and people (patients and professionals) (Smith et al., 2004; Blouin et al., 2006).

* Correspondence: Richard Smith, Health Economics Group, School of Medicine, Health Policy and Practice, University of East Anglia, Norwich, UK. Tel: +44 (0)1603 593617; Email: Richard.Smith@uea.ac.uk
The health sector has been relatively unaffected by globalization directly, as it remains a predominantly service-oriented sector. Most trade liberalization has concerned the movement of ‘goods’, and to a lesser degree people, since these can be ‘stored’ and therefore transported (Smith, 2006a). However, while services (such as banking, education, and telecommunications, as well as health) account for only around 20% of global trade (on a Balance of Payments basis), this sector is the fastest growing (Karsenty, 2000; UNCTAD, 2001). Much of this increase in services trade has resulted from changes in technology, making, for example, e-commerce and telemedicine a technical possibility, easier travel making movement of patients and professionals feasible, and transnational corporations making ownership and management of health care facilities more fluid (Smith, 2004).

A recent, critical, development in international legislation concerning trade and health services has been the World Trade Organization (WTO) negotiations aimed at the further liberalization of trade in services: the General Agreement on Trade in Services (GATS). Since its inception in the 1994 ‘Uruguay Round’, the pace of development of GATS commitments, and especially their binding nature, has created a fresh imperative to establish how health services will be affected, and thus how health and economic well-being will be affected by international trade (Adlung, 2002; Price and Pollock, 1999; Smith, 2006a).¹

One fundamental aspect in the assessment of how greater liberalization of the health sector may affect national health and wealth is whether the rather intuitive notion of ‘openness’² can be captured empirically, and with sufficient rigour to be useful in analyses (Smith, 2006b). Having such a measure of openness would, for example, enable us to assess the degree to which liberalization may be correlated with changes in health, GDP, and inflation. Given that national health sectors have tended to remain relatively ‘closed’ systems, there are no readily available methodologies for this assessment ‘off the shelf’. However, as international trade in goods has a significant history, and trade in other services has progressed over recent years, there are a number of indicators of ‘openness’ that may possibly be adapted.

This paper therefore focuses on reviewing methodologies that have been used to date for measuring openness to trade, and from this outlines a proposed methodology for measuring openness in the health sector. Following this introduction, the paper outlines the different approaches that have been used to measure openness, and then outlines a proposed methodology for health services before concluding.

¹ An overview of current commitments and offers is also obtainable from http://gats-info.eu.int/
² Note that ‘openness’ is used synonymously with ‘liberalized’, as it is usually the case that a country being ‘liberalized’ assumes the opening of domestic markets to international trade.
Measuring openness to trade: a review of existing methodologies

The fundamental issue with respect to measuring openness is to reconcile the vast array of tariffs, quotas, licenses, prohibitions, exchange controls, trade promotion activities, bi-lateral and multi-lateral trade policies etc. to forge a view on the overall trade orientation of a country (or even economic sector). Although this difficulty is reflected in the range of ways in which trade openness has been assessed, there remain two broad approaches:

- those which use easily and readily measurable factors, such as exchange rates; or
- those which construct a composite index of a country’s openness to trade through combining information on a variety of factors, such as average tariff rates, non-tariff barriers, and wider social factors.

Readily measurable factors

Readily measurable factors may be dichotomized into those which: (i) measure trade volume (assess the proportion of trade that is actually observed) or trade restriction (seek to establish what barriers are in place to constrain trade occurring) (Yanikkaya, 2003); and (ii) measure trade incidence (direct observation of policy instruments) or outcome (the deviation of actual outcome from the outcome that would have occurred without the trade barrier – a comparative static approach) (Baldwin, 1989). These categorizations may be combined to form a matrix within which different measures may be located, as illustrated in Table 1, with each reviewed briefly below.

