

Conceptual issues behind the assessment of the degree of internationalization.

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Abstract.

This article identifies four major research perspectives on internationalization related to: level of aggregation, internationalization modality, activities configuration and other elements of internationalization at firm level. This is followed by the identification of three major dimensions in the internationalization concept: the *intensity*, *extensity* and *geographical concentration* dimensions. Discussions of issues related to the construction of indices and of the range of choices of indices open to researchers, are followed by a brief analysis of the effects of internationalization and how they and the underlying theories of the motivations behind international activities should drive the search for appropriate indices. Four examples on the linkages between theoretical approaches to the effects and the development of appropriate indices are discussed: innovation; trade; TNCs' bargaining power and performance elements. The article concludes that: (a) the degree of internationalization is a multifaceted concept and therefore there is no unique, 'correct' index: indices may or may not be appropriate to the task we assign them; and (b) the theoretical and conceptual frameworks behind the effects of internationalization are key to the development of appropriate indices.

Key words: Internationalization; transnational corporations; indices of internationalization; internationalization and innovation; transnationals and bargaining power; trade; performance and internationalization.

JEL classification: F20; F21; F23;

1. Introduction

The last twenty five years have seen a growing number of publications on the assessment of the degree of internationalization (Dunning and Pearce 1981; Sullivan 1994; Dunning 1996; Ietto-Gillies 1998; UNCTAD 1995 and following years²). The works usually present development and estimation of existing or new indices. They differ in many respects including the terminology used; some authors use the generic term internationalization, others refer to degree of multinationality or transnationality or to the degree of globalization. I shall here use the term internationalization in a general and inclusive way.

A variety of variables are used in the literature to capture the concept of internationalization ranging from macro variables such as foreign direct investment (FDI) or trade to firm-level ones such as the number of foreign subsidiaries or the

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² More specific and recent references in section two.

value of foreign sales by corporations. I consider any such variable to be ‘indicator’ of internationalization and the terms variable and indicator will be used interchangeably.

From the various indicators a variety of more or less sophisticated indices are developed: an index is arrived at by applying mathematical and statistical techniques to one or more indicators. The techniques can be as simple as percentage ratios or more sophisticated ones such as Herfindhal indices.

The aim of this paper is not to develop specific indices or to do a full review of the indices already in the public domain³. Indeed I feel that there is a need to pause, reflect and ask ourselves: is internationalization a unique concept that can be identified by a unique construct? Is it possible to identify a unique index or a unique approach to the construction of indices of internationalization to be used in all circumstances? What is the meaning we can attach to various measures of internationalization? Why do we want to develop indices of internationalization? These questions cannot easily be answered with reference to existing research. They therefore identify a gap which the present paper aims to fill. The gap relates to the need for clarification of the conceptual underpinning to the degree of internationalization.

The paper proceeds as follows. The next section analyses various research perspectives in the assessment of the degree of internationalization; section three considers three main dimensions of indices in terms of intensity, extensity and geographic concentration. Section four discusses construction issues and five the choices deriving from different perspectives and dimensions. Section six briefly analyses effects of international business activities as relevant for the choice of indices. Section seven gives four examples of linkages between underlying theories and the choice of indicators and indices. The last section summarises and concludes.

2. Different research perspectives on indices

Internationalization can be viewed from various research perspectives each giving scope for the use of a variety of indicators and indices. The different perspectives are not mutually exclusive and various combinations of their components are possible. The following are the main perspectives used in the literature.

Level of aggregation

Many works consider internationalization indicators and indices at the level of the country and sometimes the region. Some authors see the region as the main stage for the internationalization of firms’ activities (Rugman and Verbeke, 2004; Rugman and Oh, 2008). The UNCTAD has been publishing several FDI ratios by country in their annual *World Investment Report*, such as FDI (foreign direct investment) flows as percentage of the country’ GDP (gross domestic product) or domestic capital formation. Heshmati (2006) develops a composite index of a country’s globalization using a variety of indicators for the following components of globalization: economic integration; personal contact;⁴ internet technology, and political engagement.

Most indicators and indices in the international business literature are at the firm level and, for reasons linked to data availability, there are many more related to

³ A very useful review and critical discussion of indices is in Dorrenbacher (2000). See also UNCTAD (2007).

⁴ “Personal contact is charted by looking at international travel and tourism, international telephone traffic, and across-borders money transfers.” (Heshmati 2006: 4)

the largest transnational corporations (TNCs) than to smaller ones (UNCTAD, 2001 and 2007). Some authors use a combination of macro and firm level indicators (Fisch and Oesterle, 2003). In the attempt to develop measures of globalization, the OECD (2005 a and b) suggest a detailed list of indicators (and some indices) related to: FDI; activities of TNCs; international dissemination of technology; and trade.

In principle it should be possible to consider indices at the industry levels: some industries are more internationalized than others either for reasons linked to resources access or for reasons linked to markets. However, in practice there are not many indices developed and applied specifically to the industry. What we tend to see are indices developed and estimated at the level of firms and the results grouped and analysed by industry (Ietto-Gillies, 2002: ch. 5; UNCTAD: various *World Investment Reports*).

