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Measuring Board Internationalization – Towards a More Holistic Approach

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Abstract: The internationalization of a firm is reflected in many criteria, such as foreign turnover, employees and assets. In recent years internationalization of top management has also become an increasingly important indicator to be taken into account. For instance, upper echelons research has often included internationalization of top management as a variable. But what is internationalization of top management? In this paper, we will first outline that internationalization of top management has not only been assessed by means of several different indicators but also with varying measures of these indicators. In a next step, we will develop an integrated index of board internationalization. We will select four important indicators of board internationalization and we will present three different ways of combining them in one index. We will apply the three resulting indices to the members of the management and supervisory boards of the firms represented in the German stock index DAX30. Finally, we will discuss advantages and disadvantages of the three alternatives and note some implications for future research on top management team internationalization.

Key Words: Top Management Team Research, Upper Echelons Research, Board Internationalization, Internationalization Index, Internationalization, Corporate Governance

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Measuring Board Internationalization – Towards a More Holistic Approach

1 Introduction

Hambrick and Mason's "upper echelons" perspective (Hambrick & Mason, 1984: 431-433) has initiated a considerable amount of research on top management teams. The basic theoretical assertion of the upper echelons perspective is that organizations will constitute a "reflection" of their top management teams. The approach assumes that the managers' most relevant characteristics in terms of their influence on strategic choices and organizational outcomes are psychological characteristics, such as their cognitions, their values and their perceptions (Knight et al., 1999: 446). Since these characteristics are latent and difficult to measure directly, researchers use demographic characteristics as proxies for the psychological variables. These are relatively easy to assess and are assumed to underlie an individual's psychological features (Carpenter et al., 2004: 750). Among the variables which have been most frequently used are the executives' age (Mellahi & Guermat, 2004), functional tracks (Carpenter & Fredrickson, 2001) and education (Tihany et al., 2000), as well as company and board tenure (Keck, 1997). Board heterogeneity regarding any of the aforementioned variables has also been frequently studied (e.g. Tihany et al., 2000; Carpenter, 2002; Carpenter et al., 2004).

Starting in the mid-1990s, internationalization of top management teams has been introduced as an additional variable in upper echelons research (e.g. Sambarya, 1996; Elron, 1997; Hambrick et al., 1998; Carpenter et al., 2001; Athanassiou & Nigh, 2002). There has been growing awareness that international interactions constitute an important part of the daily business of many firms. This may require consequences at top management level. Behind this is the assumption that, in order to successfully manage cross-boarder activities, specific knowledge, skills and experience are helpful for the managers of these companies (Heijltjes et al., 2003; Carpenter et al., 2004).

The focus of this paper will be on top management team internationalization and its measurement. In the following section we will first provide an overview of different facets of top management team internationalization and of theoretical arguments and measurement concepts which can be found in literature (section 2). After addressing major problems associated with widespread measurement approaches, we will develop three alternative versions of an integrated index to capture board internationali-

zation. These alternatives try to overcome some of the problems inherent in previous measurement concepts (section 3). We will then apply the indices to a specific data set. We will analyze the German DAX30 and hence provide evidence on the internationalization of the management boards and supervisory boards of major German firms (section 4). We conclude by discussing positive and problematic aspects of the three alternative indices with reference to our empirical results (section 5).

2 "Internationalization" of Top Management Teams

When reviewing the relevant literature, a number of different indicators can be found for assessing top management team (TMT) internationalization. While nationality and international experience of TMT members are the two main variables used in previous research, there are other variables which also express TMT internationalization. This is the reason why, besides multinationality (section 2.1) and international experience (section 2.2), we will discuss international network ties (section 2.3) and foreign language proficiency (section 2.4). Finally, we will point out the importance of differentiation between cultures (section 2.5). We will clarify the logic and the theoretical reasoning underlying each of these indicators and outline the ways how these indicators are operationalized in literature. We will conclude by evaluating the indicators to be discussed (section 2.6).

2.1 Multinationality

For many scholars, differences in team member nationality are the most obvious source of internationalization of TMTs. To refer to differences in nationality within a TMT, many terms are used, such as "multinationality" (Ruigrok & Wagner, 2003: 3), "multiculturality" (Mühlbacher & Vallaster, 2002: 76) or "cultural heterogeneity" (Elron, 1997: 400). Nationality does not only affect an individual's values, cognitions and behaviour, but also his or her native language and the ease with which other foreign languages are learned (Hambrick et al., 1998: 185-187). Nationality is therefore considered an influential demographic variable.

Strategy-manager matching models argue in favour of a fit between firm strategy on the one hand and its managers' profiles on the other hand (Gupta, 1984; Szilagyi & Schweiger, 1984). A number of empirical studies show that a greater degree of alignment between strategy and managers' characteristics is associated with supe-

rior performance (Gupta & Govindarajan, 1984; Govindarajan, 1989; Thomas et al., 1991). Accordingly, it is expected that firms which are active across borders benefit from international managers (Ruigrok & Wagner, 2003: 3). Ashby's "law of requisite variety" (Ashby, 1961: 206-208) is also used to explain the positive effects of cultural heterogeneity within TMTs on the performance of firms that face considerable environmental complexity in cross-border business (Ruigrok & Wagner, 2003: 6).[1] Admittedly, the relationship between TMT multinationality and the performance of firms is not expected to be perfectly correlated. For instance, Hambrick et al. argue that TMT multiculturality is not per se desirable; they assume that its effect depends to a large extent on the nature of the task to be performed (Hambrick et al., 1998: 195).

Formal criteria to assess an individual's nationality are, for example, birthplace or passport nationality (Hambrick et al., 1998: 183). However, such attributes can hardly be claimed to be responsible for shaping values, cognitions or behaviour. An individual may have a certain nationality on paper, but may never have lived in the respective country. What seems to be decisive is rather the country or the culture in which an individual was socialized and received his or her specific "cultural imprint". Accordingly, Hambrick et al. define nationality as "the country in which an individual spent the majority of his or her formative years" (Hambrick et al., 1998: 183). This definition has also been adopted by other authors in the field of international TMT research (e.g. Ruigrok & Wagner, 2003: 10). In addition, there is also some justification for considering the parent identities as an additional criterion (see Hambrick et al., 1998: 183). For instance, an individual may have been raised in Germany; but if his or her father is French and the mother is Swedish, this may have had an additional influence on the individual.

2.2 International Experience

While nationality is largely "imposed" on an individual, he or she also has the opportunity to actively gather international experience later in life. International experience during an individual's educational or professional life can add different perspectives to his or her national point of view and to some extent help "overcome" original tendencies (Hambrick et al., 1998: 184). This formative power of international experiences was, for example, shown in research by Gregersen et al. The authors found

[1] As will be shown, the resource based view is the main theoretical argument used to explain the positive effects of TMT international experience and is also applied when looking at international networks; surprisingly, to our knowledge there is no study focusing on TMT multinationality drawing on the resource based view.

that executives report their international assignments as the "most powerful experience in [their] life for developing global leadership capabilities" (Gregersen et al., 1998: 30).

Some authors draw on the resource based and dynamic capabilities view to establish a relationship between a TMT's international experience and the performance of highly internationalized firms. They expect the managers' international experience to function as a valuable, rare, inimitable, and non-substitutable resource for a firm (e.g. Daily et al., 2000; Carpenter et al., 2001). This assumption builds on the fact that managers with international experience are still atypical. The social complexity associated with international experience may add to the difficulties of competitors to understand or acquire this resource (Carpenter et al., 2001: 495). For the same reason the skills developed through international experience can hardly be attained through other means (Daily et al., 2000: 516). However, managers with such experience are regarded as valuable for firms since they possess "unique and often tacit knowledge with which to better oversee and transform their MNCs' far-flung operations" (Carpenter et al., 2001: 496). Athanassiou and Nigh describe the wide-ranging impact of international experience as follows: "Thus, the more international experience a TMT has, the more likely it will perceive good opportunities for firm expansion internationally, the more likely it will reach good decisions about the firm's internationalization strategy, and the more likely it will facilitate successful implementation of this strategy" (Athanassiou & Nigh, 2002: 161). Accordingly, many researchers have tried to establish a relationship between the international experience of a firm's top management and the firm's international strategy (e.g. Sambarya, 1996; Reuber & Fischer, 1997) or its performance (e.g. Daily et al., 2000; Carpenter et al., 2001).

International experience can be operationalized in different ways. Mainly, experiences during an individual's education and work life are considered. In some cases only a single dimension is used (see, for instance, Sullivan, 1994: 332; Carpenter & Fredrickson, 2001: 538; Carpenter et al., 2001: 500), while in other cases several dimensions are combined (Roth, 1995: 216; Sambarya, 1996: 743; Reuber & Fischer, 1997: 816; Athanassiou & Nigh, 2002: 166-167; Herrmann & Datta, 2002: 560). For example, educational and professional experience can be combined in one measure (Sambarya, 1996: 743) or they can be considered as two different types of experiences and analyzed separately (Bloodgood et al., 1996: 68; Tihany et al., 2000: 1168). Some researchers simply ask whether an individual has international experience or not (Bloodgood et al., 1996: 68; Reuber & Fischer, 1997: 816; Tihany et al., 2000: 1168; Wally & Becerra, 2001: 175-176), while for others the duration of the experience has to exceed a certain level (for example one year) to be taken into

account (Carpenter et al., 2003: 811). A number of researchers refer to the exact number of years an individual spent abroad (Roth, 1995: 216; Sambarya, 1996: 743; Reuber & Fischer, 1997: 816; Carpenter et al., 2001: 500; Herrmann & Datta, 2002: 560) or to the relation between the years spent abroad and the years spent in the home country (Carpenter & Fredrickson, 2001: 538). In addition, the number of different assignments can be analyzed (Daily et al., 2000: 519). Instead of the duration of international educational experience, the possession of a foreign university degree has also been used as a measure in previous research (Carpenter et al., 2003: 811).

Not only time that was actually spent abroad is considered to be relevant for internationalization. It can also be asked whether an individual studied the customs and culture of a foreign country intensely in his or her home country. In this sense, for example, studying a certain cultural region, responsibility for an international department (Wally & Becerra, 2001: 175-176) or work experience in an international division (Sambarya, 1996: 743; Herrmann & Datta, 2002: 560) or function (Roth, 1995: 216; Reuber & Fischer, 1997: 816) may reflect an individual's international orientation.

2.3 International Network Ties

International network ties constitute another variable which can express the internationalization of board members. Board members may have links to individuals or organizations that are external to the focal firm. Such links may, for example, exist in the form of official mandates as board appointments. On the one hand, the appointment of an individual to a board is likely to show that this individual is considered to be valuable for the firm. On the other hand, board appointments require an individual to become familiar with the respective firm, to be in frequent contact with this firm and his or her peers on the board and to regularly attend board meetings. In sum, international board membership is at once a sign of and a contribution to an individual's knowledge of business practices in different countries.

A socio-cognitive perspective suggests that experience on external boards in areas that are strategically relevant for the focal firm may positively influence board members' knowledge structure and their ability to contribute to the firm's strategy (Carpenter & Westphal, 2001: 640, 653; Geletkanycz et al., 2001: 896). The same argument can be applied to foreign board appointments. For internationally operating firms, international external board appointments of board members constitute a valuable resource. Board members gain insights into business practices, strategy devel-

opment processes, organizational structures, management behaviour, or leadership practices outside their home country (Carpenter & Westphal, 2001). This enhances board members' understanding of the international dimension of business and improves their ability to contribute to the success of the firm's cross-border activities.

Network ties can be assessed in various ways. One possibility is to ask TMT members directly about their networks, for example, how often they have contact with certain people concerning specific issues (Athanassiou & Nigh, 2002: 167-168). Another option is to rely on objective indicators, such as board appointments to other firms. When external networks to firms in different countries are of interest, the number of board appointments in foreign firms can be counted (Carpenter & Westphal, 2001: 646). It is, however, important to establish which network ties should be considered. As Geletkanycz et al. (2001) note, "all directorships are not equal in their impact" (Geletkanycz et al., 2001: 891). For instance, appointments to boards of large or profitable firms may be particularly desirable.

2.4 Foreign Language Proficiency

Furthermore, an individual's ability to speak a foreign language can as well be considered a sign of his or her internationalization. Proficiency in a foreign language signals a particular interest in or a connection with the country or the region where the language is spoken. Whether studying the language in the home country or abroad, learners regularly have contact with native speakers and the respective culture. Even if language courses take place in the learner's home country, lessons usually contain information on the culture in the particular country. It is also evident that language and culture are tightly connected (Kassis Henderson, 2005: 69). Different languages not only incorporate certain cultural traits in their vocabulary and expressions, but also require specific interpretative mechanisms.

Foreign language proficiency does not only show a certain amount of preoccupation with a country or culture, it also provides the individual who masters a language with certain advantages. Marschan-Piekkari et al. report on language as an important factor in managing international firms in which individuals are frequently required to operate in different foreign language environments. They observe that language can function as a barrier (Marschan-Piekkari et al., 1999: 426-430) as well as a facilitator (Marschan-Piekkari et al., 1999: 430-431) for communication and information flows. Managers with superior language skills are better able to build broad contact networks within an international firm and to gain power at the same time (Marschan-

Piekkari et al., 1999: 431-433). Successful knowledge transfer also depends on the language proficiency of the sending as well as the receiving counterpart (Buckley et al., 2005: 55).

Language proficiency can be assessed using different forms of written (Jewell & Malecki, 2005) or oral tests (Butler & Stevens, 1997). In the context of TMT research, however, it is more suitable to rely on the self-assessment of the individuals studied (Zareva, 2005).

2.5 Cultural Differentiation

While most studies simply distinguish between the "home country" and "abroad" or "nationals" and "non-nationals", reality is much more complex. The measurement of indicators for internationalization can be further refined by taking into account the country or region where experience was gained. It seems evident that an Austrian manager adds less "internationalization" to a German board than a Korean manager. Similarly, a German manager will experience more significant differences and will encounter more "foreign" perspectives during an assignment in Nicaragua than during a stay in Switzerland. It can therefore be argued that the precise nationality or the exact location of an assignment should be taken into account.

