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The Performance Implications of Speed, Regularity, and Duration in Alliance Portfolio Expansion

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Extant research on the management of time shows that the speed of undertaking new strategic moves has negative consequences for firm profitability. However, the literature has not distinguished whether this outcome results from the effects of speed on firms' revenues or from the effects of speed on firms' costs, or examined how firms can become more profitable by reducing the negative consequences of speed. We address these gaps for a specific strategic move: alliance portfolio expansion. We show that the speed at which firms expand their alliance portfolios increases managerial costs disproportionately relative to revenues, leading to an overall negative effect on firm profitability. However, a more regular rhythm of expansion and a longer duration of existing alliances reduce the negative profitability consequences of expansion speed by moderating the increase in managerial costs. These findings suggest that firms that make strategic moves, such as alliances, may reduce the negative profitability consequences of speed when they maintain a regular expansion rhythm and when their existing strategic engagements require modest managerial resources.

Keywords: *alliance portfolio; expansion speed; pace; regularity; alliance duration; firm profitability*

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Alliance portfolio expansion is a major strategic move that can have a profound effect on firm profitability. Prior research has shown that interfirm profitability variations are driven by attributes such as the size of alliance portfolios, partner quality, redundancy among partners, and partner diversity (Ahuja, 2000; Baum, Calabrese, & Silverman, 2000; Goerzen & Beamish, 2005; Lavie & Miller, 2008). However, the development of alliance portfolios is not an isolated event, and firm profitability is driven not only by the attributes of alliance portfolios but also by the temporal variations and patterns through which they are built (Das & Teng, 2002; Shi & Prescott, 2011). A key temporal dimension that may affect firm profitability is the speed at which firms expand their alliance portfolios (Shi, Sun, & Prescott, 2012). However, the extant research has not investigated how the expansion speed of alliance portfolios affects firm profitability.

To enhance our understanding of the effect of expansion speed on profitability, we investigate how speed of alliance portfolios' expansion influences firm-level revenue generation, "managerial costs," and, thereby, profitability. By analyzing both the revenue-generating and cost-escalating consequences of alliance portfolio expansion speed, we offer a finer-grained view of the factors affecting firm profitability when expansion speed is increased. Furthermore, this distinction allows us to investigate how two additional temporal dimensions—the rhythm of expansion and the duration of alliances in existing portfolios—influence the ability of firms that expand their alliance portfolios quickly to accelerate revenue generation while minimizing the increase in managerial costs associated with rapid expansion.

Managerial costs are a particularly salient feature in alliance portfolio expansion that is associated with the time and effort invested in creating, nurturing, and managing alliances (White & Lui, 2005). Managerial costs do not depend just on transaction costs (i.e., the costs associated with partners behaving opportunistically; Williamson, 1985). Creating and sustaining alliance portfolios is a managerially challenging and costly endeavor. Even when firms do not face transaction costs, alliance portfolio expansion may still increase managerial costs because of the need to identify and interact with new partners, to maintain an effective interorganizational interface, and to implement changes in response to partners' actions (White & Lui, 2005). Alliance portfolio expansion therefore requires partner firms to commit substantial managerial time to developing partner-specific capabilities, to building trust and reputation, to identifying synergies, and to creating positions in networks of alliances (Dyer & Singh 1998; Schilke & Goerzen, 2010).

Our analysis of 147 high-tech firms engaged in 1,043 alliances reveals that alliance portfolio expansion speed is positively associated with both firm-level revenue generation and managerial costs. However, managerial costs increase disproportionately more than revenues, leading to a negative net effect on firm profitability. Subsequently, we show how firms can expand quickly while avoiding, or at least reducing, the disadvantages of rapid expansion. This analysis underscores the moderating role of the regularity with which firms expand their alliance portfolio and the duration of existing alliances in the firm's portfolio. Firms that expand their alliance portfolio in a more regular rhythm and firms that sustain their existing alliances for longer durations can limit the negative implications that expansion speed has on managerial costs. In other words, a constant alliance portfolio expansion speed and lower managerial resource demands resulting from maintaining alliances for longer durations help firms to reduce the disproportionate increase in managerial costs, thus improving their profitability.

