
Two Dimensions of the Internationalization of Firms*

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ABSTRACT The paper argues that there are two dimensions of internationalization: one which refers to the production activities of firms abroad and one which focuses on the corporate governance dimension of firms. While the first one is well known in the literature on internationalization, the financial dimension has not yet been addressed empirically. At the same time there are indicators that financial internationalization is gaining importance. Using a sample of the 100 largest German companies it shows that both dimensions, the real and the financial dimension, do not co-vary and therefore cannot be combined into one index.

INTRODUCTION

The aim of this paper is to analytically conceptualize and empirically show that there are two distinct dimensions of the internationalization of firms: one that relates to the production sphere of a firm and one that relates to the corporate governance sphere of the firm. We argue that the internationalization of firms does not only take place in the sphere of production, i.e. turnover abroad and international production sites, that have traditionally been seen as the main indicators for internationalization. There is also an internationalization of the corporate governance dimension of firms that focuses on the type of investors firms look at and whose interests they take into account. As we will argue below the internationalization of the corporate governance dimension is in particular salient in countries that do not have an Anglo-American corporate governance tradition.

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THE CONTEXT

Identifying distinctive processes of real and financial internationalization of firms can help to disentangle the impact of economic internationalization on national institutions. In theories about the 'variety of capitalism' two main types of production regimes are distinguished: a coordinated continental European regime and an Anglo-American regime (Crouch and Streeck, 1997; Hall and Soskice, 2001; Whitley, 1999). Economic regimes or business systems are combinations of economic institutions such as training, corporate governance and industrial relations that develop complementarities and specialize in certain types of production processes. The question arises whether these nationally distinct regimes are converging under the impact of globalization; in particular whether the coordinated regime type moves closer towards a more liberal and market-based regime.

Internationalization can have different effects. Hall and Soskice (2001, pp. 54–60) assume that the internationalization of production and trade does not contribute to the decline of coordinated economies. Since companies focus on their comparative advantages when facing stronger competition, national distinctions might increase rather than decrease. However, a move towards more Anglo-American corporate governance standards might have the opposite effect. Internationalization of corporate governance will introduce imbalances between labour relations and the monitoring of firms and might erode institutions that rely on co-ordination rather than markets.

This paper refers to the debate by showing that these two different dimensions of internationalization are not only theoretically important but can also be identified empirically at the company level. The empirical distinction allows us to test the expected effects of internationalization on national institutions. In another paper, we were able to prove that a high degree of financial internationalization of German firms has a negative effect on the change of labour's share in the distribution of net value added of a firm while it has a positive effect on the change of shareholders' share (Beyer and Hassel, 2002).

We have therefore strong reasons to believe that there are not only two dimensions of the internationalization of firms, but that these dimensions have distinct impacts on the evolution of national 'Varieties of Capitalism'.

THE NEW DIMENSION: FINANCIAL INTERNATIONALIZATION

Central to the understanding of a corporate governance dimension of the internationalization of firms is the distinction between strategic and financial interests of shareholders. Shareholders in continental European firms traditionally had a strategic interest in the firm. For instance, in German companies shareholding is highly concentrated (La Porta, 1998). In 1996 only a third of the shareholders of

the 100 biggest firms were dispersed owners. Banks, other industrial companies, families and the state owned the majority of shares of big firms (Monopolkommission, 1998). These shareholders had other priorities such as employment interests in the case of the government, trustful supplier relations in the case of other companies, the securement of bank credits in the case of banks or family wealth.

In accordance with the ownership structure of big German firms, a type of corporate governance has evolved in which insiders were favoured and the influence of external investors was minimized. The features of that 'insider system' of German corporate governance has been widely described in the literature (Allen and Gale, 1995; Franks and Mayer, 1998; Mayer, 1998; Roe, 1993): banks could cast proxy votes for their clients, companies could issue shares with multiple votes (Mehrfachstimmrechte) and limited votes (Höchststimmrechte). Accounting standards allowed for a high degree of managerial discretion in accounting and favoured creditors. Management itself usually did not pursue a clear policy based on return on investment criteria. On top of these factors, co-determination and workers' representation on supervisory boards increased the role of insiders and enabled the management to insulate itself from capital market influence.

