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Two Dimensions of the Internationalization of Firms

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Abstract
The debate about measuring the degree of internationalization of firms has not solved the question about the usefulness of having one index on the internationalization of firms. This article argues in favour of constructing indices, if the components of those are theoretically and empirically coherent. It also proves empirically that there are at least two dimensions of internationalization: one referring to the activities of firms abroad and one relating to the proximity of the firm to international capital markets. Using a sample of the 100 largest German companies, this study shows that both dimensions, the real and the financial one, do not co-vary and therefore cannot be combined into one index.

Zusammenfassung
Um den Einfluß wirtschaftlicher Internationalisierung auf nationale Institutionengefüge zu überprüfen, werden geeignete Meßverfahren zur Messung von Internationalisierung benötigt. Der Beitrag stellt ein Verfahren zur Messung der Internationalisierung von Unternehmen vor. Dabei wird davon ausgegangen, daß die Internationalisierung von Unternehmen mehrere unterscheidbare Dimensionen hat. Die realwirtschaftliche Dimension beschreibt die güter- und produktionswirtschaftliche grenzüberschreitende Expansion der Unternehmen, während die kapitalmarktbezogene Dimension die Orientierung der Unternehmen an internationalen Kapitalmärkten abbildet. Anhand einer Untersuchung über den Internationalisierungsgrad der 100 größten deutschen Unternehmen werden beide Internationalisierungsdimensionen empirisch überprüft. Die Faktorenanalyse unterstützt die Annahme, daß sich beide Dimensionen empirisch deutlich voneinander unterscheiden lassen. Anhand der vorgestellten Messmethoden lassen sich die Unternehmen eindeutig in stark und schwach internationalisierte Unternehmen einteilen.

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Introduction

Measuring the degree of internationalization of firms has become a contested and largely unresolved issue in international business research (Sullivan 1994; Ramaswamy, Kroeck et al. 1996; Sullivan 1996). At the same time, there are a great number of theories on internationalization and an equally large number of empirical studies attempting to test what effect the degree of internationalization has on the behaviour and performance of firms. As Sullivan argued in 1994, the unsatisfactory results of some of these studies might be due to the largely unreliable measurement of just how internationalized firms are. (Sullivan 1994). In order to improve the quality of empirical studies, Sullivan proposed an aggregate index of the degree of internationalization, comprised of five variables. Measuring the degree of internationalization of firms by an aggregate index begs two major questions: First, is the degree of internationalization of companies one-dimensional? Second, can we combine different variables that could potentially have different effects on firm performance or behaviour into one index?

In this paper, we would like to contribute three points to the ongoing debate. First, we contend that the method of measuring the degree of internationalization is contingent on the research question and design. This refers to the sample of cases one wants to look at and to the assumptions of the expected effect of internationalization on firms. Second, we argue that aggregate indices of related variables can be a good measurement of internationalization, if they consist of coherent components that are theoretically justified (content validity) and are plausibly constructed (construction validity). Third, using a sample of the 100 biggest companies in Germany we can show empirically the existence of two distinct dimensions of the internationalization of firms.

The rationale for any measurement of the degree of internationalization of a firm is its potential to help explain important causes and consequences of the global expansion of firms. Therefore, the validity of measurement has to be assessed against the background of its potential explanatory power. Rather than using the degree of internationalization of a firm as a universal device, it must - at least analytically - be seen in the context of the theoretical assumptions on which it is based. For example, product cycle theories assume that the process of internationalization of firms follows a specific pattern that starts with exports, which is followed by sales activities abroad and then by production (Johanson and Vahlne 1977; Glaum 1996; Dülfer 1999). In that case, a firm with a high percentage of foreign employees might be considered to be more internationalized or in a later stage of internationalization than a firm with a high percentage of foreign sales.

A similar case can be made with regard to the effects of internationalization on the performance of a firm. For example, John H. Dunning claims that multiple location of value-added activities were perceived by management to yield positive gains (Dunning 1996: 10). Therefore, we can assume that the spread of a company across

many countries might have a linear positive effect. This contrasts with the results of some studies that found the effect of the percentage of foreign sales to be possibly curvilinear with declining returns for companies with a very high percentage of foreign sales (see for example Gomes and Ramaswamy 1999). In that case, a combination of two components that are expected to have different effects on the outcome would distort the analysis.

Nevertheless, if the selected variables are expected theoretically to covary and empirically correlate sufficiently, we think it justified to combine them into one and to construct an aggregate index. For example, the Product Cycle Theory of Johanson and Vahlne (Johanson and Vahlne 1977) mentioned above would suggest that an index might be a better measure since a decline of the share of foreign sales is not a sufficient indicator for a decline in internationalization, if the share of foreign assets increases. In that case, one could assume that the firm has just taken another step in its internationalization process. On the one hand, an index could overcome the location of companies on different levels of internationalization and would generally measure the degree of internationalization. On the other hand, it might conceal important information about the process of internationalization.

