

PACE, RHYTHM, AND SCOPE: PROCESS DEPENDENCE IN BUILDING A PROFITABLE MULTINATIONAL CORPORATION

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Many potential benefits of foreign expansion have been identified in the literature, yet empirical support that multinational firms perform better than domestic firms is mixed. This paper takes a longitudinal perspective and argues that how much a firm benefits from having foreign subsidiaries depends on its process of internationalization. We argue that a firm's capacity to absorb expansion is subject to constraints: some expansion patterns increase profitability less than others, owing to diseconomies of time compression. We hypothesize that the speed of internationalization, the spread of the geographical and product markets entered, and the irregularity of the expansion pattern negatively moderate a firm's increase in profitability resulting from international expansion. Model estimations based on panel data raised strong support for these predictions. Copyright © 2002 John Wiley & Sons, Ltd.

INTRODUCTION

Since the early days of international business research, theorists have argued that firms can realize substantial benefits expanding into foreign countries (e.g., Hymer, 1960; Vernon, 1966). Firms may, for instance, reduce market imperfections through internalization (Rugman, 1979, 1981), or realize economies of scale and scope, which allows them to increase their profitability (Franko, 1989; Kobrin, 1991). Setting up foreign subsidiaries may also foster innovation and knowledge transfer, which increases the firm's long-term performance and viability (Bartlett and Ghoshal, 1989; Kogut and Zander, 1992, 1993; Barkema and Vermeulen, 1998). However, while theorists have emphasized the potential gains from internationalization, the empirical evidence on the impact of a firm's international posture on its profitability is decidedly mixed (for reviews see, for instance, Tallman

and Li, 1996; Hitt, Hoskisson, and Kim, 1997; Geringer, Tallman, and Olsen, 2000). Apparently, some firms manage to increase their profitability in response to international expansion while others don't. We expect that there are important contingencies regarding the relationship between internationalization and firm profitability which at present are insufficiently understood.

In this paper, we focus on the *process* of international expansion. Although it has long been recognized that organizations face constraints with respect to their growth and development (e.g., Penrose, 1959; Cyert and March, 1963), little research has directly examined how different rates and patterns of expansion may result in performance differences between firms. We approach this issue head-on. We investigate how the relationship between foreign subsidiaries and firm profitability is moderated by various characteristics of its international expansion process, in terms of where and when subsidiaries were established. Drawing from the notions of time compression diseconomies (Dierickx and Cool, 1989) and absorptive capacity (Cohen and Levinthal, 1990) we build

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a theoretical argument why and how the process of expansion matters. From this perspective, we identify several concrete characteristics regarding how a firm's profitability depends on the process of growth when developing from a domestic firm to a multinational corporation (MNC). In particular, we examine the effects of the *pace*, the *rhythm*, and the geographic and product *scope* of a firm's international expansion process.

The process of expansion matters because building an MNC is a highly complex task (e.g., Hedlund, 1994; Malnight, 1995, 1996). Foreign expansion is constrained because the firm has to learn how to operate in a variety of cultural and institutional settings, how to set up novel operations or acquire existing ones in unfamiliar locations, and how to deal with new suppliers, customers, governments, and competitors. It also needs to adapt home-grown mental maps, organizational structures, systems, and processes to the international setting (Barkema and Vermeulen, 1998). However, since the capacity of a firm to expand and absorb new experiences is limited (Penrose, 1959; Cohen and Levinthal, 1990), learning how to operate in a variety of foreign settings cannot endlessly be compressed in time (Dierickx and Cool, 1989). Therefore, even if substantial performance benefits can be reaped from setting up subsidiaries abroad, it requires balanced growth to realize this potential.

Our hypotheses were tested on panel data on 22 firms that expanded abroad over a period of 25 years (1967–92). We developed measures of the speed of international expansion (i.e., *pace*), the dispersion of the internationalization process across different geographic and product markets (i.e., *scope*), and the regularity of the expansion pattern (i.e., *rhythm*), and tested whether these variables moderate the relationship between foreign subsidiaries and firm profitability. Our results corroborate a key notion of international business theory: that firms can increase their profitability due to international expansion. However, consistent with our theory, we also found that the firms in our sample only realized this potential if they had selected a growth strategy that was balanced with respect to the speed, the scope, and the regularity of the expansion process. Thus, our research shows that a firm's profitability not only depends on its (current) strategic posture, such as its international diversification, but also on how it was built.

THE INTERNATIONAL EXPANSION PROCESS AND ITS CONSTRAINTS

Potential benefits of international expansion

The international business and strategy literature has suggested many reasons why substantial profits may be realized from building an MNC. From an economic perspective, as in industrial organization models and transaction cost economics (e.g., Hymer, 1960; Rugman, 1979; Caves, 1982), it has been argued that MNCs benefit from increased market power and internalization in response to market imperfections. Operations beyond domestic borders enable firms to reap tax benefits, to benefit from common purchasing, to avoid high transaction costs, and to exploit low-cost sources of labor (Vernon, 1966; Hennart, 1982). Increased sales due to foreign expansion also allow firms to spread R&D, marketing costs, and so on, across a larger number of units (Franko, 1989). And, foreign direct investments imply (additional) options for MNCs to leverage their production to foreign locations when deemed favorable (Kogut and Kulatilaka, 1994).

Over the last decade, an increasing number of researchers have adopted a behavioral perspective on international expansion, and many of them have explored a second set of benefits: accruing from the (social) interaction between units within an MNC. Examples are the benefits of learning from foreign subsidiaries, and of the transfer of intangible assets overseas (e.g., Ghoshal and Bartlett, 1990; Kogut and Zander, 1992, 1993; Hedlund, 1994; Barkema and Vermeulen, 1998). For instance, Kogut and Zander (1992, 1993) emphasize that building an MNC facilitates the knowledge transfer across countries (i.e., within the MNC). Barkema and Vermeulen (1998) argue that the need to adapt to foreign settings when setting up foreign subsidiaries may lead to temporary problems and local search (cf. Simon, 1959), but also to innovations in products, marketing, and organizational practices (cf. Ghoshal, 1987; Kim, Hwang, and Burgers, 1993; Almeida, 1996), which may subsequently spread to other units within the MNC (Ghoshal and Bartlett, 1990; Hedlund, 1994). In fact, recent inductive research (Birkinshaw, 1997; Malnight, 1995, 1996) shows that over time foreign subsidiaries may obtain important roles in developing, testing, and marketing new products, which allows MNCs to further capitalize on unique

local knowledge and capabilities (see also Hedlund, 1986; Bartlett and Ghoshal, 1989; Birkinshaw and Hood, 1998; Birkinshaw, Hood, and Jonsson, 1998). Hence, also from a behavioral perspective, setting up foreign subsidiaries may imply considerable gains.

