

Winfried Ruigrok/Wolfgang Amann/Hardy Wagner

The Internationalization-Performance Relationship at Swiss Firms: A Test of the S-Shape and Extreme Degrees of Internationalization

Abstract and Key Results

- Researchers have recently suggested that on average the relationship between internationalization and performance will be S-shaped. In this study, we test this pattern investigating 87 Swiss multinational companies in manufacturing industries over an 8-year period (1998-2005; N = 696).
- Large Swiss companies cover the full range of internationalization, with many measuring over 90 percent foreign sales-to-total sales. This allows for a unique test of performance levels at very high degrees of internationalization.
- We find that in the case of Swiss MNCs the S-curve is *shifted to the right*, and preceded by an initial stage of increasing performance.
- We find that companies operating at *extreme* (very high) degrees of internationalization face lower average performance and higher average performance variation.

Key Words

Internationalization, Performance, Switzerland, Extreme Degrees of Internationalization

Authors

Winfried Ruigrok, Professor of International Management and Director of the Research Institute for International Management, University of St. Gallen, St. Gallen, Switzerland.

Wolfgang Amann, Fellow in Strategic Direction and International Business, Henley Management College, Henley-on-Thames, United Kingdom.

Hardy Wagner[†], Research Fellow and Lecturer, Research Institute for International Management, University of St. Gallen, St. Gallen, Switzerland.

Manuscript received June 2005, revised October 2006, final version received January 2007.

Introduction

The question of whether and how internationalization impacts firm performance is one of the most addressed research problems in the international management field (Werner 2002). To date, close to a hundred investigations of this linkage have been undertaken worldwide. Unfortunately, the findings generated by this research stream have been inconclusive and contradictory (Annarajula/Beldona 2000, Capar/Kotabe 2003, Contractor/Kundu/Hsu 2003, Ruigrok/Wagner 2003, Sullivan 1994).

Initially, researchers addressed and occasionally found evidence in support of a positive linear form (e.g. Grant 1987). Inconclusive results led researchers to consider the non-linearity hypothesis (Sullivan 1994): if a non-linear curve best reflects the internationalization–performance relationship, linear regressions provide misleading findings. Over the past decade, researchers applying quadratic estimation models found evidence in support of a U-shaped form (Capar/Kotabe 2003, Ruigrok/Wagner 2003), as well as an inverted U-shaped form (Geringer/Beamish/daCosta 1989, Gomes/Ramaswamy 1999, Hitt/Hoskisson/Kim 1997).

More recently, researchers have aimed at reconciling research findings and proposed that on average a horizontal-S curve best describes the internationalization-performance relationship (Contractor/Kundu/Hsu 2003, Lu/Beamish 2004, Riahi-Belkaoui 1998). According to this three-stage model, multinational companies (MNCs) experience a performance downturn at low degrees of foreign expansion, increasing performance levels at moderate degrees of internationalization (DOIs), and eventually a second and final performance downturn at high DOIs. The inflection point between the second and third stage has been referred to as the “internationalization threshold” (Geringer/Beamish/daCosta 1989). Beyond this point the incremental costs of internationalization will begin outweighing the incremental benefits of internationalization. The academic implication of this is that while companies may cover a broader spectrum of DOIs, performance pressures will ultimately select against both under-internationalization and over-expansion/over-internationalization (Contractor et al. 2003). The managerial implication of this finding is that managers should seek to control costs at lower DOIs and steer away from high DOIs. As a rough indication, stage 2 has been located in the 40-70 percent foreign-sales-to-total-sales (FSTS) range (Daniels/Bracker 1989, Geringer et al. 1989, Riahi-Belkaoui 1998).

The next step in this line of inquiry is to test whether the S-shape curve also holds for MNCs based in other countries and whether inflection points are similar across countries. Earlier research has relied either on an international dataset of service companies of which 42 percent were headquartered in the U.S., or a dataset of Japanese companies. Thus the first contribution of this paper is to test the S-shaped pattern using a sample of Swiss companies. Swiss companies have thus far not been the objects of investigation in the internationalization-performance stream of research. The second contribution of this paper is to examine stage 3 and

test performance levels at very high DOIs. The implication of the S-curve is that some firms may overextend themselves and “stray into a suboptimal strategy” associated with stage 3 (Contractor et al. 2003) to be exposed to performance pressures at high DOIs. Due to their large home markets, U.S. and Japanese companies will display lower to moderate DOIs. Our data enable us to address the counterintuitive situation that a remarkable percentage of successful Swiss multinational companies in fact do have very high (*extreme*) DOIs, i.e. operate at what would be stage 3 of the S-curve.

Switzerland, located in the heart of Europe, provides a unique setting because Swiss MNCs are headquartered in a small home market with approximately 7 million inhabitants. Swiss companies have been forced to expand into foreign markets early in their lifetimes and as a result, the UNCTAD World Investment Report (2000) ranked Swiss companies no. 1 in the world with respect to the “transnationality index” (average of firms’ three DOI ratios: foreign sales-to-total sales, foreign employees-to-total employees, and foreign assets-to-total assets). To illustrate, Nestlé (today’s largest consumer food producer on the globe), Novartis (among the largest pharmaceuticals and healthcare firms), Ciba (among the largest specialty chemicals firms), and ABB (among the largest industrial technology firms) have generated, employed, and invested more than 80 percent of their sales, employees, and assets, respectively, in foreign markets for decades. Swiss MNCs thus provide a good case not only because they include a broad and diverse base of MNCs, but also because many MNCs have operated at high DOIs.

The article is structured as follows. In the next section, we depict the research stream’s underlying logic by examining the *incremental benefits* and *incremental costs* of internationalization, and their trade-off along the internationalization continuum. On this basis we derive our hypotheses. We subsequently present our methods and results. We close the article by discussing the findings, acknowledging limitations, and proposing implications for future research and management practice.