Also, on an aggregate level, to rely solely on a one-dimensional variable for measuring the degree of internationalization of firms might even be misleading. In the debate about the degree of globalization of business, some authors have argued that internationalization is confined to specific geographical and sectoral segments given the low level of dynamism in the foreign share of sales and employment (Hirst and Thompson 1996). However, if the process of internationalization takes firms through different steps, one could expect that these measures are too one-dimensional to reflect the dynamic process of internationalization.

Indices on the Degree of Internationalization

Considering the potential gain of an index compared to a variety of single variables that are vulnerable to unusual events or measurement error, it is rather surprising that more effort has not been spent on constructing an internationalization index. Our review of the recent research showed that only three indices are available in the literature: the Transnationality Index (TNi) published by UNCTAD, the Transnationality Spread Index (TSi) introduced by Ietto-Gillies (1998), and the Degree of Internationalization Scale (DOI) of Sullivan (1994).

The criteria for constructing an index must be based on whether the individual components of the index are sufficiently complementary so that the combination of different variables measures something that can be described both theoretically and empirically. These criteria are not as straightforward as they sound. The internationalization index of the UNCTAD is made up of an average term of the foreign share in sales, employment, and assets (FSTS; FETE, FATA). It is calculated for the 100 largest multinational enterprises (MNEs) world-wide and published annually in its World Investment Report (UNCTAD 1997; UNCTAD 1999). Upon closer inspection, factor analysis of the data given in the UNCTAD report shows, however, that while the foreign share in assets and sales can be grouped into one factor, the percentage of foreign employees working for a company cannot be grouped into the same category. There is one potential reason for this observation: since companies spread their activities all over the world, the lack

of correlation can be due to varying degrees of assets per employee in different countries. A second reason would be related to the fact that the 100 biggest companies are based in both large and small countries. Depending on the size of the home country, foreign direct investments, as indicated by the foreign share of employees, might vary substantially. Furthermore, one cannot conclude from a high score that a company's competitiveness is also high. A high value can also be caused by a small home country. Not surprisingly, the ten leading MNEs ranked by the TNi are from small industrial countries, Switzerland, the Netherlands, Belgium, Sweden, and Canada among them (Ietto-Gillies 1998; UNCTAD 1998). Therefore, due to the company sample, the Transnationality Index of the UNCTAD does not seem to be very helpful, while the individual variables can sufficiently describe some aspects of the degree of internationalization of those firms.

Another important drawback of the Transnationality Index, according to Ietto-Gillies, is that it only distinguishes between local/national vs. foreign activities and does not take into account how widely the foreign activities are spread. Her answer to this problem is the Network-Spread Index (NSi). This index can be derived by dividing the number of foreign countries in which a company has affiliates by the total number of countries worldwide in which there is inward stock of Foreign Direct Investment (FDI) minus 1 (to exclude the home country). NSi does not provide information about either the volume or the form of foreign activities by the firm. A combination of both indices - the transnationality and the network-spread index - is supposed to capture both dimensions of internationalization: the volume and the dispersion of foreign activities. Therefore, IettoGillies constructs the Transnationality Spread Index by calculating TNi * NSi.

Using an index instead of multiple single indicators aims at reducing a large amount of different indicators without losing important information. The rank-correlation coefficient of TNi and NSi, analysed for the top 100 MNEs of the UNCTAD sample is, however, only 0.4 (UNCTAD 1998). Assuming that varying degrees of NSi go along with different implications for firms' performances and strategies, it is even less convincing to combine this measure with three other indicators instead of using it as a single one.

Daniel Sullivan (1994) has developed a third index. The Degree of Internationalization Scale (DOI) draws upon available data for 74 out of the 100 most international American manufacturing and service firms according to a Forbes ranking, based on total foreign revenues.

By calculating corrected item-total correlation, he chooses five out of nine available measures for his scale, reaching a reliability of alpha = .79. The components of his scale are the following ratios: foreign sales to total sales (FSTS), foreign assets to total assets (FATA), number of foreign (overseas) subsidiaries to total number of subsidiaries (OSTS), and amount of top managers' international experience to years of overall work experience (TMIE). The fifth element is an estimate of the 'Psychic Dispersion of International Operations' (PDIO), measured by the dispersion of the subsidiaries of a firm among the ten psychic zones of the world as defined by Ronen and Shenkar (1985). To get a firm's score on the internationalization scale, these five ratios are simply added up.

Sullivan has been criticized for combining measures of different levels, i.e. structural and attitudinal as well as performance-related indicators of

internationalization (Ramaswamy, Kroeck et al. 1996). According to Sullivan, the mixture supports construct validity because it conforms with theory. According to his critics, components of different levels could not act as substitutes, as conveyed by the score. A high degree of one variable could not simply be replaced by any other high value, regarding the different outcomes on the part of the dependent variable. We agree with this criticism in so far as such a multidimensional index is difficult to interpret and hides a number of potentially relevant variations. Nevertheless, Sullivan's scale is empirically confirmed by factor analysis.