Complexities of international expansion

The behavioral research on the international expansion of firms has also emphasized the complexities of establishing and managing subsidiaries in foreign countries. One source of complexity is that firms have to learn how to operate in a variety of institutional and cultural settings (Johanson and Vahlne, 1977; Lane, 1995). In every new location, the firm and its management need to invest time and attention to establish the firm's presence, hire and train a new labor force, or identify a suitable acquisition candidate, and integrate the new subsidiary into the MNC (Davidson, 1983). Each new subsidiary confronts a firm and its managers with new experiences in terms of customers, competitors, and stakeholders (e.g., Li, 1995; Barkema, Bell, and Pennings, 1996). Learning from foreign subsidiaries and the knowledge transfer within a company also requires the careful assimilation of newly formed subsidiaries (Malnight, 1996). An additional source of complexity for internationalizing firms is the need to adapt their systems, processes, and organizational structures to the international setting (Stopford and Wells, 1972; Bartlett and Ghoshal, 1989). Firms have 'mental maps,' which permeate and underpin their structures and processes (Perlmutter, 1969; Bartlett and Ghoshal, 1989; Murtha, Lenway, and Bagozzi, 1998). International expansion requires them to adapt these home-grown mental maps and consequently their structures, systems, and processes rooted in these maps, to fit an international setting (Calori, Johnson, and Sarnin, 1994a; Nohria and Ghoshal, 1994). Such processes are complex and take time (e.g., Calori, Lubatkin, and Very, 1994b; Hastings, 1999; Tsai, 2000).

Organizational constraints

In fact, we will argue that the extent to which organizations are able to realize the above-described benefits is constrained by their capacity to handle

and absorb the complexities that accompany international expansion. Our theory, which builds on the concepts of 'time compression diseconomies' (Dierickx and Cool, 1989) and 'absorptive capacity' (Cohen and Levinthal, 1990), will allow us to explain why some expansion processes imply larger benefits than others, even though the resulting international posture may be identical.

Dierickx and Cool (1989) introduced the concept of time compression diseconomies: the fundamental mechanism of diminishing returns when—everything else equal—the pace of processes increases. They explain it by providing the example of MBA students in a 1-year program, who may not accumulate the same stock of knowledge as students in a 2-year program, even if all inputs other than time are doubled. We argue that the same mechanism applies to companies that establish foreign subsidiaries. Firms can handle and benefit from new expansions, but the amount of new experience they can absorb and put to commercial use (Cohen and Levinthal, 1989, 1990, 1994) is constrained in time. New subsidiaries have to be identified, built up, and integrated into the firm, but managers are bounded in terms of their rationality (Simon, 1959) and cognitive scope (Sutcliffe, 1994). Furthermore, due to inertia, organizations are slow to adapt to new circumstances and configurations (Hannan and Freeman, 1984). New structures, processes, and routines need to be worked out and fine-tuned over the course of time (Nelson and Winter, 1982). Too much foreign expansion in too short a period of time leaves the firm with inappropriate structures and models. Or, as Eisenhardt and Martin (2000) put it: 'experience that comes too fast can overwhelm managers, leading to an inability to transform experience into meaningful learning.'

While some benefits of international expansion (e.g., tax benefits, common purchasing, tapping into low-cost sources of labor) may be relatively easy to accomplish, other potential benefits, such as those resulting from the social interaction within MNCs (e.g., learning from foreign subsidiaries; new roles of foreign subsidiaries to capitalize on local knowledge and capabilities; weaving new subsidiaries into the MNC) appear to be more difficult to realize. Such benefits require the careful absorption of foreign ventures within the firm and, as a result, may be subject to diseconomies of time compression.

HYPOTHESES

Pace

We will argue that the contribution of foreign subsidiaries to the profitability of an MNC is not automatic or fixed, but contingent on its development process, since there are limits to the amount of expansion the firm can absorb within a given period of time. For instance, time compression diseconomies may emerge dependent on the amount of expansion the firm undertakes within a given period of time, i.e., dependent on the speed or *pace* of the internationalization process.

Time compression diseconomies during international expansion emerge, for one, because bounded rationality and limited cognitive scope imply that search and decision making are imperfect and take time (Simon, 1959). Firms that expand into foreign countries at a high pace—perhaps even with several subsidiaries at the same time—will have little time to evaluate their foreign experience, assimilate it, and apply it to commercial ends (Cohen and Levinthal, 1994). Hence, when initiating new foreign expansions at a high pace, it is less likely that the firm will realize the full profit potential of these new expansions. A high internationalization pace makes it more likely that (top) management of the MNC will devote suboptimal time and attention to carefully building greenfields, or to screening, selecting, and implementing acquisitions, weaving them into the existing system of subsidiaries, and carefully nurturing their role within the MNC (Birkinshaw, 1997; Birkinshaw and Hood, 1998). Tsai (2000), for instance, showed that it might take considerable time before linkages between different units in a multinational company start to form. Unremitting expansion will be particularly toil-some and difficult to absorb when the MNC is still restructuring to fit its international environment in terms of its mental maps, organizational structures, systems, and processes (Barkema and Vermeulen, 1998). Diseconomies also emerge if the firm has not been able yet to learn from its prior experiences and to apply them throughout the organization.

Hence, the more foreign subsidiaries a firm tries to establish in a given period of time, the more likely it will suffer from diseconomies of time compression. This negatively affects the profits that accrue from its foreign subsidiaries. In other words, a faster pace of foreign expansion

negatively moderates the (positive) impact of the foreign operations of an MNC on its profitability.

Hypothesis 1: A faster foreign expansion pace negatively moderates the impact of a firm's foreign subsidiaries on its profitability.