Conceptual Framework and Hypotheses

The conceptual logic underlying research on the internationalization–performance relationship rests on an analysis of the incremental benefits and costs of internationalization. The word *incremental* refers to the benefit increase/decrease and cost increase/decrease obtained by a one-unit DOI increase (e.g., from 50 to 51 percent FSTS). The benefit-cost trade-off resulting from this incremental expansion change determines the performance outcome at each DOI point. The essence of quadratic (U-shape and inverted U-shape) and cubic (S-shaped) models is that this trade-off varies along the internationalization continuum of firms.

The Logic of the S-shaped Curve

Below we discuss the trade-offs occurring along the hypothesized S-shaped curve of the internationalization–performance relationship as well as the underlying assumptions.

Stage 1: In the early stage of foreign expansion, firms face significant entrance costs (Gomes/Ramaswamy 1999, Zaheer 1995) stemming from what the literature terms the “liability of foreignness and newness” (i.e., lack of familiarity with legal, social, and economic regulations, as well as consumer tastes and cultural aspects of the targeted foreign markets) that initially outweighs the incremental benefits of internationalization (e.g., cost savings, tax benefits, economies of scale). In addition, firms expanding internationally will face initial learning costs and insufficient economies of scale (Contractor et al. 2003).

Stage 2: After firms have learned to successfully handle these initial costs of foreign expansion e.g. by adjusting organizational structures, processes, and systems, they start to reap the benefits while holding costs under control (Contractor et al. 2003). Thus, in the mid-term expansion phase firm performance on average recovers and increases.

Stage 3: Unfortunately, on average firms do not experience infinite performance increases after entering stage 2. Rather, it has been proposed that firms at some point face an “internationalization threshold” at which the performance apex is reached and further expansion causes value deterioration (Tallman/Li 1996). From that point onwards, increased organizational and environmental complexity (Qian 2002, Zaheer/Mosakowski 1997) lead to incremental (governance, coordination, and transaction) costs that begin outweighing the benefits. Although in stage 3 firms may still generate benefits in better managing foreign subsidiaries, they do so at costs which outweigh these benefits (Gomes/Ramaswamy 1999). Thus, while companies may cover a broader spectrum of DOIs, i.e. may be found also in stage 1 and stage 3, performance pressures will ultimately select against under-internationalization (i.e. stage 1) and especially against over-expansion or over-internationalization (i.e. stage 3) (Contractor et al. 2003).

Studies that established a U-shaped curve (Capar/Kotabe 2003, Ruigrok/Wagner 2003) and an S-shape (Contractor et al. 2003, Lu/Beamish 2004, Riahi-Belkaoui 1998) presented three reasons explaining why companies expanding internationally at low DOIs have relatively low and diminishing performance. At low DOIs, the costs associated with the liability of foreignness and newness, initial learning costs, and insufficient economies of scale will outweigh the incremental benefits.

Ceteris paribus, these assumptions appear particularly valid for companies expanding internationally that meet the following conditions:

- Companies are based in a relatively large home market. Large home markets reduce companies’ and managers’ exposure to different (foreign) business envi-

ronments, increasing learning costs. Furthermore, companies from large countries may struggle with partly irrational or undeserved negative images abroad, increasing the costs of foreignness;

- Companies are based in a country without larger foreign markets in which customers and employees speak the same first language and where institutional arrangements are comparable. Under these conditions firms expanding internationally will face non-negligible language hurdles and institutional differences, and are more likely to face the damaging effects of the liability of foreignness and newness, initial learning costs, and insufficient economies of scale;
- Companies are not based in a country part of, or with unrestricted access to, a much wider economic union. Companies that do not have access to a wider economic union will find it more difficult to overcome the costs associated with insufficient economies of scale.

Swiss MNCs: A Test of the S-Curve Hypothesis

Studies that established a standard U-curve or S-curve particularly looked at companies based in the U.S., Japan and Germany and have thus used datasets meeting most or all of these conditions. Therefore, a genuine test of the S-shape (and U-shape) hypothesis, *specifically of stage 1*, is to identify a contrasting case of companies that do not meet any of these conditions. Swiss companies, with their long tradition of operating internationally, do provide such a case:

- Swiss MNCs are based in a *very small* home market (just over 7 million inhabitants);
- Swiss MNCs *are* based in a country with much larger foreign markets in which customers and employees speak the same first language and where institutional arrangements are comparable. Switzerland has four official languages, incl. German, French and Italian. Most Swiss nationals speak German as their first language and many Swiss managers speak two foreign languages. Especially the adjacent German market (83 million consumers), but also the French and Italian markets are many times larger than the Swiss market, providing Swiss firms with nearby institutionally related host markets;
- Swiss MNCs *do* have virtually unrestricted access to the European Union (EU), even though Switzerland itself is not an EU member. The EU accounts for the vast majority of Swiss international trade.

Swiss manufacturing-based MNCs active in industries such as pharmaceuticals, chemicals, engineering, and machine tools appear to provide a contrasting case where the liability of foreignness and newness, initial learning costs, and insufficient economies of scale do not necessarily constitute key internationalization hurdles at low DOIs. Our theoretical assumption here is that Swiss manufacturing-based

MNCs internationalize following a pattern as suggested by the Uppsala Internationalization Process Model, i.e. that Swiss firms internationalize through increasing commitments to foreign markets, and that Swiss firms choose new markets sequentially according to their perceived proximity (Johanson/Vahlne 1977). Over the past years the Uppsala Model has been criticized for its inability to account for international new ventures (Zahra 2005). However, researchers investigating internationalization processes of firms based in smaller European countries have continued to defend basic tenets of the Uppsala Model (Arenius 2005, Forsgren/Hagström 2001, Johanson/Vahlne 2006). Building on the Uppsala Internationalization Process Model, and on the empirical fact that Swiss firms are surrounded by institutionally related host markets, we argue that Swiss firms in a first stage internationalize to these geographically nearby and institutionally related host markets, and that Swiss firms will be able to experience increasing performance at low and moderate DOIs.