During the 1990s however, large German companies have made considerable steps towards the adoption of international corporate governance standards. Companies now have increasing listings in foreign stock exchanges, have set up investor relations departments based on Anglo-American role models, aim for international investors and implement shareholder value policies. They have introduced international accounting methods, and stock option schemes for management, engage in share buy-back processes and co-operate with rating agencies (Höpner, 2001). These processes, we argue, are also part of the internationalization of firms. The reasons for this process are manifold: increasing competitive pressure, the evolution of a market for corporate control, the increase of equity capital and the evolution of an external labour market for top managers. In order to point out this form of internationalization as a distinct process independent from the production sphere of big firms, we have labelled it the financial internationalization of firms.

In the following parts of the paper we will locate the two dimensions of internationalization of firms in the literature of measuring internationalization. We will discuss the pros and cons of constructing indices and typologies for internationalized firms. We argue that aggregate indices of related variables can be a good measurement of internationalization, if they consist of coherent components which are theoretically justified (content validity) and are plausibly constructed (construction validity). 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.

MEASURING INTERNATIONALIZATION

Measuring the degree of internationalization of firms has become a contested but largely unresolved issue in international business research (Ramaswamy et al., 1996; Sullivan, 1994, 1996). At the same time, the body of theories on internationalization is large as is the number of empirical studies which have attempted to test the effect of the degree of internationalization 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 the internationalization of firms (Sullivan, 1994). In order to improve the quality of empirical studies, Sullivan proposed an aggregate index of the degree of internationalization which is made up 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 which could potentially have different effects on firm performance or behaviour into one index?

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, the degree of internationalization 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 which starts with exports, which is followed by sales activities abroad and then by production (Dülfer, 1999; Glaum, 1996; Johanson and Vahlne, 1977). In that case, a firm with a high share of foreign employees might be considered to be more internationalized or in a later stage of internationalization than a firm with a high share 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, p. 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 which found that the effect of the share of foreign sales might be curvilinear with declining returns for companies which have a very high share of foreign sales (see for example Gomes and Ramaswamy, 1999). In that case, a combination of two components which are expected to have different effects on the outcome would distort the analysis.

Nevertheless, if the selected variables are theoretically expected to co-vary 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 moved on a step in its internationalization process. On the one hand, an index could overcome the location of companies on different steps 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, relying on just one unidimensional 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 in 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 which 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 biggest MNEs world-wide and published annually in its World Investment Report (UNCTAD, 1997, 1999). At 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 share of foreign employees in total employees cannot be grouped into the same category. There is one potential reason for this observation: since the firms spread their activities all over the world, the lack of correlations can be due to varying degrees of assets per employee in different countries. Secondly, the 100 biggest companies are based in both small and large countries. Depending on the size of the home country,

foreign direct investments as indicated by the foreign share in 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 and 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 world-wide in which there is inward stock of FDI minus 1 (to exclude the home country). Information about the volume or form of foreign activities by the firm cannot be obtained from NSi. A combination of both indices – the transnationality and the network spread index – is supposed to catch both dimensions of internationalization: the volume and the dispersion of foreign activities. Therefore Ietto-Gillies constructs the Transnationality Spread Index by calculating $TNi \times NSi$.

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' performance 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) develops a third index. The Degree of Internationalization Scale (DOI) draws upon available data for 74 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 correlations he chooses five of nine available measures for his scale, reaching a reliability of $\alpha = 0.79$. 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 time of Top Managers' international experience to years of 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 obtain a firm's score on the internationalization scale these five ratios are simply summed 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 et al., 1996). According to Sullivan, the mixture supports construct validity because it conforms with theory. According to his critics, components of different levels were no 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 hold some advantages as 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.

REAL AND FINANCIAL DIMENSIONS OF INTERNATIONALIZATION

In order to construct indices which 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 to international capital markets on the other hand. The share of foreign activities we refer to as the *real* dimension of internationalization, while the orientation towards international capital markets we refer to as the *financial* dimension.

The *real* dimension of internationalization is most straightforward. Research on the internationalization of firms has traditionally focused 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 most 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 criterion 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 focused 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 has so far looked at the extent to which a company internationalizes its financing or ownership structure by approaching international investors.