Product scope of the expansion process

Our first hypothesis dealt with the impact of the amount of foreign expansion a firm undertakes in a given period of time, in terms of the number of foreign subsidiaries the firm establishes. In addition, our second hypothesis focuses on the businesses in which the expansion takes place. We expect that a firm's absorptive capacity is not only taxed by a fast international expansion pace, but also by the diversity of businesses that are entered in the process. Diseconomies of time compression emerge when an organization is less able to absorb the expansion and the new experiences this accompanies. This may occur due to the sheer number of ventures, but also due to their dispersion into different product markets, which we label the *product scope* of the expansion process.

New businesses require new knowledge, and different routines and business practices. New businesses also imply that a firm and its management may have to learn a different corporate culture (Reynolds, 1986; Chatman and Jehn, 1994; Phillips, 1994), perhaps even another core logic (Prahalad and Bettis, 1986). Hence, it takes considerable time and attention of a firm's managers to successfully enter novel businesses, particularly if the novel business is in a foreign country. When foreign expansion coincides with product diversification, it becomes more likely that a firm makes suboptimal choices when setting up new subsidiaries, or when screening, selecting, and implementing acquisitions, due to causal ambiguity and information overload (Huber, 1991; Haleblan and Finkelstein, 1999). Moreover, diversifying into new businesses while internationalizing makes organizational adaptation—in terms of organizational processes, processes, and systems—particularly toilsome (Barkema and Vermeulen, 1998). The simultaneous jump into (relatively) new institutional and cultural settings and into new businesses makes it more likely that the firm is unable to fully understand and absorb the

plethora of new impressions, signals, and experiences. In sum, when expanding abroad, a simultaneous dispersion into new businesses makes a firm encounter diseconomies of time compression sooner. Formally:

Hypothesis 2: A higher product scope of the expansion process negatively moderates the impact of a firm's foreign subsidiaries on its profitability.

Geographic scope of the expansion process

While our prior hypothesis implied that dispersion into multiple businesses negatively influences a firm's ability to increase profitability due to foreign expansion, a similar reasoning applies to expansion into multiple countries, i.e., the *geographic scope* of a firm's expansion process. Placing ventures into many different countries is a complicated process compared to concentrating on a limited number of geographic markets. While, eventually, being active in many countries may have a positive influence on a company's performance (Geringer, Beamish, and daCosta, 1989; Barkema and Vermeulen, 1998), the route to get there is a difficult one. The more countries involved in an expansion process, the more difficult it becomes to absorb the experience, which may lead to diseconomies of time compression.

Individual countries have unique features in terms of their cultural and institutional characteristics; local networks with suppliers and customers; languages; nature of contacts with the national government; education systems, and so forth (e.g., Lane, 1995). Given a certain pace of the internationalization process, a higher geographic scope implies that the firm has to learn about more unique national settings, which requires more time and attention than if the expansions were to take place in a smaller number of countries. The organization and its management have to absorb a larger variety of experiences since the firm has to familiarize itself with new customers, build relationships with new suppliers, identify and understand competitors, and so forth (e.g., Ghoshal and Bartlett, 1990)—all of which taxes a firm's absorptive capacity. Moreover, subsidiaries in different circumstances ask for different organizational systems and processes (e.g., Lebas and Weigenstein, 1986; Gupta and Govindarajan, 1991) and companies active in a variety of cultures need to

adapt their structures as well (Bartlett and Ghoshal, 1989). Building these systems and structures takes considerable time and attention. Unless the firm allows itself sufficient time, the expansion process becomes toilsome.

In contrast, an expansion process that takes a firm into a limited number of countries is much more easy to digest. As a result, companies that expand into just a few geographical markets suffer less from time compression diseconomies than firms that disperse into many markets. We expect that the larger the geographic scope of an expansion process, the more time an MNC needs to fully absorb the accompanying experiences. Hence, the moderating effect of the geographic scope of the expansion process on the relation between foreign subsidiaries and company performance is negative.

Hypothesis 3: A higher geographic scope of the expansion process negatively moderates the impact of a firm's foreign subsidiaries on its profitability.

Rhythm

Firms that set up foreign subsidiaries face time compression diseconomies because there are limits to their capacity to absorb expansion, in terms of the novel experiences this produces and its consequences. A firm's absorptive capacity (Cohen and Levinthal, 1994), however, is not necessarily constant. For instance, it is influenced by the extent to which it is utilized. Specifically, we argue that overload—caused by a very high pace—reduces a firm's capacity to further absorb expansion, as does prolonged non-use (i.e., no expansion). Along these lines, we argue that the profits that firms can realize from their foreign expansions are not only influenced by the pace and dispersion of the internationalization process, but also by the (simultaneous) regularity of the process, or the *rhythm* at which new subsidiaries are established. We will argue that firms that follow a constant, rhythmic pace are better able to benefit from foreign expansion than firms that expand in an irregular, ad hoc fashion.

Consider the example of the expansion paths of the two firms depicted in Figure 1. Over the years, Firm A established its foreign subsidiaries in a rhythmic, regular fashion; it may, for instance, have expanded with one subsidiary every year. However Firm B, which at the end of the period