To sum up, the three indices show that the usefulness of an index depends on the chosen sample and the object of research, the dependent variable. At first glance, dealing with national samples seems to have some advantages since one does not need to control for the size of the home country, etc. Certainly, the selection of the sample depends on the field of interest.

Regarding continental European firms, we assume - as we will argue below - that their proximity to international capital markets might have distinct effects on their behaviour. The internationalization of capital markets must be seen as an important step in the globalization process. But so far, no consideration has been taken of a firm's financing or ownership structure when it comes to measuring the degree of internationalization.

Real and Financial Dimensions of Internationalization

In order to construct indices that are based on coherent but distinct components, we decided to distinguish between the share of foreign activities of companies, on the one hand, and the degree to which they orient themselves toward international capital markets, on the other. We refer to the share of foreign activities as the *real* dimension of internationalization and the orientation toward international capital markets as the *financial* dimension.

The real dimension of internationalization is very straightforward. Research on the internationalization of firms has traditionally focussed on the role of foreign direct investments and the location of production. By definition, multinational enterprises control and manage production establishments - plants - in more than two countries (Caves 1996). Clearly, the most visible and important aspect of the internationalization of firms is their decision to invest in cross-border production activities rather than selling their rights to other firms in foreign markets (Dunning 1998). Given the fact that the decision to invest and produce goods across borders is the most important criteria for the internationalization of firms, measuring internationalization has usually also concentrated on the foreign share in *real* activities of the firm, such as sales, assets, and employees.

Finance-oriented research has frequently focussed on the impact of foreign-exchange rates on investment decisions (Blonigen 1997; Caves 1998). Some studies have looked into the role of local borrowing by foreign subsidiaries (Caves 1998). No study so far has looked at the extent to which a company internationalizes its financing or ownership structure by approaching international capital markets. However, in particular with regard to continental European firms, there might be good reason for taking financial and ownership variables into account.

As research on comparative corporate governance and corporate ownership structures has established, there are a range of institutional reasons why corporate ownership patterns vary widely between countries (Pedersen and Thomsen 1997; Porta, Lopez-de-Selanes et al. 1998). In particular, corporate governance institutions on the Continent have been seen to constrain dispersed ownership and to enable a high degree of managerial control over the firm. At the same time, in these countries the rate of market capitalization is low, and a market for corporate takeovers hardly exists (OECD 1995).

Differences in the structure of ownership and financing patterns have proven to impact company behaviour and performance. The effect of ownership structure on firm performance was shown for French MNEs (Riahi-Belkaoui 1996). Also, the distribution of net value added in continental European firms varies greatly from Anglo-Saxon firms. It has been shown that in Continental firms, shareholders receive a much lower share of net value added compared to Anglo-Saxon firms, while the share paid to employees is substantially higher (Jong 1997). It is therefore fair to assume that corporate ownership structure will in itself have an impact on firm behaviour.

Due to the perceived rigidities of Continental corporate governance systems and the assumed dysfunction accompanying them, companies have started to emigrate from these systems by approaching international capital markets for investors. This frequently entails the listing of those companies in foreign stock exchanges and the application of international accounting practices rather than national standards, but it also means that companies seek communication with potential international investors. In preparation for greater involvement in international capital markets, firms have changed their reporting systems. Increasingly, they report results for segments of the company rather than for the company as a whole.

When companies approach international capital markets, these strategies are often accompanied by a stricter appreciation of 'shareholder values' in an Anglo-Saxon sense. The financial dimension of internationalization also implies a whole range of changes with regard to management practices, strategic business restructuring, and business goals. These practices and strategies are often more directed at the business operations in the home country than at its foreign activities. One can therefore expect that *financial* internationalization has distinctly different implications for the management, labour relations, and the performance of a firm than does the internationalization of its *real* activities. Another reason why it might become increasingly important, not just for continental European countries, to use the proximity of firms to international capital markets as an *indicator* of a financial dimension of internationalization is the rising share of mergers and acquisitions as part of foreign direct investments. The majority of foreign direct investments today takes the form of mergers and acquisitions (Wortmann 1999). With the rapid increase in the number and volume of international mergers, takeovers, and international firms, the classification of the degree of internationalization based on the real activities of a firm becomes increasingly difficult. An indicator of the internationalization of the ownership structure of a firm and its outlook on international capital markets might become a necessary complementary tool, if it assesses how international a firm actually is.

Research Method

Research Sample

Since 1978, the *Monopolkommission* (the German Commission on the concentration of German industry) has biannually ranked the largest 100 German companies on the basis of net value added (in Germany). In contrast to sales, which is a more common variable for ranking companies, net value added has several advantages. First, it is a more stable factor that enables banks and insurance companies to be included. Second, it ignores different price developments across industries that would bias the company sample. Third, net value added can indicate the vertical integration of different industries. For example, in retailing companies with a low degree of vertical integration, the ratio of net value added to sales is frequently lower than in companies in other industries (Monopolkommission 1998: 153).