As the S-shape hypothesis suggests, the incremental benefits associated with internationalization will not outweigh the costs indefinitely. When Swiss companies start expanding less related foreign markets, costs associated with physical and institutional distance, and increased coordination costs associated with organizational restructuring (Hitt et al. 1997) are likely to outweigh the incremental internationalization benefits attainable at mid-level DOIs. Thus, during the mid-phase of the internationalization continuum, we expect Swiss firms to face a performance decline.

The underlying assumption of stage 3 is that performance pressures will positively select companies that refrain from over-internationalization. Thus, the S-curve hypothesis suggests that market pressures will favor companies that seek and find the *sweet spot* of the optimum DOI-performance combination located at moderate DOIs. However, it is conceivable that companies under certain circumstances may venture internationally *beyond* an optimum DOI-performance combination. First, if managers observe *other* highly internationalized yet successful companies, these may serve as role models to replicate. Indeed, Swiss MNCs are characterized by very high *average* DOIs (cf. table 1). As indicated above, numerous successful Swiss companies in a range of industries offer popular *prima facie* support to the idea that high DOI companies may generate satisfactory performance levels. Second, the literature on mergers and acquisitions (M&A) and executive behavior suggests that managers may occasionally be motivated to grow their companies at the expense of their shareholders but to their personal financial benefit (Lorsch/MacIver 1989). Since a large proportion of FDI is M&A-based, it seems plausible that firms may occasionally internationalize beyond a given optimum. Third, in institutional environments characterized by more concentrated ownership, shareholder attitudes may differ in favor of a longer-term perspective towards performance and company survival (Ruigrok/Peck/Keller 2006).

We argue that under circumstances such as outlined above, companies may expand internationally beyond the optimum DOI-performance combination at mod-

erate DOIs – even if the disadvantages outweigh the advantages. In such a process, it is conceivable that managers will urgently look for new organizational solutions and relevant experience, which *to some extent* match the new environmental setting. MNCs based in small open economies facing increasing international competition have been shown to be particularly adaptive in this respect (Bengtsson 2000). The Swiss home base has been known for its liberal legislation, protection of free competition, and cooperative arrangements that foster the (informal) diffusion of experiential knowledge across firms (Parkhe 1991, Sattler/Schrader/Lüthje 2003). This has fostered a strong international mindset at many Swiss-based companies, which may support their reconfiguration at higher DOIs.

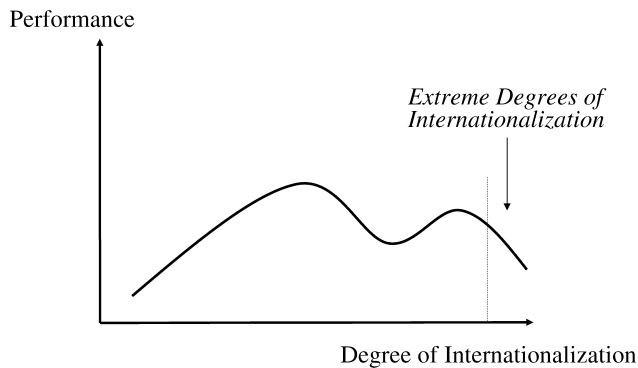
Thus we anticipate that Swiss firms will not experience a *terminal* performance decline at *mid-range* DOI intervals. Further, we assume that Swiss organizations will use their ability to learn, adaptability and internationalization experience to adjust organizational designs at higher DOI levels in order to reduce disadvantages associated with over-expansion.

In sum, we expect the idiosyncratic home base and expansion potential of Swiss MNCs to yield a slightly different form of the internationalization-performance relationship. Effectively we expect the S-pattern to *shift to the right*, i.e. to occur at higher DOI levels. Before stage 1 as hypothesized by the S-curve (i.e. downward performance) we expect Swiss MNCs to display an initial stage of *increasing* performance. The above-depicted line of argument can be expressed by the following hypothesis:

Hypothesis 1. The relationship between internationalization and firm performance exhibits a *sinus-shaped curve*; i.e. the performance development shows an upper-bound and a subsequent lower-bound inflection point at moderate degrees of internationalization.

Beyond the upper-bound inflection point mentioned in hypothesis 1 we expect the S-curve to hold. Thus, the lower-bound inflection point in hypothesis 1 is the inflection point that sets off stage 2 of the S-curve hypothesis. As the S-shape hypothesis suggests, the incremental disadvantages at higher DOIs cannot be fully overcome. At *extreme degrees of internationalization* in particular, complexity costs stemming from coordinating, integrating, and monitoring foreign subsidiaries scattered across nations at a large physical and institutional distance to firms' home markets can reach a critical magnitude. Extreme DOIs will push firms to the "edge of chaos", i.e. an unstable and unpredictable state of disorder and ambiguity (Merry 1995). At extreme DOIs, managers steering a widely dispersed web of foreign subsidiaries are likely to face more information bundles (relevant and irrelevant, consistent and contradictory, explicit and tacit) than they can possibly absorb and apprehend. Such complexity challenges may exhaust management's information-processing resources. Despite organizational adaptability and internationalization experience Swiss companies will not automatically have developed the required

Figure 1. The Hypothesized Sinus-shaped Internationalization-performance Link



absorptive capacities (Cohen/Levinthal 1990), i.e., the cognitive ability, to effectively absorb information and translate this into relatively cost-effective operations.