There is ample theoretical reasoning why we should adopt a differentiated view on culture and not take a dichotomous perspective. In particular, the literature on cultural distance provides numerous arguments why a differentiated view seems adequate (e.g. Tihany et al., 2005; Lung-Tan, 2006).[2] It has been found that there are more differences between culturally distant countries than between culturally close countries. This applies to many management fields such as leadership styles or market entry decisions (Barkema et al., 1996; Barkema & Vermeulen, 1997; Hennart & Larimo, 1998). It is therefore reasonable to assume that within a TMT cultural distance also matters.

Measures of cultural distance (Kogut & Singh, 1988: 422) or a classification according to cultural clusters (Ronen & Shenkar, 1985: 449) could be used to differentiate "degrees of internationality" (Athanassiou & Nigh, 2002: 166-167).

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2 We will not discuss in detail the differences between cultural and psychic distance. On this topic see Schmid, 1996: 276-283 and Sousa & Bradley, 2006.

2.6 Concluding Remarks

Internationalization of TMTs has been shown to be a multifaceted concept. Researchers not only draw on a range of variables to describe TMT internationalization but they also apply different indicators to measure them. The indicators which are used vary in degree of detail and focus. Most researchers select one or two of the dimensions of internationalization described above for their assessment (Schmid & Kretschmer, 2005: 8).

We are convinced that any single indicator used to measure board internationalization only covers a certain aspect of a TMT's international orientation. Combined measures reported in the literature are a step towards a more holistic view of internationalization, but still focus on a very limited number of elements and neglect others (Roth, 1995: 216; Sambarya, 1996: 743; Reuber & Fischer, 1997: 816; Athanassiou & Nigh, 2002: 166-167; Herrmann & Datta, 2002: 560). Roth can serve as one example. He uses two indicators for the international background of CEOs, i.e. "(1) experience in an international function or in a function that included international responsibilities and (2) time spent on overseas assignments" (Roth, 1995: 216). Although Roth applies two different variables, it is evident that they are very similar and tap the same area of experience (i.e. working life).

In the following, we will address this general shortcoming of measurement concepts for board internationalization. By covering several important areas of internationalization within one index we aim at a more comprehensive picture of TMT internationalization. In section 3 we will outline the development of three versions of an integrated index of board internationalization.

3 Methodology

After arguing why CV analysis seems to be the most suitable way to collect data for our purpose (section 3.1), we will present the indicators we selected for an integrated index of board internationalization and discuss why other indicators are not included in the index we suggest (section 3.2). We will also discuss three different alternatives to combine the chosen dimensions in an index (section 3.3) and conclude by describing the sample we used to test the index measures (section 3.4).

3.1 Data Source

To assess TMT internationalization, specific information about the team members is required. Considering the tight time tables of top managers it does not seem very promising to rely on their willingness to provide detailed information about themselves. However, since top managers are rather prominent and influential individuals, there is a public interest in their backgrounds and certain facts are likely to be publicly available. As pointed out by a number of researchers who are interested in top managers' characteristics (Hambrick & Mason, 1984: 203; Thomas, 1993: 84; Hartmann, 2002: 32), curricula vitae (CVs) or similar biographic documents provide adequate data on an individual's education and career since they contain all important steps in his or her life. Many researchers therefore draw on published collections of CVs as Dun & Bradstreet's *Reference Book of Corporate Managements* (Carpenter, 2002: 278) or the German *Who is Who?* (Hübner, 2003; Beleke, 2004). We share the opinion that CVs are the most appropriate source of information on top managers' backgrounds and will also rely on CV analysis.

3.2 Dimensions and Measures

The quality of an index depends on the comprehensiveness and relevance of the indicators used. Their selection should be guided by theoretical considerations as well as by empirical findings (Bortz & Döring, 2002: 143). After having reviewed the most important indicators of TMT internationalization in the previous section, we choose to analyze the following four dimensions for each board member (see Figure 1):

(1) Multinationality: Germans and non-Germans are differentiated. Following Hambrick et al., nationality is determined as the country in which an individual spent his or her formative years (Hambrick et al., 1998: 183).

(2) International Education: The time spent abroad during higher education is relevant for this indicator. International education is only considered when it lasted at least one year. If no exact time period is mentioned, one year duration is assumed.

(3) International Work Experience: The time spent abroad on foreign assignments is taken into account. International assignment experience is only considered when it lasted at least one year.

(4) International Linkage: This is measured by considering external board appointments in foreign countries. Board appointments in unrelated firms as well as appointments to foreign subsidiaries of the focal firm are counted since we are mainly interested in the "different country experience".[3]

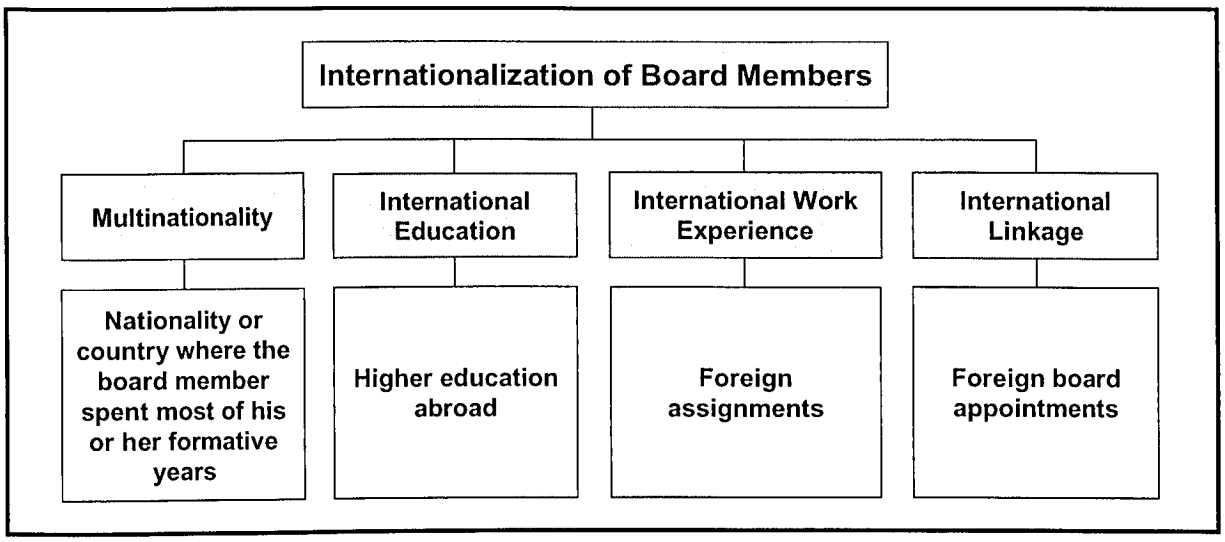

Figure 1: Components of Board Internationalization.

The definitions presented above apply for all alternative index calculations to be described in section 3.3 even though there will be some variations in the exact formulas to be used.

By taking into account these four dimensions, we include the main indicators used in previous studies and even go a step beyond. We encompass all important periods of an individual's life: Multinationality covers an individual's "formative years", i.e. the period until finishing school. Higher education and work experience account for the time from then onwards. Each of these periods represents a separate context for experiences with specific learning opportunities and specific requirements to be fulfilled. International linkage addresses an additional aspect of internationalization: It reflects a board member's ability to build a professional network outside of his or her home country. In the following paragraphs we will explain why some of the other potential indicators for TMT internationalization mentioned above are not part of our index.

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3 With regard to this dimension we do not rely on CV analysis. Many board members do not provide a complete list of their appointments in their CV. Even if board appointments are considered, CVs may not provide the information for the desired date since board appointments can change relatively frequently. As external appointments of management and supervisory board members have to be published, we draw on the annual reports of the firms under question. This regulation can be found in the German "Handelsgesetzbuch" HGB Art. 285, Par. 10, Cl. 1.

Foreign language proficiency is not included in the index even though we consider this dimension to be relevant. This is basically due to the judgement that CV analysis is the most adequate method to be used with TMTs. Since we do not explicitly ask for language abilities, we have to rely on the information presented in an individual's CV. Whether or not language skills are included in the CV differs significantly. Even if information on language skills is included, an individual's rating of his or her own proficiency could be problematic. However, by including international experience during education and work as well as multinationality in the analysis, we cover the main opportunities an individual has to achieve a high level of language proficiency. We presume that we thereby compensate this shortcoming to some extent.

We also do not incorporate any kind of "indirect" international experience as, for example, time worked in a position with international responsibilities in the home country. While the titles of some positions indicate responsibility for a certain region (e.g. "Marketing Americas") others leave this question open (e.g. when somebody was responsible for "Marketing", we cannot be sure whether the position entailed any direct contact with different markets or any internationally differentiated strategy). Even if there is a definite regional assignment of responsibilities, we do not know how intense the actual contact with representatives of the respective region was. To avoid drawing wrong conclusions and the "discrimination" of some individuals compared to others, we include only "direct" international experiences during education as well as during professional life – i.e. time actually spent abroad. We are aware that this may underestimate real contacts and responsibilities an individual has or had outside his or her home country.

The number of different assignments one single individual experienced is not taken into account and we also refrain from including a measure of cultural distance. Following Carpenter et al. we find that these finer grained measures considerably add to measurement complexity, but do not improve the face validity of the index (Carpenter et al., 2001: 500).

When determining board internationalization, two alternative reference points can be chosen: The perspective of the firm or the perspective of the individual board member. When selecting the first option, the reference point is the home country of the firm, in our case Germany. Every nationality that is not German and every experience outside of Germany can be considered "international" from this point of view. However, this leads to the counterintuitive result that, for instance, a South African who spent his entire life in South Africa receives a very high value of internationalization. The second alternative is the individual perspective. From an individual's point of

view, he or she gains international experience whenever leaving his or her home country. While this makes sure that experience in the home country does not increase an individual's value of internationalization, it implies on the other side that experience in Germany counts as international experience for all non-Germans. In order to decide which alternative to choose we have to keep our intention in mind: We want to develop an index in order to measure the board internationalization which is relevant for a firm. Consequently, we opt for the home country of the respective firm as the more appropriate reference point. We admit, however, that this may not adequately portray individual internationalization.

3.3 Calculation of the Indices

Even if we agree that our indicators cover internationalization, we have different possibilities to combine them. In this subsection we present three different ways to put the chosen indicators into one integrated index. First, we will describe a linear index that was tested in a pilot study (a), second, we will illustrate the possibilities of a logarithmic approach (b), before coming, third, to binary measurement (c).

(a) Linear Index on a Percentage Basis

In a pilot study Schmid and Kretschmer, 2005, determined the internationalization value on the four dimensions in the following way:

"(1) Multinationality: For each board member a degree of foreignness is determined: To Germans a value of zero is attached, while foreigners reach a value of 100%.

(2) International Education: The degree of board international educational experience is determined as the number of years spent abroad on higher education divided by the total duration of higher education of the board member.

(3) International Work Experience: For the degree of board international work experience the years spent on foreign assignments are added to the years spent in functions or business units with clearly defined international responsibility for one country or region. The resulting value is divided by the total years of work experience for each individual.

(4) International Linkage: The degree of international linkage is defined as the number of foreign board appointments of a board member divided by the total number of board appointments of the individual" (Schmid & Kretschmer, 2005: 9-10).[4]

The values of the four components are summarized for each board member and then divided by four. The index at board level is calculated as the average of the individual team members' indices. Figure 2 shows how the four dimensions are combined to one measure.

Linear Board Internationalization Index

$$INT_{lin} = \frac{1}{n} \bullet \sum_{i=1}^{n} \left[\frac{1}{4} \left(F_i + \frac{E_{if}}{E_{it}} + \frac{W_{if}}{W_{it}} + \frac{A_{if}}{A_{it}} \right) \right]$$

n	-	Total number of board members
F_i	-	Foreignness of person i's home country, F=0 for Germany; F=1 for any foreign country
E_{if}	-	Years of higher education abroad of person i
E_{it}	-	Total number of years of higher education of person i
W_{if}	-	Years of international work experience of person i (foreign assignments)
W_{it}	-	Total number of years of work experience of person i
A_{if}	-	Number of appointments to boards of companies abroad of person i
A_{it}	-	Total number of board appointments of person i

Figure 2: Linear Board Internationalization Index on a Percentage Basis.

In the case of international experience and board appointments internationalization is determined as the ratio of the international value to the total value. This corresponds to measures of firm internationalization used for the UNCTAD Transnationality Index (UNCTAD, 2004: 37).[5] A problematic aspect of this method is that a larger extent of total experience – whether longer education, more work experience, or more board

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4 As was determined before (section 3.2), we do not include indirect experiences (such as international responsibility carried out from the home base) in our index; our "linear" index therefore differs from Schmid & Kretschmer, 2005 in that aspect. Another aspect that should be mentioned refers to the variable "international linkage": This characteristic is operationalized through appointments on boards in companies outside of Germany. We do not consider appointments on boards of foreign companies in Germany as international linkage.

5 The so-called "Transnationality Index" combines several indicators of firm internationalization to one index. A firm's foreign assets, foreign sales, and foreign employees are considered to be central and are therefore chosen for the index. The Transnationality Index is calculated as the average of the three ratios (1) foreign assets to total assets, (2) foreign employment to total employment, and (3) foreign sales to total sales (UNCTAD, 2004: 37). For a short critical discussion of the index see Kutschker & Schmid, 2006: 260-265.

appointments within the home country – negatively influences an individual's internationalization.[6]

(b) Logarithmic Index

The linear index is problematic since more extensive total experience leads to a "devaluation" of international experience. In order to address this shortcoming we developed a logarithmic index. While we measured multinationality the same way as done in the exploratory study by Schmid and Kretschmer (Schmid & Kretschmer, 2005), we transformed the other three dimensions by using a logarithmic function (see Figure 3).