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 (La Porta et al., 1998; Pedersen and Thomsen, 1997). In particular, continental European corporate governance institutions have been identified as constraining dispersed ownership and allowing a high degree of manager control over the firm. At the same time, in these countries the rate of market capitalization is low and a market for corporate take-overs 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 which is paid to employees is substantially higher (de 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 European corporate governance systems and assumed disfunctionalities which come with 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 applying international accounting practices rather than national standards, but also seeking communication with potential international investors. In order to present themselves for international capital, firms have changed their reporting systems and increasingly report results for segments rather than the company as a whole.

RESEARCH METHOD

Research Sample

The German Commission on the concentration of German industry (Monopolkommission) has since 1978 bi-annually 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 which allows the inclusion of banks and insurance companies. Second, it ignores different price developments across industries which would bias the company sample. Third, net value added can indicate the vertical integration of different industries. For example, in retailing companies which have 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, p. 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 employees in Germany; about 16 per cent of all employees in the private sector. Similarly they contribute nearly 18 per cent to the gross national product produced in the private sector. Also in terms of international activities, the sample covers a proportionally large share. The hundred largest companies in Germany employ about a third of all employees of German companies abroad (1.4 million compared to an estimated 3.5 million employees). They are therefore on average 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 machines (10), automotives (8), electronics (2) and others. The service sector firms are comprised of in banks (10), insurance firms (8), retail (10) and general services (8).

Research Variables

Based on our assumptions that we can distinguish a *real* dimension of internationalization which is based on activities of firms abroad and a *financial* dimension which refers to the proximity of the 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 which look at 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 (Ietto-Gillies, 1998; Sullivan, 1994; UNCTAD, 1997). A typical structural measure is Foreign Employees as Percentage of Total Employees (FETE). This measure is used by two of the major internationalization indices (Ietto-Gillies, 1998; UNCTAD, 1997). 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 highly in annual reports. Companies with large numbers of foreign subsidiaries which operate in 50 and 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 therefore also took into account other information from the firm on its international activities in the annual report and grouped the number of countries in which firms operate into three groups: *high*, *middle* and *low*. High indicates that the firm has operations in more than 16 countries, middle is between seven and 16 countries, and low is the category for operations in less than seven countries.

The financial dimension has not been dealt with in empirical studies yet. Since it aims at measuring the proximity of the company to international capital markets, it asks to what extent the firm invites international/foreign capital to participate in the firm. We found three variables which might be useful for measuring this. 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 which are predominantly German is seen as a high degree of openness and a closer relationship to international capital markets (Rubach and Seborá, 1998). The vast majority of foreign shareholders of German firms are institutional investors. About two thirds of them are from Anglo-american countries. In contrast to private shareholders, institutional investors are able to digest a vast amount of financial information of firms and have an active portfolio management. They can therefore be characterized as particularly active shareholders.

The second measure of proximity to international capital markets is the number of listings in foreign stock exchanges (FSE). Listings in foreign stock exchanges are attempts to attract foreign shareholders. They do not necessarily lead to a high standard of share trading in foreign stock exchanges, because institutional investors are acting world wide and usually prefer the home country stock exchange of the firm for trading. The listing at the New York Stock Exchange is of special importance since companies have to comply with the Securities and Exchange Commission (SEC). The SEC protects the interest of minority shareholders much more effectively than the German stock exchange supervisory authority (Bundesaufsichtsamt für den Wertpapierhandel). Nevertheless, a higher number of foreign stock exchange listings of German companies indicates a stronger effort by the company to attract institutional investors.

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). In contrast to German accounting standards that are primarily focused on protecting creditors' interests, international accounting standards are based on the 'true and fair view' principle that protects the minority shareholder. This variable Accounting Standards (AS) has an ordinal scale.

Data Sources

We calculated FSTS and FETE with data obtained from a project funded by the German Research Association (DFG) on the international mobility of German companies (Wortmann et al., 1997), publications by the firms 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 foreign share in small holdings as well as large shares by individual holders. Data were provided by the reports of the Monopolkommission as well as reporting in the media, annual reports and the internet. In some cases, investor relations departments of firms contributed their information. The number of listings in Stock Exchanges outside Germany is 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 given 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 that were subsidiaries of foreign firms themselves. Companies in Germany which are subsidiaries of other foreign MNEs usually have few international activities and a 100 per cent foreign ownership. They would therefore severely disturb the distribution of data points. Of the remaining 86 firms, data were 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 no 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 per cent) which did not show any indications of having real internationalization (no foreign sales, no foreign employees, low spread). Thirty-three firms (38 per cent) did not show any

