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# LOCAL, REGIONAL OR GLOBAL? QUANTIFYING MNC GEOGRAPHIC SCOPE

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September 2006

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## **Abstract**

This paper proposes a multidimensional index of regional and global orientation which can be used in confirmatory studies with econometric methodologies. Unlike extant measures, the index is objectively scaled and controls for home country orientation and market size differences. The index is shown to be consistent with models of internationalization that incorporate different assumptions about strategic choice and global competition. Preliminary results show that large multinationals follow home region oriented internationalization paths, although much of the regional effect reported by previous studies in fact reflects strong home country biases.

**Keywords:** globalization; regional integration; global strategy; regional strategy; local strategy; triad; liability of foreignness

# LOCAL, REGIONAL OR GLOBAL? QUANTIFYING MNC GEOGRAPHIC SCOPE

The emerging literature on regional multinationals (Rugman and Hodgetts, 2001; Rugman and Verbeke, 2004; 2005; Rugman, 2005) has added renewed relevance to the debate on globalization. While extant theories of international strategy have taken their departure in the dichotomous local-global distinction (e.g. Prahalad and Doz, 1987; Bartlett and Ghoshal, 1989), we know now that intermediate levels of geographical aggregation, in particular at the regional level, may be the dominant paradigm in many multinational corporations (MNCs). One of the key questions in this literature is whether the process of internationalization itself occurs along regional or global paths. A pioneering study of this was provided recently by Rugman and Verbeke (2004, henceforth “RV”) who used regional sales data to show that very few MNCs had a truly global sales dispersion, whereas a majority were oriented towards their home region. So, while adding an additional layer of complexity between the global (headquarter) level and the local (subsidiary) level, the regional approach clearly captures an important element of spatial coordination which is apparent in real-world firms, and casts serious doubt on the commonly accepted view that we are living in an ‘increasingly globalized world’.

Even though the regional approach holds much promise, there have been few attempts to test a “theory of regional multinationals” against competing hypotheses in confirmatory analysis with econometric methodologies. This is not surprising, however, as there currently exist no methodology to set up such a test, due primarily to a lack of appropriate metrics to measure MNCs’ regional and global orientation in a consistent and objective way. A classification based on regional sales ratios may indeed be eye-opening, but it can never corroborate the theory of

regional multinationals, for several reasons. First, looking at regional sales ratios does not enable us to control for the effect of home country orientation, which influences measured home region sales. As such, regional sales data may indeed show that very few firms are global, but it cannot tell us if this is because they are regional, or because they are local: it is a *simultaneous* test of home country and home region orientation and therefore effectively a test of neither. Second, the result of a classification or segmentation is always sensitive to the choice of cut-off points (Sammartino and Osegowitsch, 2006). Finally, one may also question if the same classification criteria should be applied to firms from different countries and regions, as the extant metrics do not take into account the relative sizes of home and host economies. This makes it difficult to generalize the results across geographical contexts and to compare firms of different origins. On a more general level, the metrics of regionalization currently being used, while intuitive, are also quite detached from the theory of regional multinationals. As long as there are no theoretically derived measures, it is questionable if we can use regional orientation as a dependent or independent variable in large sample studies.

To address these challenges, this paper extends the work of RV by proposing an index of regional and global market penetration. The main contribution of the index over the existing sales dispersion indices is that it incorporates into them an objective criterion of globalization: the criterion, suggested by Fisch and Oesterle (2003), that the sales distribution of a global firm must match the distribution of global GDP. For example, as the Swedish economy constitutes 1% of global GDP and the US economy 29%, we should require both Swedish and US firms to have 1% of their sales in Sweden and 29% in the US, if these firms are to be called ‘global’<sup>1</sup>. In short, the implication of being globalized is that we cannot say anything about a firm’s

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<sup>1</sup> We could also use other benchmarking variables, e.g. GNI, PPP, private consumption, domestic demand, or – ideally – industry sales. This paper uses GDP throughout, but GNI and PPP were also tested with this framework, with similar results (all these macroeconomic variables are highly correlated).

geographic origins merely by looking at its sales. This paper extends this criterion to the regional dimension as well, asserting that the sales distribution of a regional firm must mirror the regional GDP distribution. It then combines the globalization and regionalization dimensions to arrive at a composite index of internationalization spanning local, regional, and global firms. This enables us to assess MNCs' global orientation (whether they favor home or host region) independently of their degree of internationalization. Then, by presenting formal models of strategic choice and global competition – the index is derived from, and hence shown to be compatible with, different assumptions about the internationalization process of the MNC. Finally, the empirical evidence on regional strategies is reassessed, and implications for further research are highlighted.

## **The Theory and Evidence of Regional Multinationals**

A central tenet in the studies of regional multinationals is that international expansion and cross-border integration is more costly *across* regional blocks, e.g. between the US and Japan, than *within* them, e.g. between the US and Canada. There are two main arguments behind this (Rugman and Verbeke, 2004; 2005). First, environmental diversity is assumed to be higher when the MNC operates outside the home region than it is for countries within the home region, because the economic and institutional differences are larger across regional borders. For example, issues of language and cultural norms would make it easier for Spanish firms than for Japanese firms to enter the French market. Second, products, knowledge, people and capital flow more easily between countries within the same region than between regions. This is in part because of geographical proximity but also, and perhaps primarily, as a result of policy-driven regional integration within the EU, NAFTA, and ASEAN.