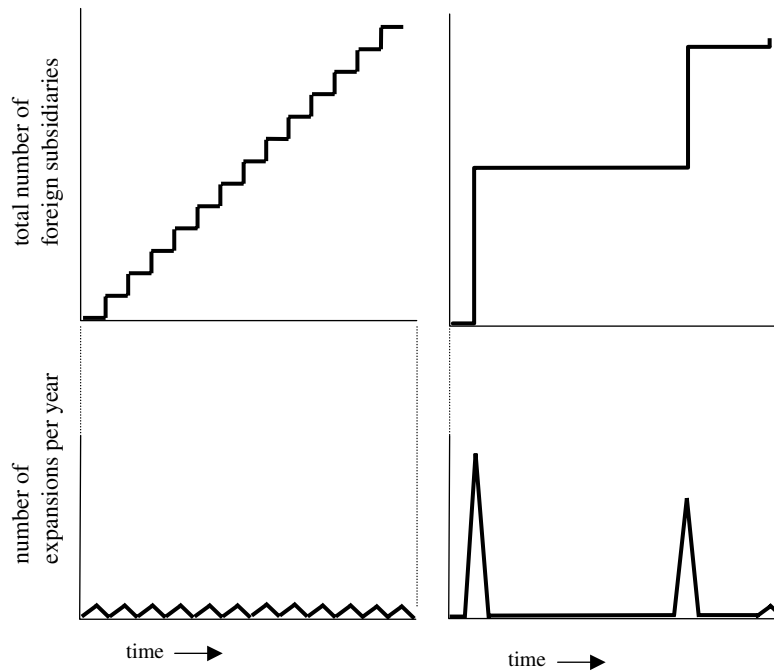


Figure 1. Rhythmic and irregular expansion patterns

has an equal number of subsidiaries, expanded through a very different pattern: years of rapid expansion are alternated with long periods of inactivity. Organizations with expansion patterns like Firm A utilize but do not overstretch their absorptive capacity. They are able to interpret and absorb their experiences because they can relate them to similar actions in their recent past (Ellis, 1965; Cohen and Levinthal, 1989; Barkema *et al.*, 1997). As a result, they are flexible and capable to implement and absorb additional expansions (Hitt *et al.*, 1998; Vermeulen and Barkema, 2001). Firms that implement and absorb changes in an optimal, rhythmical pattern may even reach a state of 'flow,' as Brown and Eisenhardt (1997) found for firms adopting innovations in the computer industry.

Patterns as displayed by Firm B, however, involve large peaks of rapid expansion followed by long periods of inactivity. Peaks of rapid expansion may lead to overload, and organizations and managers that experience overload see their absorptive capacity reduced (Simon, 1959; Huber, 1991). They are unable to further absorb expansions because they are unable to interpret and assess them, while being left with systems and structures unfit to accommodate (additional) foreign subsidiaries. Periods of inactivity reduce a firm's

absorptive capacity as well (Cohen and Levinthal, 1990; Eisenhardt and Martin, 2000). Organizations gradually forget what they have learned (Bailey, 1989; Argote, Beckman, and Epple, 1990; Darr, Argote, and Epple, 1995), while they get more rigidly locked into their existing structures, systems, cultures, and mental models (Lewin, 1936; Miller, 1993; Bettis and Prahalad, 1995). Owing to the lower absorptive capacity, firms following an irregular expansion path will encounter time compression diseconomies sooner than firms that expand in a rhythmic pattern. Thus, we expect that in internationalizing firms where management has 'rhythmically' initiated foreign expansion, subsidiaries contribute more to profitability than in companies that established their foreign presence in an irregular, ad hoc fashion.

Hypothesis 4: An irregular pace negatively moderates the impact of a firm's foreign subsidiaries on its profitability

METHODOLOGY

Data

To test the hypotheses, we collected a longitudinal database on multinational firms, covering

a relatively large number of years, sufficient to determine their patterns of internationalization. For practical reasons, we did not select a random sample, but examined a set of firms that had existed over a longer period of time.

We started with all firms in the main segment of the Amsterdam Stock Exchange—a total of 40 firms—in 1992, and excluded all financial institutions. All remaining companies were Dutch (with six firms of the final sample cross-listed). Next we determined the timing and location of their foreign ventures. Data were mainly acquired from annual reports, but in later stages most firms were also contacted to verify and, sometimes, to complete information. We traced these firms back in time until we had a sufficient number of years available. This turned out to be in the year 1967—further back in time annual reports became very concise, and/or difficult to obtain. Several firms had to be eliminated from the sample because they came into existence and/or became listed on the Stock Exchange well after 1967. Others were eliminated from the sample because they appeared to have internationalized earlier—well before the year 1967. This resulted in a panel of 572 observations: 22 firms covering 26 years.

The firms in the sample are fairly large companies—their average sales were about 2.5 billion NLG with 14,000 employees—with an average percentage of sales abroad of 63 percent (median: 63%) at the end of the observation period. In total, the firms undertook 741 foreign expansions, of which 67 percent were within the EU. They were active in a wide variety of industries, including manufacturing office equipment, precision machinery, paper and packaging, food products, pharmaceutical and chemical products, brewing, publishing and printing, retailing, trading, and tank storage. Obviously, however, it is not a random sample. They are all firms that internationalized throughout the last few decades. Moreover, collecting data working back in time creates a bias towards surviving firms. How internationalization and the pattern of expansion influences the survival chances of firms is a topic well worth examining, but beyond the scope of the current paper.

Variables

Profitability

The dependent variable is firm profitability. It was measured through the firm's return on assets (e.g.,

Venkatraman and Ramanujam, 1986; Hitt *et al.*, 1997). The models shown below are based on a 3-year moving average of return on assets, since firms are (to some extent) able to manipulate in which year they report profits or losses. Models based on 1-year observations of return on assets led, however, to virtually identical results.

Foreign subsidiaries

Foreign subsidiaries were measured yearly as the number of foreign affiliates of the firm. Affiliates had to represent a 'physical' foreign presence, ranging from a sales office to production facilities. By the end of our sample period (i.e., the end of 1992) the average firm in the sample had established 34 subsidiaries.

Speed

'Speed' indicates how many foreign expansions a firm undertakes in a certain period of time. Therefore, to measure speed, the average number of foreign subsidiaries per year was computed, i.e., the number of foreign subsidiaries divided by the number of years since the firm's first foreign expansion. A large (average) number of expansions per year indicates a fast-paced international expansion process. Alternatively, speed can be measured through the variable 'number of years since the firm's first foreign expansion,' i.e., how many years it took the firm to reach its current international posture. This alternative variable—based on the same information—led to identical results.

Geographic scope

The number of countries in which a firm established subsidiaries during its international expansion is used to measure the geographic scope of the expansion process. At the end of the sample period, the average firm had expanded into 10 different countries.

Product scope

The product scope of a firm's expansion process is measured as the number of additional 3-digit SBI codes entered by the firm while internationalizing. The SBI code is the Dutch equivalent of the SIC code.

Irregularity

Regularity, or rhythm, of the internationalization process was measured through the kurtosis of the first derivative of the number of foreign ventures of the firm over time. This variable measures how concentrated in time the change in the number of foreign subsidiaries is. Figure 1 illustrates this relationship. The upper graphs depict the level of internationalization of the firm, i.e., the number of foreign subsidiaries. The bottom graphs depict the change (i.e., the first derivative) in internationalization. How concentrated in time the changes in internationalization are is measured through the kurtosis of this distribution:

$$\text{kurtosis} = \left\{ \frac{n(n+1)}{(n-1)(n-2)(n-3)} \sum \left(\frac{x_i - \bar{x}}{s} \right)^4 \right\} - \frac{3(n-1)^2}{(n-2)(n-3)}$$

where n = number of observations, x_i = number of expansions in year i , and s = standard deviation of the number of expansions.

