Firm Internationalization and Systematic Risk: a multidimensional approach

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Abstract

This study aims at characterizing the benefits of corporate international diversification on stock values by introducing the notion of psychic distance in the analysis. In order to capture this crucial dimension, we construct a new internationalization index. Our findings display evidence that this dimension significantly influences international exposure of firms belonging to the same industry provided that the sector is homogeneous. The paper shows that domestic and international exposures tend to decrease as firms expand their activities among psychically distant countries. Interestingly, the opposite is observed for firms belonging to industries in which the degree of differentiation and entry barriers are weak.

Key words: industry factors, international asset pricing, internationalization index, psychic distance, systematic risk.

JEL F23, F30, F36
1 Introduction

The question whether corporate international diversification level influences stock prices has received a great deal of attention for the last three decades. However, this question is somewhat unresolved, resulting from the wrong specification of an internationalization index and the dodging of other elements such as the industrial ones. Indeed, current literature is paying a growing attention to industry factors, which tend to exhibit an increasing importance.

More specifically, this paper takes into consideration the psychic distance of firms’ international commercial markets, which is a key dimension identified in the internationalization process literature. The purpose of this paper is twofold. Firstly, in order to see the effect of corporate international diversification on stock prices, it is important to characterize the geographical breakdown of firm’s activities. Although traditional measures such as the foreign sales ratio are appealing, they are inaccurate and may lead to erroneous conclusions. Therefore, we propose a new internationalization index, which incorporates the psychic distance of each geographical areas of destination. Our second objective is to show that the relation existing between firm internationalization and systematic risk is not necessarily the same, whatever the industry the firm belongs to. The effect of expanding its international activities on shareholders’ returns may be extremely different according to the industrial characteristics, notably the likelihood of product differentiation and the level of entry barriers.

The paper is organized as follows. Section 2 reviews the existing literature. Section 3 introduces the psychic distance concept. The fourth Section
presents our model that incorporates the notion of psychic distance. Data, methodology and the construction of the internationalization index are proposed in Section 5. Further evidence regarding the effect of corporate international diversification is reported in Section 6. The last Section concludes the paper.

2 Does Corporate International Diversification really matter?

Since the articles of Grubel (1968), Levy and Sarnat (1970), Lessard (1974) and Solnik (1974), the benefits from international diversification of a portfolio have been clearly demonstrated. On the other hand, empirical evidence on the benefits from corporate international diversification (CID) on stock values has been somewhat mixed. According to Hugues, Logues and Sweeney (1975), high stock prices of American multinational firms reflect the fact that these firms provide an international diversification service for their investors, which cannot be achieved otherwise without excessive costs. They find that the Treynor (1966) performance measure is greater for multinational firms than for purely domestic ones. Furthermore, they argue that systematic risk, measured in respect to the US stock index, is significantly smaller for multinationals than for domestic firms. Their results are however less conclusive when a world index is used. In this case, they observe a relative similarity between the two kinds of firms. Fatemi (1984) finds no significant difference in performance of American multinationals or domestic firms, regardless of whether the NYSE index or the World index is used. In addition, he notices
that the more internationalized the firm, the lower its systematic risk. Besides, abnormal returns of multinational firms seem to be weaker than those of domestic firms, with a few exceptions\(^1\). Errunza and Senbet (1984) confirm this "market Completion Theory" in that "costless international corporate intermediation through foreign direct investment restores perfect market type results by undoing barriers to international capital flows faced by investors". Brewer (1981) finds that the security market line for the multinational firms is statistically identical to the security market line for purely domestic firms, in terms of intercept and beta. Agmon and Lessard (1977) and Goldberg and Hefflin (1995) suggest that systematic risk, computed with respect to the NYSE index, is a decreasing function of the degree of international involvement. On the contrary, more internationally involved firms experience a higher systematic risk computed against the world index orthogonalized to the US index. Jacquillat and Solnik (1978), Senchack and Beedles (1980) and Shaked (1986) tend to confirm this finding. However, unlike in Agmon and Lessard (1977), their results suggest that the degree of responsiveness of investors is weak, suggesting that multinationals might be a poor tool for international diversification, similarly to Rowland and Tesard (1998), who also notice that foreign stocks perform better on this dimension. In a recent paper, Lombard, Roulet and Solnik (1999), further completed by Diermeier and Solnik (2001), show some evidence of "global pricing". They claim that