Thus, we argue that firms at extreme degrees of internationalization on average face increasing costs of complexity management that will ultimately outweigh any incremental benefits obtained. The following hypothesis can be derived from the preceding line of argument:

Hypothesis 2. Firms operating at extreme degrees of internationalization face lower performance levels than other firms.

Figure 1 graphically exhibits the shape of the hypothesized internationalization-performance relationship compounded in hypotheses 1 and 2.

Hypothesis 2 states that we expect the *average* Swiss firm located at extreme DOIs to face lower performance levels than organizations located other DOI ranges. However, this does not preclude the possibility that *some* Swiss firms operate at extreme degrees of internationalization *and* attain relatively high performance levels. Therefore, we expect the low performance mean value at extreme DOIs to be associated with significant performance *variation* (i.e., a high spread of higher and lower performance levels) between firms, and not to be the result of homogenous low performance levels. Firms at extreme DOIs maneuver in so-called “weak situations” (Mischel 1973, 1977). A “weak situation”, a construct developed in cognitive psychology research, is an unstructured condition characterized by extreme complexity that imposes high resource demands on individuals and thus most rigorously sorts out those capable of handling it and those not (Just/Carpenter 1992, Snyder/Ickes 1985). In “strong conditions” this selection force is less salient. “Strong conditions” are situations of lower complexity in which persons can compensate for low capability by applying established routines or mimicking successful others.

By transferring this psychology construct to the organizational level (firms *are* run by humans), we argue that companies located at extreme DOIs operate in “weak

situations". In "weak situations", firms are most meticulously sorted out according to their managements' cognitive ability; and this screening process will be reflected in observable performance differences between firms. This screening process is likely to be strongest first, when firms are beginning to internationalize and relatively inexperienced, and second, when firms are operating at very high DOIs. Our argument here focuses on the latter situation. Managers heading firms at extreme DOIs are confronted with a very demanding task complexity. They need to process highly interrelated task components adequately for good corporate decision-making. In particular, the internationalization benefits specifically retrievable at extreme DOIs (e.g., knowledge development and transfer, global synergistic nexuses) are *tacit* and need to be *proactively induced* and *consistently promoted* (Hitt et al. 1997, Vermeulen/Barkema 2002). Simultaneously, at this expansion level, the complexity challenges (coordination, integration, and monitoring) are most prevalent. Because all executives face absorptive capacity *constraints*, they will at some point encounter a complexity degree at which their cognitive ability is exhausted and information cannot be absorbed and translated into effective strategic actions anymore. Importantly, this capability threshold will vary across managers and these differences will be most observable at the extreme DOI level ("weak situation"), resulting in salient performance differences between firms.

This particular screening force will be less strong at medium-low and moderate DOI levels (comparatively "strong situations"). After having overcome the first selection pressures, firms in the middle of the internationalization continuum can exploit environmentally *given* and *tangible* internationalization opportunities (e.g., cost savings, tax benefits, economies of scale), i.e. benefits whose realization can be attained through the application of established routines. Further, costs related to liabilities of foreignness and newness arising at medium-low and moderate expansion stages may in relative terms be lower than the complexity costs arising at extreme DOIs (Contractor et al. 2003). At medium-low and moderate DOIs, organizational learning will come more easily, and thus at these DOI ranges the specific forces screening the cognitive ability of top management teams will be less salient.

In conclusion, we hypothesize that performance varies significantly more between firms operating in the extreme DOI interval ("weak situation") than between firms operating in lower DOI intervals ("strong situation"):

Hypothesis 3. The performance variation between firms operating at extreme degrees of internationalization is higher than the performance variation between firms operating in other DOI ranges.

Methodology

Company Sample

This investigation is based on a company sample encompassing 87 medium to large, stock-quoted Swiss firms over the eight-year time frame 1998-2005. The selection process was fourfold and began with the 268 Swiss companies quoted on the SWX Swiss Stock Exchange in the year 2005. First, we eliminated those firms that exhibited no foreign sales in their annual accounts. Second, we excluded those firms that were – as determined by share voting majority – dominantly government or foreign owned. The purpose of this second criterion was to address the analysis-confounding effects of idiosyncratic ownership structures. Third, we eliminated companies that operated in the banking and financial services sectors with the goal of creating a validly comparable company sample (in terms of *degree of internationalization* and *performance* measures). Finally, we had to erase those firms for which we could not retrieve the data needed for variable operationalization over the complete eight-year investigation period. Overall, this selection procedure resulted in 87 multinational firms operating in the machinery (29), chemicals/pharmaceuticals (20), construction/metals (6), electrical components and equipment (18), and consumer goods (14) industries. These firms can be considered representative of medium to large Swiss organizations with foreign direct investment over the eight-year period 1998-2005.

Variable Operationalization

Degree of internationalization: We choose firms' foreign sales-to-total sales (FSTS) ratio as the *degree of internationalization* measure. We excluded firms that only engage in exporting. We defined *extreme degrees of internationalization* as those Swiss companies located in the 90-99 percent FSTS. Previous inquiry has found that the FSTS measure correlates highly with other operationalization alternatives such as foreign assets-to-total assets and foreign subsidiaries-to-total subsidiaries (Gomes/Ramaswamy 1999, Sambharya 1995, Tallman/Li 1996). As a result, we believe that our DOI operationalization mode validly proxies foreign direct investment. Data for the degree of internationalization measure have been drawn from *Worldscope Global* as well as *Amadeus* and have been confirmed using annual reports.

Firm performance: Firm performance is measured using Return on Assets (ROA), an established accounting-based performance indicator not only in this train of research. It grasps economic success at the aggregate firm-level and thus the main bottom line (Venkatraman/Ramanujam 1986). We operationalized accounting-based performance using the *pre-tax ROA* measure. In order to ensure comparability

with other studies, we used the ROA defined as the profit (or loss) before tax in relation to total assets times 100. The profit before tax consists of the operating profit plus the financial profit minus financial expenses including interest. *Performance variation* between firms located in certain DOI intervals is measured using the SD of the pre-tax ROA. Data for the performance measures over the eight-year period under investigation are drawn from *Worldscope Global* and cross-checked for completeness and consistency with *Amadeus* data as well as annual reports.