Large peaks in a firm's expansion pattern, combined with periods of inactivity, result in a relatively concentrated distribution and therefore a high kurtosis. A constant pace of foreign expansion—that is, a rhythmic or regular expansion pattern—results in a relatively flat distribution and therefore a lower kurtosis.

Control variables

A number of control variables were included in the analyses. First, we controlled for the level of

product diversity of the firm, that is, the number of businesses—measured as 3-digit SBI codes—in which the firm was active during the expansion. Product diversity may influence both internationalization (Fouraker and Stopford, 1968; Hitt *et al.*, 1994) and firm performance (Hoskisson and Hitt, 1990; Datta, Rajagopalan, and Rasheed, 1991). Consistent with prior research (Tallman and Li, 1996; Hitt, Hoskisson, and Ireland, 1997), we added the square of this variable to capture nonlinearities.

Second, we controlled for firm size through the firm's assets, corrected using a price index. Again, the square was added to control for nonlinearities, as found in previous research (Haveman, 1993a). Larger firms may benefit from economies of scale or scope (Franko, 1989), while very large firms become rigid and inert (Hannan and Freeman, 1977).

Following prior research (Hitt *et al.*, 1997), we also controlled for the firms' financial structure through a debt ratio (total liabilities to assets), since capital structure may affect a firm's ability to expand, as well as its performance (Jensen, 1986).

Finally, following prior research (Hitt *et al.*, 1997), we also controlled for the number of foreign acquisitions and the number of equity alliances during each year, since these modes of expansion may be related to both internationalization and performance (Gulati, 1995; Barkema and Vermeulen, 1998).

Table 1 displays summary statistics and partial correlations of the variables.

Table 1. Means, standard deviations, and partial correlations^a

Variables	Means	S.D.	1	2	3	4	5	6	7	8	9
1. Return on assets	6.98	5.76									
2. Foreign subsidiaries	13.9%	15.0%	0.03								
3. Speed	0.94	0.78	-0.05	0.53							
4. Product diversity	7.38	5.29	-0.08	0.08	0.08						
5. Number of countries	6.34	4.70	-0.00	0.55	0.53	0.03					
6. Irregularity	2.26	3.36	-0.00	0.02	-0.01	-0.08	-0.24				
7. Firm size	5.03	7.78	0.09	0.11	0.20	0.24	-0.06	-0.08			
8. Debt ratio	0.42	0.15	-0.26	0.20	0.20	0.23	0.15	-0.03	0.09		
9. Acquisitions	1.73	2.17	0.10	0.19	0.25	0.17	0.09	0.01	-0.01	0.00	
10. Equity alliances	0.11	0.36	0.06	-0.01	0.05	0.07	-0.02	-0.04	-0.07	0.00	0.10

$N = 572$. Correlations with absolute value greater than 0.08 are significant at the 5 percent level.

^a Pearson correlations partialled for fixed firm-effects and a free time polynomial.

Analysis

We estimated ordinary least squares, fixed-effects models since the assumptions necessary to employ random effects would be violated in the current research setting (Hsiao, 1986), as confirmed by a Hausman test. Hence, we used firm dummies to control for firm-specific effects. A polynomial, consisting of calendar time and several of its powers, was included to control for any possible (possibly nonlinear) development over time throughout the sample period. However, models with yearly time dummies led to virtually identical results.

Since our hypotheses concern moderating effects, we used interactions to test them. We predicted that the speed, the product scope, the geographic scope, and the irregularity of the expansion process will all reduce the beneficial effect of foreign subsidiaries on firm profitability. Therefore we expect that, for instance, the interaction between foreign subsidiaries and speed will be negative. The interpretation is that foreign subsidiaries—i.e., the main term—may have a positive influence on firm profitability, but that the benefits will be smaller when the speed of international expansion is high. The estimate on the main term of speed itself may be insignificant (Jaccard *et al.*, 1990; Aiken and West, 1991),

since speed may not have a direct effect on firm performance, but only as a moderator. Likewise for the interactions with product scope, geographic scope, and process irregularity.

Finally, to make sure that significance of these interactions was not caused by ‘spurious correlation’ (e.g., Aiken and West, 1991; Ganzach, 1998), we also tested each of the interactions in models that included squares of the main variables. These analyses led to identical conclusions to those reported below.

RESULTS

Table 2 provides the statistical results of the hypotheses tests. Model 1 shows the estimates without interactions. The effect of the variable ‘number of foreign subsidiaries’ is positive and significant, showing that, on average, the firms in our sample experienced an increase in profitability due to their international expansion. The size of the coefficient implies that, for instance, firms with 10 foreign subsidiaries have a return on assets which is, on average, 1.08 percent higher than when they were purely domestic firms. Interaction terms were entered into Models 2–5 successively. Model 6 shows the results of the full model.

Table 2. Regression of firm profitability

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Tests of the hypotheses</i>						
Foreign subsidiaries × speed		−0.108***				−0.066*
Foreign subsidiaries × product scope			−0.009*			−0.011*
Foreign subsidiaries × geographic scope				−0.017***		−0.009*
Foreign subsidiaries × irregularity					−0.005*	−0.009**
<i>Control variables</i>						
Intercept	9.914***	10.66***	10.16***	10.24***	10.03***	11.04***
Foreign subsidiaries	0.108***	0.412***	0.159***	0.357***	0.133***	0.539***
Speed	−0.641	−0.169	−0.678	−1.827	−0.806	−1.340
Irregularity	−0.048	−0.009	−0.065	0.017	0.033	0.127
Geographic scope	−0.309**	−0.363***	−0.340***	0.096	−0.319	−0.169
Product diversity	0.359	0.464*	0.506**	0.359	0.338	0.564*
Product diversity squared	−0.020**	−0.025***	−0.019***	−0.021**	−0.019**	−0.022***
Firm size	0.459**	0.494***	0.470***	0.563***	0.488**	0.601***
Firm size squared	−0.005*	−0.006*	−0.006**	−0.007**	−0.006*	−0.008**
Debt ratio	−10.23***	−11.15***	−10.53***	−11.04***	−10.15***	−11.49***
Acquisitions	0.204*	0.204*	0.200*	0.193*	0.186*	0.163
Equity alliances	0.791	0.717	0.835	0.668	0.768	0.692
R ²	0.64	0.65	0.64	0.65	0.64	0.66

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Tests of the hypotheses

Hypothesis 1 predicts that the speed of internationalization negatively moderates the relation between a firm's foreign subsidiaries and profitability. Models 2 and 6 display the models that include the interaction between the variables 'number of foreign subsidiaries' and 'speed,' which is used to test this hypothesis. The estimates on foreign subsidiaries are positive and significant, which indicates that these have a beneficial influence on the profitability of a firm. The coefficient on the main term of the variable speed is insignificant, which indicates that speed of international expansion has no *direct* effect on profitability. However, as predicted, speed does negatively *moderate* the relationship between foreign subsidiaries and profitability. Hence, the models show that the subsidiaries of companies that very quickly expand abroad contribute less to a firm's profitability than the subsidiaries of companies that expand more slowly. This corroborates Hypothesis 1.