Modality

Indices can be developed for various modalities of internationalization from trade (imports or exports or both) to foreign direct investment to licensing to collaborative agreements. It is also possible to develop indices related to financial flows at both the macro and micro levels (Hassel *et al.* 2001). Petri (1994) estimates and juxtaposes gravitation indices of trade and FDI.

Two modalities tend to be overlooked in the literature. The first is the extent to which the degree of internationalization is linked to greenfield investment or to mergers and acquisitions. This is an issue of relevance at both macro and micro levels. The second modality is one that tends to be forgotten for both conceptual and data availability reasons: it is the outsourcing modality particularly via sub-contracting. The dichotomy in-house v out-sourcing has become a very important strategic issue in the last twenty years. Yet, it has attracted very little interest from researchers working on measures of the degree of internationalization either at the level of development of indices – which is understandable given the paucity of data – or at the level of interpretation of results. Some of the implications of the latter in relation to interpretation of results will be considered in the conclusions. Regarding the paucity of data (OECD 2005b: pp. 205-8) the situation is improving: some data are now becoming available (Lewin and Peeters, 2006) and this may allow the development of specific indices in the future.

Activities configuration

The internalization versus outsourcing of production activities is one aspect of the organization of production which can take place at either domestic or international levels. A connected organizational aspect is the configuration of activities (Porter, 1986), i.e. the extent to which different segments of the value chain of production are located within the same country or across frontiers and indeed whether – in either case – they are internalized or sub-contracted. Asmussen *et al.* (2007) develop an index that measures the extent to which different segments of the value chain are located internationally. In the construction of the index the authors use matrix analysis and apply primary data from a specific survey of Danish TNCs. Van den Berghe (2003) also takes account of the configuration perspective.

Different elements within the firm

In assessing the degree of internationalization of companies some indices focus on elements of performance – such as profits or sales or financial indicators (Hassel et al. 2001); others focus on a variety of indicators including structural and/or organizational ones. Examples of the latter can be found in UNCTAD (2007) which considers a ‘stakeholders’ perspective’ including the nationality composition of managers (pp. 21 and 28); it also considers the spatial organization of management (p. 21). Sullivan (1994) includes “Top managers’ International Experience” among its variables.

The variety of perspectives and of possible variables within each is an indication that there is not a single concept of internationalization but several. The obvious conclusion from this is that no single index can capture internationalization as a whole. The choice of perspective and of variables/indicators within them depends on the specificity of the research project. However, the research perspective is not the only element of choice in the development of indices. Another important element is discussed in the next section.

3. Three dimensions on the degree of internationalization

Whatever the research boundaries, and therefore, whatever the level of aggregation, internationalization mode, activities configuration or other elements within the firm we want to concentrate on, we can also identify specific dimensions i.e. conceptual approaches to internationalization and to the measurement of its degree. Conceptually, internationalization can be seen in terms of ‘activities’⁵ away from the home country. In this case the stress is on the dichotomy: foreign versus domestic. This dimension of internationalization is here referred to as *intensity dimension*.

A different way of looking at internationalization is to put more emphasis on the geographic scope by highlighting the geographic spread or concentration dimensions. In this case the relevant dimensions of internationalization are seen as either the number of countries in which activities take place (*the geographic extensity dimension*) or the degree to which activities are concentrated within the foreign countries: *the geographic concentration dimension*.

Intensity dimension

The *intensity dimension* focuses on the dichotomy foreign versus domestic. It measures the degree of internationalization as the intensity of foreign activities in relation to the quantum of domestic activities or the quantum of total (foreign plus domestic) activities. Most ‘intensity’ indices effectively measure the degree to which activities take place away from ‘home’, i.e. the degree of foreign projection (*‘degree of foreignness’*) of the specific activity or other business element considered. This is because the ‘foreign’ activities are considered all together independently of the number of foreign countries in which they take place.

The variables/indicators chosen to express ‘foreignness’ vary according to the level of aggregation chosen (such as firm or country variables) or according to the internationalization mode the researchers wish to concentrate on (such as trade or

⁵ As mentioned above, internationalization can be – and has been - expressed by a variety of variables not all of them related strictly to production/ business activities. The word activity(ies) will be used throughout in a very general sense which encompasses all possible business-related variables.

foreign investment or alliances) and/or other perspectives of internationalization. For example, a measure of intensity at the firm level could be the extent of foreign sales as a proportion of the company's sales in the home country or as a proportion of the company's total sales (both at home and in foreign markets).

At the industry level we could assess the value of activities abroad in relation to the activity in the domestic economy or in total (domestic plus foreign). As regards the macro economy we could, for example, assess the extent of the country's foreign investment (outward or inward) in relation to the size of the domestic economy, whether measured by GDP or GDFCF (gross domestic fixed capital formation).

Geographic scope: extensity and concentration dimensions

The intensity dimension focuses on the dichotomy home v abroad. However, 'abroad' could be in one country or in 50 or more and within the 50+ countries there could be equal or unequal distribution. There are effects for which the number of countries in which activities take place or resources are located is of relevance. In other cases the geographic concentration of resources or activities may be relevant. In other words, the geographic scope of operations matters and some authors have tried to develop indices in relation to it. Several indices have been developed and they can be grouped into two main dimensions.