We extend prior research on the speed, regularity, and duration of expansion and provide insights for firms undertaking new strategic moves, in general, and those expanding their alliance portfolio, in particular. Prior research has focused on the overall profitability consequences of speed as it pertains to strategic moves, such as entry into new countries and business sectors (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). Engaging in strategic moves at greater speeds has been shown to have negative profitability implications (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). Yet these studies have not explicitly considered whether and why profitability variations are driven by differences in revenue generation or differences in the managerial costs involved in making strategic moves. The current study highlights that the reason for such profitability reduction is the disproportionate increase in managerial costs relative to revenues, rather than a decrease in revenues due to firms' limited capacity of capturing the benefits of fast-paced strategic moves (Vermeulen & Barkema, 2002). Clearly, each type of strategic move differs in its context and in its revenue-generating and cost-escalating patterns. Yet we expect the direction of the hypothesized effects to remain similar.

Our analysis further identifies the circumstances in which firms that expand quickly can succeed in reducing the negative effects of this strategy. These results show that firms that make strategic moves at high but constant speed manage to moderate the negative consequences of rapid expansion. Hence, whereas previous studies have focused on the direct effect of regularity on firm performance (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2012; Vermeulen & Barkema, 2002), we show that a regular expansion rhythm enables firms that make fast-paced strategic moves to reduce the acceleration of managerial costs. Furthermore, although research on the profitability implications of expansion speed has considered the role of regularity or rhythm, it has not sufficiently explored the duration of existing strategic engagements. Our analysis suggests that because existing strategic engagements of longer duration place lower managerial demands compared to "younger" strategic engagements, they increase firms' capacity to direct managerial resources to new strategic moves, thus reducing the negative effect of expansion speed on managerial costs.

Overall, our findings suggest that two firms may end up undertaking similar strategic moves but experience different profitability outcomes because they have expanded at different speeds, with different regularities, and for different durations. The remainder of this study is organized as follows: The next section presents our theoretical framework and specifies our hypotheses. We then present our data, measures, and methods and follow with a presentation of our results. Finally, we present the conclusions and elaborate upon the theoretical and practical implications of the study.

Theoretical Framework

The Performance Consequences of Speed

The extant research on time management and its consequences (Shi et al., 2012) suggests that new strategic moves may accelerate organizational learning and facilitate the acquisition of new capabilities and the adoption of new routines and processes (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). Fast-paced strategic moves may also help firms avoid competency traps, implement new initiatives, and pursue new opportunities by facilitating the

implementation of "change" routines that support subsequent strategic moves (Amburgey, Kelly, & Barnett, 1993; Barkema & Schijven, 2008; Beck, Brüderl, & Woywode, 2008). Fast-paced strategic moves can further help firms adapt to changing environments (Teece, 2007).

Although these benefits may assist firms in generating revenues, fast-paced strategic moves also require managerial attention, time, and resources and may disrupt existing organizational operations (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). Because establishing new organizational routines takes time, firms that engage in new strategic initiatives face substantial adaptation costs in seeking to exploit new resources and capabilities (Dierickx & Cool, 1989; Zollo & Winter, 2002). Rapid strategic moves also require senior managers to make many decisions within a short time, which raises the risk of information overload (Huber, 1991) and may lead to ineffective decision making and costly mistakes (Hambrick, Finkelstein, & Mooney, 2005). Prior studies have shown that the speed of strategic moves negatively affects firm profitability (e.g., Klarner & Raisch, 2013; Vermeulen & Barkema, 2002) and other performance measures, such as market returns (Laamanen & Keil, 2008), but this literature has not examined whether the negative effects on firm profitability result from increases in managerial costs, difficulties in capturing new streams of revenues, or a combination of the two.

The extant research also shows that firm profitability depends on the regularity at which firms make strategic moves, with regular expansion having positive effects on profitability (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). Whereas this observation has its own merits, the literature is silent regarding the question of whether regularity also has a moderating effect on the relationship between the speed of strategic moves and firm profitability. As a result, it remains unclear how fast-paced strategic moves affect profitability differently depending on whether they are made regularly or irregularly. Similarly, we know very little about how the temporal characteristics of firms' existing strategic engagements, such as their duration (Child & Yan, 2003; Shi et al., 2012), affect the profitability consequences of fast-paced strategic moves. We confront the unresolved issues concerning the effect of speed and its interaction with regularity and the duration of existing strategic engagements on revenue generation, managerial costs, and firm profitability in the context of alliance portfolio expansion.