### *Liability of Foreignness and Regional Strategy*

While most studies of regionalism have emphasized empirics (with notable exceptions such as Rugman and Verbeke, 2005), they implicitly build on and extend the concept of *liability of foreignness*, which originates with the work of Hymer (1976). Hymer described the disadvantages faced by foreign firms when competing against purely national firms in their home market, such as the foreign firm's lack of information about the host market, host market discrimination against outsiders, and exchange rate risk. Zaheer (1995) subsequently coined the term 'liability of foreignness' and tested the concept empirically by comparing the performance of locally- and foreign-owned financial trading rooms, finding that the former did indeed outperform the latter (Zaheer, 1995; Zaheer and Mosakowsky, 1997).

Although not shown in these studies (each trading room was coded as being either foreign or local), the liability of foreignness is conceptualized as being caused in part by "cultural, political, and economic differences" (Zaheer, 1995: 341). In other words, the liability of foreignness should be seen not as a universal constant, but as related to the diversity and distance between the home and host country. In the context of regional theory, we therefore need to distinguish between the liability of foreignness inside and outside the MNC's home region. As described by Rugman and Brain (2003: 7): "When MNEs have exhausted their growth opportunities in the home-triad and go into other regions, they then face a liability of foreignness and other additional risks by this expansion". *A priori* one could interpret this statement in two ways: One is that the MNC encounters liability of foreignness *only* when it ventures outside its home region, because regional integration is sufficiently strong to allow firms the luxury of unconstrained internationalization within the home region. A weaker but maybe more realistic

assumption is that the liability of foreignness exists also in the home region (except of course in the home country), but that it is significantly higher outside it.

Regardless of which interpretation we choose, the empirical implication is that MNCs' international expansion should occur primarily within their home regions, and to a much lesser degree in other regions. On the macro-level, this proposition can be evaluated by export data (e.g. Rugman and Hodgetts, 2001). On the firm level, it can be assessed by the geographic dispersion of employees, assets, or sales. RV define a "global" firm as one having more than 20% of its sales in each of the triad regions and no more than 50% in one single region, while the "home region oriented" firm has more than half of its sales in its home region. This leads them to classify 320 of the firms in their Fortune 500 sample as home region oriented and only 9 as global. The finding has been replicated within several sub-samples, e.g. Japanese companies (Collinson and Rugman, 2006) and multinational retailers (Rugman and Girod, 2003).

#### *Limitations of the RV Classification*

While these results may seem, *prima facie*, to be strong evidence in favor of regionalization, a closer look at the criteria used to distinguish between global and home region oriented firms illustrates some of the inherent intricacies of measuring regionalization and globalization.

First, looking at the share of home region to total sales (henceforth denoted O/T), does not tell us how much of the measured regional sales bias of a given firm is explained by a lack of internationalization. Firm pursuing local strategies, with a very high share of their sales in their home countries, would also get high values of O/T and hence appear to be highly home-region oriented even though they were in fact constrained by national and not regional boundaries. To take an extreme example, consider a British firm that sells 55% of its output in the UK and 45%

in the US. This firm would be classified as home region oriented, even though it had no sales to European customers outside of the UK. To remedy this problem we could combine O/T with the share of foreign to total sales, F/T, which is also reported by RV. However, until now there is no guideline in the literature for how these two numbers should be compared or interpreted jointly. The index in this paper enables us to compute a “global orientation” score which controls for home country orientation.

Second, we lack a theoretical justification of the cut-off points used to draw the line between regional and global firms. RV operationalize globalization as an ‘even sales distribution’ across the three triad regions. However, there are clearly degrees of evenness and the result would therefore seem to depend on the exact operationalization of the term (in RV it is set at 20% sales in each of the triad regions), just as the amount of firms with home region orientation is sensitive to the 50% criterion (Sammartino and Osegowitsch, 2006). This paper suggests an alternative approach, which is to measure the degree of globalization and regionalization against a theoretically derived absolute benchmark. This will tell us, in percentage terms, how close MNCs are to the ideal of globalization and is therefore better for comparative purposes.

Finally, both F/T and O/T are sensitive to the size of the home economy, and as such it is not obvious how we can compare them across different countries and regions. For example, does globalization mean the same for a Swedish and a US firm? Consider two global firms with the same geographical sales dispersion corresponding to the distribution of world GDP. One firm is from the US where 29% of the world’s GDP is generated, and one from Sweden where only 1% is generated. Using F/T to measure the internationalization of these two firms would assign 99% to the Swedish firm and only 71% to the US firm. Hence we would arrive at the erroneous

conclusion that the Swedish firm was more global than the US firm, even though they had the exact same global sales distribution. In general, any F/T comparison would almost inevitably lead us to the conclusion that Swedish firms are more internationalized than US firms are, but one may question if this is a meaningful statement, or if it is merely a result of the way that our internationalization measure is defined. A similar objection can be applied against the use of O/T as a regionalization measure. By controlling for the size of the home country and region, the index proposed in this paper lends itself more easily to cross-country and cross-region comparisons.

## Two Dimensions of Globalization

When we combine the GDP criterion of globalization with the notion of liability of foreignness, it seems natural to assume that a given firm may deviate from a global sales distribution primarily in two ways. First, a firm's foreign sales *within* its home region may be low compared to the intra-regional GDP distribution between the home country and the rest of the region. Such a firm can be said to be imperfectly *intra-regionalized*, in the sense that it has not yet fully penetrated the markets within its home region. For example, the UK constitutes 17% of European GDP, so a fully intra-regionalized UK firm should derive 83% of its European revenues outside the UK. Second, a firm's foreign sales *outside* its home region may be lower (relative to the home country) than the global GDP distribution suggests. If this is the case, the firm is not fully *inter-regionalized*. For example, as 5% of world GDP is in the UK and 68% is outside Europe, the non-European revenues of a fully inter-regionalized British firm should be approximately  $14 (=68/5)$  times as large as its UK revenues.