Trade shares

This is the simplest measure, calculated as the sum of exports plus imports divided by GDP, where the higher the ratio the more open the country is deemed to be (Frankel and Romer, 1999). The premise is that the more an

Table 1. Summary of classification of indicators of trade policy openness

<table>
<thead>
<tr>
<th>INCIDENCE</th>
<th>TRADE VOLUME</th>
<th>TRADE RESTRICTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Not applicable</td>
<td>• Average tariffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NTB frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bilateral payment arrangements</td>
</tr>
<tr>
<td>OUTCOME</td>
<td>• Trade shares</td>
<td>• Exchange rates</td>
</tr>
</tbody>
</table>

3 With respect to health, and health services trade, this is likely to be compounded by the desire to differentiate policy and trade openness in the health sector from these activities in other sectors; yet all will be interlinked to a greater or lesser degree.
economy trades overseas (as a proportion of overall trade), the more open to trade they are (Harrison, 1996). Its appeal is simplicity and applicability. However, the critical weakness is that it measures actual trade volume rather than trade policy, where, for example, actual trade may be low but policy is very liberal. Further, the effect of ‘openness’ tends to disappear once geographical, demographic, and institutional factors are added (Rodrigues and Rodrik, 2001; Irwin and Tervio, 2002; Rodrik et al., 2002; Sachs and Warner, 1997). An additional problem in the measurement of trade openness in services is that much of this trade is less substantive and clearly measurable in volume terms, and we are more likely to be looking instead to generate an index of policy stance, in terms of regulation, toward trade.

**Tariffs and related measures (including average tariff rates, total tax on international trade and indices of non-tariff barriers)**

This category of indicators encompasses a range of existing ‘indices’ which represent a barrier to trade. Tariffs are one of the most direct indicators of trade restrictions, and are typically measured as the ratio of tariff revenues (duties) to import values (where a higher ratio means more restriction on trade) (Pritchett and Sethi, 1994; Anderson, 1994; Anderson and Neary, 1994; Lee, 1993). In addition, the licensing, prohibition and quota control of imports is also a means by which many countries control imports. Such non-tariff barriers (NTBs) are measured as the ‘import-weighted percent of tariff code lines covered by the various forms of NTB as a percentage of all tariff code lines within the aggregate’ (Nogues et al., 1986). Another alternative is to use duties applied to exports and imports, where the rate of export duty is measured as the ratio of export duty revenue to the value of exports, and the rate of import duty is measured as revenue from imports as a ratio of import value. Again, these are relatively easy to identify and measure, but have several weaknesses. For instance, there can be a wide divergence between official tariff rates and those actually imposed and collected (Edwards, 1992, 1998; Clemens and Williamson, 2001), other forms of taxes (which nonetheless may impact on the price of imports and exports) are ignored, and NTB ratios group disparate types of NTB together – quotas, licenses, health regulations etc. – which may have very different effects on imports (Edwards, 1992, 1998). They will also not be readily applicable to trade in (health) services, which are mostly affected by more numerous and complex NTBs.

4 A development of this simple measure is the ‘structure-adjusted trade intensity measure’, which allows for structural features of the specific economy under consideration (Chenery and Syrquin, 1989). The factors are accounted for in regression analyses, such that, for example, trade intensity is set as a function of population, GDP per capita and a dummy variable for whether the country has oil or not as a natural resource. The residuals are taken as the ‘measure’ of openness, as they indicate the amount that a country’s trade intensity exceeds or falls short of that expected for a country of that size and composition. However, this remains ad hoc and a theoretic.
Bilateral payment arrangements (BPAs)

BPAs are sometimes used as a general indicator of the trade orientation of a country, as they describe the method of settlement of trade balances between two countries. However, these have become less common and thus less able to be used in recent years (Auguste, 1997). However, we may argue that such arrangements between countries may become more important again with the WTO, as this means signing up to multilateral deals and indicates the general trade orientation of a country. In effect, this may suggest using WTO membership and/or the GATS commitments themselves as measures of openness (and is indeed a method that has recently been used – for example by Kemp, 2000).