1. *Geographic extensity dimension.* The extensity indices aim to capture the overall geographic scope of operations in terms of the number of countries the activities spread into. The indices can be expressed in absolute terms (1a) or in relative terms (1b) whenever a normalizer is used (as discussed in sec. 4 below).
2. *Geographic concentration dimension.* It aims to measure the degree of spatial (usually by nation-state) concentration of activities within a specific region independently of the quantum of activity and/or the number of countries involved.

The indices under 1 highlight the relevance of operating in many or few countries while those under 2 stress the relevance of the relative distribution of operation between different countries/regions independently of the number of countries/regions involved.

Similarly to the intensity indices, any index related to geographic scope dimensions can be considered at various levels of aggregation (such as firms or countries) and for a variety of internationalization modes (such as trade or FDI).

4. The construction of indices

For any of the perspectives (sec. two) or combination of them and for any of the three dimensions (sec. three), it is possible to derive specific indices. At the most basic level an intensity index is just a percentage: for example – at the micro level - sales abroad as a percentage of the company's total sales; or at the macro level, export or imports as percentage of GDP. It is also possible to develop intensity indices using non-value indicators such as the number of foreign affiliates as percentage of the company's total (Jetto-Gillies 1998 and 2002).

In relation to the geographic scope, the basic idea is to construct indices that take account of the distribution of activities in the various countries. In the *extensity*

dimension (1) the relevant variable is seen as the number of foreign countries in which activities take place. In the absence or difficulty of getting quantum/value activities by country some authors have just used the number of foreign countries as indices without normalization (1a) (Anastassopoulos and Rama, 2004) or with normalization (Ietto-Gillies, 1998 and 2002; Sanders and Carpenter, 1998). The normalizer in Ietto-Gillies's works is – for any given year - the total number of countries world wide in receipt of inward FDI minus one. The countries in receipt of inward FDI is taken to be an indication of potential for foreign investment in that country; the subtraction of one eliminates the home country from the total. In this case the index – called Network Spread Index (NSI) - can vary between 0 and 1. Sanders and Carpenter (1998) use, as normalizer, the number of countries in which a specific firm has activities as a percentage of the highest number of countries exhibited by a single firm in their sample. In their case the index is equal to one for the firm with the highest number of countries in which it operates. Whatever the index and the variables chosen, the normalizer, i.e. the variable in the denominator, varies according to what type of index one wants to construct. The scale of the denominator affects the scale of the index.

In the *concentration dimension* the relevant geographic scope is captured in terms of concentration of activities in certain countries or regions. Several indices have been used such as: the Herfindhal index (Davies and Lyons, 1996: chs 7 and 11; Ietto-Gillies, 2002: ch. 4); Lorenz curves (Fisch and Oesterle, 2003); or the degree of 'gravitation' of foreign activities towards specific regions or areas (Petri, 1994).

Apart from the choice of perspective and dimension three further issues are of relevance in the construction of indices. First, the number of variables to be used: some indices are *simple, uni-variable* others are *composite, multi-variables*. The former are constructed by using a single variable as a measure of foreign activities such as sales or employment or profits (Dunning and Pearce, 1981). UNCTAD's *World Investment Report* publishes three uni-variable intensity indices for the world's largest 100 TNCs. They are calculated as: ratio of foreign sales to total sales; of foreign assets to total assets and of foreign employment to total employment. These three indices are then combined into a single composite one – as average of the three – called the Transnationality Index (TNI). Similarly, Dunning (1996) uses three uni-variable indices based on assets, employment and R&D to arrive at a final transnationality index. Sullivan (1994) constructs a composite five-variables index based on firms' 'sales', 'profits', 'assets', 'Top Managers' International Experience' and 'Psychic Dispersion of International operations'.

Second, whether to develop *complex indices* in which the intensity and extensity dimensions are combined. Gomes and Ramaswamy (1999) combine two intensity and one extensity indices. Similarly van den Berghe (2003) develops an index that combines intensity and extensity as well as activities configuration. Ietto-Gillies (1998) combines the UNCTAD TNI with her extensity index, the NSI. Lastly, there is the issue of data, in particular, whether to use cross section or time series data; primary or secondary data.

In many cases the drive towards multi-variables or complex indices is the desire to arrive at the 'ultimate measure of internationalization' by taking account of several indicators, sub-indices or by taking account of more than one dimension. However, sophistication and complexity can generate their own problems. The construction pitfalls of multi-variables indices are highlighted in Ramaswamy *et al.* (1996). Moreover, multi-variables and multi-dimensions indices may be difficult to interpret.

5. Spoilt for choice

Figure 1 summarises the various elements of indices discussed in the previous sections regarding different perspectives, dimensions and construction issues. Each element as well as combinations of various elements can lead to a specific index. There are indeed many, many possible indicators and indices of internationalization: we are spoilt for choice. The many choices we face include the following.