\(^1\)With regard to firms belonging to special industries (rubber, plastics and chemicals, for one thing, and conglomerates for another), where, according to Fatemi, the level of differentiation is low and entry barriers are weak, investors face negative abnormal returns.
exposure to non domestic factors is directly positively related to the degree of international activities of the firm. In correlation, the relative importance of domestic factors declines as the firm expands its international activities. Finally, Chambliss, Madura and Wright (1994) observe that American multinationals are subject to a lower sensitivity to the US stock market as they expand their activities in Europe, at the cost of an increased European exposition.

A plausible reason for these ambiguous results may be found in the design of the estimator of the degree of CID. Sullivan (1994) underlines seventeen studies that analyze the relationship between the CID and the financial performance of a firm, and stress out the inevitable use of the ratio of foreign sales (or revenues) to total sales, named the Foreign Sales Ratio (FSR), as the sole estimator of the CID. Such a ratio has obvious limitations. Indeed, multinationalism involves several dimensions, that are not fully captured by the FSR or even the foreign assets ratio. To illustrate this, imagine simply two German firms that both exhibit a foreign sales ratio equal to 50%. However, the first one operates abroad only in France. The second one operates abroad equally in France, in Chile and China. According to the Foreign Sales Ratio, both firms have the same degree of international involvement. However, if we examine the geographical breakdown of both firms’ activities, the second one is more ”international” than the first one in terms of ”psychic distance”, as detailed in the next section.

\[^2\text{Net international exposure is defined by the authors as the sum of three regional exposures, i.e. exposures to European, North American and Asian Pacific factors.}\]
3 The Psychic Distance Concept

Since its first use in Beckerman’s study (1956) on the distribution of international trade, this dimension of the firm internationalization has been spread to capture differences between countries (see Buckley and Ghauri, 1999). The psychic distance can be defined as the perceived distance between the home country and a foreign country, resulting from the differences in terms of cultural, business and political differences, i.e. differences in language, political and legal system, trade practice, industry structure, etc. This notion was used notably in the description of the different sequences in internationalization processes. According to the Johanson and Vahlne (1977) model, firms tend to expand their international activities stage by stage, considering in the beginning psychically close markets, and afterwards, once knowledge and experience acquired, taking more and more psychically distant markets into consideration. Considering the psychic distance of different targeted foreign countries, these firms can be expected to have a different net international exposure, although they generate the same proportion of sales abroad. Grinblatt and Keloharju (2001) also document that distance, language and culture influence investors’ behavior.

Thus far, four different composite internationalization indicators are to be found in the literature. Since 1995, United Nations Conference on Trade and Development (UNCTAD) has been using a transnationality index, which is the average of three ratios: the foreign sales to total sales ratio, the foreign assets to total assets and the foreign employment to total employment ratio. This index is nevertheless limited to the dichotomy of home versus foreign, as the foreign sales ratio is. Ietto-Gillies’s Transnational Activities Spread In-
dex (1998) multiplies the transnationality index by the proportion of foreign countries in which the firm has direct linkages (subsidiaries and affiliates) in respect to the number of foreign countries in which the firm potentially could have located direct linkages. This index also ignores the country types of destination. Qian (1996) proposes to make use of an entropy measure of foreign involvement, which looks like the following:

\[
D = S_i \ln(1/S_i)
\]  