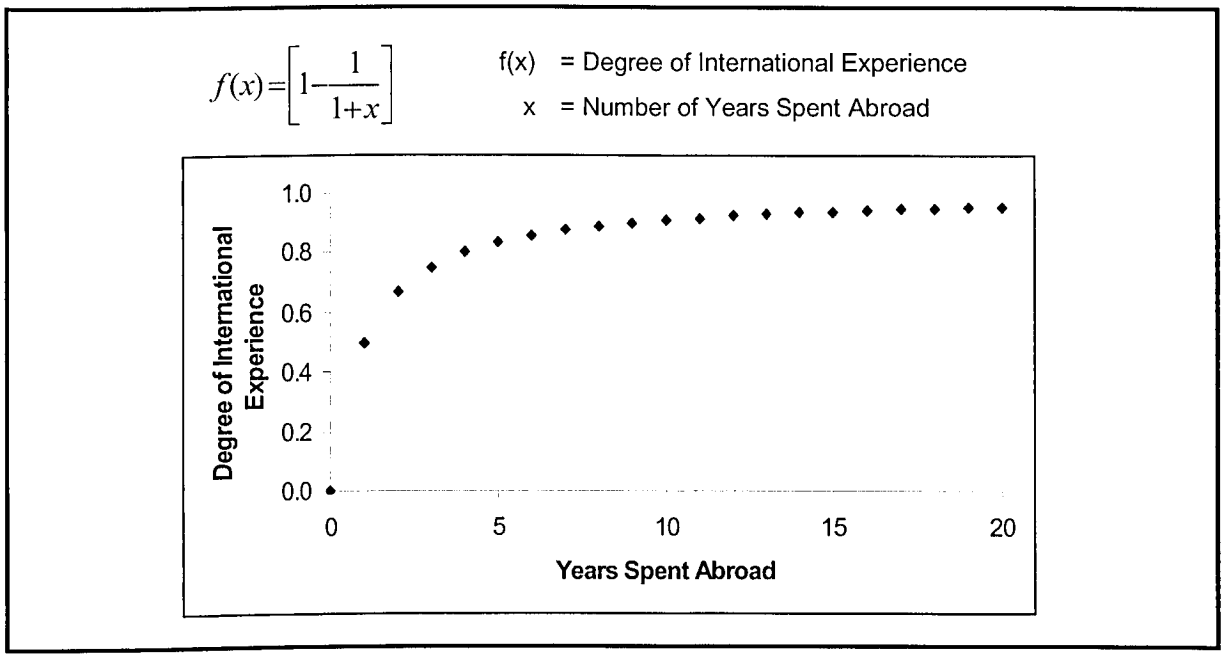

Figure 3: Logarithmic Function (Degree of International Experience in Years Spent Abroad).

[6] E.g.: Individual A has 40 years of work experience of which he spent five years abroad. According to Schmid and Kretschmer's procedure (Schmid & Kretschmer, 2005) A gets a value of 0.125 on the dimension "International work experience". B has worked for ten years and spent two years abroad. He or she will be assigned a value of 0.2 on the same dimension while A has more than twice as much international work experience.

The following operationalizations are used for the four components:

(1) Multinationality: The degree of foreignness attached to Germans is 0, while foreigners are attributed a value of 1.

(2) International Education: Irrespective of the country studied in, we count the number of years spent abroad during higher education. Through the logarithmic function portrayed in Figure 3 we transform this number to a value between 0 and 1.

(3) International Work Experience: The years spent abroad on foreign assignments are summarized. The same logarithmic transformation is applied as for international education.

(4) International Linkage: This indicator is defined as the number of external board appointments in foreign countries. Here as well the logarithmic transformation is applied.

As in Schmid and Kretschmer's exploratory study, the individual index value is calculated as the average value an individual receives on the four dimensions. In this study no different weights are used for the individual dimensions as we assume that the four index components represent different areas of experience and of learning and that they are equally important (on the topic of index formation see Bortz & Döring, 2002: 144-147). The index at board level is calculated as the average of the individual team members' indices (see Figure 4).

Logarithmic Board Internationalization Index

$$INT_{log} = \frac{1}{n} \bullet \sum_{i=1}^{n} \left[\frac{1}{4} \left(F_i + \left(1 - \frac{1}{E_{if} + 1} \right) + \left(1 - \frac{1}{W_{if} + 1} \right) + \left(1 - \frac{1}{A_{if} + 1} \right) \right) \right]$$

- n - Total number of board members
- F_i - Foreignness of person i's home country, F=0 for Germany; F=1 for any foreign country
- E_{if} - Years of higher education abroad of person i
- W_{if} - Years of international work experience of person i (foreign assignments)
- A_{if} - Number of appointments to boards of companies abroad of person i

Figure 4: Logarithmic Board Internationalization Index.

One advantage of the logarithmic index is that it relies on absolute numbers rather than an international to total ratio. We apply the logarithmic function due to two reasons: (1) Despite the use of absolute numbers we developed an index standardized on the range from 0 to 1 to attain index measures that are better comparable relatively to each other. (2) A logarithmic function better corresponds to theories of intercultural learning than does a linear function (see, for instance, Pausenberger & Noelle, 1977: 365; Kealey, 1989: 401). It has been found that even short stays abroad can have a large impact on intercultural sensitivity and awareness (Thomas et al., 2006) while after some years the learning curve flattens and additional time spent abroad only leads to limited additional effects (Pausenberger & Noelle, 1977: 365).

We acknowledge that the selection of the presented logarithmic function is not without problems. It can be questioned whether the curve of international learning exactly follows a logarithmic function – and even if it does, whether it is the one chosen here. The application of the same function for all individuals in our population does not account for individual differences which exist without doubt. These differences are not only due to the individual personalities but also due to specific situations in which individuals find themselves. Still, the logarithmic function can be considered an approximation to the average learning curve that is more comprehensive and intuitive than a linear function.

(c) Binary Index

Third, we can also consider a binary index alternative. As was apparent in the outline of the first two indices, there are problems to justify each of the more complex measurement concepts. We therefore tested an index that only takes into account two alternatives for each dimension – that is German or not German, international experience or no international experience, and international board appointments or no international board appointments. The formula for the calculation of this index is displayed in Figure 5.

Binary Board Internationalization Index

$$INT_{bin} = \frac{1}{n} \bullet \sum_{i=1}^{n} \left[\frac{1}{4} \left(F_i + E_i + W_i + A_i \right) \right]$$

n - Total number of board members
F_i - Foreignness of person i's home country, F=0 for Germany; F=1 for any foreign country
E_{if} - Higher education abroad of person i; E=0 for no, E=1 for yes
W_{if} - International work experience of person i (foreign assignments); W=0 for no, W=1 for yes
A_{if} - Appointments to boards of companies abroad of person i; A=0 for no, A=1 for yes

Figure 5: Binary Board Internationalization Index.

The binary index is especially appealing because of its simplicity. It combines the four indicators selected for the assessment of TMT internationalization in a very basic form without using an additional formula which might be judged arbitrary. However, there is the drawback that it does not capture the complexity of international experience. For instance, it treats an individual the same whether he or she spent 20 years abroad or just one year.

3.4 Sample

We put our indices to the test by using an empirical data set. Our data set is based on biographic information about the members of the management and supervisory boards[7] of all firms represented in the German stock index DAX30.[8] The reference date for our data is December 31, 2005.

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7 The board representing and managing a German stock corporation is called "Vorstand" in German. This term can best be translated as "management board". The second board in the German corporate governance system is the "Aufsichtsrat" which we refer to as "supervisory board" (von Werder & Talaulicar, 2006). The "Aufsichtsrat" consists of two different groups, i.e. representatives of the shareholders of the firm and representatives of the employees (For a brief overview of the German corporate governance system see also Schmid & Kretschmer, 2004 and Kutschker & Schmid, 2006: 573-576).

8 The DAX30 is the major German stock index. It reflects the performance of the 30 largest German stock corporations in terms of their market capitalization and number of exchange transactions. For our empirical study, all DAX30 corporations were included. The only special case is Fresenius Medical Care. Fresenius Medical Care which is part of the DAX30 companies is in fact a business division of Fresenius AG. We decided to include Fresenius AG in our sample instead of Fresenius Medical Care, since in most of the other cases the whole group (and not single units, such as business units) are considered.

Building on the experiences gained during the exploratory study by Schmid and Kretschmer we decided to rely mainly on detailed CVs published on company websites whenever available (Schmid & Kretschmer, 2005). This included the websites of the DAX30 companies as well as websites of other companies or institutions where supervisory board members have their main professional focus.

For 143 of the 187 management board members detailed CVs were available on company homepages. With regard to the supervisory boards we were able to find detailed CVs for 73 of the 279 shareholders' representatives and 14 of the 267 employees' representatives. To complete our data, we sent a personal letter to the remaining 503 board members, asking them to provide a detailed CV. By this request and using biographical compendiums like the *Who is Who?* (Hübner, 2003; Beleke, 2004) as well as information in press articles we succeeded in finding adequate information on 264 additional board members. In total our enquiries resulted in sufficient data for 164 members of management boards (this equals 88% of our original sample), 249 shareholders' representatives on the supervisory boards (89%) and 81 employees' representatives on the supervisory boards (30%). This can also be seen from Table 1. The lower response rate of employees' representatives is due to the fact that for those individuals hardly any information is publicly available. In some cases CVs are accessible for union representatives while this is rarely the case for employees.[9] Another reason is that most of these individuals have spent their entire life in a particular firm and never faced the need to update their CV.[10]

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9 In the German system, some of the employees' seats in the supervisory board can be taken by union members.

10 In personal interviews with employees' representatives this was stated to be a major reason for not providing a detailed and up-to-date CV.

	Total Number of Individuals	Individuals Included in the Analyses	Response Rate
Entire Population of Board Members	733	494	67.39%
Management Board Members	187	164	87.70%
Supervisory Board Members - Shareholders' Representatives	279	249	89.25%
Supervisory Board Members - Employees' Representatives	267	81	30.34%

Table 1: Response Rates by Groups.

4 Empirical Findings

Having suggested three index versions, we will apply these alternatives to our data set. We will give a brief overview of the analyzed individuals (section 4.1), before presenting the results concerning the international orientation of the individuals and of the three different groups analyzed – management board members, shareholders' representatives on the supervisory boards, and employees' representatives on the supervisory board (section 4.2). Finally, the index values at board and firm level are calculated and results will be presented (section 4.3).[11]

4.1 Description of the Analyzed Individuals

Table 2 provides an overview of general characteristics of all individuals included in our analysis. It can be seen that, on average, shareholders' representatives on the supervisory boards are older (61.4 years) than both members of the management boards (53.3 years) and employees' representatives on the supervisory boards (52.2

[11] The results presented in this section only concern the analyzable individuals (see Table 1).

years). Total work experience varies with age (r=0.91**) so that, on average, shareholders' representatives on the supervisory board exhibit the largest amount of work experience (34.8 years) of the three groups. When it comes to education, not surprisingly employees' representatives (4.8 years) have a shorter period of education as compared to both management board members (5.9 years) and shareholders' representatives on the supervisory board (6.2 years). While on average management board members and shareholders' representatives on the supervisory boards have about six external board appointments, employees' representatives have about two.

	Individuals Included in the Analyses	Average Age	Average Total Years of Education	Average Total Years of Work Experience	Average Total Number of Board Appointments
Management Board Members	164	53.32	5.88	27.63	6.05
Supervisory Board Members-Shareholders' Representatives	249	61.40	6.23	34.82	6.12
Supervisory Board Members-Employees' Representatives	81	52.15	4.77	29.51	2.21

Table 2: Characteristics of the Analyzed Individuals.

With regard to the dimensions concerning the internationalization of the three groups we find the following picture (Table 3): The percentage of non-Germans is much higher in management boards (nearly 18%) and on the shareholders' side of the supervisory boards (more than 19%) than in the group of the employees' representatives on the supervisory board (5%). While the relative number of employees' representatives who spent time abroad during education is much lower (8 individuals or 10%) than the relative number of shareholders' representatives (100 individuals or 40%) and management board members (53 individuals or 32%), the individuals who gained international experience during education do not differ much in the amount of time spent abroad (2.8-3.6 years on average). More than half of the analyzed management board members have worked some time abroad (on average 8.8 years) and approximately half of the shareholders' representatives have international work experience (on average 14.9 years) as opposed to only around 7% of the employees'

representatives (on average 13.8 years).[12] About two thirds of the analyzed management board members have at least one appointment in the board of a foreign firm (on average 3.2 board appointments). The same is true for approximately half of the shareholders' representatives on the supervisory boards (on average 2.6 board appointments) but just three of the employees' representatives serve as board members abroad (on average 1.3 board appointments).

	Individuals	Non-German		Individuals with International Education		
		n	%	n	%	Average Duration
Management Board Members	164	29	17.68	53	32.32	3.51
Supervisory Board Members - Shareholders' Representatives	249	48	19.28	100	40.16	3.60
Supervisory Board Members - Employees' Representatives	81	4	4.94	8	9.88	2.75

	Individuals with International Work Experience			Individuals with International Board Appointments		
	n	%	Average Duration	n	%	Average Number
Management Board Members	94	57.32	8.84	108	65.85	3.18
Supervisory Board Members - Shareholders' Representatives	118	47.39	14.91	128	51.41	2.63
Supervisory Board Members - Employees' Representatives	6	7.41	13.83	3	3.70	1.33

Table 3: Internationalization of the Population.

[12] The high average time spent abroad in the employees' group is an artefact of the small sample. Only six of the analyzed employees' representatives have experience in international assignments, but out of those six individuals one spent 31 years abroad and another one 42 years.

4.2 Internationalization of Individual Board Members

How international are the board members within the German DAX30? In this subsection the distributions of the three composite indices for individual board members will be illustrated. Differences between the three board groups (a) as well as variations caused by using alternative indices (b) will be addressed. Furthermore, relationships between the four index dimensions will be examined (c).