Models 3 and 6 include the interaction between foreign subsidiaries and the product scope of the expansion process. Hypothesis 2 implies that simultaneous entry into a variety of businesses negatively moderates the (positive) impact of a firm's foreign subsidiaries on its profitability. The estimate is consistently negative and significant, which supports Hypothesis 2. As evidenced by the main term of foreign subsidiaries combined with its interaction with product scope, firms benefit from international expansion, but less so if it also takes them into many different businesses.

Likewise, Hypothesis 3 predicts a negative interaction between foreign subsidiaries and geographic scope of the international expansion process. The interaction in Models 4 and 6 is indeed negative and significant, which corroborates the hypothesis: the larger the number of countries where the foreign expansion takes place, the smaller the increase in profitability due to setting up foreign subsidiaries. Interestingly, in the models without the interaction, the coefficient on the main term 'geographic scope' is negative, suggesting that firm profitability is hampered by being active in a number of different countries. Adding the interaction reveals why: foreign subsidiaries contribute less to firm profitability when they are placed into many different countries. They contribute more to profitability when they are concentrated in a limited number of geographical markets. If this effect

is sampled out through the inclusion of the interaction, the main term on geographic scope becomes insignificant. This suggests that the benefits of international expansion stem from operating in a number of foreign subsidiaries abroad, rather than from diversifying into different countries. We will return to this issue in more depth below, where we will present the results of further analysis.

Finally, Models 5 and 6 show that the interaction between foreign subsidiaries and the irregularity of the expansion process is consistently negative and significant. This supports Hypothesis 4: firms that have expanded through an irregular pattern benefit less, in terms of profitability, from having foreign subsidiaries.

Size of the effects

The coefficient of the variable foreign subsidiaries in Model 1 implies that, on average, every additional subsidiary increases a firm's return on assets by 0.108 percent. This number increases to 0.412 percent if controlled for the negative, moderating effect of speed (Model 2). For example, if a firm establishes 10 subsidiaries in 5 years it would increase its return on assets by 1.96 percent ($= 0.412 * 10 - 0.108 * 10 * 10/5$). Likewise, the coefficients in Model 3 imply that a company that places 10 subsidiaries in seven countries increases its return on assets by 2.38 percent ($= 0.357 * 10 - 0.017 * 10 * 7$). Similar computations can be made for the effect of product scope (Model 4) and irregularity (Model 5).

These effects highlight the trade-offs in the models, for instance, between the positive effect of having foreign subsidiaries and the moderating negative influence of the speed at which they are established. Figure 2 illustrates this trade-off based on the estimates in Table 2. Slow foreign expansion (speed = 0.5) limits the negative effects of speed, and firms following this expansion pattern benefit more from their foreign subsidiaries than firms that establish subsidiaries at a higher pace (speed = 2 or 5), as shown by the higher, positive slope of the relationship depicted in Figure 2(a). Obviously, slow speed also leaves the firm with very few subsidiaries to benefit from. Plotting the profitability of these internationalizing companies against time (Figure 2b) shows that the company expanding at speed = 2 is better off than the firm expanding at speed = 0.5. It simply has more subsidiaries to benefit from, which compensates for the negative

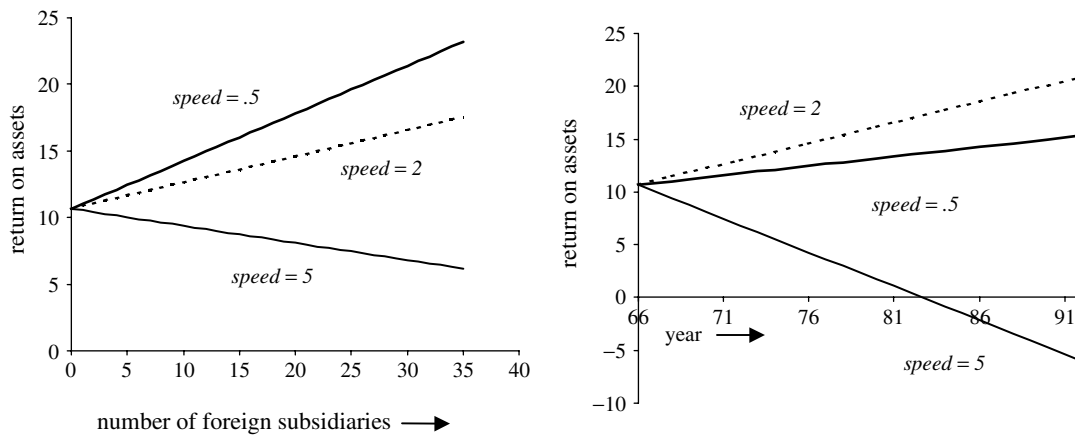


Figure 2. (a) Estimated relationship between foreign subsidiaries and firm profitability moderated by speed. (b) Estimated profitability of internationalizing firms during the course of time

effect of speed. For instance, after 10 years it has 20 companies while the firm expanding at speed = 0.5 has only five. Furthermore, *very* rapid expansion (speed = 5) annuls the entire beneficial effect of foreign subsidiaries; in this case international expansion even decreases firm profitability.

The model estimates, however, imply that the firms in our sample typically did not overstrain themselves in terms of speed, product and geographic scope, and irregularity. For instance, additional computations showed that firms only failed to increase profitability as a result of their foreign expansion if they selected expansion strategies implying that they were at least one standard deviation above average on all four moderators.