Control variables: In performing the econometric analyses and in line with previous studies on the internationalization-performance link and the tradition in this field, we control for two key variables that can affect the performance of multinational firms, i.e., *firm size* and *industry* (Gomes/Ramaswamy 1999, Ruigrok/Wagner 2003). Firm size is measured by the *log of total employees* and industry is operationalized using four dummy variables: I1 (chemicals/pharmaceuticals), I2 (construction and metals), I3 (electrical components and equipment), I4 (consumer). The residual industry is represented by machinery. The industry variable thereby serves as a proxy to control for patterns of risk, R&D, and the role of intangibles in different industries. We decided in favor of a simplified system of control variables due to the problem of insufficient data availability. Data for the control variables have been drawn from *Worldscope Global* and cross-checked for consistency with *Amadeus* data.

Analysis Techniques

We chose panel data analysis pooling time-series and cross-sectional data points as the method for H1. This enlarges the degrees of freedom of the econometric analysis, improves the reliability and stability of parameter estimates, and, most importantly, allows for the investigation of relationship dynamics that are undetectable in pure cross-sectional analyses based on OLS (Gomes/Ramaswamy 1999, Contractor et al. 2003). We also apply t-tests for H2 and ANOVA techniques for H3 that test performance differences for firms located in tight DOI intervals (see also Daniels/Bracker 1989, Geringer et al. 1989).

Results

Table 1 presents our descriptive statistics, which show that over the period investigated, the average Swiss organization operated at a 61 percent FSTS ratio. More importantly, our descriptive analysis also indicates that the 87 firms in the analysis are rather equally distributed along the DOI continuum. In this regard, our company sam-

Table 1. Descriptive Statistics (N=696)

	Min	Max	Mean	SD	2	3
1. ROA	-.639	.615	.054	.108	-.138**	.285**
2. DOI (FSTS)	2.4	99	61.36	28.04		.109**
3. Employees (log)	1.362	5.405	3.45	.673		

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

DOI = Degree of internationalization

FSTS = Foreign sales-to-total sales

ROA = Pre-tax return on assets

SD = Standard deviation

ple investigated in this study is unique in comparison to previous investigations into companies headquartered in other nations (with significantly larger home markets and thus lower average DOIs) as such studies have been unable to analyze firms at the full internationalization continuum (i.e., 1-99 percent FSTS). To illustrate, researchers examining the degree of internationalization-performance relationship for U.S. firms have only been able to address coarse and left-sided DOI ranges (e.g., Daniels/Bracker 1989, six intervals: 0-10, 10-20, 20-30, 30-40, 40-50, 50 and above; Riahi-Belkaoui 1998, three intervals: 0-14, 14-47, 47 and above). Thus, this study is the first to address the complete DOI continuum in a fine-grained and balanced manner.

Table 2 reports the findings obtained through our pooled cross-sectional and panel data analysis. Hypothesis 1 states that the relationship between international expansion and performance of Swiss firms is best depicted by a nonlinear sinus

Table 2. Results of the Panel Data Analysis

	Panel data analysis (N = 696) ^a		
	Linear	Quadratic	Cubic
DOI	-.137**	.530**	1.777**
DOI ²		-.676**	-3.926**
DOI ³			2.050**
Employees (log)	.306**	.299**	.306**
Industry 1: Chemicals	.141**	.146**	.145**
Industry 2: Construction	.093*	.089*	.092*
Industry 3: Electrical	.173**	.164**	.176**
Industry 4: Consumer	.119**	.149**	.161**
Adj. R-square	12.6	14.4	15.2
Delta adj. R-square		+1.8 ^b	+2.6 ^c

** p < 0.01 * p < 0.05 † p < 0.10

^a Standardized coefficients

^{b,c} Changes in *adj. R-square* is calculated in relation to the linear model.

curve. Our statistical results provide support for this hypothesis and indicate that a sinus curve (or *Swiss landscape* form) has the highest explanatory power. This confirms that the cubic term is not only significant in itself, but also adds to the overall results. A t-test for equality of group means not assuming equal variance among the highly international companies with a DOI ratio above 90 percent and the remaining companies confirm at a significance level of $p = 0.000$ that these highly international companies show indeed a lower performance ratio in average, which provides support to hypothesis 2.

Hypothesis 3 states that MNCs operating at extreme DOI levels experience higher performance variation between each other than firms located at lower DOIs. We also find support for this hypothesis in our data. We aimed to ensure that these differences in performance variation across DOI intervals are not due to sample size differences. ANOVA results displayed in table 3 as well as the statistics in Table 4 provide evidence for the suggested problems associated with *extreme degrees of*

Table 3. Operating at Extreme Degrees of Internationalization (DOI)

	N	Mean	SD	95% confidence interval for mean		ANOVA between groups	
				Lower bound	Upper bound	F-value	p-value
ROA_1-89 ^a	525	.062	.096	.053	.070	12.972	.000
ROA_90-99 ^b	171	.026	.140	.004	.049		

^a Pre-tax return on assets of firms located at a DOI scale between 1 and 89%.

^b Pre-tax return on assets of firms located at a DOI scale between 90 and 99%.