(a) Differences in the Distribution of Index Values by Group

The distributions of the logarithmic internationalization index are displayed in Figure 6 for the individuals analyzed. They are differentiated according to their board membership.

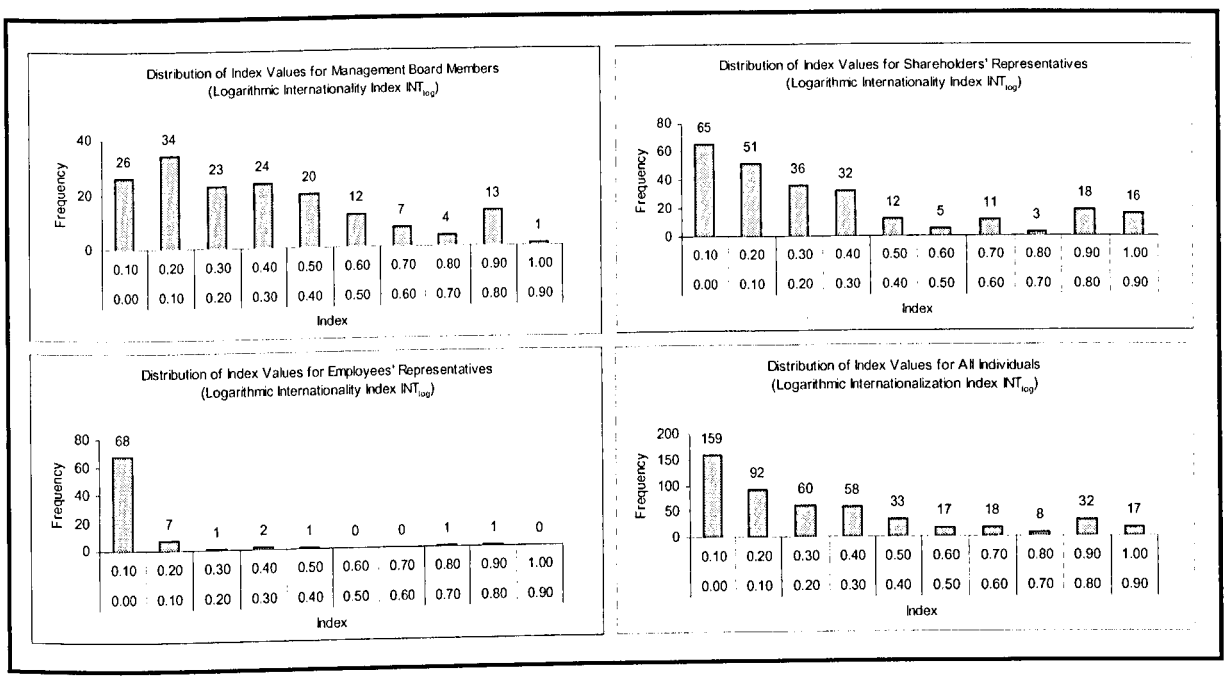

Figure 6: Distributions of the Logarithmic Index for the Three Board Groups and All Individuals.

The logarithmic index is used as an example (see Appendix A on page 41 for a complete list of the results described in this paragraph). The differences identified between the three board groups, however, can be regarded as prototypical for the other two index alternatives as well. Irrespective of the index, it is evident that, on average, management board members and shareholders' representatives on the supervisory

boards obtain clearly higher values of internationalization than employees' representatives. The distribution of the employees' representatives on the supervisory board shows an extreme accumulation of cases at the very low end of the scale and only few incidents of higher internationalization values. The distributions of management board members' and shareholders' representatives' indices are quite similar to each other. One difference that can be observed is a higher number of shareholders' representatives with very low and very high internationalization indices compared to management board members. The middle range of the two groups is almost identical.

(b) Distribution of the Values of the Three Indices

In order to evaluate the effect of the three alternatives of index calculation, the three distributions for the entire population are compared. Figure 7 shows the different pictures for all board members included in the analysis.

The linear index leads to an accumulation of very low indices and very few cases of index values in the middle or at the high end of the range. The other two indices as well show their maximum at the low end of the scale, but are still more evenly distributed with a higher portion of index values in the middle range of the scale. This illustrates that the linear index generally tends to result in lower values than both other indices. This phenomenon can be explained by the way the indices are calculated: While the logarithmic and the binary indices steadily increase with increasing international experience, the linear index "qualifies" international experience by total experience. The more total experience an individual has (with the identical international experience), the lower is his or her linear internationalization index so that it is quite hard to obtain very high values. The binary index leads to the highest internationalization values. With this alternative an individual who has any international experience on a dimension receives the highest possible value – i.e. a value of 1 – on the respective dimension regardless of how extensive the experience is.

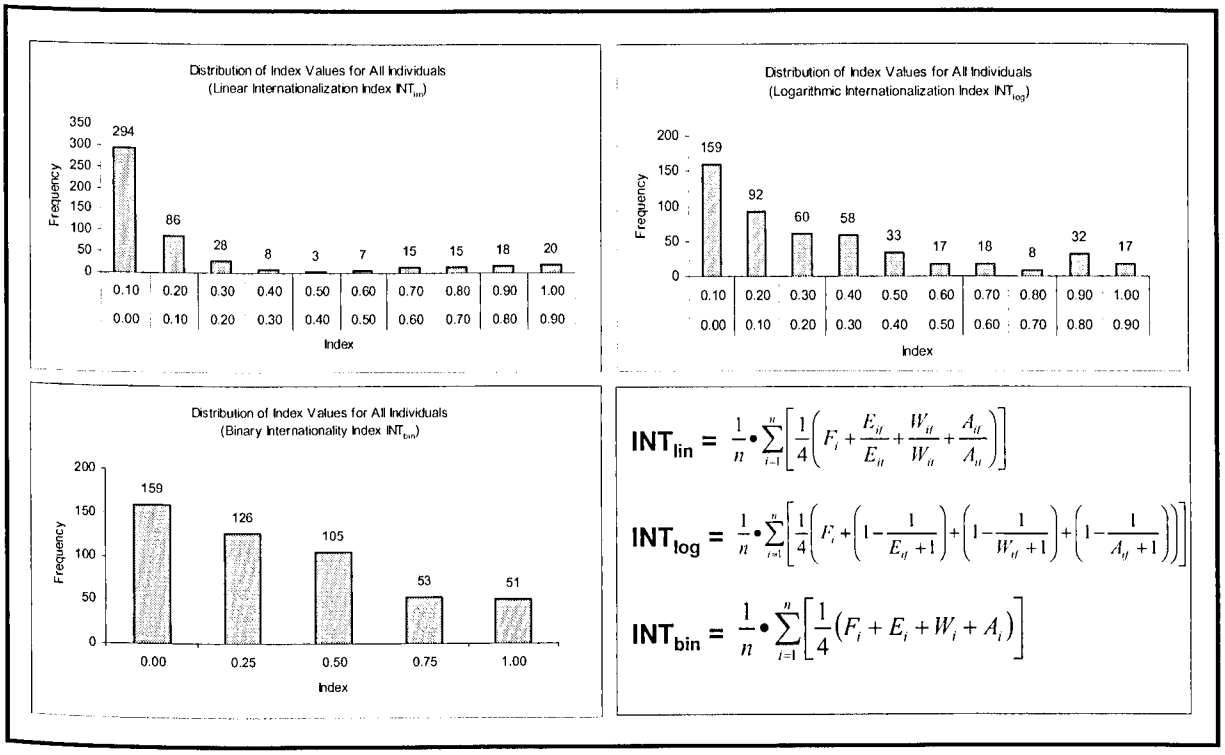

Figure 7: Distribution of Index Values for the Three Alternative Indices.

(c) Relationships between the Internationalization Dimensions[13]

Since all four indicators are meant to measure an individual's internationalization, we can assume that there should be a certain link between the dimensions. We carried out Chi²-tests as well as correlation analyses to determine the relationships of the indicators. The indicator "Foreignness" could only be included in the Chi²-tests, but not in the correlation analyses since it is a binary variable measured as 0 or 1. We also carried out correlation analyses with the variable "Age". The correlations are presented in Table 4 while the results of the Chi²-tests can be found in Appendix B on page 43.

[13] We are generally not focusing on the individuals on the boards as individuals but rather as members of a particular board. Individuals who are members of more than one board are considered as members of each one of those boards and consequently appear in the data base more than once. In this subsection, however, we look at individuals and therefore remove "duplicates" from the data set.

		Age	Total Duration of Education	Total Duration of Work	Sum of all Board Appointments	Duration of International Education	Duration of International Work Assignments	Sum of International Board Appointments
Age		1.00						
Total Duration of Education		0.18	1.00					
Total Duration of Work		0.91	-0.07	1.00				
Sum of all Board Appointments		0.05	0.17	-0.03	1.00			
Duration of International Education		0.06	0.11	0.04	0.03	1.00		
Duration of International Work Assignments		0.19	-0.01	0.21	0.02	0.73	1.00	
Sum of International Board Appointments		-0.07	0.09	-0.11	0.74	0.22	0.26	1.00
Linear Index	Dimension: Education	0.02	-0.02	0.03	0.04	0.95	0.76	0.22
	Dimension: Work	0.07	-0.01	0.09	0.04	0.75	0.97	0.29
	Dimension: Board Appointments	0.01	0.12	-0.03	0.41	0.42	0.51	0.74
	TOTAL	0.04	0.00	0.05	0.11	0.87	0.88	0.39
Logarithmic Index	Dimension: Education	0.01	0.08	-0.02	0.08	0.91	0.65	0.24
	Dimension: Work	0.05	0.03	0.04	0.08	0.53	0.72	0.25
	Dimension: Board Appointments	0.04	0.16	-0.03	0.62	0.31	0.36	0.71
	TOTAL	0.04	0.07	0.02	0.23	0.81	0.82	0.44
Binary Index	Dimension: Education	0.01	0.09	-0.04	0.11	0.80	0.56	0.25
	Dimension: Work	0.03	0.05	0.01	0.08	0.43	0.60	0.23
	Dimension: Board Appointments	0.05	0.14	-0.01	0.53	0.29	0.34	0.56
	TOTAL	0.04	0.09	0.01	0.26	0.76	0.75	0.43

Table 4: Correlations between the Individual Indicators of Internationalization.

It is trivial to assume that a foreigner has a higher probability to possess international education and work experience as well as board appointments outside Germany. The Chi²-tests confirmed this assumption. However, the strength of the relationship varies: While the correlations of foreignness and international education and work experience are quite strong, the link to international board appointments is not that significant.

We were also able to confirm the assumption that international education and international work experience are highly correlated for Germans as well as for non-Germans. Individuals who showed an international orientation during their education and spent some time abroad can be expected to do the same during their work experience. From a firm's perspective it seems reasonable to select people for expatriate careers who not only speak a foreign language but who have already experienced what it means to live abroad (Stahl, 1998: 22-28).

Stays abroad can be regarded as opportunities to build foreign networks. We therefore expected a positive relationship between international education and work experience on the one hand and international board appointments as indicators for foreign networks on the other hand. We confirmed the existence of such a relationship, although it did not prove to be very strong.

4.3 Internationalization at Firm Level

While we have concentrated on the individual level so far, we will now proceed to the firm level.[14] First, a general overview of the results concerning board internationalization in the analyzed firms will be provided. Second, some factors which might be associated with the level of board internationalization in a firm are examined.

(a) General Picture

We compare the aggregate values of internationalization of all 30 firms calculated with the three alternative indices (see Table 5). As already mentioned above, the linear index generally results in the lowest values and the binary index in the highest.

[14] In this paragraph we refer to aggregated results for all board members. Here, we did not average the results for the three groups of board members, but calculated the average of all individuals analyzed.

This can be seen for all firms in the DAX30. The firm level linear indices range from 4.6% (E.ON) to 42,0% (DaimlerChrysler) , while the logarithmic indices lie between 14.5% (Deutsche Telekom) and 52.3% (Hypo Real Estate) and the binary indices between 21.4% (E.ON) and 66.7% (Hypo Real Estate).

	Linear Index	Logarithmic Index	Binary Index
Adidas-Salomon	18.58%	24.77%	31.82%
Allianz	17.77%	27.21%	34.48%
Altana	8.27%	16.13%	22.73%
BASF	15.87%	24.59%	32.14%
Bayer	14.46%	23.00%	28.95%
BMW	17.91%	30.16%	41.18%
Commerzbank	20.00%	31.96%	41.18%
Continental	21.03%	31.44%	40.28%
DaimlerChrysler	41.95%	43.24%	51.14%
Deutsche Bank	15.13%	20.40%	26.67%
Deutsche Börse	34.18%	45.28%	59.09%
Deutsche Post	8.81%	16.53%	25.00%
Deutsche Telekom	5.33%	14.51%	22.37%
E.ON	4.61%	15.11%	21.43%
Fresenius	14.38%	17.28%	21.88%
Henkel	28.79%	37.39%	47.73%
Hypo Real Estate	39.75%	52.25%	66.67%
Infineon	17.80%	28.89%	39.06%
Linde	12.70%	24.51%	30.77%
Lufthansa	12.63%	25.40%	37.50%
MAN	14.72%	26.91%	38.33%
Metro	10.23%	19.63%	26.79%
Münchener Rück	19.96%	27.99%	38.24%
RWE	19.42%	22.99%	28.13%
SAP	14.34%	18.49%	23.33%
Schering	22.11%	34.11%	44.64%
Siemens	27.08%	38.89%	50.00%
ThyssenKrupp	17.34%	28.37%	37.50%
TUI	27.96%	33.01%	41.67%
Volkswagen	13.31%	20.08%	26.25%

Table 5: Internationalization Indices at Firm Level.