Exchange rates

The most common measure is the black market exchange rate, which is deemed to show the success of the rationing function of prices in the foreign exchange market; that is, the higher the black market premium, the more restrictive trade is (Harrison, 1996; Edwards, 1998; Sala-i-Martin, 1997). However, there are considerable difficulties here in controlling for confounding factors, such as inflation, external debt, and greater bureaucracy, all of which are also significant determinants of the black market exchange rate. An alternative is to divide the purchasing power parity (PPP) exchange rate by the official currency exchange rate. Assuming that trade restrictions result in higher prices (an overvalued currency, relative to PPP, requiring import controls), then, ceterus paribus, the inverse of the price level, adjusted for the level of GDP per capita, may be a measure of openness (Rodrik, 1994). However, overvaluation can also be caused by factors other than import controls, such as foreign aid availability.

Composite indices of trade orientation

One ‘meta-problem’ with these measures is that, in addition to being largely uncorrelated, they have little or no theoretical (or indeed empirical) guidance to suggest which measure is the superior, for what purpose, or why. To address this, a set of alternative measures construct a ‘composite’ index utilizing all relevant information concerning the measurement of a country’s openness to trade. The three most influential of these ‘indices of trade orientation’ are reviewed briefly here.

Dollar, 1992

This is the most-cited paper in the openness literature, and constructs two indices of openness (termed ‘outward orientations’ in the paper): (i) real exchange rate distortion (the ratio of actual relative price levels (RPL) to predicted relative price levels (RPL*) averaged over a ten year period); and (ii) real exchange rate variability (the coefficient of variation of the annual
observations of RPL/RPL* for each country over the ten year period). The intuition is that openness is a function of a low level of ‘protection’ (thus an exchange rate favourable to exporters) and incentives are stable over time (thus little variability). Overall openness is based on a weighted average of these two indices.

Its obvious strengths are that it is based on easily accessible data, and is simple to construct and use. However, that is also its weakness. For instance, it is insensitive to the form of trade restriction, such that economies combining import restrictions with export taxes will appear to be less protected than those with import restrictions alone, and countries combining import restrictions with export subsides will appear less open than countries that do not.

Sachs and Warner, 1995

This index combines information on tariffs, quota coverage, black market premia, social organization, and the existence of export marketing boards to form a binary indicator – a zero-one dummy for use in econometric analyses – where a value of 1 represents a country as open and 0 as not. A country is assigned a value of 0 (i.e. closed) if:

- it had average tariff rates higher than 40%;
- its non-tariff barriers covered, on average, more than 40% of imports;
- it had a socialist economic system;
- it had a state monopoly of major exports;
- its black market premium exceeded 20% during either the decade of the 1970s or the decade of the 1980s.

The rationale for these elements is that they represent the means by which policy makers may close their economy to international trade (and introducing them as separate indices in econometric analysis would lead to high collinearity). The strength of the index is that it takes a more ‘policy-oriented’ view of measuring openness (Sala-i-Martin, 1997). However, there are several important limitations to this index. For instance, the main strength of the index appears to result from a combination of the black market premium and state monopoly variables, and econometrically little would be lost by reducing the index to a combination of these two variables.

Further, one element of the index is whether there is a ‘socialist economic system’, which has a negative impact on openness. Whilst this may be true, it raises an important concern with respect to health services, as many countries without a general ‘socialist’ economic system will nevertheless have a form of ‘socialist’ health insurance; that is, for population health protection and security

5 Others have tried similar approaches. For example, the Heritage Foundation constructed an index of health policy, which classifies countries into five categories according to the level of tariffs and other (perceived) distortions (Johnson and Sheehy, 1996).
some element of socialist organization and ‘strong’ government is generally agreed to be critical. This is likely to make the index either inappropriate or unfeasible.

**Anderson and Neary, 1994**

This Trade Restrictiveness Index (TRI) is a theoretically based index of trade policy, which aggregates trade restrictions whilst holding the level of real income constant. The TRI is thus equal to the uniform deflator which, applied to domestic prices distorted by trade policy, is just as inefficient as the given trade distortion structure. As an inverse figure, it thus measures the degree of openness to trade. The advantages of this measure are that:

- it is a welfare-based measure, reflecting a standard cost-of-living deflator used in consumer theory (the uniform deflator that, when applied to the new prices allows the old level of utility to be maintained with the old level of expenditure, or income). The TRI is the deflator which deflates distorted trade prices at their new level to maintain the old level of utility for the representative consumer, whilst respecting general equilibrium conditions;
- it is based within the general equilibrium framework, rather than a partial equilibrium framework, and thus reflects the interaction of factors in a more realistic and theoretically tractable manner; and
- it combines information on tariffs, quotas, taxes, and subsidies.