- Choice of research perspective(s), bearing in mind that the different perspectives are not necessarily mutually exclusive; for example performance or structural issues can be considered from the macro or micro perspective.
- Choice of dimension (intensity, extensity or concentration).
- Choice of indicator(s)/variables within each perspective and dimension.
- Choice between single and multi-variable(s) indices; between simple and complex (multi-dimensional) ones.
- Choice of normalizer.
- Choice of mathematical/statistical structure of the index as well as choice of type of data.

The choice implicit in the first three perspectives - as in fig. 1 - and the many elements within them is not a problem because the decision is usually determined by the research agenda. Usually, we know at the outset whether we want to study the firm or industry or macro economy or which internationalisation mode we are interested in.

Nonetheless, we are still left with many choices and, most relevant, with the choice between extensity, intensity or concentration dimension: the relevance stems from the fact that different dimensions mirror different conceptual approaches to internationalization. How do we decide? Let us look at the task(s) we want our indices to perform or to assist us in. The actual operationalization of our measures should be guided by the task(s) we assign to our indices.

At the more practical level, once we focus on a specific approach to the development and construction of indices, we have to confront the problem of availability of data. This is likely to have an impact on our choice of variable(s) and/or period of analysis. It should not, however, affect our choice of dimension (extensity, intensity or concentration) because the constraints on the availability of data should not be a reason to compromise on our conceptual framework on internationalization. To do that might constrain our ability to derive conclusions regarding effects of internationalization. This issue is the subject of the next two sections.

6. Effects of international activities

At the surface level the indices are usually used to make comparisons between firms or between industries or between countries/regions at a particular point in time or across several years. At a deeper level, the indices are always, directly or indirectly, used to draw comparative inference about some effects of international activities be these related to the performance of the firm or the industry or the macroeconomy and in relation to a variety of performance elements. The ultimate aim may be to use this inference to assist large firms and other business actors – such as labour or smaller unational firms - involved in and/or affected by international activities to develop

appropriate strategies. It can also assist governments to develop policies with regard to various aspects of internationalization.

There is a large literature on the effects of international activities (OECD, 1994; UNCTAD, 1994 and 2002; Barba Navaretti and Venables, 2004; Ietto-Gillies, 2005) and indeed there are many aspects to the assessment of effects specifically in relation to the following. (a) *Effects on whom*: firms; industries; the macroeconomy; other actors in the economic system and specifically: workers; consumers; suppliers and distributors; SMEs; governments. (b) *Effects on what*: performance elements such as growth of sales, profits or productivity at the firm level; GDP, productivity, employment or trade and balance of payments at the macro level; development and diffusion of innovation and technology; environment; international relations; effectiveness of economic policies.

What is common to all the elements of effects is the fact that the assessment of the effects – of whatever type and at whatever level of aggregation - has strong theoretical connotations. There are two sources of theoretical implications. The first one derives from the fact that in order to be able to say something meaningful about effects we must begin to understand the motivations behind the drivers of internationalization: why internationalization takes place and why it takes a specific form/mode; why do firms engage in FDI and/or licensing; why some industries appear to be more projected towards production and/or markets in foreign countries compared to others; why are some countries relatively more open to trade or FDI than others and whether or how trade is related to their FDI record. In any of these questions we do not have ready-made answers: all we have are theories (Buckley and Ghauri, 1999; Cantwell, 2000; Ietto-Gillies, 2005)

The second source of theoretical implications derives from the fact that even when we, approximately, agree on the motivation behind internationalization, we still have to understand and work out the specific effects that derive from it. Here again we do not have ready-made answers but theories and hypotheses to be subjected to tests. Therefore, there are implicit or explicit theories behind the effects as well as theories behind the reasons for the foreign activities that produce those effects. This means that any index of internationalization that aims to shed light on the effects, must take account of the theories underpinning the motivations for internationalization and of the relationship of such motivations to the effects of internationalization. The ultimate choice of variables and indices depends on: (a) what effects of internationalization we are interested in; (b) what theoretical explanations we have regarding the motivations behind international activities and the relationships between those explanations and effects; and (c) how we link those theoretical aspects to the indices.

7. Linkages between theory and dimensions of indices: four examples

The link between theoretical underpinning of effects and the measurement of the degree of internationalization is particularly relevant in relation to the choice between intensity, extensity and concentration indices. They are all relevant for making comparisons; however, the preference for one or other dimension very much depends on which effects we are interested in and what theory(ies) lie behind them.

This section presents four examples to illustrate the linkages between the development of indices and the theoretical underpinning behind the assessment of the effects. Specifically we shall consider effects on:

- Knowledge acquisition and innovation
- Volume and structure of trade

- TNCs' bargaining power
- Performance elements

Innovation

The contribution of internationalization to innovation can be related to the different internationalization modes (trade, FDI via greenfield or M&As, licensing or joint ventures). Whether we concentrate on a specific mode, depends on the theory we have about the impact of TNCs on development and diffusion of innovation. We may work on the theoretical assumption that direct production has a strong impact on the diffusion of innovation, or, for example, on the assumption that such effects can be achieved via alliances and/or via trade. Moreover, it is possible to work at various levels of aggregation in terms of impact of internationalization on innovation. It is also possible to attempt to draw inference about the comparative impact on innovation and knowledge diffusion of the international location of horizontal or vertical activities.