The selection criterion itself is size and not foreign sales, as in the studies of Sullivan (1994), Stopford and Dunning (1983), and Daniels and Bracker (1989). We therefore expect that some companies do not have any international involvement, in particular those former public enterprises that were privatized during the 1980s and 1990s.

The selection by size (measured in value added) produces a bias towards the largest employers since labour costs are a major component of value added. The firms in the sample employ 3.7 million people in Germany; about 16 percent of all employees in the private sector. Similarly, they contribute nearly 18 percent to the gross national product produced in the private sector. In terms of international activities, the sample covers a proportionally large percentage. The 100 largest companies in Germany employ about a third of all employees working for German companies abroad (1.4 million compared to an estimated 3.5 million employees). On average, then, these large companies are much more internationalized than the average German company.

In our sample, we have 64 manufacturing firms and 36 firms in the service sector. The manufacturing firms include the chemical sector (11), industrial machinery (10), the automotive industry (8), electronics (2), and others (33). The service sector firms are classified under the rubrics of banks (10), insurance firms (8), retail (10), and general services (8).

Research variables

Based on our assumption that we can distinguish a real dimension of internationalization, which is measured by the activities of firms abroad, and a financial dimension, which refers to the proximity of a firm to international capital markets, we have identified six variables.

Three variables operationalize the real dimension of internationalization. In the context of distinguishing between *performance, structure*, and *attitude* (Sullivan 1994), the variables measure performance and structure. The most common measure of internationalization is Foreign Sales as Percentage of Total Sales (FSTS) (Stopford and Dunning 1983). Most empirical studies that examine the impact of internationalization on firm performance use the foreign share in total sales for measuring internationalization (see overview in Sullivan 1994). Also, FSTS is a component in all internationalization indices of companies (Sullivan 1994;

UNCTAD 1997; Ietto-Gillies 1998). A typical structural measure is Foreign Employees as Percentage of Total Employees (FETE). This measure is used by two of the major internationalization indices (UNCTAD 1997; Ietto-Gillies 1998). The third variable is based on the contribution of Grazia Ietto-Gillies (Ietto-Gillies 1998) and measures the geographical spread of activities of firms abroad (SPREAD). The geographical spread of activities impacts many areas of firms' activities such as the spread of risks, the opportunities of different locations, and increased power vis-à-vis governments and labour (Dunning 1996; Ietto-Gillies 1998). It is measured by the number of countries in which the firm operates. However, there are major difficulties with the number of countries as with the number of foreign subsidiaries as used by Sullivan (1994), Stopford and Wells (1972), and Vernon (1972), since reporting standards on foreign subsidiaries vary greatly in annual reports. Companies with a large number of foreign subsidiaries operating in 50 or more countries tend to name only very few in their annual reports, while companies with few foreign subsidiaries tend to report all of them. Because of the poor quality of the data, we also took into account other information on international activities reported by the firm in its annual report and divided the companies into three groups - labelled *high, middle* and *low* - based on the number of countries in which they operate. *High* indicates that the firm has operations in more than 16 countries, *middle* is between 7 and 16 countries, and *low* is the category for operations in less than 7 countries.The financial dimension has not yet been dealt with in empirical studies. Since it aims at measuring the proximity of the company to international capital markets, this dimension seeks to identify the extent to which a firm invites international/foreign capital to participate in it. We found three variables to be useful in measuring this. First we use the Foreign Owners as Percentage of Total Ownership (FOTO) to estimate the actual extent of foreign shareholders of German companies. A high degree of foreign ownership in firms that are predominantly German is seen as reflecting a high degree of openness and a closer relationship to international capital markets (Rubach and Sebora 1998). The second measure of proximity to international capital markets applied here is the number of listings in foreign stock exchanges (FSE). The third variable points to the need to communicate effectively with international investors. It measures whether firms use German accounting rules according to German commercial legislation or whether they use international accounting standards, either according to the US General Accepted Accounting Principles (US-GAAP) or to the International Accounting Standards (IAS). This Accounting Standards (AS) variable has an ordinal scale.

Data Sources

We calculated FSTS and FETE with data obtained from a project funded by the German Research Foundation (DFG) on the international mobility of German companies (Wortmann, Bochum et al. 1997) and from company publications and annual reports. SPREAD was taken from annual reports. Here the number of countries and subsidiaries were topped up with other information from the firm on its international activities. In order to estimate FOTO, we used the foreign percentage in small holdings as well as large percentages owned by individual shareholders. Data were provided by the reports of the *Monopolkommission* as well as by media reports, annual reports, and the internet. In some cases, the investor relations departments of the companies themselves contributed information. The number of listings in stock exchanges outside Germany was provided by the OnVista Financial Database. Accounting Standards were taken from annual reports and media reporting. The data on the real dimension of internationalization are for the

year 1996. The data on the financial dimension refer to 1999.