(1)

where \(S_i\) is the ratio of a firm’s holdings (number of subsidiaries) in country or region \(i\) to the total number of foreign subsidiaries. Still here, this index does not take into account the psychic distance of the regions of destination. This ratio depends on both the number of geographic regions in which the firm operates and the number of subsidiaries in each region. Finally, Sullivan (1994) suggests a composite index, consisting in the summation of five ratios: the foreign sales ratio, the foreign assets ratio, the foreign subsidiaries ratio, the top manager’s international experience, and the psychic dispersion of international operations. The adopted approach to implement this crucial dimension, however, is questionable. Ten psychic zones in the world are indentified. According to Sullivan, the greater the scattering of the foreign subsidiaries across these zones, the greater the psychic dispersion of the corporate international activities. Inside Europe, for example, 5 psychic zones can be indentified, i.e. Anglo (UK, Ireland), Germanic (Germany, Austria, Switzerland), Nordic (Norway, Sweden, etc.), Near Eastern (Greece, etc.), and Latin European (France, Spain, Italy, etc.). A firm operating in France, Uk and Germany would be considered more "international" than one operating in Israel (Near Eastern zone) and Brazil (Latin American zone),
as pointed out by Ramaswamy, Kroeck and Renforth (1996).

In this paper, we propose and test an internationalization index that incorporates the notion of psychic distance. Its relative explanatory power for required rate of returns of multinational firms is assessed against the traditional measure of internationalization, i.e. the foreign sales ratio.

4 The model

Consider two firms. One is a purely domestic firm and the other an internationalized firm. The purely-domestic one is only active economically in its home country, i.e. the value of its distributable earnings is wholly derived from its home country. Following Diermeier & Solnik (2001), investors can be expected to value the earnings at a national risk-adjusted discount rate. Hence, the return on this firm is given by:

$$R_{d,t} = \alpha_d + \beta_d R_{DM,t} + \varepsilon_{d,t} \quad (2)$$

where $R_{d,t}$ is the return on firm $d$ at time $t$, $R_{DM,t}$ is the home index return, $\beta_d$ the sensitivity to the national market index and $\varepsilon_{d,t}$ the error term of the regression.

Note that the home index returns are correlated with the world market factor and even with other country factors. Since the domestic market factor is sensitive to the world market factor, the return on the firm is proportional to both its world beta and its domestic beta (see Solnik, 2000).

As for the internationalized firm, the distributable earnings are derived from $n$ different countries. If we regard the internationalized firm as a portfolio of international activities, the total return on this firm $i$ (i.e. the return
on this international portfolio) is the weighted average of returns of domestic activities, as proposed in equation (2):

\[ R_{i,t} = \sum_{j=1}^{n} w_{ij} R_{ij,t} = \sum_{j=1}^{n} w_{ij} (\alpha_{ij} + \beta_{ij} R_{Mj,t} + \varepsilon_{ij,t}) \]  

(3)

where \( w_{ij} \) is the relative importance of country \( j \) in the economic activity of the firm \( i \), \( R_{ij,t} \) is the rate of returns on the activity of the firm in country \( j \), and \( R_{Mj,t} \) the return on the index of country \( j \). To see the potential diversification benefits, \( R_{Mj,t} \) has to be broken down a bit further. Specifically, on one side, the return on the index of country \( j \) has to be a function of the psychic distance with the home country \( D \) and, on the other side, it is a function of the degree of world cointegration too:

\[ R_{Mj,t} = \alpha_{jW} + \beta_{jD} R_{DM,t} + \beta_{jW} R_{WM,t} + \nu_{Mj,t} \]  

(4)

where \( \beta_{jD} \) is the psychic distance index between country \( j \) and the domestic market \( D \), \( \beta_{jW} \) is the world integration index and \( R_{WM} \) is a world index.

Hence,

\[ R_{i,t} = \sum_{j=1}^{n} w_{ij} \alpha_{ij} + \sum_{j=1}^{n} w_{ij} \beta_{ij} \left[ \alpha_{jW} + \beta_{jW} R_{WM,t} + \beta_{jD} R_{DM,t} + \nu_{Mj,t} \right] + \sum_{j=1}^{n} w_{ij} \varepsilon_{ij,t} \]

\[ = a_i + b_{ID} R_{DM,t} + b_{IW} R_{WM,t} + \varepsilon_{i,t} \]  

(5)

where

\[ a_i = \sum_{j=1}^{n} w_{ij} \alpha_{ij} + \sum_{j=1}^{n} w_{ij} \beta_{ij} \alpha_{jW} \]  

(6)

\[ b_{ID} = \sum_{j=1}^{n} w_{ij} \beta_{ij} \beta_{jD} \]  