There are, however, deeper theoretical linkages between internationalization and knowledge development and diffusion and these have to do with the different dimensions of internationalization discussed in section three. To these we now turn.

The link between multinationalization and the development and diffusion of innovation and technology was, for a long time, dominated by the international product life cycle (IPLC) model (Vernon, 1966). This model is product-centred, and puts forward a hierarchical view of innovation: there is a hierarchy of innovative versus non-innovative products and firms, of innovative versus less or non-innovative countries. The diffusion of innovation and technology is seen – in the original paper by Vernon - as moving linearly from the most developed country (the US) to others, first European and later the developing countries. Indeed we talk, in the context of the IPLC, of technology transfer rather than technology diffusion.

Building on the evolutionary theory of the firm and of the TNC (Nelson and Winter, 1982; Kogut and Zander, 1993) more recent literature has challenged this view on the development and diffusion of innovation and technology (Cantwell, 1989 and 1995) in favour of a more dialectical and interactive relationship in which various units of the transnational company spread knowledge and innovation within the company itself through their operation in various countries and therefore through the TNC's internal linkages.

Units of the corporation – be they subsidiaries or headquarters - learn also from the environments in which they operate and their knowledge is transferred internally to other parts of the company within the same country or from country to country. They learn from the local environments via their linkages with customers, suppliers, distributors as well as, in many cases, via innovation-specific collaborative agreements with other firms. For the company as a whole two types of networks are of particular relevance for innovation acquisition: the internal networks of TNCs' subsidiaries and the external networks of collaborative ventures with other companies (Tether 2002; Laursen and Salter 2004; Hagedoorn 1993 and 1996; Frenz and Ietto-Gillies 2009). The latter work finds that companies' internal networks are more likely to contribute to innovation performance than their external ones.

At the same time the acquired knowledge and innovation in each subsidiary produces spillover effects to the local environment⁶ via their external linkages. The double network (Hedlund 1986; Hedlund and Rolander 1990; Castellani and Zanfei, 2006: ch. 2;) in which units of the TNC are involved – the internal, intra-company network and the network of linkages with the local environments – has a positive impact on knowledge and innovation diffusion and acquisition at both the company and countries levels.

Behind all this there is the assumption that knowledge and innovation are more diversified between different countries than between regions of the same country⁷. This means that companies that operate in several countries have an advantage in terms of knowledge and innovation acquisition. Several theoretical and empirical studies seem to corroborate this perspective (Cantwell, 1989; Zanfei, 2000; Zahra *et al.* 2000; Castellani and Zanfei, 2006; Frenz and Ietto-Gillies, 2007 and 2009).

The different theoretical approaches to the effects of internationalization on the spread of innovation are linked to a different approach to determinants of international production. The theoretical explanations given by Vernon (1966) and by the evolutionary theory for why firms invest abroad are indeed different.⁸

What are the implications of this discussion for the dimensionality of our indices? If we operate with the theory that TNCs learn from various environments and contribute to the development and diffusion of knowledge and innovations in such environments, then the geographic *extensity* dimension becomes very relevant. Companies that locate in several countries would appear to have an advantage – in terms of knowledge acquisition and innovative potential – over companies confined to one or two countries⁹. Within the geographic scope, is the concentration dimension relevant? It could be. For example it could be claimed that concentration of activities – be they FDI or trade - in innovation-intense countries may facilitate learning and spread of innovation across the TNC and across other countries.

Nonetheless, some specific *intensity* indicators may also be considered relevant in the assessment of the impact of innovation. For example, the ratios of imports of innovative products to GDP or of inward FDI in innovative industries to total FDI. It may be that we need indices of various dimensions in order to capture the full impact of internationalization on innovation. In any case we can conclude that our theories behind the effects on innovation have an impact on the choice of dimension for our indices.

Trade volume and structure

Trade is a specific internationalization mode and therefore researchers are often interested in the development and assessment of indices of the degree of internationalization related specifically to trade. These can be *intensity indices* in which trade variables are considered in relation to the size of the domestic economy

⁶ Jaffe *et al.* (1993) in a study based on patent citations find that spillover effects are localized and fairly long-lasting.

⁷ Page (2007) argues that diversity of human resources has a positive impact on performance. The diversity of different geographic contexts is more inclusive and complex than the human resources one. Nonetheless, some of the arguments may apply.

⁸ For a summary and critical analysis of the two theories see Ietto-Gillies (2005: chs. 5 and 11) and Forsgren (2008).

⁹ However, there are also bound to be specific costs attached to multinationality (Hymer 1960; Zaheer 1997) and to operating in many countries.

(in the macro context) or in relation to the domestic sales or total sales of the company (in the micro context). It is also possible to develop *extensity indices* in which the number of countries/regions involved in trade becomes the main focus. Most often it is the regional or countries' concentration of trade that is the focus of attention. In this case various measures of spatial distribution and gravitation are used. Behind all these analyses are standard theories about the determinants of trade at the macro level or about the distribution of international markets and sales at the firm level.