Table 4. Descriptive Statistics for Individual DOI Intervals

DOI interval	N per interval	% of total N	ROA ^a	
			Mean	SD
1-19	60	8.6	.020	.140
20-29	59	8.5	.066	.088
30-39	60	8.6	.082	.056
40-49	90	12.9	.097	.059
50-59	71	10.2	.082	.093
60-69	76	10.9	.038	.114
70-79	37	5.3	.040	.097
80-89	72	10.3	.053	.079
90-99	171	24.6	.027	.137
Total	696	100	.054	.108

^a Performance means for ROA are 8-year averages (1998–2005).

internationalization. Table 3 reports the findings obtained through an additional ANOVA test of our H3 with the statistical analysis confirming a significant increase in performance variance. Table 4 depicts the DOI-performance relationship Swiss firms experienced along the nine DOI intervals examined. To sum up, our data thus show that performance increases until the 40-49 FSTS interval, declines through the 50-59 and especially 60-69 FSTS intervals, then slightly increases again up to the 80-89 FSTS interval, and finally decreases again in the 90-99 extreme DOI interval. Table 4 suggests that performance is lowest and variance is highest at very low and at very high DOIs.

Discussion and Implications

This study builds on earlier work that hypothesized the existence of a more integrative S-shape form in the internationalization-performance link (Contractor et al. 2003, Lu/Beamish 2004). Our results suggest that in the case of Swiss MNCs the S-curve is *shifted to the right*, and preceded by a stage of increasing performance. We also find new directions that research could focus on.

Home Country Effects

To date, the line of inquiry has tended to assume that the internationalization-performance relationship is largely independent of the home-country attributes of internationalizing firms. However, our findings suggest that specific contextual settings firms may lead to divergent internationalizing trajectories (North 1990, Wan/Hoskisson 2003). Such alternative strategic paths may result in different forms of the internationalization-performance relationship. Thus, while the S-shape curve should provide the conceptual starting point for analyses of the link between international expansion and firm performance, home-country effects should be taken into account as well.

We believe that the research stream could benefit from investigators joining current efforts in other research domains to pursue contextual inquiries that emphasize *company nationality* as one determinant of firms' strategic conduct and, in turn, performance development (Ill/Waring 1999, Peterson/Jolibert 1995, Mayrhofer 2004, Wan/Hoskisson 2003). Thus, future research could address cases of companies internationalizing from similar starting conditions (in terms of home-market size, institutional attributes, and the availability of relatively accessible large foreign markets) in order to identify the effects on the internationalization-performance relationship. Examples could include Danish, Dutch, or Taiwanese firms.

Reconfiguration Terrains

Our statistical results suggest a temporary performance downturn for Swiss firms operating at mid-level DOIs. From this point onwards, international sales make up the majority of the business. At this expansion stage, we propose that Swiss firms start addressing the costs associated with liabilities of foreignness and newness as well as learning by reconfiguring organizational structures, processes, and systems to match the new environmental setting. Yet our approach does not enable us to pinpoint the particular *organizational terrain* of such reconfiguration challenges. We are unable to establish at what point on the internationalization continuum foreign markets are no longer considered as an “adjunct to domestic business or as a source of quick profits” (Magaziner/Reich 1985, p. 8) but rather as the market upon which organizational economic success chiefly depends. Future research could help to identify what reconfiguration terrains (i.e. moderating variables) at specific DOI intervals become critical. For example, at roughly what point in their internationalization process should firms drawing a growing percentage of their employees from foreign markets rethink human resource mechanisms and policies (e.g., implementation of expatriate programs)? Do specific financial or accounting instruments become more or less crucial for performance development as DOIs increase? At what point should firms shifting from *peripheral* to *focused* internationalization strategies reconfigure top executive demography (i.e., in terms of international experience and multinational composition)?

By identifying key reconfiguration terrains or moderating variables along the internationalization process, future research on the internationalization-performance relationship may add to knowledge that is of both academic and managerial relevance. This focus on moderating variables could also address another key concern. The level of explained variance is quite low in all models of estimation. This suggests that adding more observations, a larger number of years, and using more advanced techniques do not *per se* provide a profitable avenue for future research on the internationalization-performance relationship. Instead, research should probably focus more strongly on identifying the role of promising moderating variables.

Screening Forces at Extreme DOIs

Our analysis shows that firms operating in extreme DOI intervals (“weak situations”) are strongly subject to screening forces. We found that firms located at extremely high DOIs face higher performance variation between each other than firms operating at other expansion levels. Absorptive capacity (cognitive ability) appears to vary significantly across firms, causing high performance variation in the extreme DOI intervals. For firms operating at extremely high DOIs, absorptive capacity constraints appear to be salient. That is, even companies with substantial internation-

alization experience will face vigorous selection forces at the outermost expansion level. At this level, an organizational and environmental complexity mass appears to arise that is extremely difficult to handle successfully.

While earlier research addressed the challenges to manage initial international expansion successfully, future research could particularly focus on MNCs operating at extremely high DOIs. The counterintuitive finding of this study is not that many MNCs at extreme DOIs face severe performance pressures. Rather, the interesting finding is that *some* companies at extreme DOI levels would appear to have found ways to deal with weak situations *relatively successfully*. Research could focus on MNCs operating at extreme DOIs in order to identify what makes these companies more successful than their peers at high DOI levels. In practical terms, such knowledge will be particularly useful for managers working at MNCs based in small home countries.

Limitations

Although we have taken great care to maintain methodological rigor, this study has several limitations. First, due to data unavailability, we had to rely on FSTS as the operationalization mode for degree of firm internationalization. Although this mode is the most widely used in the internationalization-performance line of inquiry, it has its weaknesses. For instance, it did not allow explicit testing for the scope of internationalization of Swiss firms (institutionally related vs. institutionally unrelated), a problem shared by many studies in this research stream. Thus, we have been unable empirically to test the theoretical assumption derived from the Uppsala Internationalization Process Model that Swiss firms in a first stage internationalize to geographically nearby and institutionally related host markets. Future inquiry having access to databases that report the countries and geographical regions from which firms draw their foreign sales may calculate Herfindahl or entropy measures as valid indicators for the scope of organizational foreign expansion (Goerzen/Beamish 2003). Our DOI measure is sales based and thus may not adequately reflect organizational expansion progress in other value-chain activities, e.g. manufacturing or R&D. Thus, future inquiry may benefit from using other DOI operationalization modes to more explicitly grasp the performance impact of differing expansion objects.