To show this more generally, assume that the firm's sales can be segmented into three geographic areas: (1) home country sales denoted  $H$ ; (2) sales in the rest of the home region (i.e. total home region sales minus home country sales) denoted  $E$ ; and (3) sales in the rest of the world denoted  $W$ . The firm's global revenue is given by  $T=H+E+W$ . From these numbers we can calculate sales *ratios*:  $h=H/T$ ,  $e=E/T$ , and  $w=W/T$ , with  $h+e+w=1$ <sup>2</sup>. We will compare these ratios to similarly defined GDP ratios, denoted  $h_I$ ,  $e_I$ , and  $w_I$ , where  $h_I$  is the GDP of the home country as a share of global GDP,  $e_I$  is the GDP share of rest of the home region and  $w_I$  that of the rest of the world.

If the firm had no nationality – and therefore encountered no liability of foreignness – it could take full advantage of demand in any country in the world. This (admittedly highly hypothetical) MNC is akin to the perfectly globalized firm described earlier, with a sales distribution corresponding to the global GDP distribution. In the notation used here, the global firm would have  $h=h_I$ ,  $e=e_I$ , and  $w=w_I$  ( $\Leftrightarrow H=h_I T$ ,  $E=e_I T$ , and  $W=w_I T$ ). However, due to the imperfect nature of international expansion, a given firm's observed sales outside the home country are likely to be lower than this ideal. This could for example be written as  $E=Re_I T$  and  $W=Gw_I T$ . The scaling constant  $R$  is then the firm's intra-regionalization, defined as its relative sales penetration of other home region countries, compared to the global firm. Similarly, the scaling constant  $G$  is the degree of inter-regionalization, reflecting the relative sales penetration outside the home region. As we will see, these two values can be derived from a three-way segmentation of GDP and firm sales.

A high degree of liability of foreignness leads to low values of  $R$  and  $G$  (presumably below 1) as it prevents the firm from realizing its foreign sales potential. In the extreme, if the

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<sup>2</sup> The relative sales ratios can be calculated directly from the  $F/T$  and  $O/T$  values reported by RV:  $h=1-F/T$ ,  $e=O/T-h$ , and  $w=1-h-e$ .

cost of operating abroad were prohibitive, we would get  $R=G=0$  and hence no sales outside the firm's home country at all. On the other hand, the perfectly globalized firm incurs no foreign penalty and is a special case with  $R=G=1$ . To capture this inverse relationship between liability of foreignness (denoted  $L$ ) and market penetration, let  $R=1-L_e$  and  $G=1-L_w$ , where  $L_e$  and  $L_w$  are the liability of foreignness in home and host regions, respectively<sup>3</sup>. If  $L$  is higher in host region markets than it is in the home region, we should, *ceteris paribus*, observe  $R>G$ . A comparison of  $R$  and  $G$  is therefore an indirect assessment of the difference in liability of foreignness: it reveals the home region effect implied by the firm's sales distribution. Indeed, this is why  $R$  and  $G$  have more theoretical content than the traditional  $F/T$  and  $O/T$  measures and can be used for hypothesis testing.

### *Calculating the Metrics*

By definition, the MNC's host market sales ratios  $e$  and  $w$  are the sales in each host area divided by the total sales:

$$\begin{aligned}
 e &\equiv \frac{E}{H + E + W} = \frac{Re_i T}{h_i T + Re_i T + Gw_i T} \\
 w &\equiv \frac{W}{H + E + W} = \frac{Gw_i T}{h_i T + Re_i T + Gw_i T}
 \end{aligned}
 \tag{1}$$

Solving for the implied values of the two globalization metrics yields:

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<sup>3</sup> Other functional forms of this relationship (e.g. exponential) could also be used, as long as  $(R-G)$  and  $(L_w-L_e)$  has the same sign, and that  $R=1 \Leftrightarrow L_e=0$  and  $R=0 \Leftrightarrow L_e=1$  (and similarly for  $G$  and  $L_w$ ). If these condition are fulfilled all conclusions in this paper are robust to the functional form.

$$\begin{aligned}
R &= \frac{e/h}{e_I/h_I} \\
G &= \frac{w/h}{w_I/h_I}
\end{aligned}
\tag{2}$$

These expressions have an intuitive interpretation. Intra-regionalization is increasing in the foreign-to-home country sales ratio *within* the home region ( $e/h$ ), and inter-regionalization is increasing in the foreign-to-home country sales ratio *outside* the home region ( $w/h$ ). Alternatively,  $R$  and  $G$  can be seen as measures of the MNC's market penetration in each host location relative to its market penetration in the home country. In absolute terms, denote global GDP by  $T_I$  and area GDP by  $H_I=h_I T_I$ ,  $E_I=e_I T_I$ , and  $W_I=w_I T_I$ . The MNC's share of GDP in each host area is then given by:

$$\begin{aligned}
\frac{E}{E_I} &= R \frac{H}{H_I} \\
\frac{W}{W_I} &= G \frac{H}{H_I}
\end{aligned}
\tag{3}$$

Hence, a fully globalized firm ( $R=G=1$ ) has an identical share ( $=H/H_I$ ) of GDP in every location in the world, whereas a less globalized firm has lower shares of GDP in host economies than it does in its home economy. Note that a firm can potentially have values of  $R$  and  $G$  above 1, if it has a higher share of GDP in some host countries than it does at home. From a theoretical viewpoint this type of 'overglobalization' should be unusual (since it would imply a negative liability of foreignness), but ultimately that is an empirical question.