Table I. Correlations for the research variables

	<i>FETE</i>	<i>FSTS</i>	<i>SPREAD</i>	<i>AS</i>	<i>FSE</i>	<i>FOTO</i>
FETE	1.00	0.725**	0.679**	0.260*	0.295**	0.265*
FSTS		1.00	0.656**	0.315**	0.346**	0.365**
SPREAD			1.00	0.329**	0.318**	0.306*
AS				1.00	0.629**	0.784**
FSE					1.00	0.589**
FOTO						1.00

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table II. Rotated component matrix

	<i>Component/loading</i>		<i>Communality</i>
	1	2	
FETE	0.906	1000E-01	0.831
FSTS	0.866	0.207	0.793
SPREAD	0.813	0.254	0.726
AS	0.112	0.880	0.787
FSE	0.240	0.733	0.595
FOTO	0.188	0.903	0.851

Extraction method: principal component analysis.

Rotation method: varimax with Kaiser normalization. Rotation converged in 3 iterations.

sign of financial internationalization (no listing in foreign stock exchanges, German accounting standards and no foreign ownership).

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

Coefficients higher than 0.5 exist between FETE, FSTS and SPREAD as well as between AS, FSE and FOTO.

Applying principal component factor analysis to the six variables showed – not surprisingly given the correlation matrix – that two factors were loaded (Table II).

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.

$$\text{REAL} = (z\text{FSTS} + z\text{FETE} + z\text{SPREAD})/3$$

$$\text{FINANCE} = (z\text{FOTO} + z\text{AS} + z\text{FSE})/3$$

Table III. Item – total correlations

	<i>FETE</i>	<i>FSTS</i>	<i>SPREAD</i>	<i>AS</i>	<i>FSE</i>	<i>FOTO</i>
REAL	0.901**	0.894**	0.838**			
FINANCE				0.899**	0.823**	0.899**

** Correlation is significant at the 0.01 level (2-tailed).

The results of these indices correlate highly with the factor scores of the factor analysis ($r_{\text{real}} = 0.975$ and $r_{\text{financ}} = 0.978$).

Standardized scores can only be used for ranking purposes within the sample, making it impossible to compare either different samples or over time. But we could not find a suitable combination of unstandardized values which would lead to an interpretable index for any of these two dimensions of internationalization. Therefore, we gave up the idea of internationalization indices which are comparable over time.

Testing the correlation between REAL and each of the three constructing items as well as between FINANCE and each of its three components also leads to satisfactory results (Table III).

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

We finally looked at the correlation between REAL and FINANCE. The rank correlation coefficient turned out to be $r = 0.41$, therefore 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 form of limited liability companies (GmbH). Therefore one could argue that – because of their legal structure – they have a higher institutional barrier to 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 ($r = 0.60$, $N = 49$). Nevertheless, factor analysis led to the same conclusion as 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 vari-

Table IV. Company rankings on three estimators of the degree of real internationalization of a firm (highest 25 ranks out of 86)

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

ables was based on their measuring goal. The foreign share in employment, sales and the number of countries in which the firm operates aimed at measuring the physical dispersion of economic activities of MNEs around the world; the number of foreign stock exchange listings, the international versus national accounting standard and the share of foreign stock owners were meant to measure the proximity of the company to international capital markets. Therefore the choice of indicators for constructing the two indices was based on the theoretical expectation of the grouping of variables, not on the empirical results of the factor analysis. At the same time, factor analysis and rank correlations supported the claim that the two indices measure two distinct dimensions of the internationalization of firms.

However, one has to be aware of the fact 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

Table V. Company rankings on three estimators of the degree of financial internationalization of a firm (highest 25 ranks out of 86)

<i>Company</i>	<i>FINANCE</i>	<i>AS</i>	<i>FSE</i>	<i>FOTO</i>
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
Münchener Rückversicherungsgesell. AG	25	IAS	27	22

exchanges, international accounting standards), the index on the financial dimension of internationalization takes an Anglo-Saxon financing behaviour as a benchmark for internationalization. Firms which are based in the USA 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 which have either a high degree of real or of financial internationalization (see Figure 1). Six 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). The dimension of real internationalization therefore captures the main components of the traditional pathway of the internationalization of the activities of firms. On the other hand, among the top ten firms of financial internationalization we find at least four firms which were involved in the biggest cross-border mergers of firms in recent years.