When ranking the firms according to their internationalization, the order varies in accordance with the index version (Table 6). For the logarithmic and the binary index the rankings are similar but not identical. The largest difference between these two

alternatives can be found for MAN for which the position differs by three ranks. When comparing the linear and the logarithmic index, there are more significant differences. For instance, RWE ranks ten positions higher according to the linear index compared to the logarithmic index. An even larger difference exists between the linear and the binary index for Lufthansa which rises by eleven ranks in internationalization when judged by the binary instead of the linear index. The general picture, however, varies only slightly for the three alternatives.

We can see that the variations are caused by differences in calculating the indices. Each index puts specific weight on certain features of the data and treats them in distinct ways. The linear index is the only one of our three alternatives that gives explicit consideration to the total amount of experience an individual has. The resulting order can therefore diverge from the other two indices, because board members (and consequently boards) have a differing amount of total experience.

The manner in which international experience is "counted" is another relevant characteristic of the indices. International years or additional board appointments add up in a linear way for the linear index. The logarithmic index on the other hand does not give the same value to each year of international experience or every international board appointment. The "first" year and the "first" board appointment weigh much heavier than every consecutive year or appointment. Consequently, it adds more in terms of internationalization at board level, if many board members possess short international experiences compared to only a few board members who have very long-lasting international experiences. This is even more pronounced for the binary index for which an individual's international experience simply exists or not, independent of the exact timeframe.

Linear Index		
Rank	Company	Value
1	DaimlerChrysler	41.95%
2	Hypo Real Estate	39.75%
3	Deutsche Börse	34.18%
4	Henkel	28.79%
5	TUI	27.96%
6	Siemens	27.08%
7	Schering	22.11%
8	Continental	21.03%
9	Commerzbank	20.00%
10	Münchener Rück	19.96%
11	RWE	19.42%
12	Adidas-Salomon	18.58%
13	BMW	17.91%
14	Infineon	17.80%
15	Allianz	17.77%
16	ThyssenKrupp	17.34%
17	BASF	15.87%
18	Deutsche Bank	15.13%
19	MAN	14.72%
20	Bayer	14.46%
21	Fresenius	14.38%
22	SAP	14.34%
23	Volkswagen	13.31%
24	Linde	12.70%
25	Deutsche Lufthansa	12.63%
26	Metro	10.23%
27	Deutsche Post	8.81%
28	Altana	8.27%
29	Deutsche Telekom	5.33%
30	E.ON	4.61%

Logarithmic Index		
Rank	Company	Value
1	Hypo Real Estate	52.25%
2	Deutsche Börse	45.28%
3	DaimlerChrysler	43.24%
4	Siemens	38.89%
5	Henkel	37.39%
6	Schering	34.11%
7	TUI	33.01%
8	Commerzbank	31.96%
9	Continental	31.44%
10	BMW	30.16%
11	Infineon	28.89%
12	ThyssenKrupp	28.37%
13	Münchener Rück	27.99%
14	Allianz	27.21%
15	MAN	26.91%
16	Deutsche Lufthansa	25.40%
17	Adidas-Salomon	24.77%
18	BASF	24.59%
19	Linde	24.51%
20	Bayer	23.00%
21	RWE	22.99%
22	Deutsche Bank	20.40%
23	Volkswagen	20.08%
24	Metro	19.63%
25	SAP	18.49%
26	Fresenius	17.28%
27	Deutsche Post	16.53%
28	Altana	16.13%
29	E.ON	15.11%
30	Deutsche Telekom	14.51%

Binary Index		
Rank	Company	Value
1	Hypo Real Estate	66.67%
2	Deutsche Börse	59.09%
3	DaimlerChrysler	51.14%
4	Siemens	50.00%
5	Henkel	47.73%
6	Schering	44.64%
7	TUI	41.67%
8	BMW	41.18%
8	Commerzbank	41.18%
10	Continental	40.28%
11	Infineon	39.06%
12	MAN	38.33%
13	Münchener Rück	38.24%
14	Deutsche Lufthansa	37.50%
14	ThyssenKrupp	37.50%
16	Allianz	34.48%
17	BASF	32.14%
18	Adidas-Salomon	31.82%
19	Linde	30.77%
20	Bayer	28.95%
21	RWE	28.13%
22	Metro	26.79%
23	Deutsche Bank	26.67%
24	Volkswagen	26.25%
25	Deutsche Post	25.00%
26	SAP	23.33%
27	Altana	22.73%
28	Deutsche Telekom	22.37%
29	Fresenius	21.88%
30	E.ON	21.43%

Table 6: Ranking of the DAX30-Firms According to the Internationalization Indices.

(b) Selected Factors Influencing Board Internationalization

Various reasons may be responsible for the fact that the boards of some firms are more international than others. Since this paper has the main objective to cover methodological aspects of the measurement of board internationalization, a discussion of influencing factors lies not at the centre of interest. However, we would like to outline at least some preliminary findings.

One factor can be the industry a firm is active in. As the DAX30 is not restricted to a certain industry but contains firms with quite different activities, we can create industry clusters within our population. Due to the relatively small size of our total population (30 firms), however, certain industry subgroups only consist of one or two firms. This does not provide a representative picture and at the same time makes it unlikely that statistically relevant differences are discovered. This is why we only present a descriptive overview of the average logarithmic values for the resultant industry clusters in Table 7. Appendix C on page 43 shows which firms were pooled within an industry as well as the results for the linear and the binary index.

	Supervisory Board		Management Board	All
	Shareholders' Representatives	Employees' Representatives		
Automotive	37.15%	7.45%	29.84%	30.82%
Financial Services	34.68%	8.82%	38.27%	30.80%
Technology	28.81%	10.19%	36.51%	29.29%
Steel	27.85%	9.17%	36.57%	28.37%
Consumer Goods	23.25%	0.00%	40.23%	26.63%
Logistics / Transportation	26.99%	2.08%	28.02%	24.31%
Chemical / Pharmaceutical	30.55%	0.93%	33.04%	23.92%
Energy	19.07%	0.00%	29.34%	18.52%
Telecommunication	19.51%	0.00%	13.43%	14.51%

Table 7: Linear Internationalization Indices by Industry.

The values of the presented logarithmic index are higher than the results of the linear index and lower than the results of the binary index. Although the order of the industry averages varies slightly for the three alternatives, the general picture remains stable: The boards in the firms of the automotive and the financial services industries possess the highest degree of internationalization according to our index measures. The telecommunications industry – which is represented by one single firm, Deutsche Telekom – receives the lowest values.

To compare the results of our individual-oriented board internationalization measures with measures of the internationalization of firm activities we take two indicators into account that are frequently used to describe firm internationalization: sales abroad and employees abroad (for more indicators to measure firm internationalization, see Kutschker & Schmid, 2006: 251-270). Regardless of which individual-oriented and which firm level measure we use, no relationship can be found between board level internationalization and internationalization of firm activities (see Appendix D on page 49). Firm size can be considered as another factor that may be assumed to correlate with internationalization. Appendix D shows that there is no such relationship either.

5 Discussion

Our objective in this paper was to develop an integrated index that provides a measure for the internationalization of top management teams. The focus is on the type of "internationalization" which is relevant and valuable for the firms in question. We wanted the index to mirror TMT internationalization as realistically as possible. Therefore, we did not only try to combine important indicators of internationalization into one index but we also tested three different indices. Our approach, however, has certain limitations which we will address in the following two sections before presenting implications for future research in the last section.

5.1 Limitations Stemming from the Analyzed Individuals

We applied the index measures to the management and supervisory boards of the firms represented in the German stock index DAX30. This selection of firms does not constitute a sample in the statistical sense of the term. The firms in the DAX30 sys-

tematically differ from other German firms in characteristics, such as their market capitalization. Nevertheless, it seemed reasonable to us to take these firms for the purpose of testing our internationalization measures, since all firms within the DAX30 have considerable cross-border activities. We therefore expected the likelihood to find international boards to be particularly high.

A problematic issue for calculating the indices at board or firm level is the fact that we did not have sufficient information on a number of individuals. Since we did not select the analyzed individuals randomly but on the basis of availability of information, we cannot assume that the analyzed subgroup is representing the entire board. The missing individuals may rather be extremely international or not international at all. This difficulty is especially pronounced for the employees' representatives on the supervisory board, because the response rate within this group was merely 30%.

5.2 Limitations Stemming from the Development of Indices

As discussed in section 3 all three index alternatives have certain advantages as well as disadvantages. We are aware that none of the three indices can solve all problems which are associated with the measurement of board internationalization. Difficulties remain when it comes to the selection of the dimensions (1), the measurement of the individual dimensions (2) as well as the mathematical combination of the four dimensions into one index (3). We will address each of these problems in the following paragraphs.

(1) Selection of indicators: Our selection of index dimensions can be criticized as subjective to some extent. Of course there are more factors which might influence a top manager's international orientation or internationalization than the four factors chosen here. We do not include, for example, language proficiency or international responsibilities as indicators of internationalization (which may be important variables) so that we cannot claim to provide an exhaustive summary. The array of measures included in our study is partly due to the chosen method, i.e. CV analysis, which does not allow for including additional indicators.

However, in light of the literature analysis we carried out, it seems that our selection of index dimensions is more complete than all previous research. We still consider a wider variety of aspects than is usually taken into account. To our knowledge there is no other study that looks at multinationality, two different types of international ex-

perience, and international networks of TMT members at the same time. We thereby hope to counterbalance biases that may result from the use of a single indicator.

(2) Measurement of indicators: For each of the individual dimensions a different way to determine the respective value would have been possible. In section 2 we discussed some of the alternatives. One potential criticism is that we do not weight our measures with indicators of cultural distance. We experimented with ways to include culture as a variable into the index but we found that this did not improve the results in terms of face validity. To avoid a further increase of complexity without clear benefit we decided against looking at the specific culture (see already Schmid & Kretschmer, 2005: 22-23).

It may also be problematic that the dimensions vary in scale level as well as in the underlying logic: On the one side, multinationality is a binary variable and differs in that respect from the other three indicators which are metric variables. We tried to deal with this limitation by standardizing the four indicators to a range between 0 and 1 in all three indices. On the other side, multinationality as well as international experience during education and work cover certain periods of an individual's life while international linkage depicts the current status.

(3) Combination of the indicators: The fact that we presented three different ways of combining the four selected indicators already shows that there is not one single way of calculating an index, even if the variables have been determined. We can find arguments for each version presented, but each one has its weaknesses as well. One shortcoming of our study is that we did not give special consideration to the weighting of the four indicators relatively to one another. We averaged them without weighting factors and thereby implicitly assumed that they are equally important. Weighting factors could be attained through expert ratings. In our context, for example, HR consultants could be asked about their estimation how much weight should be placed on each of the indicators.[15]

[15] HR consultants are directly confronted with personnel requirements of international firms. They can therefore be considered experts in how important certain features of board members are compared to others. Leading HR consultants as well study attributes and activities of boards and analyze, for instance, board size, board composition and remuneration of board members. A number of studies also takes into account board internationalization, but in most cases they use nationality as the only indicator (Heidrick & Struggles International, 2003; SpencerStuart, 2004; Heidrick & Struggles International, 2005).

5.3 Comparison of the Three Indices

When summarizing the results of the three alternative indices, similarities as well as differences become apparent. One significant difference is the absolute level of index values at individual as well as at firm level. The binary index was shown to lead to much higher values than both the logarithmic index and the linear index. The linear index shows the lowest level of the three indices. In addition to the level of index values, the distribution among the analyzed individuals differs for the three alternatives. While the individual values of the linear index accumulate at the very low end of the scale and only few cases with higher values exist, the distributions of the logarithmic and the binary indices are more even. Ranking the firms according to their values of the internationalization indices brings another aspect to the surface. Despite some variations in the exact order of firms, the main picture remains stable irrespective of which index is referred to. The differences that do emerge can be retraced to specific characteristics of the indices.

Reviewing these results as well as positive and negative aspects that were mentioned in relation with the conceptualization of the three indices, we arrive at the conclusion that the logarithmic index has several advantages over the other two alternatives: The linear index underestimates the internationalization of the analyzed board members. In comparison, the logarithmic index deals with the problem of negatively valuating experience in Germany since it considers the absolute number of years instead of an international to total ratio. In addition, the logarithmic index tries to picture the process of intercultural learning by weighting the "early" years of international experience and the "first" international board appointments heavier than the following ones. In contrast to the binary index, it is more differentiated in terms of the amount of an individual's international experience and offers a higher scale level. As discussed above, the logarithmic index is not free of critique either, but we still consider it the best alternative and a step in the right direction towards a more realistic picture of board internationalization.

5.4 Implications for Top Management Team Internationalization Research

Considering the continuing increase in international business activity, TMT internationalization will certainly remain an important topic in upper echelons research. We tried to shed some critical light on the common practice of measuring the internationalization of board members by using just one or two indicators. We developed an in-

dex of TMT internationalization that integrates several important indicators and that is able to convey a more complete picture of a board's internationalization. We selected four central indicators of TMT internationalization and presented three variations of how these indicators may be combined to one index. We argue that research of TMT internationalization could benefit from moving towards more comprehensive measures of the phenomenon that consider more than one relevant indicator.

One important finding of our study is that the picture of TMT internationalization differs depending on which measure of internationalization we apply. TMT internationalization not only varies in terms of the absolute level but also in the subsequent ranking of the observed firms.[16] This may be one reason for inconsistent results found in studies of the relationship between board composition and (most frequently used) measures of firm financial performance (Dalton et al., 1998: 284). The relationships which researchers in this area try to establish are in general quite far reaching.[17] The operationalizations of the hypothesized variables, however, seem rather arbitrary. We argued that measuring TMT internationalization by, for example, merely summarizing the cumulative years of international experience among the team members may not adequately reflect the underlying concept. By developing an index which integrates different aspects of TMT internationalization we tried to overcome the oversimplification inherent in existing measures.