We must also point out that our results reflect the performance impact of international expansion for medium to large Swiss enterprises. Therefore, our findings may not be transferable one-on-one to small-sized organizations. That is, company size may also represent an important contextual characteristic. Small organizations are not mere miniature copies of large organizations; rather, they exhibit differing ownership structures, strategic action, and management styles (Coviello/McAuley

1999, Lu/Beamish 2001). For example, with respect to international expansion, small-sized firms are found to use differing modes of internationalization (i.e., equity joint ventures) to compensate for their financial capital and human resource constraints (Inkpen/Beamish 1997). Thus, future researchers may further focus on investigating the internationalization-performance relationship for small-sized organizations.

Finally, we must note that our findings are based on the investigation of firms operating in the non-banking business. As a result, this study's results may not be applicable to financial service firms. Future inquiry may also begin to explore the form of the internationalization-performance linkage in the banking sector.

Conclusions

In this paper, we tested the S-shaped curve in the internationalization-performance relationship. Using a dataset of Swiss MNCs over an eight-year period, we found that in the case of Swiss firms the S-curve is *shifted to the right*, and preceded by a stage of increasing performance. Our results suggest that Swiss MNCs experience performance increases until mid-level DOIs, then face a performance decline, which is followed by another (more modest) performance increase at higher DOIs. Firms operating at extreme, i.e. very high, degrees of internationalization however are found to have a lower performance *mean* as well as a higher performance *variation* between each other than the average firm operating at other DOI intervals. This finding suggests future research could benefit from examining MNCs at extreme DOIs more closely.

Our findings lend support to the notion that the form of the internationalization-performance relationship is to some extent context dependent, and that the research stream may benefit from a focus on a more modest, but potentially also more fruitful, mid-range contingency theory on the internationalization-performance relationship. Future researchers may seek to develop a parsimonious moderator set (e.g., sequence of foreign market entry, scope of internationalization, experience of internationalization) for the linkage under investigation by examining firms headquartered in differing national settings (contexts). Such a more fine-grained moderator quest could help the research stream to resolve inconsistent findings and provide more practically relevant implications for managers at internationalizing firms.

Acknowledgements

The authors gratefully acknowledge the advice received from the reviewers and focused issue editors.

References

- Annarajula, M. G./Beldona, S., Multinationality-Performance Relationship: A Review and Reconceptualization, *The International Journal of Organizational Analysis*, 8, 1, 2000, pp. 48–67.
- Arenius, P., The Psychic Distance Postulate Revised: From Market Selection to Speed of Market Penetration, *Journal of International Entrepreneurship*, 3, 2, 2005, pp. 115–131.
- Bengtsson, L., Corporate Strategy in a Small Open Economy: Reducing Product Diversification while Increasing International Diversification, *European Management Journal*, 18, 4, 2000, pp. 444–452.
- Capar, N./Kotabe, M., The Relationship between International Diversification and Performance in Service Firms, *Journal of International Business Studies*, 34, 4, 2003, pp. 345–355.
- Cohen, W./Levinthal, D., Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, 35, 1, 1990, pp. 128–152.
- Contractor, F. J./Kundu, S. K./Hsu, C., A Three-stage Theory of International Expansion: The Link between Multinationality and Performance in the Service Sector, *Journal of International Business Studies*, 34, 1, 2003, pp. 5–18.
- Coviello, N. E./McAuley, A., Internationalisation and the Smaller Firm: A Review of Contemporary Empirical Research, *Management International Review*, 39, 3, 1999, pp. 223–256.
- Daniels, J. D./Bracker, J., Profit Performance: Do Foreign Operations Make a Difference?, *Management International Review*, 29, 1, 1989, pp. 46–56.
- Forsgren, M./Hagström, P., *Ignorant Internationalization? The Uppsala Model and Internationalization Patterns for Internet-Related Firms*, Working Paper Series, Institute of International Business, Stockholm School of Economics, No. 01/7, 2001.
- Geringer, M. J./Beamish, P. W./daCosta, R. C., Diversification Strategy and Internationalization: Implications for MNE Performance, *Strategic Management Journal*, 10, 2, 1989, pp. 109–119.
- Goerzen, A./Beamish, P. W., Geographic Scope and Multinational Enterprise Performance, *Strategic Management Journal*, 24, 13, 2003, pp. 1289–1306.
- Gomes, L./Ramaswamy, K., An Empirical Examination of the Form of the Relationship between Multinationality and Performance, *Journal of International Business Studies*, 30, 1, 1999, pp. 173–188.
- Grant, R. M., Multinationality and Performance among British Manufacturing Companies, *Journal of International Business Studies*, 18, 3, 1987, pp. 79–89.
- Hitt, M. A./Hoskisson, R. E./Kim, H., International Diversification: Effects on Innovation and Firm Performance in Product-diversified Firms, *Academy of Management Journal*, 40, 4, 1997, pp. 767–798.
- Ill, L. G./Waring, G., Competing Capitalisms: Capital Investment in American, German, and Japanese Firms, *Strategic Management Journal*, 20, 8, 1999, pp. 729–748.
- Inkpen, A. C./Beamish, P. W., Knowledge, Bargaining Power, and the Instability of International Joint Ventures, *Academy of Management Review*, 22, 1, 1997, pp. 177–202.
- Johanson, J./Vahlne, J.-E., The Internationalization Process of the Firm: A Model of Knowledge Development and Increasing Foreign Market Commitment, *Journal of International Business Studies*, 8, 1, 1977, pp. 23–32.
- Johanson, J./Vahlne, J.-E., Commitment and Opportunity Development in the Internationalization Process: A Note on the Uppsala Internationalization Process Model, *Management International Review*, 46, 2, 2006, pp. 1–14.