### *The Global Orientation of the Firm*

By incorporating the GDP criterion, the methodology outlined here solves some of the aforementioned limitations of the “raw” F/T and O/T measures. First, as intra- and inter-regionalization are similarly defined and scaled, we can actually compare them in order to assess the global orientation of the firm, unlike any absolute measures like F/T and O/T. Second, it relieves us from the reliance on cut-off points for determining when firms are global, regional or national, allowing us instead to measure, more realistically, the *degree* to which firms are intra- and inter-regionalized in percentage terms. Finally, the use of global GDP as a reference point solves the problem of the sensitivity to the size of the home country or region. A firm with a sales distribution corresponding to world GDP is will be seen as 100% intra- and inter-regionalized, regardless of its country of origin.

Figure 1 plots the two dimensions against one another and shows some hypothetical cases in the four corners of the grid.

\*\*\* Figure 1 About Here \*\*\*

The simplest case is the *national* firm, which derives all its sales within its home country. The opposite corner of the figure contains the *global* firm, which has fully internationalized both within its home region and outside it. In the remaining two quadrants we have firms that are internationalized along one dimension but not along the other. The *regional* firm is completely intra-regionalized, as it has the required foreign sales in its home region, but no sales outside it. The *host-regional* firm, conversely, has skipped its home region entirely in its



internationalization process, but its distribution between home country and host region markets corresponds to the GDP distribution.

By definition, large home country sales will lead to low values of  $R$ , which therefore simultaneously captures aspects of the regional orientation and the degree of internationalization of the firm. Because of this we cannot use  $R$  alone to judge whether MNCs pursue regional or global strategies; it is the *relative* value of  $R$  and  $G$  that tells us something about the importance of regional borders. In Figure 1, the further below the diagonal we are, the higher is the firm's share of  $E_I$  compared to its share of  $W_I$  (cf. Equation [3]). Therefore, to obtain a measure of 'global orientation' which controls for home country orientation, we define:

$$Z \equiv \frac{G}{R} = \frac{1 - L_w}{1 - L_e} = \frac{w/e}{w_i/e_i} = \frac{W/W_i}{E/E_i} \quad [4]$$

The global orientation score of a firm is simply the ratio of  $G$  and  $R$ : if the firm is more successful intra-regionally than it is inter-regionally, it can be said to be *home region oriented* and will get a  $Z$ -value below 1. These are the firms we would expect to see in industries with effective regional market integration on the one hand and strong globalization barriers on the other. The second expression shows that  $Z$  implies the relative liability of foreignness in host and home regions. If  $Z < 1$ , the firm is assumed to be oriented towards its home region precisely because the cost of doing business outside the home region is larger than in more proximate countries. If the liability of foreignness is the same in all host countries globally, on the other hand, we will get  $Z = 1$ . Such a firm can be said to follow a *balanced*, i.e. region-agnostic, internationalization path where close and proximate foreign markets are emphasized equally. Finally, MNCs with  $Z > 1$  are *host-region oriented*, in the sense that their intra-regional market

penetration is lower than their inter-regional market penetration. RV identify a small group of host region oriented MNCs, which are almost exclusively European or Asian firms with a high share of sales in North America. Presumably this can be explained by the strategic importance of the US market in certain industries. All in all, a test of whether and how  $Z$  differs from unity is a test of the regional effect: whether MNCs are more, less or equally successful in terms of sales in their home regions than they are in other regions<sup>4</sup>.

Each value of  $Z$  corresponds to an international expansion path, symbolized by the arrows from the origin in Figure 1. A firm of a particular global orientation may be more or less internationalized depending on how far it has moved along this path. Hence  $Z$  captures the composition of foreign sales, controlling for the degree of internationalization. Let us define the degree of internationalization similarly to  $R$  and  $G$ , as

$$I \equiv \frac{f/h}{f_i/h_i} = \frac{(e+w)/h}{e_i+w_i/h_i} = \frac{e_i}{e_i+w_i} R + \frac{w_i}{e_i+w_i} G \quad [5]$$

Defined like this,  $I$  is just a GDP-weighted average of  $R$  and  $G$ . Figure 2 plots internationalization against global orientation. Thus, these two measures can be considered orthogonal variables which in combination produce the same MNC taxonomy as shown previously<sup>5</sup>.

\*\*\* Figure 2 About Here \*\*\*

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<sup>4</sup> Note that the two last expressions in Equation [4] are intuitively similar to the ones describing  $R$  and  $G$ . They tell us that the firm is globally oriented if and only if the home region share of the foreign sales corresponds to the GDP distribution or, correspondingly, if the MNC's share of GDP is the same in both home and host regions.

<sup>5</sup> Note that regional and host-regional firms have  $I < 1$ , as they are fully internationalized only along one of the two dimensions.

## A Strategic Choice Model

In the simple model described above, the MNC generates sales “automatically” in proportion to  $(1-L)$  in each market. In that sense, the geographic scope of the firm is determined exogenously and the managerial implications of the model are therefore not obvious. In the real world, managers do have some discretion as to the geographic scope of the firm, by choosing the level of investments in the different countries and regions where they operate. The strategic choice model, described in this section, incorporates that assumption in order to represent  $R$  and  $G$  as outcomes of managerial decisions.