However, more sophistication in measurement will not help to overcome a general problem: The indicators and measures we (and others) use are proxies for psychological variables (Carpenter et al., 2004: 750). In addition to concentrating on the measurement of proxies, researchers should reconsider possibilities of assessing the assumed underlying psychological characteristics as cognitions, values and perceptions more directly. In the case of board internationalization this would, for instance, mean to look at the international orientation of top managers (Kedia & Mukherji, 1999; Perlmutter, 1969). It is also important to pay more attention on the black box of processes that lies between the analyzed features of TMT members and outcome variables at firm level (Lawrence, 1997).

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16 This means, we cannot assume that one measure results in evenly higher values of internationalization; instead, firm A may appear as more international than firm B when rated by one index and firm B could be more international than firm A when judged according to another index.

17 Examples for this assertion are the following relationships which were examined in the upper echelons research literature: TMT heterogeneity and firms' competitive moves (Hambrick et al., 1996); TMT size, CEO dominance and firm performance (Haleblian & Finkelstein, 1993); CEO characteristics and foreign market entry mode (Herrmann & Datta, 2002); TMT demographics and firm performance (Goll et al., 2001); TMT tenure and strategic persistence (Finkelstein & Hambrick, 1990) and so on.

References

Ashby, W. Ross (1961). *An Introduction to Cybernetics*. London: Chapman & Hall.

Athanassiou, Nicholas & Nigh, Douglas (2002). The Impact of the Top Management Team's International Business Experience on the Firm's Internationalization: Social Networks at Work. *Management International Review*, 42/2, 157-181.

Barkema, Harry G. & Vermeulen, Freek (1997). What Differences in the Cultural Backgrounds of Partners are Detrimental for International Joint Ventures? *Journal of International Business Studies*, 28/4, 845-864.

Barkema, Harry G., Bell, John H. J. & Pennings, Johannes M. (1996). Foreign Entry, Cultural Barriers, and Learning. *Strategic Management Journal*, 17/2, 151-166.

Beleke, Norbert (2004). *Wer ist wer? Das Deutsche Who is Who*. Lübeck: Schmidt-Römhild.

Bloodgood, James M., Sapienza, Harry J. & Almeida, James G. (1996). The Internationalization of New High-Potential U.S. Ventures: Antecedents and Outcomes. *Entrepreneurship: Theory & Practice*, 20/4, 61-76.

Bortz, Jürgen & Döring, Nicola (2002). *Forschungsmethoden und Evaluation für Human- und Sozialwissenschaftler*. Berlin: Springer.

Buckley, Peter J., Carter, Martin J., Clegg, Jeremy & Hut, Tan (2005). Language and Social Knowledge in Foreign-Knowledge Transfer to China. *International Studies of Management & Organization*, 35/1, 47-65.

Butler, Frances A. & Stevens, Robin (1997). Oral Language Assessment in the Classroom. *Theory Into Practice*, 36/4, 214-219.

Carpenter, Mason A. (2002). The Implications of Strategy and Social Context for the Relationship Between Top Management Team Heterogeneity and Firm Performance. *Strategic Management Journal*, 23/3, 275-284.

Carpenter, Mason A. & Fredrickson, James W. (2001). Top Management Teams, Global Strategic Posture, and the Moderating Role of Uncertainty. *Academy of Management Journal*, 44/3, 533-545.

Carpenter, Mason A. & Westphal, James D. (2001). The Strategic Context of External Network Ties: Examining the Impact of Director Appointments on Board Involvement in Strategic Decision Making. *Academy of Management Journal*, 44/4, 639-660.

Carpenter, Mason A., Sanders, Wm. Gerard & Gregersen, Hal B. (2001). Bundling Human Capital with Organizational Context: The Impact of International Assignment Experience on Multinational Firm Performance and CEO Pay. *Academy of Management Journal*, 44/3, 493-511.

Carpenter, Mason A., Pollock, Timothy G. & Leary, Mylene M. (2003). Testing a Model of Reasoned Risk-Taking: Governance, the Experience of Principals and Agents, and Global Strategy in High-Technology IPO Firms. *Strategic Management Journal*, 24/9, 802-820.

Carpenter, Mason A., Geletkanycz, Marta A. & Sanders, Wm. Gerard (2004). Upper Echelons Research Revisited: Antecedents, Elements, and Consequences of Top Management Team Composition. *Journal of Management*, 30/6, 749-778.

Daily, Catherine M., Certo, S. Trevis & Dalton, Dan R. (2000). International Experience in the Executive Suite: The Path to Prosperity? *Strategic Management Journal*, 21/4, 515-523.

Dalton, Dan R., Daily, Catherine M., Ellstrand, Alan E. & Johnson, Jonathan L. (1998). Meta-Analytic Reviews of Board Composition, Leadership Structure, and Financial Performance. *Strategic Management Journal*, 19/3, 269-290.

Elron, Efrat (1997). Top Management Teams within Multinational Corporations: Effects of Cultural Heterogeneity. *The Leadership Quarterly*, 8/4, 393-412.

Finkelstein, Sydney & Hambrick, Donald C. (1990). Top-Management-Team Tenure and Organizational Outcomes: The Moderating Role of Managerial Discretion. *Administrative Science Quarterly*, 35/3, 484-503.

Geletkanycz, Marta A., Boyd, Brian K. & Finkelstein, Sydney (2001). The Strategic Value of CEO External Directorate Networks: Implications for CEO Compensation. *Strategic Management Journal*, 22/9, 889-898.

Goll, Irene, Sambharya, Rakesh B. & Tucci, Louis A. (2001). Top Management Team Composition, Corporate Ideology, and Firm Performance. *Management International Review (MIR)*, 41/2, 109-129.

Govindarajan, Vijay (1989). Implementing Competitive Strategies at the Business Unit Level: Implications of Matching Managers to Strategies. *Strategic Management Journal*, 10/3, 251-269.

Gregersen, Hal B., Morrison, Allen J. & Black, J. Stewart (1998). Developing Leaders for the Global Frontier. *Sloan Management Review*, 40/1, 21-32.

Gupta, Anil K. (1984). Contingency Linkages between Strategy and General Manager Characteristics: A Conceptual Examination. *Academy of Management Review*, 9/3, 399-412.

Gupta, Anil K. & Govindarajan, V. (1984). Business Unit Strategy, Managerial Characteristics, and Business Unit Effectiveness at Strategy Implementation. *Academy of Management Journal*, 27/1, 25-41.

Haleblian, Jerayr & Finkelstein, Sydney (1993). Top Management Team Size, CEO Dominance, and Firm Performance: The Moderating Roles of Environmental Turbulence and Discretion. *Academy of Management Journal*, 36/4, 844-863.

Hambrick, Donald C. & Mason, Phyllis A. (1984). Upper Echelons: The Organization as a Reflection of its Top Managers. *Academy of Management Review*, 9/2, 193-206.

Hambrick, Donald C., Cho, Theresa Seung & Ming-Jer, Chen (1996). The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administrative Science Quarterly*, 41/4, 659-684.

Hambrick, Donald C., Davidson, Sue Canney, Snell, Scott A. & Snow, Charles C. (1998). When Groups Consist of Multiple Nationalities: Towards a New Understanding of the Implications. *Organization Studies*, 19/2, 181-205.

Hartmann, Michael (2002). Die Spitzenmanager der internationalen Großkonzerne als Kern einer neuen "Weltklasse". In: Rudi Schmidt, Hans-Jörgen Gergs & Markus Pohlmann (eds.), *Managementsoziologie. Themen, Desiderate, Perspektiven. Soziologie des Managements und der betrieblichen Modernisierung*. Munich, Mering: Rainer-Hampp, 184-208.

Heidrick & Struggles International (2003). *Is Your Board Fit for the Global Challenge? Corporate Governance in Europe*. Chicago: Heidrick & Struggles International.

Heidrick & Struggles International (2005). *Corporate Governance in Europe: What's the outlook?* Chicago: Heidrick & Struggles International.

Heijltjes, Mariëlle, Olie, René & Glunk, Ursula (2003). Internationalization of Top Management Teams in Europe. *European Management Journal*, 21/1, 89-97.

Hennart, Jean-Francois & Larimo, Jorma (1998). The Impact of Culture on the Strategy of Multinational Enterprises: Does National Origin Affect Ownership Decisions? *Journal of International Business Studies*, 29/3, 515-538.

Herrmann, Pol & Datta, Deepak K. (2002). CEO Successor Characteristics and the Choice of Foreign Market Entry Mode: An Empirical Study. *Journal of International Business Studies*, 33/3, 551-569.

Hübner, Ralph (2003). *Who is Who in der Bundesrepublik Deutschland*. Zug: Verlag für Prominentenenzyklopädien.

Jewell, Jennifer & Malecki, Christine Kerres (2005). The Utility of CBM Written Language Indices: An Investigation of Production-Dependent, Production-Independent, and Accurate-Production Scores. *School Psychology Review*, 34/1, 27-44.

Kassis Henderson, Jane (2005). Language Diversity in International Management Teams. *International Studies of Management & Organization*, 35/1, 66-82.

Kealey, Daniel J. (1989). A Study of Cross-Cultural Effectiveness: Theoretical Issues, Practical Applications. *International Journal of Intercultural Relations*, 13/3, 387-428.

Keck, Sara L. (1997). Top Management Team Structure: Differential Effects by Environmental Context. *Organization Science*, 8/2, 143-156.

Kedia, Ben L. & Mukherji, Ananda (1999). Global Managers: Developing a Mindset for Global Competitiveness. *Journal of World Business*, 34/3, 230-251.

Knight, Don, Pearce, Craig L., Smith, Ken G., Olian, Judy D., Sims, Henry P., Smith, Ken A. & Flood, Patrick (1999). Top Management Team Diversity, Group Process, and Strategic Consensus. *Strategic Management Journal*, 20/5, 445-465.

Kogut, Bruce & Singh, Harbir (1988). The Effect of National Culture on the Choice of Entry Mode. *Journal of International Business Studies*, 19/3, 411-432.

Kutschker, Michael & Schmid, Stefan (2006). *Internationales Management*. 5th edition. München, Wien: Oldenbourg.

Lawrence, B. S. (1997). The Black Box of Organizational Demography. *Organization Science*, 8/1, 1-22.

Lung-Tan, Lu (2006). The Relationship between Cultural Distance and Performance in International Joint Ventures: A Critique and Ideas for Further Research. *International Journal of Management*, 23/3, 436-445.

Marschan-Piekkari, Rebecca, Welch, Denice & Welch, Lawrence (1999). In the Shadow: The Impact of Language on Structure, Power and Communication in the Multinational *International Business Review*, 8/4, 421-440.

Mellahi, Kamel & Guermat, Cherif (2004). Does Age Matter? An Empirical Examination of the Effect of Age on Managerial Values and Practices in India. *Journal of World Business*, 39/2, 199-215.

Mühlbacher, Hans & Vallaster, Christine (2002). *Managing Diversity in Multicultural Project Teams*. In: Werner Auer-Rizzi, Erna Szabo & Cäcilia Innreiter-Moser (eds.), *Management in einer Welt der Globalisierung und Diversität. Europäische und nordamerikanische Sichtweisen*. Stuttgart: Schäffer-Poeschel, 75-90.

Pausenberger, Ehrenfried & Noelle, Gerd F. (1977). Entsendung von Führungskräften in ausländische Niederlassungen. *Zeitschrift für betriebswirtschaftliche Forschung*, 29/6, 346-366.

Perlmutter, Howard V. (1969). The Tortuous Evolution of the Multinational Corporation. *Columbia Journal of World Business*, 4/1, 9-18.

Reuber, A. Rebecca & Fischer, Eileen (1997). The Influence of the Management Team's International Experience on the Internationalization Behaviors of SMEs. *Journal of International Business Studies*, 28/4, 807-825.

Ronen, Simcha & Shenkar, Oded (1985). Clustering Countries on Attitudinal Dimensions: A Review and Synthesis. *Academy of Management Review*, 10/3, 435-454.

Roth, Kendall (1995). Managing International Interdependence: CEO Characteristics in a Resource-Based Framework. *Academy of Management Journal*, 38/1, 200-231.

Ruigrok, Winfried & Wagner, Hardy (2003). *Top Management Team Multinationality: Requisite Variety for Firms with High Foreign Market Dependence?* Unpublished Research Note, St. Gallen: University of St. Gallen.

Sambarya, Rakesh B. (1996). Foreign Experience of Top Management Teams and International Diversification Strategies of U.S. Multinational Corporations. *Strategic Management Journal*, 17/9, 739-746.

Schmid, Stefan (1996). *Multikulturalität in der internationalen Unternehmung*. Wiesbaden: Gabler.

Schmid, Stefan & Kretschmer, Katharina (2004). *The German Corporate Governance System and the German "Mitbestimmung" – An Overview*. Working Paper No. 8, Berlin: ESCP-EAP Europäische Wirtschaftshochschule Berlin.

Schmid, Stefan & Kretschmer, Katharina (2005). *How International Are German Supervisory Boards? – An Exploratory Study*. Working Paper No. 14, Berlin: ESCP-EAP Europäische Wirtschaftshochschule Berlin.

Sousa, Carlos M. P. & Bradley, Frank (2006). Cultural Distance and Psychic Distance: Two Peas in a Pod? *Journal of International Marketing*, 14/1, 49-70.

SpencerStuart (2004). *2004 UK Board Index*. London: SpencerStuart.

Stahl, Günter K. (1998). *Internationaler Einsatz von Führungskräften*. Munich: Oldenbourg.

Sullivan, Daniel (1994). Measuring the Degree of Internationalization of a Firm. *Journal of International Business Studies*, 25/2, 325-342.

Szilagyi, Andrew D. Jr. & Schweiger, David M. (1984). Matching Managers to Strategies: A Review and Suggested Framework. *Academy of Management Review*, 9/4, 626-637.

Thomas, Alexander, Chang, Celine & Abt, Heike (2006). *Erlebnisse, die verändern – Langzeitwirkungen der Teilnahme an internationalen Jugendbegegnungen*. Göttingen: Vandenhoeck & Ruprecht.