The total amount of variance explained by the different models ranges from 64 percent to 66 percent. Hence, allowing for interactive effects in models does not explain much *additional* variance; instead it reveals the different components that constitute it (cf. Jaccard *et al.*, 1990; Aiken and West, 1991), which enables a more fine-tuned view on the relationships between the different variables. A good indication of the impact of the interaction effects is the change in the main term ‘foreign subsidiaries’ induced by inclusion of interactions. In Model 1 the coefficient of this variable indicates that the profitability of a firm, on average, increases by 0.108 percent per foreign expansion. When controlling for the moderating effects of the four process characteristics, this coefficient increases to 0.539 percent. Hence, together, the four moderating variables account for 0.431

percent (0.539 – 0.108) of the effect on firm profitability per foreign subsidiary.

Geographic scope versus number of foreign subsidiaries

The degree of internationalization of a firm can be measured in several ways, for instance, through the *size* of its foreign operations (e.g., the number of foreign establishments) or the *scope* of these operations (e.g., the number of foreign countries where the firm is operating). Large size does not necessarily imply large scope: firms may either choose to spread their operations over a large number of countries, or concentrate their foreign presence in a few selected countries. Previous research has typically focused on capturing either the size or the scope of foreign operations (e.g., Grant, Jammine, and Thomas, 1988; Geringer *et al.*, 1989; Tallman and Li, 1996), or combined them into one variable, through an entropy measure (e.g., Hitt *et al.*, 1997). In our study we measured them separately: the number of foreign subsidiaries relates to the size of foreign operations, while we measured geographic scope through the number of countries involved. Our results clearly show that the two may have very different effects—something that is concealed when they are combined into one measure. The number of foreign subsidiaries consistently has a positive influence on firm profitability throughout the different models, while in the model without interactions (Model 1) geographic scope is even negative. If controlled for the moderating effect of geographic scope (cf. Hypothesis

3), the direct effect on profitability appears negligible. Hence, internationalizing firms seem to benefit predominantly from building an organization that consists of multiple foreign subsidiaries.

Our theory suggests that expansions dispersed across many countries tax a firm's absorptive capacity more than expansion into a limited number of geographic markets. Our arguments also seem to imply that expansions into different countries are more easy to absorb if the countries are related (e.g., Ronen and Shenkar, 1985). Therefore, we also computed an entropy measure of geographical 'diversification' (Kim, 1989; Vachani, 1991) to replace our measure of geographic scope, because the former measure also takes into account to what extent countries are alike. We defined country regions according to Ronen and Shenkar (1985) and assigned weights using the number of subsidiaries per region, rather than sales per region (Barkema and Vermeulen, 1998), to avoid problems with assigning exports and for reasons of data availability. Analyses with this alternative measure replicated the results as reported above, with the interaction between the number of foreign subsidiaries and geographical diversification even more significant (-0.44 ; $p < 0.0001$). Apparently, the moderating negative effects of the geographic scope of the expansion process are aggravated if the countries involved are highly dissimilar. This raises further support for our theory. Moreover, this more fine-grained analysis of geographic scope resulted in a positive estimate of the direct effect of geographic scope on firm profitability (3.09 ; $p < 0.0001$), in addition to the influence of the number of foreign subsidiaries (0.81 ; $p < 0.0001$). These results show that the process of expanding into very different countries is difficult and toil-some; however, once a firm has established this position, it may experience a positive influence from its dispersed foreign presence on its profitability.

Sensitivity analysis

When estimating models with interaction terms it is often advisable to center the variables involved (Jaccard *et al.*, 1990; Aiken and West, 1991): to reduce problems of multicollinearity, or when the variables do not have a meaningful interpretation at value zero. Neither condition appears to apply to our models; however, to examine the sensitivity of the support from our models to this alternative

specification, we reestimated all models using centered variables. All above-mentioned results were clearly replicated.

To further examine the robustness of our findings, we also estimated models with return on assets replaced by return on equity. Although it has been argued that return on assets is preferable to return on equity because the latter is sensitive to differences in capital structure (Hitt *et al.*, 1997), the estimation results were largely similar, except for the influence of process irregularity, which lost some of its statistical significance (although still $p < 0.10$). Models using a composite measure based on both return on assets and return on equity led to similar conclusions to those reported above.

Alternative entropy measures for product diversification (Jacquemin and Berry, 1979; Hoskisson *et al.*, 1993), based on the SBI codes in which the foreign subsidiaries were active, also led to highly similar findings, including a significant interaction with number of foreign subsidiaries (-0.14 ; $p < 0.0001$). Dispersion across different businesses appears to be particularly complicated if those businesses are very different. These findings raise further support for the perspective outlined in this study.

Finally, we estimated models with lagged independent variables (1, 2, or 3 years) *vis-à-vis* firm profitability, since investment in foreign operations may precede profit gains. The models produced results comparable to those reported above. Only the estimates on product scope appeared somewhat less significant, especially in the models with longer time-lags, but further analysis indicated that this was mainly due to the smaller number of observations on which the estimates were based—we had to delete a number of observations, dependent on the specific time-lag in the model, due to missing values in the early years of the sample.

DISCUSSION

The internationalization of a firm is a complex task. Although many potential benefits of international expansion have been identified in the literature, the empirical support for a key assumption of this theory—that firms successfully increase their profitability as a result of international expansion—is mixed. Our study adds to this literature

by showing that how much an MNC benefits from where it stands 'today,' in terms of its international posture (e.g., Tallman and Li, 1996; Hitt *et al.*, 1997), depends on how it has arrived there. We developed and tested a theory regarding how various characteristics of the internationalization process of a firm influence how much its foreign subsidiaries 'currently' contribute to its profitability. Consistent with predictions, we found that the speed at which subsidiaries were established, the dispersion of the expansion process into different countries and businesses, and the irregularity of the process (i.e., large expansion peaks and periods of inactivity, as opposed to a rhythmic pace) negatively moderate how much a firm benefits from its international operations.