In this model, the MNC determines how much sales it wants in each area as a fraction of that area’s GDP, and then pays the costs of the investments needed to obtain these sales targets. The managers thus set the choice variables  $a_h$ ,  $a_e$ , and  $a_w$ , which are the *target GDP shares* (sales as a fraction of GDP) for the home country, home region, and host regions, respectively. This results in sales of  $H = a_h H_i$ ,  $E = a_e E_i$ , and  $W = a_w W_i$  in the three areas. Hence, the choice variables in this model are not absolute investment levels, but scaled so that  $a=0.001$  corresponds to obtaining sales of 0.1% of GDP in a geographic area,  $a=0.002$  results in 0.2% of GDP, and so forth. It is assumed that the equilibrium shares of GDP are in any case negligible, so that the total size of the world economy  $T_i$  can be considered exogenous (not affected measurably by the firm’s choice<sup>6</sup>).

Of course, to obtain these sales numbers the MNC needs to undertake real investments. These could be a combination of FDI in the target countries, and expenditures on marketing and

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<sup>6</sup> This assumption is probably realistic for all but the very largest MNCs. The largest firm in the data set, Wal-Mart, has about 1.5% of US GDP and 0.5% of world GDP, whereas the average Fortune 500 MNC only has 0.07% of world GDP.

export capacity made in other countries, directed towards the target country. The costs of these investments are  $cH_i a_h^2$ ,  $cE_i a_e^2 / (1 - L_e)$ , and  $cW_i a_w^2 / (1 - L_w)$  for the three areas. These expenditure functions require some explanation: The parameter  $c$  captures the overall cost of obtaining GDP share. The target shares  $a$  are squared to reflect diminishing returns or, equivalently, increasing marginal costs of attaining incremental GDP share points, as demand becomes saturated. Furthermore, the cost of investment is proportional to the size of the market that the MNC is attempting to capture, and therefore the cost of investment in each area is multiplied by the size of that area's economy. For example, getting a 0.1% share of the Chinese market would require much higher investment expenditure than getting a 0.1% share of the Danish market. Finally, because of the liability of foreignness, it is more costly to obtain a certain GDP share outside the home country than it is within it. Therefore, the investment cost in each region is divided by  $1 - L$  (where  $L = 0$  in the home country). If  $L$  goes towards 0 there is no penalty, and if  $L$  goes towards 1 the costs of investment for any positive target GDP share approaches infinity and the firm will therefore not capture any part of that market, as was the case in the previous models.

To complete the model, the firm earns a margin of  $m$  on each dollar of sales in any market, and it has a fixed cost of  $C$ . The total profit function is then:

$$\pi = ma_h H_i + ma_e E_i + ma_w W_i - cH_i a_h^2 - cE_i a_e^2 / (1 - L_e) - cW_i a_w^2 / (1 - L_w) - C \quad [6]$$

### *Solution to the Model*

The following first-order conditions require the firm to equate marginal benefits and marginal costs of GDP share in each of its three markets:

$$\begin{aligned}
mH_i &= 2cH_i a_h \Leftrightarrow a_h = \frac{m}{2c} \\
mE_i &= 2cE_i a_e / (1 - L_e) \Leftrightarrow a_e = \frac{m}{2c} (1 - L_e) \\
mW_i &= 2cW_i a_w / (1 - L_w) \Leftrightarrow a_w = \frac{m}{2c} (1 - L_w)
\end{aligned}
\tag{7}$$

These show us that the firm chooses a lower share of GDP in its host markets than it does in its home country, like in the simple model, with the chosen share being proportional to  $(1-L)$ . The dollar amount invested in each area can be found by inserting the optimal  $a$ -values into the investment expenditure functions, resulting in investments of  $\frac{m^2}{4c} H_i$ ,  $\frac{m^2}{4c} (1 - L_e) E_i$ , and  $\frac{m^2}{4c} (1 - L_w) W_i$  in the three areas. This implies that the MNC should invest proportionally to the size of the economy in each area, while reducing its investments accordingly in areas where it encounters a liability of foreignness.

Finally, with some manipulations (inserting the optimal  $a$ -values in the sales functions, deriving relative sales in the three areas, and solving for the liability of foreignness) we arrive at the result:

$$\begin{aligned}
(1 - L_e) &= \frac{e/h}{e_i/h_i} = R \\
(1 - L_w) &= \frac{w/h}{w_i/h_i} = G
\end{aligned}
\tag{8}$$

In other words, the measures of intra- and inter-regionalization developed previously are consistent with a model in which the MNC is allowed to choose its geographic scope. Since the MNC's optimal choice is determined by the liability of foreignness – which affects the marginal

cost of attaining GDP share in a given area – the observed average values of  $R$  and  $G$  can be seen as estimators of that liability. The difference is that in this model,  $(1-L)$  is not the actual but the *optimal* value of  $R$  and  $G$ , so bounded rationality in the scope decision may lead some managers to choose too high or low values of these variables. The implications of this will be discussed in the conclusion.

## A Competitive Model

As described in the literature review, the liability of foreignness is often conceptualized as a performance penalty suffered by the MNC in a host market *relative to local competitors* (Hymer, 1976; Zaheer, 1995). The models presented so far are limited by their lack of explicit recognition of this. This section therefore incorporates competitive aspects into the analysis by presenting a model of regional and global competition.