Clearly, there are variations in the revenue-generating and cost-increasing patterns within and across different types of strategic moves, such as alliances, acquisitions, entry into new foreign markets and business segments, and other types of investment. For example, managerial costs in alliances result from monitoring and interacting with partners, managerial costs in foreign market entries result from the need to identify new locations and analyze their characteristics, and managerial costs in acquisitions result from the complexities of integrating firms with different structures and cultures into a unified entity. Yet we expect the relationship between the speed of undertaking new strategic moves and firm-level revenue generation and managerial costs to be similar, where fast-paced strategic moves are expected to increase both the benefits and costs of firms (Pacheco de Almeida, Hawk, & Yeung, 2015).

In the following subsections, we define the nature of the benefits of building a portfolio of alliances, the effect of building such a portfolio on revenue generation, and the associated managerial costs firms face. Then, we hypothesize how the speed of alliance portfolio expansion and its interactions with the regularity of alliance portfolio expansion and the duration of existing alliances affect revenue generation, managerial costs and, subsequently, firm profitability.

Revenue Generation and Managerial Costs of Alliance Portfolios

It has long been recognized that firms do not have to fully own resources to enjoy their benefits (Das & Teng, 2000; Kale, Dyer, & Singh, 2002; Lavie, 2006; Zaheer & Bell, 2005). Rather, they can exploit rent-generating resources residing outside the firm's boundaries (Dyer, 1996; Gulati, 1999; Gulati, Nohria, & Zaheer, 2000) that are embedded in interfirm routines and processes (Dyer & Singh, 1998). Hence, firm performance is directly linked to the alliances in which firms participate, where idiosyncratic interfirm linkages may result in economic benefits generated through the joint contributions of alliance partners. Such benefits may take the form of greater product differentiation and faster product development cycles (Dyer & Singh, 1998; Vasudeva & Anand, 2011). In turn, greater differentiation and faster development cycles allow firms to improve competitive positions, expand customer bases, and increase their revenues (Belderbos, Carree, & Lokshin, 2004; Singh & Mitchell, 2005; Stuart, 2000).

Engagement in alliances, however, may also lead to increased managerial costs. These costs are associated with the managerial time and effort required to generate and maintain new relationships, develop partner-specific learning capabilities, monitor alliance outcomes, build trust and reputation, and identify synergies and complementarities (Dyer & Singh, 1998; Levinthal & Fichman, 1988; Schilke & Goerzen, 2010; Zaheer, McEvily, & Perrone, 1998). Managerial costs not only result from the transaction costs associated with partners that behave opportunistically (Williamson, 1985) but also stem from the need to collaborate with alliance partners to achieve certain strategic objectives. Even in the absence of transaction costs, managerial costs may be incurred. Such costs can be classified into "task-related" and "social" dimensions (White & Lui, 2005). Task-related dimensions involve the difficulties of coordinating interdependent projects, changing internal routines, and addressing conflicts and complexities in knowledge transfer. Social dimensions involve the need to establish an effective interorganizational interface and to overcome cultural and social differences (White & Lui, 2005).

Because managers need a stream of supporting services to operate effectively, managerial costs do not merely refer to managers' direct compensation. Managerial costs include the costs related to the time and effort invested by existing managers, the costs related to the acquisition of additional managerial resources, and the costs of supporting managerial resources, such as administrative assistance, legal and financial consulting, communication, and travel.

The Effects of the Speed of Alliance Portfolio Expansion

We expect the speed with which firms expand their alliance portfolios to have a substantial impact on revenue generation, managerial costs, and, subsequently, firm profitability. Rapid alliance portfolio expansion is likely to positively affect the generation of firm revenues by accelerating organizational learning and the adaptation of new routines and processes from alliance partners (Dyer & Nobeoka, 2000; Hoffmann, 2007). As in the case of acquisitions (Barkema & Schijven, 2008; Laamanen & Keil, 2008), a faster expansion rate can help firms to more rapidly access new resources, capitalize on external knowledge, and learn from their alliance partners how to develop more efficient structures (Kale, Singh, & Perlmutter, 2000). A faster alliance portfolio expansion also enhances firm flexibility, which is particularly important in volatile competitive environments (Teece, 2007). In turn, these

mechanisms enable firms that expand their alliance portfolios quickly to enjoy advantages, such as greater product differentiation and faster product development cycles (Dyer & Singh, 1998). A faster alliance portfolio expansion allows firms to widen their customer base and increase revenues (Singh & Mitchell, 2005; Stuart, 2000) more than firms that expand their alliance portfolios slowly.