Thomas, Anisya S., Litschert, Robert J. & Ramaswamy, Kannan (1991). The Performance Impact of Strategy-Manager Coalignment: An Empirical Examination. *Strategic Management Journal*, 12/7, 509-522.

Thomas, Robert J. (1993). Interviewing Important People in Big Companies. *Journal of Contemporary Ethnography*, 22/1, 80-96.

Tihany, Laszlo, Griffith, David A. & Russel, Craig J. (2005). The Effect of Cultural Distance on Entry Mode Choice, International Diversification, and MNE Performance: A Meta-Analysis. *Journal of International Business Studies*, 36/1, 270-283.

Tihany, Laszlo, Ellstrand, Alan E., Daily, Catherine M. & Dalton, Dan R. (2000). Composition of the Top Management Team and Firm International Diversification. *Journal of Management*, 26/6, 1157-1177.

UNCTAD (2004). *World Investment Report 2004. The Shift towards Services*. New York: UNCTAD.

von Werder, Axel & Talaulicar, Till (2006). *Corporate Governance Developments in Germany*. In: Christine A. Mallin (ed.), *Handbook on International Corporate Governance*. Cheltenham: Edward Elgar, 28-44.

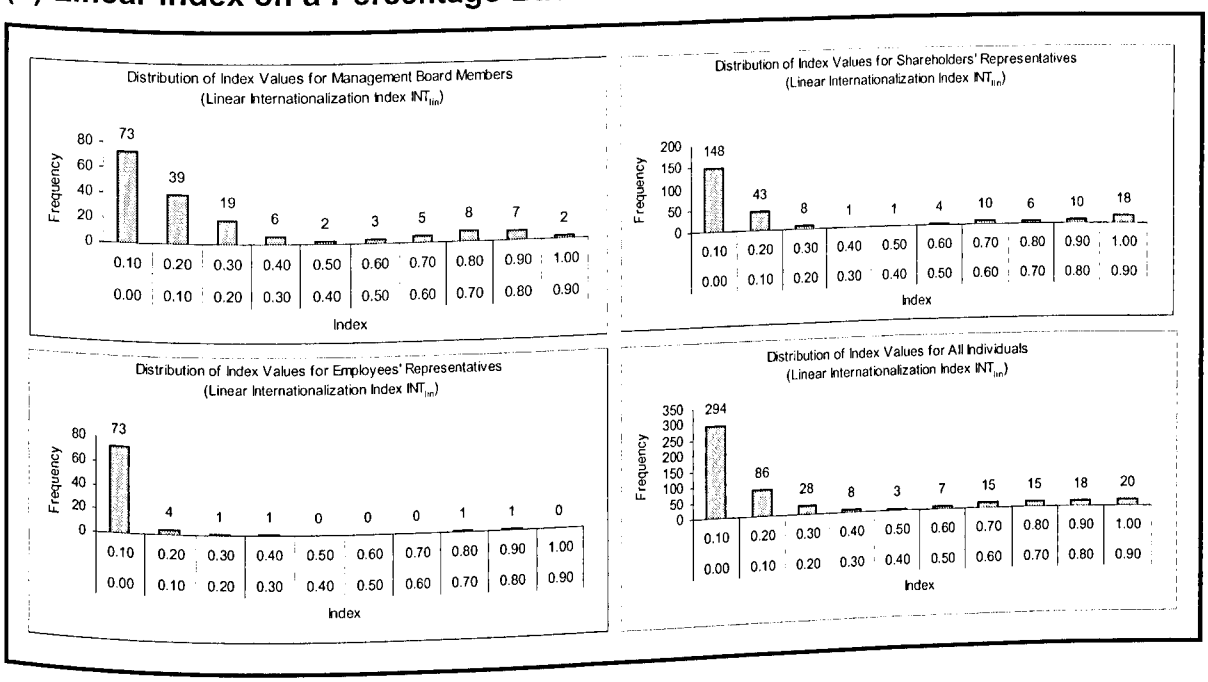
Wally, Stefan & Becerra, Manuel (2001). Top Management Team Characteristics and Strategic Changes in International Diversification. The Case of U.S. Multinationals in the European Community. *Group & Organization Management*, 26/2, 165-188.

Zareva, Alla (2005). Models of Lexical Knowledge Assessment of Second Language Learners of English at Higher Levels of Language Proficiency. *System*, 33/4, 547-562.

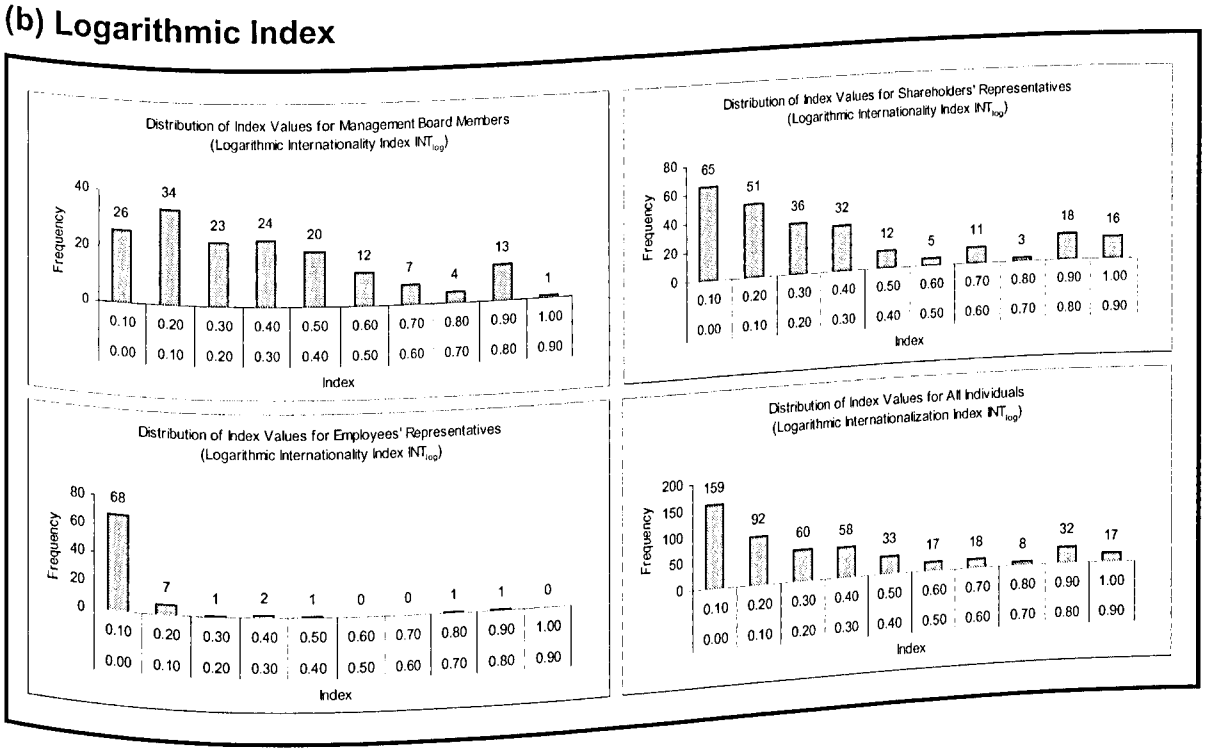
Appendix

Appendix A Distribution of Index Values for Management Board Members, Shareholders' Representatives and Employees' Representatives

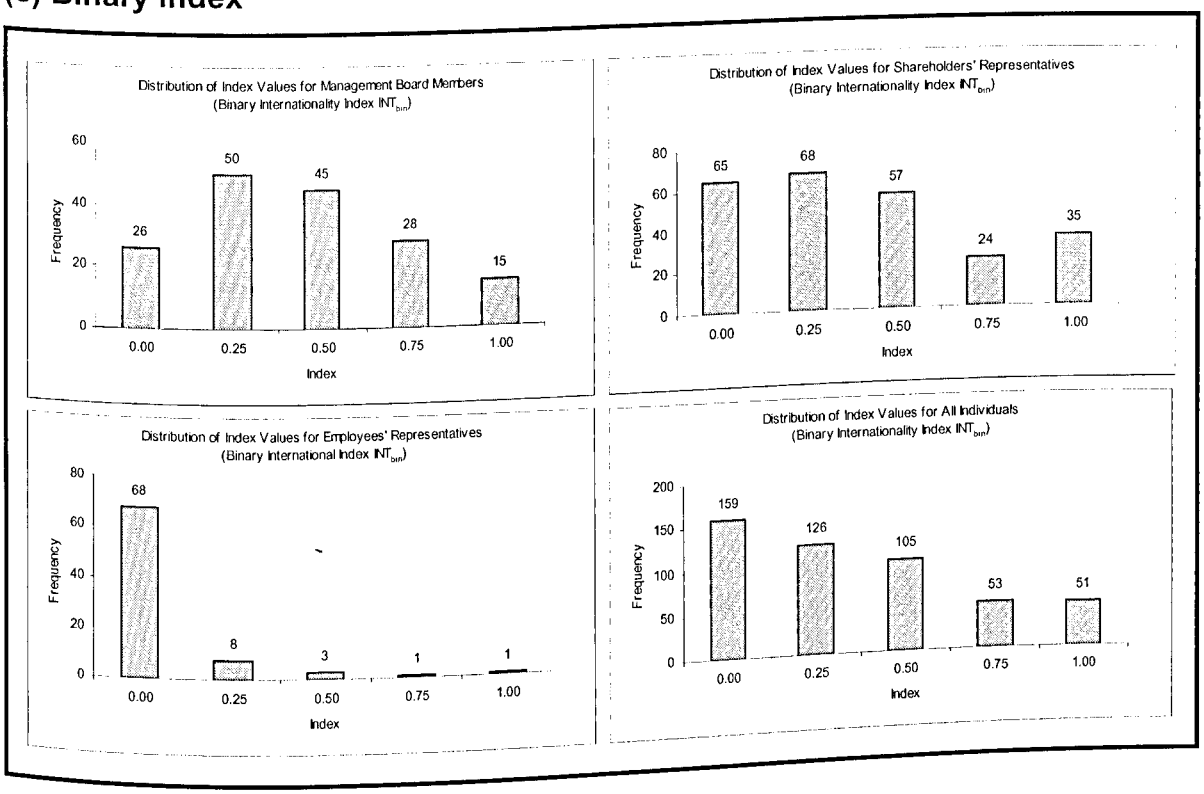
(a) Linear Index on a Percentage Basis



(b) Logarithmic Index



(c) Binary Index



Appendix B Results of the Chi²-Tests to Determine the Relationship between the Four Dimensions of Internationalization

(a) Foreignness – International Education

Observed Frequencies		International Education		Total
		yes	no	
Foreignness	yes	61	7	68
	no	57	252	309
Total		118	259	377

Expected Frequencies		International Education		Total
		yes	no	
Foreignness	yes	21.28381963	46.71618037	68
	no	96.71618037	212.2838196	309
Total		118	259	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	131.6163479
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.59

(b) Foreignness – International Work Experience

Observed Frequencies		International Work Experience		Total
		yes	no	
Foreignness	yes	63	5	68
	no	106	203	309
Total		169	208	377

Expected Frequencies		International Work Experience		Total
		yes	no	
Foreignness	yes	30.48275862	37.51724138	68
	no	138.5172414	170.4827586	309
Total		169	208	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	76.70682527
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.45

(c) Foreignness – International Board Appointments

Observed Frequencies		International Board Appointments		Total
		yes	no	
Foreignness	yes	49	19	68
	no	128	181	309
Total		177	200	377

Expected Frequencies		International Board Appointments		Total
		yes	no	
Foreignness	yes	31.92572944	36.07427056	68
	no	145.0742706	163.9257294	309
Total		177	200	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	21.0008907
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.24

(d) International Education – International Work Experience

Observed Frequencies		International Work Experience		Total
		yes	no	
International Education	yes	89	29	118
	no	80	179	259
Total		169	208	377

Expected Frequencies		International Work Experience		Total
		yes	no	
International Education	yes	52.89655172	65.10344828	118
	no	116.1034483	142.8965517	259
Total		169	208	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	65.01141327
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.42

(e) International Education – International Board Appointments

Observed Frequencies		International Board Appointments		Total
		yes	no	
International Education	yes	83	35	118
	no	94	165	259
Total		177	200	377

Expected Frequencies		International Board Appointments		Total
		yes	no	
International Education	yes	55.4005305	62.5994695	118
	no	121.5994695	137.4005305	259
Total		177	200	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	37.72597615
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.32

(f) International Work Experience – International Appointments

Observed Frequencies		International Board Appointments		Total
		yes	no	
International Work Experience	yes	114	55	169
	no	63	145	208
Total		177	200	377

Expected Frequencies		International Board Appointments		Total
		yes	no	
International Work Experience	yes	79.34482759	89.65517241	169
	no	97.65517241	110.3448276	208
Total		177	200	377

Degrees of Freedom:	1
Probability of Error Threshold (a):	0.01
Chi square:	51.71385064
Critical value:	6.634896712
f (Phi) Value for 2x2 Matrix:	0.37