(7)
\[ b_{iW} = \sum_{j=1}^{n} w_{ij} \beta_{ij} \beta_{jW} \]  
\[ e_{i,t} = \sum_{j=1}^{n} w_{ij} \beta_{ij} \nu_{M,j,t} + \sum_{j=1}^{n} w_{ij} \varepsilon_{i,t} \]  

Therefore, if the firm considers operations in countries whose index returns correlation with the domestic returns is low or negative, the firm’s responsiveness to these local market movements will be different and even, in some case, out of phase. Since the stock price of an internationalized firm should be influenced by a country factor in proportion to the value of its components in this country, both the net international and domestic exposure will decrease as it diversifies its activities in different countries that are “psychically distant”.

5 Data and methodology

In order to show the potential diversification effect on the net international exposure, we proceed as follows. First of all, the traditional measure of firm internationalization, i.e. the foreign sales ratio, is modified by taking into account the striking differences among the countries in which the firm operates. The output is a measure of “psychic distance” of each country or region of destination. The proxy for this measure is obtained by computing the correlation coefficient between the returns of the national index and the returns on the foreign country index. Indeed, as mentioned by Solnik (2000), correlations between economically and culturally close countries tend to be relatively high, compared to those that are more psychically distant. For example, Western European countries are getting psychically close each other
thanks to the construction of the European Union and, at the same time, correlations with the Western European index are relatively high. Another example is United Kingdom and Australia, member states of the British Commonwealth. Although these countries are geographically distant, they are nevertheless quite psychically close in terms of languages, culture, etc. As reported in Solnik (2000), the correlation between the British market and the Australian one, calculated on the 1971-1998 period, turns out to be higher than the correlations between UK and Italy, UK and Germany or UK and Spain, though they obviously geographically closer. Another example is Spain and Latin America.

Since some developing countries have no organized stock markets and the details of the geographical distribution of sales is usually limited at the firm’s level, we limit our investigation to geographical regions of destination.

As pointed out by Dörrenbächer (2000), “there is neither a single indicator nor an index that satisfactorily measures the overall degree of the internationalization of a firm”. An internationalization index will be rather a construct following the aim of a research. Therefore, we propose the following internationalization index for a firm $i$ belonging to a home country $k$:

$$INT_{i,k} = \sum_{j=1}^{n} FRSR_{i,j} \left( \frac{1 - \rho_{kj}}{2} \right)$$

where $FRSR_{ij}$ is the region $j$ sales to total sales mean ratio for company $i$ and $\rho_{kj}$ is the correlation coefficient between the region $j$ index and the domestic country $k$ index.

The range value for our index is 0 to 1, as the foreign sales ratio or the foreign assets ratio. Notice that this index has to be computed at the corporate
level, given the diversity of firms. Note also that the more psychically close
the regions of destination, the lower the internationalization index: psychi-
cally distant regions are given a bigger weight. Therefore, from equation (5),
there should be a negative relationship between the systematic risk coeffi-
cients $b_{iD}$ and $b_{iW}$ with the index. This proxy for internationalization can
include any number of regions or countries, provided an index is available.

Notice that Diermeier & Solnik (2001) used a static foreign sales to total
sales ratio. The index computed in this paper is an average computed on the
sampling period.

The original sample considers European internationalized firms with indus-
trial or commercial activities originally located in seven Western Euro-
pean countries, i.e. France, Germany, Italy, the Netherlands, Spain, Switzer-
land and United Kingdom. We selected firms belonging to the main segment
as well as the high tech segments of the stock markets. Among them, firms
that failed to produce public annual report older than the latest or the penul-
timate one, that were not internationalized or did not report their amount
of domestic sales were put aside. Companies whose annual report did simply
not disclose geographical segmental information were also rejected. This left
us with a final sample of 206 companies. For the geographical breakdown
of their sales, we collected the data for each year from 1998 to 2002 in an-
annual reports, available on their web sites. The geographical and industrial
breakdown of the sample is given in Table I.

Insert Table I approximately here
Firms are classified according to the Global Industry Classification Standard (GICS), introduced by MSCI, in collaboration with Standard & Poor’s.