More practically, this means that the TRI can be operationalized using the relatively common CGE (computable general equilibrium) macro-economic modeling approach (in essence combining the index with an appropriate – and often existing – general equilibrium model of trade) (Anderson, 1998; Anderson and Neary, 1996, 2004, 2005). This also then allows for considerable ‘comparative static’ analysis of the actual with the predicted level of trade intensity, prices, income etc.

This index shows considerable promise for development and refinement as an index of health sector openness for three reasons. First, it is the only measure to have as its theoretical base the concept of the welfare effect of trade – where the index takes real income as its reference (i.e. finding a uniform tariff that yields the same real income as the original differentiated tariff structure). Second, just as the MTRI adapts the TRI to take volume of trade as the starting point, we might consider a version being constructed that takes volume of health as its reference point, rather than real income. Third, the general approach allows us to encompass the most relevant policy restrictions to the sector in question.

6 A variant, where import volume is held constant rather than income, is termed the ‘Mercantilist TRI’ (MTRI).
Measuring openness to trade in services

In recent years there have been a number of attempts made to specifically measure trade in services, both in total, across country, and across sectors such as finance, education, and telecommunications (for an overview of studies see Findlay and Warren, 2000; Dee, 2003; and Deardorff and Stern, 2004).

Studies have used a variety of means to assess restrictiveness. For example, Hoekman (2000) suggests that financial data on gross operating margins may indicate the effect of government policies on competition. In an earlier paper, Hoekman (1995) constructed frequency ratios to measure openness based upon country GATS commitments, where this is defined as the fraction of possible commitments that were made. Of course, this may be biased as it assumes that an absence of positive country commitments indicates the presence of restrictions (Holmes and Hardin, 2000). Other studies have sought to construct price-impact measurements of trade restriction (Bosworth et al., 2000; Doove et al. (2001), or quality-impact measurements (Warren, 2000). In these cases, a model of the determination of price or quantity is estimated, and the trade restrictiveness index included to assess the effect of trade barriers on the price or quantity of a service. However, because this modeling is necessarily sector specific, these techniques have limited use for cross-sector or cross-country analyses. For this, a more general model is required, such as the ‘gravity model’, which relates bilateral trade volumes positively to the incomes of trading partners and negatively to the geographical distance between them (Anderson, 1979; Deardorff, 1998). However, this approach applies to total trade rather than individual sectors. An alternative is the CGE model, which provides a framework for cross-sector and cross-country analyses, and it has begun to be applied in the case of services (e.g. Holmes and Hardin, 2000; Brown and Stern, 2001; Stern, 2002; Fink et al., 2003).

Most of the studies have, however, used in their analyses some variant on the TRI. This is no doubt because restrictions on trade in services encompass a multitude of policies significantly different to the restrictions relevant to trade in goods. For instance, tariffs are leveled on goods, whereas trade in services is effected more by regulations in the form of, for example, citizenship requirements, residency requirements, forms of establishment of business structures, levels of investment, requirements for local partners, and recognition of foreign qualifications. In this case, it is clear that a multi-factorial index will be required to assess openness.

It is worth noting, however, at this stage that the TRI as used by many of these studies differs from that proposed by Anderson and Neary, whose TRI takes a general equilibrium approach, which gives an economically meaningful measure of the importance of interventions, given an initial characterization of them (e.g. in terms of tariff equivalents). Of course, in services there is
a lack of an initial characterization of interventions, leading to the three-stage approach adopted by these papers with respect to assessing a TRI for services: (i) use basic information and judgments to generate a TRI (see below); (ii) use econometric techniques to estimate the effects of this TRI on some intermediate economic measure to enable estimation of a ‘tax equivalent’, or ‘productivity equivalent’, of the interventions; and (iii) use a CGE model to generate the counterfactual on the direct and indirect economic measures (Deardorff and Stern, 2004). Nonetheless, despite this difference, the general approach of the TRI, in comparison to other techniques described here, remains fundamentally the same.