Appendix C Industry Clusters

(a) Linear Board Internationalization Index

	Supervisory Board					Management Board		ALL
	n	Shareholders' Representatives	n	Employees' Representatives	Total	n		n	
Altana	5	7.08%	2	0.00%	5.06%	4	13.91%	11	8.27%
BASF	8	23.22%	6	0.00%	13.27%	7	21.07%	21	15.87%
Bayer	10	25.50%	5	0.00%	17.00%	4	4.95%	19	14.46%
Fresenius	5	4.81%	2	8.33%	5.82%	1	74.36%	8	14.38%
Schering	7	26.09%	3	0.00%	18.26%	4	31.72%	14	22.11%
Adidas-Salomon	4	25.15%	3	0.00%	14.37%	4	25.94%	11	18.58%
Henkel	4	3.06%	1	0.00%	2.45%	6	50.75%	11	28.79%
Metro	9	13.48%	1	0.00%	12.13%	4	5.46%	14	10.23%
Allianz	10	23.10%	10	11.25%	17.18%	9	19.09%	29	17.77%
Commerzbank	7	25.88%	3	0.00%	18.12%	7	22.69%	17	20.00%
Deutsche Bank	9	12.98%	2	0.00%	10.62%	4	27.54%	15	15.13%
Deutsche Börse	9	30.78%	1	25.00%	30.20%	1	73.96%	11	34.18%
Hypo Real Estate	5	43.82%	0	n.v.	43.82%	1	19.44%	6	39.75%
Münchener Rück	10	23.99%	2	7.50%	21.25%	5	16.87%	17	19.96%
BMW	10	21.86%	1	0.00%	19.87%	6	14.32%	17	17.91%
Continental	9	33.62%	3	0.00%	25.21%	6	12.65%	18	21.03%
DaimlerChrysler	9	54.27%	3	29.17%	48.00%	10	34.70%	22	41.95%
Volkswagen	10	18.56%	4	0.00%	13.26%	6	13.43%	20	13.31%
MAN	8	13.56%	0		13.56%	7	16.04%	15	14.72%
E.ON	10	5.10%	5	0.00%	3.40%	6	7.65%	21	4.61%
RWE	9	18.01%	2	0.00%	14.73%	5	29.73%	16	19.42%
Infineon	8	13.41%	3	8.19%	11.99%	5	30.58%	16	17.80%
SAP	8	11.74%	1	3.57%	10.83%	6	19.61%	15	14.34%
Siemens	9	38.92%	4	0.71%	27.16%	11	26.98%	24	27.08%
Linde	8	12.97%	1	0.00%	11.53%	4	15.31%	13	12.70%
Deutsche Post	9	2.75%	2	0.00%	2.25%	8	17.84%	19	8.81%
Lufthansa	10	12.96%	3	2.78%	10.61%	3	21.39%	16	12.63%
TUI	10	38.66%	1	0.00%	35.15%	4	8.21%	15	27.96%
ThyssenKrupp	10	16.64%	4	2.72%	12.66%	10	23.89%	24	17.34%
Deutsche Telekom	10	7.50%	3	0.00%	5.77%	6	4.39%	19	5.33%

	Supervisory Board			Management Board	ALL
	Shareholders' Representatives	Employees' Representatives	Total		
Chemical / Pharmaceutical	19.51%	0.93%	13.20%	21.21%	15.39%
Consumer Goods	13.77%	0.00%	10.64%	30.72%	18.45%
Financial Services	25.30%	8.47%	20.85%	22.91%	21.43%
Automotive	28.34%	7.95%	24.41%	20.05%	22.75%
Energy	11.21%	0.00%	8.20%	17.69%	11.02%
Technology	19.86%	3.44%	16.34%	24.17%	19.33%
Logistics / Transportation	18.65%	1.39%	15.69%	15.98%	15.78%
Steel	16.64%	2.72%	12.66%	23.89%	17.34%
Telecom	7.50%	0.00%	5.77%	4.39%	5.33%

(b) Logarithmic Board Internationalization Index

	Supervisory Board					Management Board		ALL
	n	Shareholders' Representatives	n	Employees' Representatives	Total	n		
Altana	5	17.20%	2	0.00%	12.29%	4	22.85%	11	16.13%
BASF	8	33.60%	6	0.00%	19.20%	7	35.36%	21	24.59%
Bayer	10	36.45%	5	0.00%	24.30%	4	18.13%	19	23.00%
Fresenius	5	10.00%	2	8.33%	9.52%	1	71.58%	8	17.28%
Schering	7	42.83%	3	0.00%	29.98%	4	44.44%	14	34.11%
Adidas-Salomon	4	34.72%	3	0.00%	19.84%	4	33.39%	11	24.77%
Henkel	4	8.96%	1	0.00%	7.17%	6	62.58%	11	37.39%
Metro	9	24.51%	1	0.00%	22.06%	4	13.54%	14	19.63%
Allianz	10	33.97%	10	11.51%	22.74%	9	37.14%	29	27.21%
Commerzbank	7	39.11%	3	0.00%	27.37%	7	38.50%	17	31.96%
Deutsche Bank	9	16.81%	2	0.00%	13.75%	4	38.69%	15	20.40%
Deutsche Börse	9	42.95%	1	25.00%	41.15%	1	86.53%	11	45.28%
Hypo Real Estate	5	53.95%	0		53.95%	1	43.75%	6	52.25%
Münchener Rück	10	31.28%	2	9.38%	27.63%	5	28.87%	17	27.99%
BMW	10	35.68%	1	0.00%	32.44%	6	25.97%	17	30.16%
Continental	9	42.74%	3	0.00%	32.05%	6	30.21%	18	31.44%
DaimlerChrysler	9	52.56%	3	27.30%	46.24%	10	39.64%	22	43.24%
Volkswagen	10	25.89%	4	0.00%	18.50%	6	23.78%	20	20.08%
MAN	8	29.46%	0		29.46%	7	24.00%	15	26.91%
E.ON	10	17.67%	5	0.00%	11.78%	6	23.44%	21	15.11%
RWE	9	20.64%	2	0.00%	16.88%	5	36.43%	16	22.99%
Infineon	8	29.46%	3	15.97%	25.78%	5	35.71%	16	28.89%
SAP	8	14.87%	1	12.50%	14.61%	6	24.33%	15	18.49%
Siemens	9	42.69%	4	7.81%	31.96%	11	47.08%	24	38.89%
Linde	8	26.47%	1	0.00%	23.53%	4	26.71%	13	24.51%
Deutsche Post	9	8.80%	2	0.00%	7.20%	8	29.37%	19	16.53%
Lufthansa	10	29.66%	3	4.17%	23.78%	3	32.41%	16	25.40%
TUI	10	40.70%	1	0.00%	37.00%	4	22.02%	15	33.01%
ThyssenKrupp	10	27.85%	4	9.17%	22.51%	10	36.57%	24	28.37%
Deutsche Telekom	10	19.51%	3	0.00%	15.01%	6	13.43%	19	14.51%

	Supervisory Board			Management Board	ALL
	Shareholders' Representatives	Employees' Representatives	Total		
Chemical / Pharmaceutical	30.55%	0.93%	20.49%	33.04%	23.92%
Consumer Goods	23.25%	0.00%	17.97%	40.23%	26.63%
Financial Services	34.68%	8.82%	27.83%	38.27%	30.80%
Automotive	37.15%	7.45%	31.42%	29.84%	30.82%
Energy	19.07%	0.00%	13.94%	29.34%	18.52%
Technology	28.81%	10.19%	24.82%	36.51%	29.29%
Logistics / Transportation	26.99%	2.08%	22.72%	28.02%	24.31%
Steel	27.85%	9.17%	22.51%	36.57%	28.37%
Telecom	19.51%	0.00%	15.01%	13.43%	14.51%

(c) Binary Board Internationalization Index

	Supervisory Board					Management Board		ALL
	n	Shareholders' Representatives	n	Employees' Representatives	Total	n		n	
Altana	5	25.00%	2	0.00%	17.86%	4	31.25%	11	22.73%
BASF	8	43.75%	6	0.00%	25.00%	7	46.43%	21	32.14%
Bayer	10	45.00%	5	0.00%	30.00%	4	25.00%	19	28.95%
Fresenius	5	15.00%	2	12.50%	14.29%	1	75.00%	8	21.88%
Schering	7	53.57%	3	0.00%	37.50%	4	62.50%	14	44.64%
Adidas-Salomon	4	50.00%	3	0.00%	28.57%	4	37.50%	11	31.82%
Henkel	4	12.50%	1	0.00%	10.00%	6	79.17%	11	47.73%
Metro	9	33.33%	1	0.00%	30.00%	4	18.75%	14	26.79%
Allianz	10	42.50%	10	12.50%	27.50%	9	50.00%	29	34.48%
Commerzbank	7	50.00%	3	0.00%	35.00%	7	50.00%	17	41.18%
Deutsche Bank	9	22.22%	2	0.00%	18.18%	4	50.00%	15	26.67%
Deutsche Börse	9	58.33%	1	25.00%	55.00%	1	100.00%	11	59.09%
Hypo Real Estate	5	65.00%	0		65.00%	1	75.00%	6	66.67%
Münchener Rück	10	40.00%	2	12.50%	35.42%	5	45.00%	17	38.24%
BMW	10	50.00%	1	0.00%	45.45%	6	33.33%	17	41.18%
Continental	9	52.78%	3	0.00%	39.58%	6	41.67%	18	40.28%
DaimlerChrysler	9	61.11%	3	33.33%	54.17%	10	47.50%	22	51.14%
Volkswagen	10	35.00%	4	0.00%	25.00%	6	29.17%	20	26.25%
MAN	8	43.75%	0		43.75%	7	32.14%	15	38.33%
E.ON	10	25.00%	5	0.00%	16.67%	6	33.33%	21	21.43%
RWE	9	25.00%	2	0.00%	20.45%	5	45.00%	16	28.13%
Infineon	8	40.63%	3	25.00%	36.36%	5	45.00%	16	39.06%
SAP	8	18.75%	1	25.00%	19.44%	6	29.17%	15	23.33%
Siemens	9	52.78%	4	12.50%	40.38%	11	61.36%	24	50.00%
Linde	8	34.38%	1	0.00%	30.56%	4	31.25%	13	30.77%
Deutsche Post	9	16.67%	2	0.00%	13.64%	8	40.63%	19	25.00%
Lufthansa	10	45.00%	3	8.33%	36.54%	3	41.67%	16	37.50%
TUI	10	50.00%	1	0.00%	45.45%	4	31.25%	15	41.67%
ThyssenKrupp	10	37.50%	4	12.50%	30.36%	10	47.50%	24	37.50%
Deutsche Telekom	10	30.00%	3	0.00%	23.08%	6	20.83%	19	22.37%

	Supervisory Board			Management Board	ALL
	Shareholders' Representatives	Employees' Representatives	Total		
Chemical / Pharmaceutical	39.29%	1.39%	26.42%	43.75%	31.16%
Consumer Goods	32.35%	0.00%	25.00%	50.00%	34.72%
Financial Services	44.50%	9.72%	35.29%	51.85%	40.00%
Automotive	48.37%	9.09%	40.79%	37.86%	39.67%
Energy	25.00%	0.00%	18.27%	38.64%	24.32%
Technology	37.12%	16.67%	32.74%	46.15%	37.87%
Logistics / Transportation	37.93%	4.17%	32.14%	38.33%	34.00%
Steel	37.50%	12.50%	30.36%	47.50%	37.50%
Telecom	30.00%	0.00%	23.08%	20.83%	22.37%

Appendix D Relationship between Index Measures, Firm Size and Internationalization of Firm Activities

	International Sales / Total Sales	International Employees / Total Employees	(Int. Sales / Total Sales + Int. Employees / Total Employees) / 2	Board Internationalization		
				Linear Index	Logarithmic Index	Binary Index
Allianz	68.00%	59.40%	63.68%	17.77%	27.21%	34.48%
Altana	82.24%	52.20%	67.44%	8.27%	16.13%	22.73%
BASF	79.26%	43.60%	61.45%	15.87%	24.59%	32.14%
Bayer	84.75%	59.90%	72.31%	14.46%	23.00%	28.95%
BMW	76.42%	24.40%	64.72%	17.91%	30.16%	41.18%
Continental	66.00%	61.20%	63.60%	21.03%	31.44%	40.28%
DaimlerChrysler	86.01%	52.20%	69.22%	41.95%	43.24%	51.14%
Deutsche Börse	71.00%	46.40%	58.73%	34.18%	45.28%	59.09%
Deutsche Post	49.67%	66.10%	45.48%	8.81%	16.53%	25.00%
Deutsche Telekom	42.60%	31.10%	36.86%	5.33%	14.51%	22.37%
E.ON	40.50%	57.30%	47.28%	4.61%	15.11%	21.43%
Fresenius	88.00%	67.40%	77.70%	14.38%	17.28%	21.88%
Hypo Real Estate	48.29%	40.20%	44.26%	39.75%	52.25%	66.67%
Infineon	79.97%	55.80%	67.87%	17.80%	28.89%	39.06%
Linde	79.80%	65.00%	72.62%	12.70%	24.51%	30.77%
MAN	74.28%	37.40%	55.93%	14.72%	26.91%	38.33%
Metro	53.43%	50.40%	51.90%	10.23%	19.63%	26.79%
Münchener Rück	54.50%	28.70%	41.60%	19.96%	27.99%	38.24%
RWE	44.90%	49.30%	47.09%	19.42%	22.99%	28.13%
SAP	78.74%	61.20%	69.98%	14.34%	18.49%	23.33%
Schering	89.90%	63.80%	76.84%	22.11%	34.11%	44.64%
Siemens	79.21%	64.10%	71.61%	27.08%	38.89%	50.00%
ThyssenKrupp	67.00%	53.10%	60.07%	17.34%	28.37%	37.50%
TUI	29.23%	75.00%	52.11%	27.96%	33.01%	41.67%
Volkswagen	72.40%	48.20%	60.30%	13.31%	20.08%	26.25%

CORRELATIONS	International Sales / Total Sales	International Employees / Total Employees	(Int. Sales / Total Sales + Int. Employees / Total Employees) / 2
Linear Index	0.08	0.00	0.06
Logarithm Index	0.09	-0.09	0.02
Binary Index	0.06	-0.16	-0.04

Firms with Missing Values	International Sales / Total Sales	International Employees / Total Employees	(Int. Sales / Total Sales + Int. Employees / Total Employees) / 2	Board Internationalization		
				Linear Index	Linear Index	Linear Index
Adidas-Salomon		82.00%		18.58%	24.77%	31.82%
Commerzbank		23.50%		20.00%	31.96%	41.18%
Deutsche Bank		58.50%		15.13%	20.40%	26.67%
Henkel		78.90%		12.63%	25.40%	37.50%
Lufthansa		33.90%		28.79%	37.39%	47.73%

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