However, the trade effect can also come about via international production and therefore trade can be seen not only as an international modality in itself but also as the by-product of other internationalization modes such as FDI or alliances. It is well known that international production and trade are closely related. Transnational companies contribute to trade directly and also indirectly via the impact of their direct production abroad through FDI (Cantwell, 1994; Ietto-Gillies, 2005: ch. 19). Over three quarters of world trade is initiated by TNCs and over a third of it takes place on an intra-firm basis (UNCTAD 1996 and 2002).

The volume of trade as well as the trade structure is affected by the value and structure of international production. By trade structure I mean a variety of structural elements ranging from intra-industry trade to intra-firm trade, to the commodity composition of trade. I also refer to the geographical composition of trade. The location strategies of TNCs' production affect the geographical structure of trade for any specific country and for the world as a whole. For example, the volume and the structure of FDI in China – particularly with regard to the type of activity and products in which inward FDI takes place – is having a major impact on the volume and structure of Chinese trade with the rest of the world. The volume and structure of FDI from non-EU countries – such as Japan or the US - in the UK affects the structure and volume of trade between the UK and the rest of Europe. This means that an analysis of the impact of international production and FDI on the geographical structure of trade may have to take account of intensity, extensity and concentration dimensions of both trade and FDI.

Moreover, in relation to the impact of FDI on trade it has been argued that both domestic TNCs and foreign TNCs operating in a particular country may affect its trade volume and structure via their international production. This has led to the development of an intensity index of overall transnational activity for any specific country: one that takes account of both inward and outward FDI as a ratio of the size of the domestic economy (Ietto-Gillies, 1989). This is a further example of how a specific theoretical approach to the impact of TNCs on trade leads to the development of specific indices.

TNCs' bargaining power

The strategic behaviour of TNCs has been viewed from many angles. There is a large literature on global versus multidomestic strategies (Hout *et al.* 1982; Hamel and Prahalal 1985; Ghoshal 1987; Yip 1989; Kogut 1989). Moreover, the notion of strategic behaviour raises, among others, the issue of 'strategies towards whom?' Most literature on theories of the TNC and its activities which take a strategic rather than efficientist approach¹⁰ focus on strategies towards rival companies (Vernon 1966; Knickerbocker 1973; Graham 1978; Cowling and Sugden 1987). However, TNCs develop strategies also towards other players with which they are involved as

¹⁰ For a discussion of this issue and of the relevant literature see Ietto-Gillies (2005: chs 9, 13 and 15).

part of their activities and, in particular, towards labour, governments and suppliers. In such strategies their general aim is to cut costs and/or increase financial benefits.

Several strategies are open to corporations in their dealings with labour including the following: the type of technology to be adopted; the location of production in low cost countries of the whole or part of the production process; the adoption of specific managerial and organizational system; seeking agreement with unions on the type of industrial relations acceptable prior to entry into a host country. A specific strategy that weakens the bargaining power of labour is outsourcing which can take place at the national or international level (Germidis, 1980; Ietto-Gillies, 2002: ch. 3). Some of the strategies are, in fact, open to any company; others are specific to TNCs. The above strategies are not mutually exclusive and there are bound to be several adopted at the same time by a specific company. Whatever the adopted strategy(ies) in dealing with labour the level of the TNC's bargaining power is key to its success.

It has been argued (Ietto-Gillies 2005) that transnationals are - *ceteris paribus* – in a better position than uni-national corporations when it comes to bargaining power towards other players and specifically towards labour and governments. Having production activities spread into many countries may give the TNC a greater bargaining power compared to unination companies or to TNCs with activities in only one or two countries. This is essentially for two reasons: because the spread into many countries fragments the labour force employed and makes it more difficult for it to organize and resist the demands of management compared with a situation in which all or most of the company's workforce is located in one or few countries. This is the more so as labour has been – so far – unable to organize itself across nation-states. The second reason is because any threat of relocation is more credible if the company already has facilities in several countries. Its management can then claim that it is easy to increase commitment into some of them and decrease it in the country where the unions are becoming too demanding.

The threat of location – or re-location – into other countries is one often used not just towards trade unions but also towards regional or national governments with the aim to up the offer of financial incentives including tax breaks. Yip (1989) argues that bargaining power towards labour, suppliers and governments can be increased by adopting global rather than multidomestic strategies. Once again the existence of a network of subsidiaries into many countries – or the ease of entry into new countries - may make the threats more credible.

There are caveats to this approach. First the fact that geographical fragmentation is not the only strategy open to TNCs as mentioned above. Geographical diversification may, indeed, emerge not so much – or only - as a strategy specifically devised to increase bargaining power towards other actors but as an overall strategy designed to deal with a variety of objectives such as: market penetration; risk management; enhancement of competitiveness. Nonetheless, whatever the main reasons for geographical diversification once the TNC has developed production facilities in many countries its management can use them to enhance its bargaining power towards other players it is involved with: from labour to governments to suppliers. Second, as regards labour, there are several specific strategies that corporations, including transnationals, can adopt as mentioned above.