According to the details found in the annual reports, the number of regions considered in the construction of our index sometimes differ among the firms. In most cases, geographical information report the most important regions of operation, namely generally Western and Eastern Europe, North America, Asia Pacific, Latin America, and sometimes Australasia. The remainder is shown under the section “Rest of the World” (RoW). Since the components of this residual region can greatly fluctuate from one firm to another, its psychic distance is estimated as follows: considering the weights of the $n$ different disclosed regions in the world index, we can find the return on the rest of the world:

$$R_{RoW,t} = \frac{R_{WM,t} - \sum_{j=1}^{n} x_j R_{jM,t}}{1 - \sum_{j=1}^{n} x_j}$$

(11)

where $x_j$ is the weight of region $i$ in the world index, measured in December 2000.$^3$

To estimate the different factor exposures, we use an orthogonalized international model similar to (5):

$$R_{i,t} = a_i + b_{i,D} R'_{DM,t} + b_{i,W} R_{WM,t} + e_{i,t}$$

(12)

where $R'_{DM,t}$ is the domestic index return orthogonalized to the world index, $b_{i,D}$ the exposure to the domestic factor, $R_{WM,t}$ is the world index return.

$^3$Ideally, one should consider weekly changes in these weights, but this proxy is not likely to provide large deviations from our results. Indeed, the fluctuation range of the region weights is relatively small. Moreover, the “region” Rest of the World represents in most cases less than 10% of total sales.
computed in local currency, $b_{iW}$ is the exposure to international factors. We run then the following cross-sectional regressions:

$$b_{iD} = \gamma_0 + \gamma_1 INT_{i,k} + \nu_i$$  \hspace*{1cm} (13) \\
$$b_{iW} = \theta_0 + \theta_1 INT_{i,k} + u_i$$  \hspace*{1cm} (14) \\

For both the domestic and international exposures, the slope coefficients $\gamma_1$ and $\theta_1$ are expected to be negative.

For the sample of firms described above, we use weekly returns from 1998 to 2002. Notice that for many firms, specially british ones, financial year does not coincide with calendar year. In this case, the observations are fitted so as to exactly match the financial year. Stock prices come from Yahoo! Finance, while market indexes are obtained from MSCI. We use the All Countries World Index Free (ACWI Free) as a proxy for the world index.

In order to compare this international index with the traditional measure of internationalization, we also compute the cross-sectional regressions with the average of foreign sales ratios as the independent variable:

$$b_{iD} = \mu_0 + \mu_1 FSR_{i,k} + \xi_i$$  \hspace*{1cm} (15) \\
$$b_{iW} = \lambda_0 + \lambda_1 FSR_{i,k} + \alpha_i$$  \hspace*{1cm} (16) \\

6 Empirical Results

The first task to perform is the computation of exposures by using equation (12). We only reuse domestic and world betas that are statistically different
from zero at the 5% level. Interestingly, only 24 firms exhibit statistically significant domestic betas while 119 world betas are significant.\(^4\)

Then, the cross-sectional regression defined by equation (10) is tested against these loadings. We always compare our results with those obtained with the foreign sales ratio. The results of these cross-sectional regressions are shown in table II.

As expected, all relationships are negative and highly statistically significant at the 1% level. Thus, our results confirm that the more the firm is internationalized among countries that are not perfectly in phase in terms of psychic distance, the lower both domestic and international exposure. Co-efficients for the foreign sales ratio are also negative and highly significant. These results tend to strengthen the Johanson and Vahlne (1977) model, that suggests that firms enter psychically closer markets at the first stages of internationalization, when they generate a relatively weak proportion of sales abroad. Once knowledge and experience is acquired, firms when increasing their proportion of foreign sales tend to consider more psychically distant markets, while both their domestic and thus international exposures decrease. Table I shows that the internationalization index performs slightly worse than the foreign sales ratio. The likely reasons for this observation is that we use the whole sample of firms whatever their domestic country or the industry they belong to, but also that our index introduces an additional

\(^4\)Detailed regression results are available upon request.
measurement error with the correlation coefficient between stock market indexes that is relatively important when the regression has a low explanatory power. It is very important to notice that the notion of psychic distance is a relevant dimension only within homogenous industries. Grinold, Rudd and Stefek (1989) argue that returns to firms among different countries tend to be significantly influenced by global industry factors. And if industries are homogeneous across countries, the comparison between our internationalization index and the foreign sales ratio inside each industry turns out to be more meaningful. These findings are strengthened by Cavaglia, Brightman and Aked (2000) and Baca, Garbe and Weiss (2000), who underline that the rising importance of global homogeneous industry factors tends to dominate country factors. Consequently, the sample of firms has been split according to the industry they belong to and the country where they were originally located. Results are presented in Table III and Table IV. Given the low number of statistically significant domestic betas, we have only reported results concerning the world betas for French, German and British firms.