Data Analysis

From the set of the 100 largest German firms, 14 companies were excluded because they were subsidiaries of foreign firms themselves. Companies in Germany that are subsidiaries of other foreign MNEs usually have only a few international activities and total (100 percent) foreign ownership. They would therefore severely disturb the distribution of data points. Of the remaining 86 firms, data were as available on the three variables making up the real dimension for 79 firms and on the three variables making up the financial dimension for 68 firms. Missing data regarding the real dimension were mainly due to unreliable or non-existing information on geographical spread, while in 17 cases it was not possible to obtain information on the share of foreign ownership. As expected, we found eight firms (9 percent) that did not show any indication of having real internationalization (no foreign sales, no foreign employees, low spread) and 33 firms (38 percent) that did not show any sign of financial internationalization (no listing in foreign stock exchanges, German accounting standards, no foreign ownership).

To confirm the assumption that our variables make up two dimensions of internationalization, we first examined the correlation matrix, calculating the Pearson correlation coefficient and rank correlation where ordinal scales were included (Table 1).

Table 1 Correlations for the Research Variables

	FETE	FSTS	SPREAD	AS	FSE	FOTO
FETE	1.00	.725**	.679**	.260*	.295**	.265*
FSTS		1.00	.656**	.315**	.346**	.365**
SPREAD			1.00	.329**	.318**	.306*
AS				1.00	.629**	.784**
FSE					1.00	.589**
FOTO						1.00

**. Correlation is significant at the .01 level (2-tailed)
*. Correlation is significant at the .05 level (2-tailed)

Coefficients higher than .5 exist between FETE, FSTS, and SPREAD as well as between AS, FSE, and FOTO. Therefore, the corrected item-total correlation, using FETE, FSTS, and SPREAD for the 'real' scale and AS, FSE, and FOTO for the 'financial' scale, was also high. Combining all six items into one scale leads to considerably lower coefficients for the 'financial' variables (Table 2).

Table 2 Corrected Item-Total Correlations			
	'Real' scale	'financial' scale	6 item scale
FETE	.75		.63
FSTS	.75		.72
SPREAD	.68		.69
AS		.77	.51
FSE		.59	.47
FOTO		.65	.37

We tested the reliability of the two scales 'real' and 'financial'. The alpha coefficient worked well for the real dimension (alpha = .65) but had serious flaws regarding the financial scale. We assume that this is due to the skewed distribution of the values. When principal component factor analysis were applied to the six variables, the results showed - not surprisingly given the correlation matrix - that two factors were loaded (Table 3).

Table 3 Rotated Component Matrix			
	Component / Loading		Communality
	1	2	
FETE	.906	1,000E-01	.831
FSTS	.866	.207	.793
SPREAD	.813	.254	.726
AS	.112	.880	.787
FSE	.240	.733	.595
FOTO	.188	.903	.851
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.			

Instead of using the factor score as the degree of real or financial internationalization, we decided to construct two indices by calculating the mean of the unweighted z-scores.

REAL = (zFSTS + zFETE + zSPREAD) / 3

FINANCE = (zFOTO + zAS + zFSE) / 3

The results of these indices correlate highly with the factor scores of the factor

analysis (r_{real} = .975 and $r_{finance}$´= .978).

Standardized scores can only be used for ranking purposes within the sample, making it impossible to make comparisons either over time or between different samples. Therefore, we constructed a further index for the real dimension using absolute values:

$REAL_{uni}$ = (FSTS + FETE) * SPREAD

It is theoretically justified to use the SPREAD-indicator as a multiplier for the sum of foreign activities, expressed as the share of foreign sales plus the share of foreign employment. The results of $REAL_{uni}$ almost replicate the ranking of REAL (rank correlation coefficient: .99). The finance variables, however, are based on different scales, both theoretically and statistically. We could not find a suitable combination of unstandardized values that would lead to an interpretable index. Therefore, we gave up the idea of a financial index that is comparable over time. Testing the correlation between REAL, $REAL_{uni}$, and each of the three constructing items, as well as between FINANCE and each of its three components also leads to satisfactory results (Table 4).

Table 4 Item - Total - Correlations

	FETE	FSTS	SPREAD	AS	FSE	FOTO
REAL	.901**	.894**	.838**			
REALuni	.880**	.922**	.801**			.
FINANCE				.899**	.823**	.899**

The rank correlation coefficients are fairly similar. The company rankings on different indicators and on the three scales are given in Tables 5 and 6 for those 25 companies that scored highest on each of the two dimensions.