Regarding strategies towards governments, diversification may enhance the power of TNCs in some cases. However, TNCs' bargaining power towards a specific government may also be enhanced by the ability to show evidence of a high degree of

embeddedness in its country. The concentration of production in the country may be a starting point towards claiming embeddedness.

What is the relevance of this discussion for our choice of indices? If labour and/or governments in a specific country compete with that in other countries to attract FDI, then the TNC may be in a stronger bargaining position the more it is geographical diversified and connected to other potential investment locations. Thus, whenever the geographic size of the network – in terms of number of countries of operations - is strategically relevant, extensity indices may become appropriate rather than intensity ones or along side them. On the other hand, evidence of embeddedness may be provided more by intensity or concentration indices.

There are also implications for the choice of indicators; employment data – as well as output data – may be more relevant whenever the researcher is interested in issues related to bargaining power with labour. The level of FDI may be considered more relevant in the case of bargaining power with governments.

Performance issues

Performance can be considered at the macro or micro or meso level. At the corporation level, the ultimate and simplest indicator of performance may be taken to be profits. However, even this simple indicator is not without problems and ambiguities; for example over what period do we measure profitability: three months? One or five or ten years? The strategies and the elements leading to growth in profitability over these different periods are not the same.

There are several elements contributing to profits. At the company level they can operate by reducing costs or by increasing revenues. Innovation and trade considered above can be viewed as performance elements at both the micro and macro levels: they affect costs, competitiveness and markets. Bargaining power towards labour and/or governments is a vehicle through which elements of performance – such as labour costs or tax liabilities - can be reduced.

Geographical diversification¹¹ may be part and parcel of a strategy of production flexibility (Kogut and Kulatikola 1994) aiming to achieve lower costs or to access wider markets. It may also be part of a risk management strategy (Ghoshal 1987; Yip 1989) which decreases the probability of higher costs in long run. The risks can be in relation to a variety of elements that affect costs, ranging from natural disasters to currency fluctuations to disruption of productions flows. Whenever geographical diversification is relevant for performance effects, then the extensity dimension may be the correct approach to work with.

The degree of embeddedness of companies in the home country may be a relevant element both in the case of countries' performance and in the case of performance of a single TNC. In this case intensity or concentration indices may be appropriate. Dunning (1996), in a survey of 144 of the largest industrial firms, finds that their degree of transnationality – measured by an intensity index - impacts positively on their competitive advantages.

8. Summary and conclusions

¹¹ Diversification by countries seems to be also a strategy attractive to shareholders. Agmon and Lessard (1977) find that investors recognize - and react positively to – international diversification when acquiring equities.

The paper identifies four major perspectives on internationalization related to: level of aggregation, internationalization modality, activities configuration and other elements of internationalization at firm level. This is followed by the identification of three dimensions in the internationalization concept: the intensity, extensity and geographical concentration dimensions. A section on issues related to the construction of indices considers uni- versus multi-variables indices; simple versus composite (average of several uni-variable indices) and complex indices. The latter combine two or three dimensions together. A consideration of the range of choice of indices open to researchers is followed by a discussion of effects and how they and the underlying theories should drive the search for appropriate indices. Four examples on the linkages between theoretical approaches to the effects and the development of indices are considered.

The following conclusions can be drawn from the overall discussion. First, the degree of internationalization is not a unique concept because internationalization has many facets and can be looked at from many perspectives and dimensions. Therefore, there is no 'correct' index; indices are or are not appropriate according to the tasks we assign to them. Second, the main task we usually allocate to indices is as guides in reaching conclusions about effects with a view to develop strategies and policies at firm or macro levels. Third, it follows that the theoretical and conceptual framework behind the effects we want to analyse should be the main driver in the search for appropriate indices. Fourth, the appropriateness of the index refers to the choice of dimension (intensity, extensity or concentration), the choice of perspective and of specific variable(s) within them and to the choice of construction techniques.

Some authors (Rugman and Oh, 2008) have strongly come out in favour of a specific type of indices - intensity indices – as the only possible dimension for indices of internationalization. This is because, as they put it : “The scope measure adds little value to our understanding of the extent of multinationality”¹² (p. 10). The implication is that there is a unique concept of multinationality/internationalization, contrary to the arguments of the present article. I acknowledge that data on the extensity dimension is very unsatisfactory. However, this is a reason for pressing for information leading to better data not for dismissing the whole concept. We must distinguish between the value of concepts and the availability and quality of data related to those concepts.

The conclusion to be drawn from discussions in the paper is that, for some tasks, intensity indices are better than extensity ones; for others the reverse is true; in many cases both or a combination of them may turn out to be useful. Whenever geographical diversity is conceptually important, then extensity indices are appropriate. Whenever a specific country is the focus of attention – such as the home country – then intensity indices may be called for. Concentration indices seem appropriate when the distribution of activities within a region is relevant for assessing effects.

Similarly, with regard to composite or complex versus simple indices: in general, I would favour simplicity and would be against complexity with the aim of capturing a single notion of internationalization. However, in some cases composite or complex indices may be appropriate provided that the underlying theoretical assumptions are clear and consistent with the way the index is developed and constructed.

¹² In the quotation the word 'scope' refers to geographic scope.