**Constructing an index of openness for the health sector: a proposed methodology**

Although the TRI approach seems most appropriate to utilize in health, it requires a unique application. This is not least because of the uncertainty concerning the status of many public health care systems under GATS, given Article (I.3) which states that GATS excludes ‘services in the exercise of governmental authority’, further defined as being a service which is supplied neither on a commercial basis nor in competition with one or more service suppliers (Blouin et al., 2006). There has been much debate about what this actually covers, although it seems that the range of public–private mix in most health systems means that it is reasonable to assume that GATS would formally encompass (at least a part of) most health systems (and, of course, trade can, and does, also take place outside of GATS) (Smith et al., 2006b). It is therefore important that the impact of trade liberalization is assessed appropriately, and in this section the suggested methodology is illustrated.

**Step 1: Details of trade restrictions of relevance**

We first need to collect details of regulations and other policies affecting services in the health sector, ideally from systematic surveys of government and/or firms, but also by inference from other documents (Warren, 2000; McGuire et al., 2000). GATS offers a useful framework for identifying and differentiating restrictions that may be of relevance to health, and may itself be a good source of information (Kalirajan et al., 2000; Kemp, 2000).

Here the United Kingdom is taken as a working example, with a predominantly public health care system paid for by taxation. For the secondary (hospital) care sub-sector, trade is theoretically possible in each of the four modes of GATS, and so possible restrictions in this market are outlined by mode.
Mode 1: Cross-border supply
Here the service crosses the border although not the provider or patient, such as consultation conducted using video technology. Possible restrictions include requirements for the establishment of local operations in addition to the foreign supplied service, recognition of qualifications of the distance service provider, and availability/controls on the technology being used.

Mode 2: Consumption abroad
Here the patient travels to obtain services in another country (a patient coming to the country being an export of health services and vice versa). Possible restrictions include the portability of health insurance (restricting funds to pay for services abroad), visa requirements, and waiting lists.

Mode 3: Commercial presence
Here the service is provided within the country, but by a hospital financed by and/or controlled by an overseas investor. Possible restrictions include limiting the establishment of foreign firms through a minimum/maximum level of investment in a hospital, joint venture/partnership requirements, and requirements for proportions of local/foreign employment. Mode 3 is generally thought to be the most ‘important’ of the four modes in terms of overall trade volume and/or value (Smith, 2004; Blouin et al., 2006).

Mode 4: Temporary movement of service providers
Here the health professional moves temporarily to another country to provide health services there. Possible restrictions include visa requirements, limits on overall numbers admitted to the country, and recognition of qualifications. In some ways, although mode 3 may be of more importance in trade volume and/or value terms, mode 4 is more fundamental to services trade more generally, as services require far more human than capital resources (comprising some 80% of recurrent costs). It is a moot point whether increased openness to trade will increase the overall supply of human resources, or simply lead to ‘brain drain’ from poor to rich, and thus compound the problem of current shortages in health service personnel. However, this is a discussion of the likely benefits of trade per se, and thus beyond the remit of this current paper, although is discussed elsewhere (Blouin et al., 2006).

Step 2: Development of index of openness
This step requires: (i) scoring the degree of restrictiveness for each type of restriction, according to the magnitude of its impact on trade, on a 0 (least restrictive) to 1 (most restrictive) scale; and (ii) weighting of each restriction to reflect its overall ‘economic significance’ in restricting trade in that sector (McGuire et al., 2000; Doove et al., 2001). The final index is thus a weighted
average of the scope and importance of the elements considered (Deardorff and Stern, 2004). This exercise requires subjective judgments to be made of the trade context of the country concerned.\(^7\) In the example here, the weights result from following the framework provided by Chanda and Smith (2006),\(^8\) and are provided in Table 2.\(^9\)