However, given that integrating partners' resources with firms' existing routines and processes takes time and consumes substantial managerial resources (Barkema & Schijven, 2008; Miller, Fern, & Cardinal, 2007), a higher speed of alliance portfolio expansion may challenge existing managerial capacity to identify synergies, change organizational routines, and create interfaces with partners (Huber, 1991; Laamanen & Keil, 2008). A rapid alliance portfolio expansion therefore requires significant effort from existing managers, the acquisition of additional managerial resources, and a stream of administrative support services, which in turn significantly increase the firm's managerial costs.

When firms rapidly expand their alliance portfolios within a short time span, they are constrained by time compression diseconomies (Dierickx & Cool, 1989). According to asset accumulation theory (Dierickx & Cool, 1989), time compression diseconomies pertain to the additional costs incurred by firms seeking to quickly reach a given level of asset stock when this stock could be accumulated more economically over a longer duration. In the current context, this theory implies that creating many alliances within a short time requires a larger increase in the commitment of managerial resources (and consequently in related administrative support) than does establishing the same number of alliances over a longer period. Rapid alliance portfolio expansion requires substantial investments of managerial resources to avoid costly mistakes due to information overload (Huber, 1991) and to ensure that existing processes are appropriately adapted to those of partners. Such investments are accompanied with convex adjustment costs; that is, the cost of the investments increases disproportionally when the speed of expansion is accelerated (Knott, Bryce, & Posen, 2003). Time compression diseconomies are less likely to arise when alliance portfolios are developed gradually because the organization can handle the associated complexities without overstretching its existing managerial resources and administrative support services (Barkema & Schijven, 2008).

Because expansion speed increases both firm revenues and managerial costs, the net effect of speed on firm profitability will depend on whether the effect of rapid expansion on revenues is greater than the increase in managerial costs. We argue that although fast-paced expansion may enhance revenue generation, the disproportionate increase in managerial costs will lead to lower profitability. This prediction derives directly from the notion of time compression diseconomies, which predicts that a higher speed of conducting a given process will lead to a nonlinear increase in the costs of such a process (Dierickx & Cool, 1989). Overall, we expect disproportionate increases in managerial costs when firms expand their alliance portfolios rapidly to outweigh the positive effects of a rapid alliance portfolio expansion on revenues, which will negatively affect profitability:

Hypothesis 1: A higher expansion speed of the alliance portfolio (a) enhances revenue generation, (b) disproportionately increases managerial costs, and therefore (c) reduces profitability.

Given the predicted effects of alliance portfolio expansion speed on firms' revenues and managerial costs, an important strategic question is to determine when firms can expand quickly and at the same time reduce the negative effects of a rapid expansion. We argue that

two important factors that may make such an expansion possible are (a) the regularity with which firms conduct a rapid alliance portfolio expansion and (b) the duration of firms' existing alliances when making a rapid alliance portfolio expansion. The regularity with which strategic moves are made is often studied together with the speed of making such moves (e.g., Klarner & Raisch, 2013; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002). However, the duration of existing strategic engagements has been overlooked in this literature. Yet it is a key construct in studying temporal aspects of alliance portfolios (Shi et al., 2012) and has implications for both managerial costs and revenue generation. Since both the regularity of alliance portfolio expansion and the duration of the existing alliances are closely associated with the managerial demands placed on firms (Shi et al., 2012), they are both likely to play a significant role in facilitating a rapid alliance portfolio expansion.

The Moderating Effect of Alliance Expansion Regularity

Regularly paced alliance portfolio expansion is likely to enhance revenue generation while reducing managerial costs. By contrast, time periods between the establishment of alliances that are either too short or too long are likely to negatively affect the skills, structures, and processes a firm draws upon (Klarner & Raisch, 2013; Laamanen & Keil, 2008) when establishing new alliances. In turn, these effects will likely lead to lower revenues and higher managerial costs.