Insert Table III approximately here

Again, in Table III, the explanatory power of the foreign sales ratio is slightly better than the internationalization index. The relationship is still negative, as expected, for both internationalization measures, and statistically significant at the 1% level as far as France is concerned. However, we have not found any statistically significant relation concerning the British firms, whatever our index or the foreign sales ratio is used.
The classification of firms according to industry, displayed in Table IV, dramatically alters the previous results. The internationalization index, which takes into account the psychic distance of the countries of destination, performs much better than the foreign sales ratio. For the latter, apart from materials, there is no statistically significant relation with international exposure. On the other hand, even in the highly volatile information technology industry, we find a statistically significant negative relationship at the 5% level between our index and the international exposure.

Interestingly, as for industrials, we find a significant positive relationship. It means that as the firm expands its international activities, its international exposure tends to increase. This can be explained by the argument put forward by Fatemi (1984), who finds that multinational corporations belonging to industries in which they were likely to not have monopolistic or oligopolistic advantage tend to experience negative abnormal returns. Among the subgroups constituting the global industrials industry, a majority of firms belong to the capital goods (such as construction & engineering, electrical equipment, industrial conglomerates), commercial supplies and transportation (airlines, marine, road & rail, transportation infrastructure) subindustries, where there might be a lack of differentiation and a relative ease of entry. Thus, these firms may face severe international price competition.

It is also interesting to notice that we have not found any statistical relation between our index and international exposure concerning firms belonging to the Consumer Discretionary industry. A reason for this could be found in the particular nature of this global industry. As noted by Grinold,
Rudd and Stefek (1989), consumer goods companies behave less similarly across the world than other companies. Some industries appear to be more “global”, more homogeneous than others. For the health care and consumer staples industries, we had a too low number of statistically significant betas to perform valid regressions.

7 Concluding remarks

In this paper, we have outlined a striking relationship between the degree of international involvement of the firm and the domestic and international exposures, a indeterminate question often discussed in the literature. We have inserted for the first time, a dimension otherwise widely used in the international business literature, the psychic distance concept. It can be defined as the perceived distance between the home country and a foreign country, resulting from the differences in terms of both cultural, business and political differences. Thanks to this concept, we have constructed a new international index which outperforms the traditional measures, such as the foreign sales ratio, for homogenous populations of multinational companies. We have shown that firms belonging to the same industry will generally reduce their international exposure by taking into account psychically distant markets, which are not perfectly in phase with the original country. We have nevertheless observed exceptions. International exposures do not seem influenced by the degree of international activites for firms belonging to heterogeneous industries such as consumer discretionary. Furthermore, we have interestingly observed that international exposure tends to increase concerning the
industrial industry, where, the degree of product or service differentiation and the entry barriers are weak. A larger sample size will be necessary to spread our relation to other industries, like consumer staples or healthcare.

Further research should pay particular attention to the Fama and French factors and their sensitivity to our internationalization index, as the international asset pricing model that we have been using can only be considered as a raw proxy for a pricing model that would accurately price stocks of internationally active companies.
Appendix