We explained this phenomenon by arguing that 'diseconomies of time compression' (Dierickx and Cool, 1989) emerge during the process of international expansion. We argued that these diseconomies exist because the capacity of a firm to absorb expansion is constrained, owing to properties such as bounded rationality, cognitive limitations, and structural inertia. Hence, in our theory, absorptive capacity (Cohen and Levinthal, 1990) drives time compression diseconomies. Internationalizing firms that overstrain their absorptive capacity are more likely to devote suboptimal time and attention to setting up greenfield operations; to screening, selecting, and implementing acquisitions; to weaving new subsidiaries into the internal network, and to nurturing their role within the MNC. It is also less likely that such firms have discarded obsolete home-grown mental maps, structures, systems, and processes that are no longer optimal, and replaced them with new ones that fit the international environment better. As a result, the contribution of expansions formed during such a process of 'forced' internationalization to firm profitability is limited.

Our study clearly adds to prior research that compares the different strategic postures of firms at a given point in time. Even if two firms have ended up in the same strategic position—for instance, having the same level of internationalization—they may have gone through very different expansion processes, which may have resulted in different profitability levels. Hence, to fully understand profitability differences of internationalized firms, one may have to look back in time and take into account how they have arrived there. Some expansion routes may allow firms to absorb

their efforts and benefit from their position (cf., Chang, 1995), while other growth paths may be more difficult to digest and inhibit potential benefits from materializing. From this perspective, our study adds to more general theory on the growth of firms (Penrose, 1959).

Several fundamental managerial implications follow from our study too. Prior research has shown that high growth in one business places constraints on the ability of the firm to grow in other dimensions (Galunic and Eisenhardt, 1996). Our study implies that adding complexity in one dimension, for instance by increasing the pace of the internationalization process (in terms of the number of foreign expansions), implies that a firm needs to restrict complexity in other dimensions, for instance by limiting the number of novel countries or businesses entered during the expansion. Likewise, firms that feel the need to quickly enter a relatively large number of countries—to capture market share early, obtain a global presence, or establish a global standard (e.g., Caves, 1982)—should be aware of the restrictions this imposes on the pace of its international expansion in terms of the number of new subsidiaries that can be successfully established and absorbed. Similar considerations apply to entering different businesses and following an irregular expansion pattern. In other words, firms need to follow a path of balanced growth; they need to be aware of the different trade-offs that exist and of the necessity to make clear strategic choices about which of the different dimensions (i.e., pace, rhythm, and scope) they will prioritize. Otherwise they may jeopardize the profitability of the MNC they are building.

Practice shows that firms are frequently cajoled into a strategy of fast growth, because investors and analysts repeatedly expect commanding figures or because they imitate competitors that make similar moves (DiMaggio and Powell, 1983; Haveman, 1993b). Bandwagon effects may even result in waves of mergers and acquisitions, as observed by prior research at different points in time (Shleifer and Vishny, 1991; Stearns and Allan, 1996). While such behavior may be understandable, our study suggests that it may not be optimal from a strategic perspective. Yes, acquisitions may benefit a firm, since they may have long-term advantages that transcend the focal acquisition, by 'revitalizing' the firm and consequently enhancing its long-term profitability

and survival, as suggested by recent research (Vermeulen and Barkema, 2001). However, there are constraints on how much expansion a firm can digest, as indicated by the present study. Periods of high expansion activity (for instance, during acquisition waves) followed by relative inactivity—the very definition of an irregular expansion pattern in our study—reduce profitability. A regular expansion pattern rather than uncontrolled herd behavior helps to build a profitable MNC.

Limitations and suggestions for further research

Our paper used a behavioral perspective on the benefits of building a multinational corporation. This also informs the boundaries of our theory. Time compression diseconomies and the phenomenon of process dependence predominantly affect the potential benefits of foreign expansion that result from the social interaction between units within an MNC (e.g., mutual learning, transfer of intangible assets). Our theory probably applies much less to the potential advantages that result from higher efficiency in MNCs (e.g., common purchasing, tapping into low-cost sources of labor)—these benefits could perhaps be achieved regardless of, for instance, the speed of the internationalization process.

A limitation of our study in terms of data is that the companies in our sample do not form a random sample. They are all firms that ‘survived’ for a sustained period of time (i.e., over 25 years). As reported in the Results section, most of the firms in our sample did not seem to overstrain their capacity in terms of their speed of foreign expansion, scope, and pattern regularity. This may be due to the ‘survival bias’ in our sample: firms with high levels on these dimensions are more likely to have failed, i.e., to go bankrupt, or perhaps have been taken over, and as a result were not included in our study. We welcome future research examining the influence of expansion process characteristics examined in our study on the performance of a broader category of organizations, perhaps using other performance measures such as the exit rate of companies (e.g., going bankrupt or not, or having been taken over), and so on.

Another concern is the issue of generalizability. Although our firms stem from a wide variety of industries, a limitation of our study is that the

results are based on firms headquartered in a single country. Furthermore, these firms all started venturing abroad in the late 1960s, early 1970s, with a large proportion of expansions taking place within the EU. Although countries within the EU can also be very different (Ronen and Shenkar, 1985; Lane, 1995), additional empirical research using samples from other countries, addressing industry-specific effects, and/or examining the influence of company size and other characteristics would clearly add to the current study. Diseconomies of time compression may be more or less prevalent under different circumstances.

Along the same lines, absorptive capacity and, as a result, the incidence of time compression diseconomies may vary with organizational characteristics. For instance, it may depend on characteristics of the top management team (e.g., Eisenhardt and Schoonhoven, 1990), or the current structure of the firm (Barkema and Vermeulen, 1998). Future research uncovering how these and other factors moderate the impact of process pace, scope, and regularity on the profitability of a firm’s (international) expansion would complement the current study as well.

Finally, some of the potential benefits of internationalization identified in the literature seem more closely associated with the size of foreign operations (e.g., Franko, 1989; Kobrin, 1991), others with having operations in different countries (e.g., Kogut and Kulatilaka, 1994). Our study distinguished between the number of foreign subsidiaries of a firm and the geographic scope of its expansion. Future research aimed at further disentangling these different effects would greatly advance our understanding of the benefits of internationalization and their contingencies.

CONCLUSION

Theory and practice suggest that firms may profit substantially from having an international presence. However, as our longitudinal study showed, there are limits to how much expansion an organization can cope with. Internationalization cannot be forced, in terms of the pace of setting up foreign subsidiaries, and the number of geographic and product markets covered in the process. Irregular, ad hoc growth further complicates the absorption of the foreign expansion by the MNC. We conceptualized organizational expansion as a dynamic

process, where history and time matter, and the path taken determines the lucre at arrival. We hope that this perspective will prove useful for future investigation of the growth of firms and their prosperity.

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