- Just, M. A./Carpenter, P. A., A Capacity Theory of Comprehension: Individual Differences in Working Memory, *Psychological Review*, 99, 11, 1992, pp. 122–149.
- Lorsch, J. W./MacIver, E., *Pawns or Potentates: The Reality of America's Corporate Boards*, Boston: Harvard Business School Press 1989.
- Lu, J. W./Beamish, P. W., The Internationalization and Performance of SMEs, *Strategic Management Journal*, 22, 6/7, 2001, pp. 565–586.
- Lu, J. W./Beamish, P. W., International Diversification and Firm Performance: The S-Curve Hypothesis, *Academy of Management Journal*, 27, 4, 2004, pp. 598–609.
- Magaziner, I. C./Reich, R. B., International Strategies, in: Wortzel, V./Wortzel, L. H. (eds.), *Strategic Management of Multinational Corporations: The Essentials*, New York: Wiley 1985, pp. 4–9.
- Mayrhofer, U., The Influence of National Origin and Uncertainty on the Choice between Cooperation and Merger-Acquisition: An Analysis of French and German Firms, *International Business Review*, 13, 1, 2004, pp. 83–99.
- Merry, U., *Coping With Uncertainty: Insights from the New Sciences of Chaos, Self-organization and Complexity*, Westport, CT: Praeger Publishers 1995.
- Mischel, W., Toward a Cognitive Social Learning Reconceptualization of Personality, *Psychological Review*, 80, 4, 1973, pp. 252–283.
- Mischel, W., The Interaction of Person and Situation, in: Magnusson, D./Endler, N. (eds.), *Personality at the Crossroads: Current Issues in Interactional Psychology*, Hillsdale, NJ: Erlbaum 1977, pp. 333–352.
- North, D. C., *Institutions, Institutional Change and Economic Performance*, New York: Cambridge University Press 1990.
- Parkhe, A., Interfirm Diversity, Organizational Learning, and Longevity in Global Strategic Alliances, *Journal of International Business Studies*, 22, 4, 1991, pp. 579–601.
- Peterson, R./Jolibert, A., A Meta-Analysis of Country-of-Origin Effects, *Journal of International Business Studies*, 26, 4, 1995, pp. 883–900.
- Qian, G., Multinationality, Product Diversification, and Profitability of Emerging US Small- and Medium-sized Enterprises, *Journal of Business Venturing*, 17, 6, 2002, pp. 611–633.
- Riahi-Belkaoui, A., The Effects of the Degree of Internationalization on Firm Performance, *International Business Review*, 7, 3, 1998, pp. 315–321.
- Ruigrok, W./Peck, S./Keller, H. U., Board Characteristics and Involvement in Strategic Decision Making: Evidence from Swiss Companies, *Journal of Management Studies*, 43, 5, 2006, pp. 1201–1226.
- Ruigrok, W./Wagner, H., Internationalization and Performance: An Organizational Learning Perspective, *Management International Review*, 43, 1, 2003, pp. 63–83.
- Sambharya, R. B., The Combined Effect of International Diversification and Product Diversification Strategies on the Performance of U.S.-based Multinational Corporations, *Management International Review*, 35, 3, 1995, pp. 197–218.
- Sattler, H./Schrader, S./Lüthje, C., Informal Cooperation in the US and Germany: Cooperative Managerial Capitalism vs. Competitive Managerial Capitalism in Interfirm Information Trading, *International Business Review*, 12, 3, 2003, pp. 273–295.
- Snyder, M./Ickes, W., Personality and Social Behavior, in: Lindzey, G./Aronson, E. (eds.), *The Handbook of Social Psychology*, New York, NY: Random House 1985, pp. 883–947.
- Sullivan, D., The “Threshold of Internationalization”: Replication, Extension, and Reinterpretation, *Management International Review*, 34, 2, 1994, pp. 165–186.
- Tallman, S./Li, J., Effects of International Diversity and Product Diversity on the Performance of Multinational Firms, *Academy of Management Journal*, 39, 1, 1996, pp. 179–196.
- UNCTAD, United Nations Conference on Trade and Development, *World Investment Report 1999: Trends and Determinants*, New York and Geneva: United Nations 2000.
- Venkatraman, N./Ramanujam, V., Measurement of Business Performance in Strategy Research: A Comparison of Approaches, *Academy of Management Review*, 11, 4, 1986, pp. 801–814.
- Vermeulen, F./Barkema, H. G., Pace, Rhythm, and Scope: Process Dependence in Building a Profitable Multinational Corporation, *Strategic Management Journal*, 23, 7, 2002, pp. 637–653.

Winfried Ruigrok/Wolfgang Amann/Hardy Wagner

- Wan, W. P./Hoskisson, R. E., Home Country Environments, Corporate Diversification Strategies, and Firm Performance, *Academy of Management Journal*, 46, 1, 2003, pp. 27–45.
- Werner, S., Recent Developments in International Management Research: A Review of 20 Top Management Journals, *Journal of Management*, 28, 3, 2002, pp. 277–305.
- Zaheer, S., Overcoming the Liability of Foreignness, *Academy of Management Journal*, 38, 2, 1995, pp. 341–363.
- Zaheer, S./Mosakowski, E., The Dynamics of the Liability of Foreignness: A Global Study of Survival in Financial Services, *Strategic Management Journal*, 18, 6, 1997, pp. 439–464.
- Zahra, S. A., A Theory of International New Ventures: A Decade of Research, *Journal of International Business Studies*, 36, 1, 2005, pp. 20–28.