For convenience, suppose that the world consists of two regions of each two countries<sup>7</sup>, and that one firm from each country compete in a global industry. In a given country, all four competitors are present but with different effect: the foreign companies suffer a liability of foreignness which inhibits their ability to maintain market share, so their competitiveness in host markets is only  $(1-L)$  that of the local firms. When all four firms compete in a given country, their relative competitiveness determines who get the lion's share of the market. To capture this idea, the market share of each firm in this model is its own net competitiveness divided by the combined net competitiveness of *all* the firms in that market. Finally, assume that the industry constitutes a fraction  $x$  of the overall economy in all countries. This leads to the following sales functions for a given firm:

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<sup>7</sup> The model can easily be generalized to more regions and countries. Also, the results are identical if  $N$  rather than one firm from each country compete in the market.

$$\begin{aligned}
H &= \frac{1}{1 + (1 - L_e) + 2(1 - L_w)} xH_i \\
E &= \frac{(1 - L_e)}{1 + (1 - L_e) + 2(1 - L_w)} xE_i \\
W &= \frac{(1 - L_w)}{1 + (1 - L_e) + 2(1 - L_w)} xW_i
\end{aligned}
\tag{9}$$

Deriving the relative sales ratios  $h$ ,  $e$ , and  $w$  from these sales functions, and solving for the liability of foreignness, gives us the familiar results:

$$\begin{aligned}
(1 - L_e) &= \frac{e/h}{e_i/h_i} = R \\
(1 - L_w) &= \frac{w/h}{w_i/h_i} = G
\end{aligned}
\tag{10}$$

Hence, the introduction of competition does not invalidate the two measures: they can still be considered as estimators of the liability of foreignness in host markets.

## Hypotheses

To sum up, all three models presented above share the idea that the observed values of  $R$  and  $G$  should be related to the liability of foreignness. Hence, the theory of regional multinationals has at least one clear implication which can be evaluated with these metrics. If regional borders constrain internationalization, we should observe MNCs following home region oriented internationalization paths, and hence on average that  $Z < 1$ . This would be an indication that the average sales penetration of foreign markets *within* the home region is higher than that of host

region markets. This can be called the “weak form” of the regional hypothesis as it merely assumes that the liability of foreignness is lower in the home region than outside it.

*Hypothesis W: Large MNCs are home region oriented.*

However, if MNCs are regional in a more pure sense, we should expect them to completely overcome the liability of foreignness in their home region and obtain  $R=1$  (while still having  $G<1$ ; otherwise they would be global). This can be called the “strong form” of the regional hypothesis:

*Hypothesis S: Large MNCs are regional.*

## **A Reassessment of the RV Evidence**

To test these hypotheses, the RV database (consisting of the global Fortune 500 as of 2001) was recompiled to generate the metrics defined here. For a description of the data set, see the original RV paper or Rugman, 2005. Due to lack of data, 355 observations were discarded for a sample of 145 firms, 29% of the Global Fortune 500 and 38% of the RV data set. Of these 145 firms, 24 were not MNCs as they had no foreign sales (primarily US retail chains), so the final sample contained 121 firms.



## Results

The correlation between  $R$  and  $G$  is only 0.34, statistically different from unity, which indicates good discriminant validity. Table 2 reports the values of the four metrics. Figure 3 plots  $R$  against  $G$  and Figure 4  $I$  against  $Z$ .

\*\*\* Table 1 About Here \*\*\*

\*\*\* Figure 3 About Here \*\*\*

\*\*\* Figure 4 About Here \*\*\*

The table shows that the average value<sup>8</sup> of  $Z$  for the entire sample is 0.63. The high  $t$ -values for all regions show that this is significantly lower than 1 and lead us to confirm the regional hypothesis in its weak form: large MNCs do indeed follow home region oriented internationalization paths. However, they are clearly not very far along these paths, being on average only 30% intra-regionalized (and only 13% internationalized in general), so the importance of the home country market clearly has not been eliminated by regional integration. Indeed, the high  $t$ -values for  $R$  show that it is significantly lower than 1, refuting the regional hypothesis in its strong form.

Figure 3 conveys a similar message, as the firms cluster below the diagonal and most of them are close to the origin. The average global orientation of the firms is shown with an arrow. A few firms are fully or overly regionalized with  $R > 1$  and are therefore not shown in Figure 3.

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<sup>8</sup> Weighting by the MNC's degree of internationalization gives a slightly higher, but still significantly different from 1,  $Z$ -average.

One additional firm, GlaxoSmithKline from the UK, is truly internationalized along both dimensions, with  $R=1.12$  and  $G=1.27$ . In Figure 4 we can also see the majority of the firms in the bottom-left quadrant where the degree of both internationalization and global orientation is low.

In general, the North American firms are the most the home region oriented, with penetration of regional markets at 72%, and many of them are very close to being pure regional firms. In comparison, they have an inter-regional penetration of only 11%. This challenges the conventional wisdom that US firms dominate the global marketplace: in fact, the European MNCs in this data set are just as inter-regionalized as the American ones are. The Asian firms are generally less internationalized than companies in the two other triad regions, with low values of  $R$ , and very low values of  $G$ .

## Conclusion and Implications

The measurement approach outlined in this paper combines intra- and extra-regional sales expansion in an orthogonal index with objective reference points. Some preliminary evidence from large multinationals suggests that these two dimensions are well suited to capture the richness and complexity of actual firms' internationalization paths. Thus, the regional aspect may provide a new manifestation of the multidimensional nature of internationalization (Ramaswamy *et al*, 1996). Most importantly, it shows us – with statistical confidence – that the theory of regional multinationals is compatible with the data: to the extent that they do internationalize, large MNCs clearly do so along home region oriented paths. Yet their degree of internationalization along these paths is surprisingly low, implying that much of the regional effect reported by RV is in fact a home country effect. In that sense, large MNCs are neither purely global nor purely regional, but rather home region oriented with strong national biases.