In Table 2, each mode is listed separately and, for illustrative purposes, three restrictions within each mode are listed. Within these, several ‘levels’ of restriction are provided, which drive the scoring system. The second column, ‘score’, provides the impact factor of each restriction on the 0 (no impact on the cost of trade from that restriction) to 1 (total restriction, reflecting an absolute impact and, in theory, defined as infinite cost of trade) scale. For example, under mode 3 there may be a restriction on the minimum/maximum level of investment in the secondary care sector. If this is a total ban on foreign investment, then this restriction is assigned a weight of 1; if investment must be a minority share, this receives a weight of 0.5; if a majority share is allowed, this receives a weight of 0.25, and no restriction receives a weight of 0.\(^10\)

The third column provides the relative weights to reflect the overall importance of each restriction category in restricting trade.\(^11\) For instance, it is generally considered that restrictions on foreign direct investment (mode 3) are more restrictive, and a greater cost to efficiency, than restrictions on the movement of health professionals (mode 4) and so receives a higher weighting. These weights sum to 1 across the different categories.

The interpretation is that a health sector with a score of 0 in this example would be judged to be completely open to international trade, and a sector with a score of 0.7718\(^12\) would be completely closed. Thus, the lower the score

7 An alternative is to apply factor analysis to the assembled data to identify those barriers that vary most independently and apply the largest weights to these (Nicoletti et al., 2000; Doove et al., 2001). However, this purely statistical technique is not necessarily an improvement on judgment (Deardorff and Stern, 2004).

8 This framework assists countries in identifying and collating information relevant to the assessment of the state of, and impact of, trade in health services. The comprehensive nature of this framework means that much of the data that may be required to inform a TRI approach to measuring openness of health to trade could be collected as a part of this.

9 Note that separate indexes have been constructed for each mode of supply. This is not necessary, but may be desirable as the provision of services through different modes is likely to have different costs. Thus, differences in restrictions applying to each mode can influence the pattern, as well as the volume, of trade. For example, restrictions on foreign direct investment (mode 3) can increase demand for consumption abroad (mode 2) or cross-border supply (mode 1).

10 It is important when determining these scores to consider the actual restrictive impact rather than just stated legal requirements.

11 It is worth bearing in mind that a system of no weighting is the same as giving equal weights to each restriction. In the example here, this would imply a weight of 0.083 for each of the 12 restrictions.

12 From table 2: \(0.02*1 + (0.02*1) + (0.06*0.8) + (0.14*1) + (0.08*0.3) + (0.08*0.8) + (0.15*1) + (0.13*0.6) + (0.12*0.95) + (0.04*0.3) + (0.10*1) + (0.06*0.75) = 0.02 + 0.02 + 0.048 + 0.14 + 0.024 + 0.064 + 0.15 + 0.078 + 0.114 + 0.012 + 0.10 + 0.045 = 0.7718\).
Table 2. Index system for measuring openness¹³

<table>
<thead>
<tr>
<th>MODE and RESTRICTION</th>
<th>SCORE</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Require establishment of local operations</td>
<td>1.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Local presence/partnership required</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>No restrictions</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Recognition of qualifications</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Non-recognition of foreign qualifications</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Recognitions, but required to pass ‘equivalence exam’</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Full recognition</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Control/level of technology</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Telecommunications technology low level</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Government control of technology</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Private provision of high level technology</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Mode 2</strong></td>
<td></td>
<td>0.30</td>
</tr>
<tr>
<td>Portability of health insurance</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Public and private insurance accepted</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Reciprocal with public insurance schemes only</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Private insurance only</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>No arrangements</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Visa requirements</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Limit of length of visa</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Subject to recognition of qualifications</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>No restriction</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Waiting lists/times</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Extra time faced by foreign patients</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Domestic times apply</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Fast-track for foreign patients</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Mode 3</strong></td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>Minimum/maximum level of investment</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>No foreign equity permitted</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>&lt;50% equity permitted</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>50% to 75% equity permitted</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>No restriction</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Joint venture/partnership requirements</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Entry allowed only through joint venture</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>No restrictions</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Requirements for proportions of local employment</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Staff must be &gt;90% local</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>Staff must be &gt;50% local</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Staff must be &gt;25% local</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>No restriction</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Mode 4</strong></td>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td>Visa requirements</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Limit of length of visa</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Subject to recognition of qualifications</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>No restriction</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>
the more open to trade the sector. This allows comparison between countries, as well as tracking changes in openness over time (for example, see McGuire et al., 2000). Applying this to the example of the UK secondary care sector yields the profile in Table 3.