Table 5 Company Rankings on Three Estimators of the Degree of Real Internationalization of a Firm (highest 25 ranks out of 86)

Company	REAL	REALuni	SPREAD	FSTS	FETE
Boehringer Sohn C.H.	1	1	High	4	3
Hoechst AG	1	2	High	3	5
Henkel KG	3	4	High	8	2
Schering AG	4	3	High	1	11
Bayer AG	5	5	High	2	13
Franz Haniel & Cie. GmbH	6	6	High	13	4
SAP AG	7	7	High	6	15
Beiersdorf AG	8	8	High	19	6
Bertelsmann AG	9	9	High	17	8
Freudenberg & Co. KG	10	10	High	15	10
BMW AG	11	11	High	9	22
BASF AG	12	12	High	7	28
Bosch, Robert GmbH	13	13	High	24	18
Siemens AG	14	14	High	23	21
Allianz AG	15	16	High	29	12
Linde AG	16	15	High	21	24
Bosch-Siemens Hausgeraete GmbH	17	17	High	27	23
Carl-Zeiss-Stiftung	18	18	High	10	33
Bilfinger + Berger Bau-AG	19	26	Middle	36	1
Continental AG	20	25	Middle	14	9
Mannesmann AG	21	19	High	26	29
Metallgesellschaft AG	22	20	High	11	42
Degussa AG	23	27	Middle	5	27
Daimler-Benz AG	24	21	High	22	38
Wacker-Chemie GmbH	25	22	High	16	45

Table 6 Company Rankings on Three Estimators of the Degree of Financial Internationalization of a Firm (highest 25 ranks out of 86)

Company	FINANCE	AS	FSE	FOTO
Bayer AG	1	IAS	1	4
Hoechst AG	2	IAS	3	3
Deutsche Bank AG	3	IAS	4	7
Daimler-Benz AG	4	US-GAAP	6	10
Mannesmann AG	5	IAS	11	2
Dresdner Bank AG	6	IAS	5	17
Siemens AG	7	US-GAAP	8	8
BASF AG	8	US-GAAP	6	14
VEBA AG	9	US-GAAP	9	6
Metallgesellschaft AG	10	US-GAAP	27	1
Deutsche Telekom AG	11	US-GAAP	11	5
Schering AG	12	IAS	13	7
BMW AG	13	IAS	13	12
Commerzbank AG	14	IAS	27	8
VIAG AG	15	IAS	13	21
RWE AG	16	IAS	13	23
Allianz AG	17	IAS	13	25
Linde AG	18	IAS	27	13
Thyssen AG	19	US-GAAP	13	26
Metro Holding AG	20	IAS	21	20
Deutsche Lufthansa AG	21	IAS	27	15
MAN AG	22	IAS	13	27
Degussa AG	23	US-GAAP	21	26
Preussag AG	24	IAS	27	19
Muenchener Rueckversicherungsgesell. AG	25	IAS	27	22

Finally, we looked at the correlation between REAL and FINANCE. The rank correlation coefficient turned out to be r = .41, low enough to assume that these two indices might indeed catch two different dimensions.

Eighteen companies of our sample are not stock corporations (*Aktiengesellschaft*) but have the legal status of being limited liability companies (GmbH). One could argue that - because of their legal structure - they have a higher institutional barrier

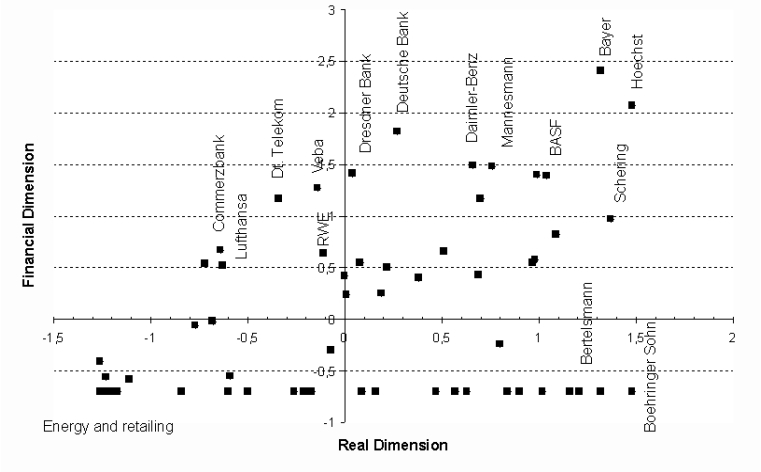
against access to international capital markets. In order to exclude this institutional effect, we repeated the statistical tests for the sample of corporations only. As we expected, the correlation between REAL and FINANCE increased by excluding those cases where the access to capital markets is restricted but the possibility to internationalize their activities is not ($r = .60$, $N = 49$). Nevertheless, factor analysis led to the same conclusion as it had for the whole sample. Therefore, even under tighter conditions we still find proof of two distinct dimensions of internationalization.