Sampling: considered indexes

France
SBF 120, le Nouveau Marché

Germany
DAX, MDAX, die Neue Markt

United Kingdom
FTSE 250, Techmark

Italy
Mibtel 30, Midex, il Nuovo Mercato

The Netherlands
AEX, AMX

Switzerland
SMI, SPI, SNMI

Spain
IBEX 35, IBEX NM
References


Lombard, T., Roulet, J. and Solnik, B.(1999), Pricing of Domestic versus


Table I. Geographical and industrial distribution of the sample

<table>
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<th>firms</th>
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<td>R²_adj</td>
<td>µ₀</td>
<td>µ₁(FSR)</td>
<td>R²_adj</td>
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<td>θ₀</td>
<td>θ₁(INT)</td>
<td>R²_adj</td>
<td>λ₀</td>
<td>λ₁(FSR)</td>
<td>R²_adj</td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>0.721***</td>
<td>-1.873***</td>
<td>0.06</td>
<td>0.772***</td>
<td>-0.301***</td>
<td>0.072</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.640)</td>
<td>(0.06)</td>
<td>(0.095)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This Table reports regression coefficients of cross-sectional regressions corresponding to equations (13) to (16) for statistically significant domestic and world betas. *, **, *** indicates that the slope is statistically different from zero at 10%, 5% and 1% level respectively. Standard errors are exhibited in parentheses.
Table III. Cross-country Analysis

<table>
<thead>
<tr>
<th># firms</th>
<th>$\theta_0$</th>
<th>$\theta_1(\text{INT})$</th>
<th>$R^2_{\text{adj}}$</th>
<th>$\lambda_0$</th>
<th>$\lambda_1(\text{FSR})$</th>
<th>$R^2_{\text{adj}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>0.819***</td>
<td>-5.260***</td>
<td>0.227</td>
<td>0.940***</td>
<td>-0.687***</td>
<td>0.248</td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(1.788)</td>
<td>(0.141)</td>
<td>(0.222)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>0.772***</td>
<td>-2.695*</td>
<td>0.124</td>
<td>0.896***</td>
<td>-0.525**</td>
<td>0.153</td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(1.429)</td>
<td>(0.156)</td>
<td>(0.131)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>0.718***</td>
<td>-0.457</td>
<td>-0.014</td>
<td>0.689***</td>
<td>0.0027</td>
<td>-0.020</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.884)</td>
<td>(0.077)</td>
<td>(0.131)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This Table reports regression coefficients of cross-sectional regressions corresponding to equations (14) and (16) for statistically significant world betas in France (F), Germany (D) and United Kingdom (UK). ***,*** indicates that the slope is statistically different from zero at 10%, 5% and 1% level respectively. Standard errors are exhibited in parentheses.
Table IV. Cross-industry Analysis

<table>
<thead>
<tr>
<th># firms</th>
<th>$\theta_0$</th>
<th>$\theta_1(\text{INT})$</th>
<th>$R^2_{\text{adj}}$</th>
<th>$\lambda_0$</th>
<th>$\lambda_1(\text{FSR})$</th>
<th>$R^2_{\text{adj}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>16</td>
<td>0.733***</td>
<td>-4.769**</td>
<td>0.266</td>
<td>0.846***</td>
<td>-0.697**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.142)</td>
<td>(1.879)</td>
<td>(0.1217)</td>
<td>(0.326)</td>
<td></td>
</tr>
<tr>
<td>Industrials</td>
<td>23</td>
<td>0.279***</td>
<td>2.281**</td>
<td>0.152</td>
<td>0.290**</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.087)</td>
<td>(1.027)</td>
<td>(0.156)</td>
<td>(0.182)</td>
<td></td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>18</td>
<td>0.628***</td>
<td>-1.791</td>
<td>0.034</td>
<td>0.680***</td>
<td>-0.293</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.118)</td>
<td>(1.419)</td>
<td>(0.077)</td>
<td>(0.197)</td>
<td></td>
</tr>
<tr>
<td>Info Tech.</td>
<td>37</td>
<td>0.892***</td>
<td>-1.745**</td>
<td>0.088</td>
<td>0.890***</td>
<td>-0.201</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.063)</td>
<td>(0.824)</td>
<td>(0.083)</td>
<td>(0.142)</td>
<td></td>
</tr>
</tbody>
</table>

This Table reports regression coefficients of cross-sectional regressions corresponding to equations (14) and (16) for statistically significant world betas for the Materials, Industrials, Consumer Discretionary and Information Technology sectors. ***, ***, *** indicates that the slope is statistically different from zero at 10%, 5% and 1% level respectively. Standard errors are exhibited in parentheses.