The score of 0.162 suggests that the UK secondary care sector is significantly open to international trade. Decomposing this, there appears to be no restriction to trade under mode 3, whereas the highest level of trade restriction (lowest level of openness) is in mode 2.

**Step 3: Use index in econometric analyses**

This index may then be incorporated within econometric models as an explanatory variable with cross-sectional (panel) data and/or longitudinal (time series) analyses (Johnson et al., 2000; Kalirajan et al., 2000; Trewin, 2000). The dependent variable usually estimated in models applied in other service sectors is a price or quality differential (Deardorff and Stern, 2004). However, within the health sector it is likely that a range of different dependent variables may be of concern. For instance, how increased openness to trade influences access to services, or health outcomes, such as mortality, or DALYs (Disability Adjusted Life Years – a measure combining mortality and morbidity). For example, an index constructed for a number of countries would enable us to construct a model taking the form

\[
\text{MORT} = f\{\text{constant, } \text{GDP, POP, UNEMP, NOPHY, PATAA, STINPAT, OPEN}\}
\]

where

- MORT = mortality rate
- GDP = Gross Domestic Product (national income)

Note that because we are measuring restrictiveness, openness is the inverse of the scores presented in this table.
Table 3. Illustrative profile of openness for the United Kingdom

<table>
<thead>
<tr>
<th>MODE and RESTRICTION</th>
<th>INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode 1</td>
<td>0.008</td>
</tr>
<tr>
<td>Require establishment of local operations – no restrictions</td>
<td>0.000</td>
</tr>
<tr>
<td>Recognition of qualifications – require ‘equivalence exam’</td>
<td>0.008</td>
</tr>
<tr>
<td>Control/level of technology – high level technology</td>
<td>0.000</td>
</tr>
<tr>
<td>Mode 2</td>
<td>0.128</td>
</tr>
<tr>
<td>Portability of health insurance – reciprocal public</td>
<td>0.084</td>
</tr>
<tr>
<td>Visa requirements – subject to recognition of qualifications</td>
<td>0.016</td>
</tr>
<tr>
<td>Waiting lists/times – domestic times apply</td>
<td>0.028</td>
</tr>
<tr>
<td>Mode 3</td>
<td>0.000</td>
</tr>
<tr>
<td>Minimum/maximum level of investment – no restriction</td>
<td>0.000</td>
</tr>
<tr>
<td>Joint venture/partnership requirements – no restrictions</td>
<td>0.000</td>
</tr>
<tr>
<td>Required proportion of local employment – no restriction</td>
<td>0.000</td>
</tr>
<tr>
<td>Mode 4</td>
<td>0.026</td>
</tr>
<tr>
<td>Visa requirements – subject to recognition of qualifications</td>
<td>0.008</td>
</tr>
<tr>
<td>Limit on numbers admitted to the country – unrestricted</td>
<td>0.000</td>
</tr>
<tr>
<td>Recognition of qualifications – require ‘equivalence exam’</td>
<td>0.018</td>
</tr>
<tr>
<td>TOTAL INDEX</td>
<td>0.162</td>
</tr>
</tbody>
</table>

- POP = population dependency ratio (proxying the ‘ageing effect’)
- UNEMP = unemployment rate (proxying poverty)
- NOPHY = number of practising physicians per capita (proxying level of health services)
- PATAA = proportion of public ambulatory healthcare expenditure of total ambulatory healthcare expenditure (proxying level of health services)
- $TINPAT = total expenditure per capita on inpatient healthcare (proxying level of health services)
- OPEN = openness index (as calculated above)