Discussion: Two Dimensions of Internationalization

The statistical tests have shown that it is justified to group our variables around a real dimension of internationalization and a *financial* dimension. The choice of variables was based on their measurement goal of each dimension. The foreign percentage found among employees and in sales, and the number of countries in which a firm operates sought to measure the physical dispersion of economic activities of MNEs around the world; the number of foreign stock exchange listings, the use of international versus national accounting standards and the percentage of foreign shareholders were meant to measure the proximity of the company to international capital markets. Thus, the choice of indicators for constructing the two indices was based on the theoretical expectation of the grouping of variables and not on the empirical results of the factor analysis. At the same time, factor analysis and rank correlation supported the claim that the two indices measure two distinct dimensions of the internationalization of firms. However, one has to be aware that these observations on the financial dimension of the internationalization of firms might only work for German or continental European firms. Since the measurement focuses on the proximity of those firms to standards in international capital markets (listings in foreign stock exchanges, international accounting standards), the index on the financial dimension of internationalization takes an Anglo-Saxon financing behaviour as a benchmark for internationalization. Firms based in the US or the UK have long lived up to these standards. Therefore, the index measures the distance between continental European practices and international (Anglo-Saxon) standards.

The empirical results are plausible when looking at the type of firms that have either a high degree of real or of financial internationalization (see Figure 1). Six out of the top ten firms with the highest degree of real internationalization are chemical companies. The chemical sector has traditionally been the most internationalized sector in German industry (Lane 1998). On the one hand, the dimension of real internationalization therefore captures the main components of the traditional path toward internationalizing the activities of firms. On the other hand, we find among the ten firms with the greatest financial internationalization that at least four were involved in the biggest cross-border mergers in recent years. These include the merger between Daimler and Chrysler into DaimlerChrysler in 1998, the merger of the French chemical firm Rhone-Poulenc and Hoechst into Aventis in 1999, the takeover of Bankers Trust by the Deutsche Bank, and the takeover of the telecommunications company Mannesmann by the British firm Vodafone in 2000. These observations confirm our claim that the index can identify those companies preparing to become active players in the international merger and acquisition market.

Figure 1: Degree of Internationalization: real and financial dimensions



(to enlarge please click on the figure)

We can also show that some companies, such as the chemical firms Bayer and Hoechst, internationalize financially as well as through their real activities, but that other companies can pursue only one of these dimensions. Some of the firms with the highest degree of real internationalization are still family owned and therefore financially domesticated (i.e. Freudenberg). Others approach international capital markets while still focussing their real economic activities on Germany. Interesting examples for the latter group are formerly state-owned firms such as the telephone company Telekom AG and the two formerly state-owned energy firms VEBA AG and RWE AG, which have since turned into diversified industrial conglomerates. In order to adjust these companies to their new business environment, management also pursues a very active 'Shareholder Value' corporate strategy in which intensive communication with important participants in international capital markets is an integral part.

The distinction between a real and a financial dimension of internationalization is thus not only theoretically and empirically sound, but might also point to a way of capturing new developments in international business research that have become fundamentally important. Since researchers estimate that 70 percent of all foreign direct investments today take the form of mergers and acquisitions and are not genuinely new investments into the host countries, the importance of the takeover market will have to be reflected in studies on internationalization in the future (Wortmann 1999).

Conclusion

In the debate on how to measure the degree of internationalization of firms, far too little attention has been paid to the fact that the degree of internationalization is contingent on both the changing nature of international business and the sample for which the measurement is used. Can there be a universal index for measuring internationalization that is not tied to these contingencies?

The findings of our research would suggest that the answer to this question is 'no'. There does not seem to be any way to avoid acknowledging that the changing nature of international business will not allow a universal measurement of the degree of

internationalization of firms. For instance, product cycle theory suggests that the internationalization of real activities by multinational firms follows a pattern consisting of certain stages. This implies that one-dimensional measures would only measure the degree of one stage (i.e. sales), which have to be supplemented with other indicators (i.e. assets or employment). At the same time, it remains questionable whether these indicators can be combined into a single index since not all companies go through all the stages of internationalization nor do all companies follow the same pattern. Moreover, our own research has shown that there are dimensions of internationalization that do not covary with the internationalization of real activities of MNEs. Since financial internationalization does not follow the same motives as real internationalization, it does not follow the logic of product cycle theory.

A combination of real and financial components in one index would therefore seriously distort the measurement of internationalization. Nevertheless, a theoretically justified and empirically grounded separation of different dimensions of internationalization can solve the problem. Factor analysis and other statistical tests are suitable tools to support this claim. Different degrees of different dimensions measuring internationalization might be the best quality of measurement available.With regard to international comparative research, the situation is even more complicated. Some indicators are particularly sensitive to the size of the home country of the firm, others are not. Big firms based in small countries will automatically have a higher share of their activities abroad. Yet this in itself does not say much about the performance or behaviour of those firms compared to firms from larger countries. Any study seeking to include firms from a number of different countries will have to take into account the country effect. While single variables might work for measuring a certain type of internationalization of firms across countries (i.e. share of foreign ownership), a combination of various indicators might distort the results.

Therefore, one probably has to concede a tradeoff between the advantage of a comprehensive index that might cure measurement problems and the potential of a universal application of such an index. As we have tried to show, there is a wide range of possibilities with great explanatory potential somewhere between the two poles of a universal index and a multitude of individual variables.