This tells us that regional integration may be less effective than previously believed, and that significant barriers to international expansion remain also *within* regions. Finally, the data showed a significant regional difference: North American firms were the most regional in their orientation, whereas Asian firms were the least internationalized in general.

Of course, these empirical findings are neither conclusive nor exhaustive of the potential uses of the index. Many observations were deleted due to missing data (for instance, supposedly global firms such as Coca-Cola and IBM), which could influence the results. Furthermore, these data do not tell us if regional firms are more or less successful than global firms. Hence, even if we can see that large MNCs are home region oriented, we cannot say if this is because it is the best strategy to be so, or merely because of cognitive biases. Note however that the performance ramifications of the models in this paper are more complex than the argument found in the extant literature. Whereas Rugman and Hodgetts (2001) argue simply that regional firms will perform better than global firms, the strategic choice model implies that there is an optimal degree of global orientation. Therefore, if firms *on average* choose the optimal strategy, we should be able to observe no linear relationship (although possibly a curvilinear one) between geographic scope and performance. Only if the typical MNC *overestimates* the optimal degree of global orientation, for example due to the emphasis on globalization in the media, should we find a negative relationship between global orientation and performance.

The theory of regional strategy presented in this paper is highly stylized and could be made more realistic by relaxing some of its assumptions. Ultimately, however, it is neither the data nor the theory in isolation which is important, but the combination and not least the alignment of the two. This paper aims to further that alignment within the research on regional multinationals, by introducing theory-based measures, and the formal models in the paper should

be seen as means to that end rather than as attempts at characterizing the complexities of the internationalization process. The models result in metrics that are easy to apply, have intuitive content, and can be used in a range of different types of empirical studies. For example, one could undertake performance studies with  $(R, G)$  or  $(I, Z)$  as independent variables to see whether the regional aspect holds more explanatory power than one-dimensional measures of multinationality. Also, measuring these variables in longitudinal settings may allow us to assess the dynamics and convergence/divergence of regional and global integration. The ability to perform these and other types of studies with consolidated samples spanning several countries is an important benefit of the proposed index.

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Figure 1 – Internationalization Paths and Profiles