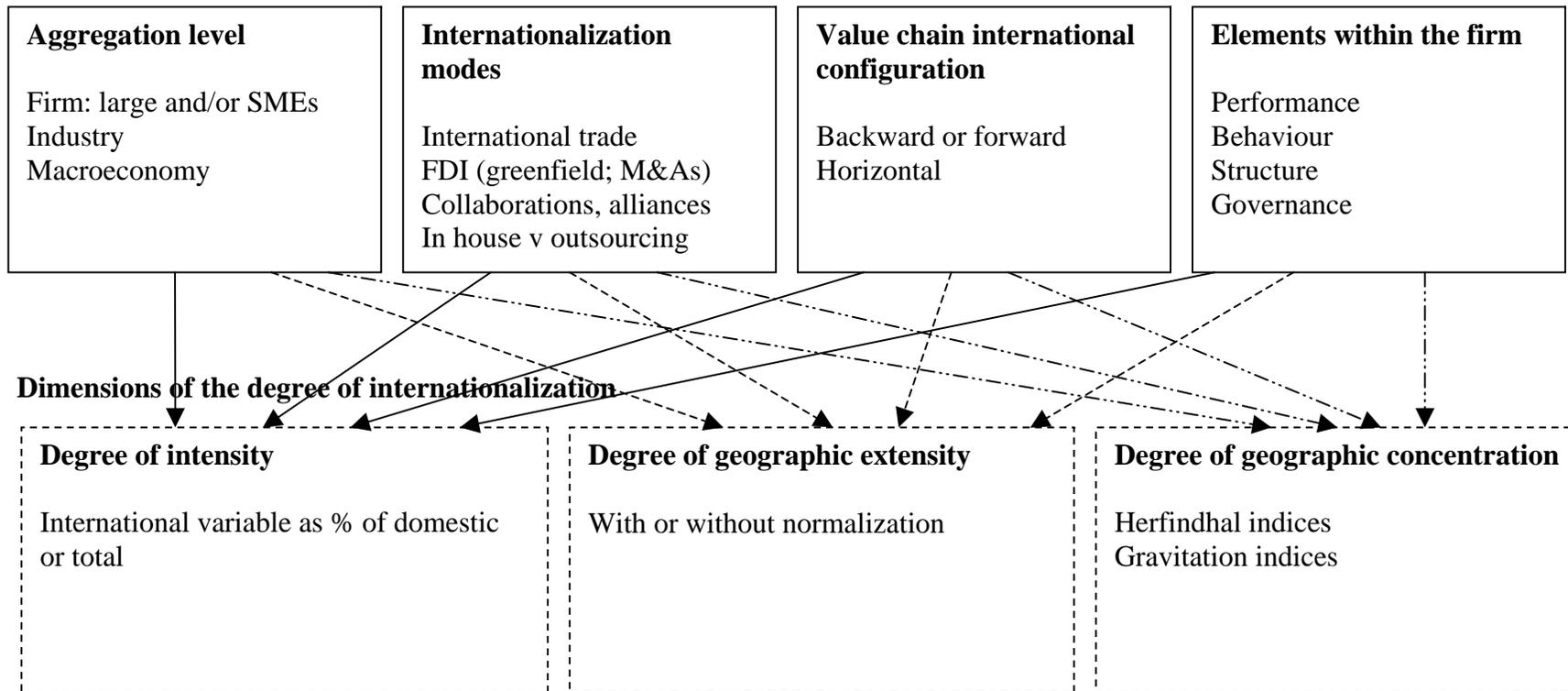
The analysis and interpretation of empirical results on indices also requires considerable caution; in particular it should take account of the following. First, the explicit or implicit assumptions made in the development and construction of the index. An example on this issue is given by Fisch and Oesterle (2003). In their interesting and sophisticated construction of indices they use GDP as a measure of market size and implicitly seem to assume that the only motive for foreign investment is the search for markets. Yet, we know that a large amount of FDI is undertaken for supply/production reasons, i.e. reasons linked to availability of cheap labour or skills or materials.

Second, any additional qualitative information available should be considered when interpreting the results. A general example on this issue can be the following. In many intensity indices that use employment data for corporations one may find that the index may not increase or even decline through time. It would be unwise to interpret this as a sign that the corporation foreign activities are declining. A look at the organization of production may give a different picture: the company may have increased its international outsourcing and thus whole parts of production do not appear in its employment statistics. This may equally apply to the establishment of foreign subsidiaries which may have been substituted by the establishment of new firms as subcontractors while the TNC retains strategic power (Cowling and Sugden 1987 and 1998) over the whole value chain.

Third, though each index can give useful comparisons across companies or countries and/or time, different indices may not be fully comparable because of different scales and different normalizers. Fourth, composite or complex indices that combine different sub-indices or dimensions of internationalization may be more difficult to interpret than simple, uni-variable and uni-dimension indices.

Fig. 1 Elements in the development of indices of the degree of internationalization

Perspectives on internationalization



Construction of indices: some choices

For any given perspective and dimension, choice of:
indicator(s); simple (uni-variable) or composite (multi-variable) or complex (multi-dimension) indices; normalizer; type of data.

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