References

Blonigen, B. A. 1997 'Firm-specific assets and the link between exchange rates and foreign direct investment', American Economic Review 87(3): 447-65.

Caves, Richard E. 1996 Multinational enterprise and economic analysis, Cambridge: Press Syndicate of the University of Cambridge.

- 1998 'Research on International Business: Problems and Prospects', Journal of International Business Studies 29(1): 5-19.

Daniels, John D. and Bracker, John 1989 'Profit performance: Do foreign operations make a difference?', Management International Review 29(1): 46-56.

Dülfer, Eberhard 1999 Internationales Management in unterschiedlichen

Kulturbereichen, München/ Wien: Oldenbourg.

Dunning, John H. 1996 'The geographical sources of the competitiveness of firms: some results of a new survey', Transnational Corporations 5(3): 1-29.

- 1998 'Location and the Multinational Enterprise: A Neglected Factor?', Journal of International Business Studies 29(1): 45-66.

Glaum, Martin 1996 Internationalisierung und Unternehmenserfolg, Wiesbaden: Gabler.

Gomes, Lenn and Ramaswamy, Kannan 1999 'An Empirical Examination of the Form of the Relationship Between Multinationality and Performance', Journal of International Business Studies 30(1).

Hirst, Paul and Thompson, Graham 1996 Globalisation in Question. The International Economy and the Possibility of Governance, Cambridge: Polite Press.

Ietto-Gillies, Grazia 1998 'Different Conceptual Frameworks for the Assessment of the Degree of Internationalization: an Empirical Analysis of the Various Indices for the top 100 Transnational Corporations', Transnational Corporations, 7: 17-39.

Johanson, Jan and Vahlne, Jan-Erik 1977 'The Internalization Process of the Firm - A Model of Knowledge Development and Increasing Foreign Market commitments', Journal of International Business Studies 8(1): 23-32.

Jong, Henk Wouter de 1997 'The Governance Structure and Performance of large European Corporations', Journal of Management and Governance 1(1): 5-27.

Lane, Christel 1998 'European companies between globalization and localization: a comparison of internationalization of British and German MNCs', Economy and Society, Routledge 27: 462-485.

Monopolkommission 1998 Marktöffnung umfassend verwirklichen. Zwölftes Hauptgutachten der Monopolkommission gemäß § 24b Abs. 5 Satz 1 GWB, Baden-Baden: Nomos.

OECD 1995 'Financial Markets and Corporate Governance', Financial Market Trends 62(December): 13-35.

Pedersen, Torben and Thomsen, Steen 1997 'European patterns of corporate ownership: a twelfe country study', Journal of International Business Studies(4): 759-778.

Porta, Rafael La, Florencio Lopez-de-Selanes, et al. 1998 Corporate Ownership around the World, Camebridge: National Bureau of economic Research.

Ramaswamy, Kannan, Galan K. Kroeck, et al. 1996 'Measuring the Degree of Internalization of a Firm: A Comment', Journal of International Business Studies 27: 167-177.

Riahi-Belkaoui, Ahmed 1996 'Internationalization, Diversification Strategy and

Ownership Structure: Implications for French MNE Performance', International Business Review 5(4): 367-376.

Ronen, Simcha and Shenkar, Oded 1985 'Clustering countries on attitudinal dimensions: A review and synthesis', Academy of Management Review 10(3): 435-454.

Rubach, Michael J. and Sebora, Terrence C. 1998 'Comparative Corporate Governance', Journal of World Business 33(2): 167-184.

Stopford, John M. and Dunning, John H. 1983 'The world directory of the multinational enterprises 1982-83', Detroit Michigan: Gale Research Company.

Sullivan, Daniel 1994 'Measuring the Degree of Internalization of a Firm', Journal of International Business Studies 25: 325-342.

Sullivan, Daniel 1996 'Measuring the Degree of Internalization of a Firm: a reply', Journal of International Business Studies 27: 179-192.

UNCTAD 1997 World Investment Report 1997. Transnational Corporations, Market Structure and Competition Policy, New York, Geneva: United Nations.

- 1998 World Investment Report 1998. Trends and Determinants, New York, Geneva: United Nations.

- 1999 World Investment Report 1999. Foreign Direct Investment and the Challenge of Develop-ment, New York, Geneva: United Nations.

Wortmann, Michael, Ulrich Bochum, et al. 1997 Globalisierung und internationale Mobilität deutscher Industrieunternehmen.

Wortmann, Michael. 1999 'Externes und internes Auslandswachstum multinationaler Unternehmen - Empirische Befunde und theoretische Implikationen' in Michael H. Stierle (ed.) 'Globalization: Effects on enterprises, employment and government', Tagungsband zur INFER - Jahrestagung 1999, VWF Berlin: 111-130.

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Figure 1: Degree of Internationalization: real and financial dimensions