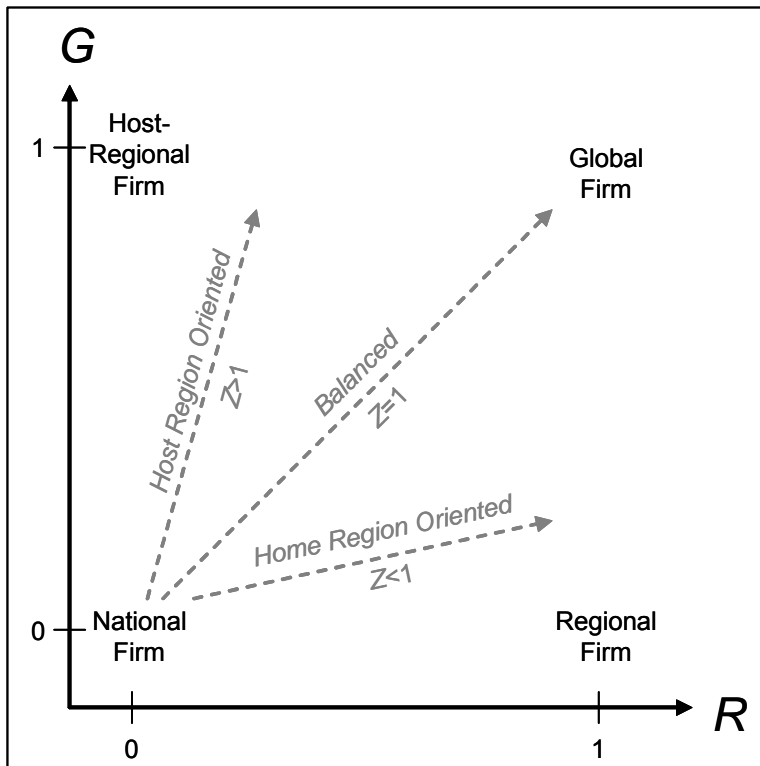


Figure 2 – Internationalization Paths and Profiles

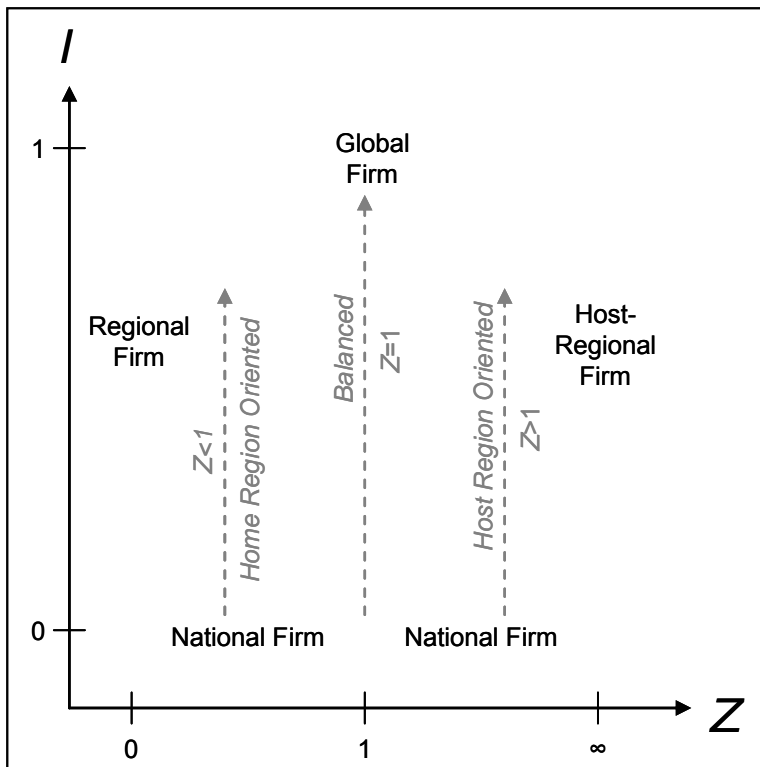


Figure 3 – Intra- and Inter-Regionalization of Large Multinationals

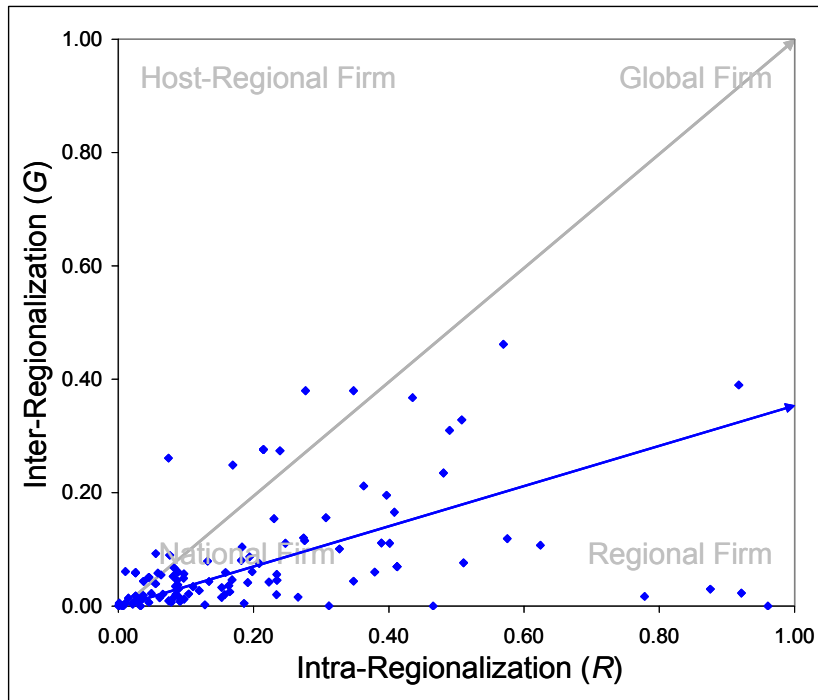




Figure 4 – Internationalization and Global Orientation of Large Multinationals

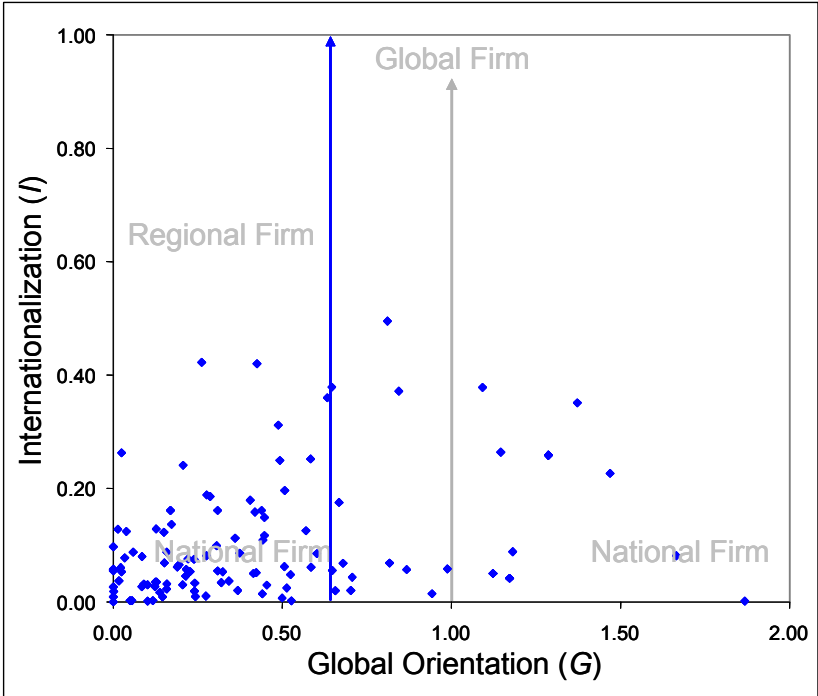


Table 1 – Regional Patterns of Internationalization

| <b>Region</b>       | <b><i>N</i></b> | <b><i>R</i></b> | <b><i>G</i></b> | <b><i>I</i></b> | <b><i>Z</i></b> | <b><i>t</i>(<i>R</i>&lt;<i>I</i>)</b> | <b><i>t</i>(<i>Z</i>&lt;<i>I</i>)</b> |
|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|---------------------------------------|
| Europe              | 75              | 0.19            | 0.11            | 0.13            | 0.68            | 42.3**                                | 3.2**                                 |
| Asia-Pacific        | 27              | 0.12            | 0.03            | 0.04            | 0.57            | 44.1**                                | 2.5**                                 |
| North America       | 19              | 0.72            | 0.11            | 0.14            | 0.27            | 7.1**                                 | 9.4**                                 |
| <b>Total Sample</b> | <b>121</b>      | <b>0.30</b>     | <b>0.10</b>     | <b>0.13</b>     | <b>0.63</b>     | <b>21.0**</b>                         | <b>4.5**</b>                          |

\* Significant at  $p < 0.05$

\*\* Significant at  $p < 0.01$

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