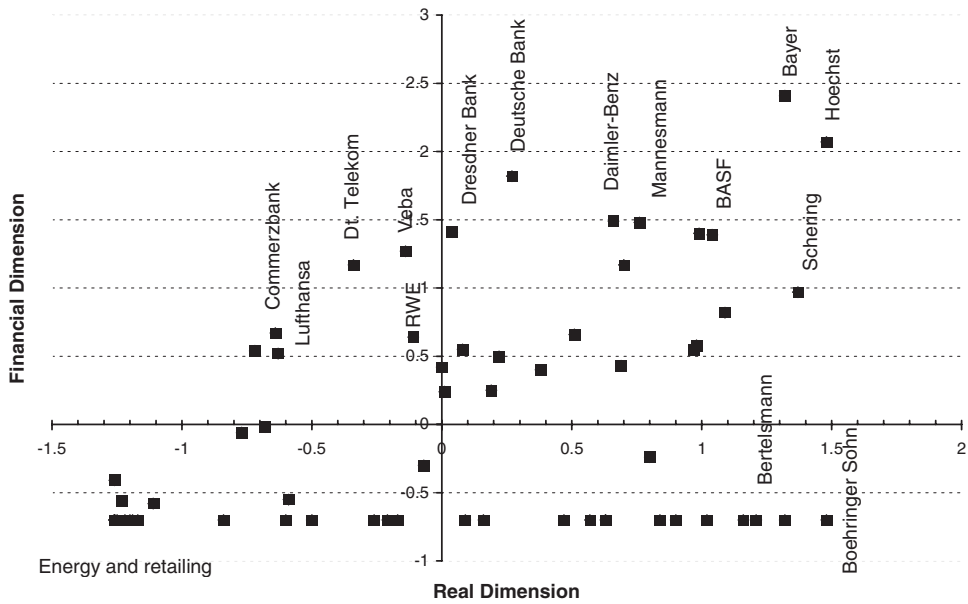


Figure 1. Degree of internationalization: real and financial dimension

These include the merger between *Daimler* and *Chrysler* into *DaimlerChrysler* in 1998, the merger of the French chemical firm *Rhône-Poulenc* and *Hoechst* into *Aventis* in 1999, the take-over of Bankers Trust by *Deutsche Bank* and the take-over of the telecommunication company *Mannesmann* by the British firm *Vodafone* in 2000. These observations confirm our claim that the index can capture the preparation of those companies to become active players in the international merger and acquisition market.

We can also show that some companies, such as the chemical firms *Bayer* and *Hoechst*, internationalize financially as well as their real activities, but that other companies can also pursue only one of those 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 focusing their real economic activities on Germany. Interesting examples for the latter group are former state-owned firms such as the former state run telephone company *Telekom AG* and the two former state-owned energy firms *VEBA AG* and *RWE AG*, which have 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 therefore not only theoretically and empirically sound, but might also point to a way of capturing new developments in international business research which

has become of fundamental importance. Since researchers estimate that 70 per cent of all foreign direct investments today take the form of mergers and acquisitions and are not genuine new investments into the host countries, the importance of the take-over market will have to be reflected in studies on internationalization in the future (Wortmann, 1999).

CONCLUSION

In this paper we have tried to analytically argue and empirically show that the internationalization of firms has a real and a financial dimension.

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

The conclusion of our research would suggest not. There does not seem to be any way round 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 internationalization of real activities of multinational firms follows certain stages. On the one hand that 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 one index since not all companies follow 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 which do not co-vary 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 product cycle logic.

A combination of real and financial components in one index would therefore seriously distort the measurement of internationalization. At the same time 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 of the internationalization of firms might be the best quality of measurement available.

With regard to international comparative research, things are even more complicated. Some indicators are particularly sensitive to the size of the home country of the firm, others are not. Big firms which are based in small countries will automatically have a higher share of their activities abroad. This however in itself does not give any meaning for the performance or behaviour of those firms compared

to firms from bigger countries. Any study which wants 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 trade off between the advantage of a comprehensive index which might cure measurement problems and the potential of a universal application of such an index. But, as we have tried to show, there is a wide range of possibilities with great explanatory potential somewhere on the middle road between a universal index and a multitude of individual variables.

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