Using this base model, it would then be possible to conduct panel data analysis of pooled cross-section time-series data using either, or all, of ordinary least-squares (OLS), fixed effects or random effects models (typically used in such analyses, with variation between methods the result of assumptions concerning the error term) (Wilton and Smith, 2002; Johnston and Dinardo, 1997). Such a model would, controlling for the effects of, for example, aging and the level of health services, infer the effect on mortality from the level of openness of the health sector to trade. The coefficient on the variable OPEN would indicate whether the effect was a positive one or not (whether increased restrictiveness (index closer to 1) would increase mortality) and, if so, the rela-
tive magnitude of openness as a contributory factor in this increase compared with the other factors (Rivera-Batiz and Oliva, 2003). Obviously, analyses can be expanded to encompass different dependent variables (such as sector size, access to services or sector-specific inflation) and incorporate different independent factors, such as the AIDS adult prevalence rate, as deemed appropriate.

We may also undertake longitudinal analyses to assess the relative change in dependent variables brought about by changes in openness, or integrate the index into a boarder macro-economic model of the economy as a whole (Dee et al., 2000; Smith et al., 2005; Smith et al. eds, 2006; Rivera-Batiz and Oliva, 2003).

Discussion

Which countries are most open to trade? How does openness affect a country’s economic and wider well-being? What policies promote openness? These and other questions are fundamental to international economic relations and policy, and depend upon being able to measure ‘openness’. In this paper, the range of options to measure openness was briefly presented, and the suggested methodology – an adaptation of the TRI approach – illustrated.

Of course, considerable development is required to develop the robustness of this approach. Key amongst these is how the weights are derived, as the validity and reliability of the index depends on the quality and depth of information available (a higher score may simply reflect a greater availability of data rather than a more restrictive regime), and some restrictions may not be captured, or may be scored differently from the way they are applied in practice. The other 'top three' developmental considerations include:

1. Determining the objective of increased openness – the hypotheses that one is likely to test will play a (significant) part in determining how best to construct the TRI, such as what types of restrictions are covered. In the health sector, it is possible that there may be a trade off between increasing economic development and ‘health’. This then, of course, requires determining how ‘health’ is measured. Health is a stock, with the flow of health services and goods used to maintain it. In this case, a real income constant uniform tariff equivalent may not be the most appropriate choice, and we may thus have to develop a model more similar to the MTRI that holds constant the stock of health.

2. Considering contingent relationships (context). For instance, whether openness operates differentially in low-, middle-, and high-income countries. Liberalization does not occur in a vacuum, but often involves many other forms of domestic as well as international policies, regulations, and incentives, and
these will all interact with efforts made to open a country’s health sector to trade.

3. Differentiating between general- and sector-specific elements. There will likely be some aspects in the measurement of openness that will relate more generally to the economy as a whole, as the degree to which health will itself be open to trade will, of course, be a function of how open to trade the country more generally is. Differentiating these is likely to be useful for two reasons: (i) existing techniques or measures of openness may perhaps be used to assess the convergent validity of the measure for openness of the health sector; and (ii) there is likely to be an existing level of data and/or evidence relating to general parameters, which will ease the analytical burden.

Despite the developmental work required, however, the TRI approach would appear to offer the most appropriate means by which to seek to measure openness to trade within the health sector. Further work to develop this approach, and tackle the issues above, is currently underway, but wider application of this general approach for a range of different countries and health care systems is urgently required if the potential risks to health are to be mitigated, and the potential opportunities exploited (Smith et al., 2006).

Acknowledgements

This paper was funded by the World Health Organization and is the result of discussions and consultations with WHO’s programme on Globalization, Trade and Health (Nick Drager, Senior Advisor) and is part of the research component of the programme that aims to better assess in a systematic way and across countries the degree of openness of the health sector. The author would also like to extend his appreciation to Mohammed Adil for research assistance, and to James Anderson, Philippa Dee, Christopher Findlay, Miyuki Shibata and Halit Yanikkaya for their advice concerning possible methodologies and comments upon an earlier draft of this paper, as well as to two anonymous referees whose comments greatly improved the clarity of the paper. The usual disclaimer applies.

References


Measuring the globalization of health services 341