Regularity in alliance portfolio expansion increases predictability. As a result, firms can interpret their experiences in establishing alliances in the past and relate these experiences to similar organizational routines and operations (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002) that are required for future alliances. Predictability therefore makes the process of alliance building more efficient (Gulati, 1995). Firms become accustomed to a given rate of new alliance engagement. Hence, they can effectively plan, implement, and adapt to new collaboration agreements because they are accustomed to the routines and structures required to assign responsibilities, take the required actions, and make appropriate resources available (Shi & Prescott, 2012). In turn, this enables firms to better leverage their alliance portfolios to increase revenues. It further allows firms to use their managerial capacities more effectively to reduce the managerial costs involved in meeting the requirements of the chosen rhythm (Klarner & Raisch, 2013).

Conversely, firms that expand at a highly irregular pace face complexities in creating new alliances—both during periods of expansion peaks and during periods of inactivity—because organizational structures and systems are seldom sufficiently flexible to manage the resulting complexities of abrupt and discontinuous changes (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2012). During peaks of rapid expansion, firms will find it difficult to assimilate knowledge and resources from their partners to reap the benefits of engaging in alliances and increasing revenues. Such peaks represent an extreme case of time compression diseconomies and will therefore also increase managerial costs significantly.

Alternatively, periods of inactivity may lead firms to gradually forget the practices they have learned in previous alliances (Darr, Argote, & Epple, 1995). This is frequently the result of the overturn of personnel who engaged in previous alliances, marked by managers leaving the firm or switching positions within it, leading to the loss of valuable knowledge and experience (Laamanen & Keil, 2008), hampering future alliance formation. Such inactivity may become detrimental to the ability of firms to reap the benefits of new alliances and increase

their revenues. It may also result in additional managerial costs, as firms will need to redevelop the necessary skills, routines, and structures to effectively reengage in new alliances.

Hence, maintaining a regular expansion rhythm is likely to allow firms to avoid some of the negative effects of rapid alliance expansion.[1] A rapid but constant pace of alliance expansion may help firms leverage the advantages of predictability when establishing alliances. It also allows them to use their knowledge of similar organizational routines and operations to become more efficient at building new alliances (Gulati, 1995; Laamanen & Keil, 2008). This efficiency further enhances firms' ability to leverage rapid alliance portfolio expansions to generate revenues while reducing time compression diseconomies and their associated managerial costs. By contrast, the combination of rapid alliance portfolio expansion and irregular expansion rhythm is likely to stretch a firm's managerial capacity even further. This combination limits firms' ability to rely on past experiences due to the severe time constraints and the limited predictability that the combination of high speed and irregular expansion pace imposes. This combination will therefore further increase managerial costs and constrain firms' ability to use previously learned skills and processes to generate revenues.

We therefore expect firms that follow both rapid and constant alliance portfolio expansion to generate higher returns and incur lower managerial costs than firms that adopt a rapid expansion but irregular rhythm. In other words, firms that choose to expand their alliance portfolio rapidly but keep their expansion rhythm regular are likely to further increase their revenues (over and above the revenue generation effect of rapid alliance portfolio expansion). In turn, these firms reduce their managerial costs and improve their profitability. By contrast, firms that expand their alliance portfolios rapidly but irregularly will find it difficult to exploit their alliance portfolio expansion to generate revenues. These firms will further face higher managerial costs because of time compression diseconomies. As a result of this combination, they will achieve lower profitability. Accordingly, we propose the following:

> *Hypothesis 2:* A regular alliance portfolio expansion rhythm (a) enhances the positive effects of a higher expansion speed on revenue generation, (b) decreases the positive effects of a higher expansion speed on managerial costs, and therefore (c) decreases the negative effects of a higher expansion speed on profitability.

The Moderating Effect of Alliance Portfolio Duration

The average duration of the alliances in alliance portfolios varies across firms. We expect such variations and the associated challenges that firms face when their portfolios consist of younger alliances (relative to more mature alliances) to have a profound impact on the revenue, managerial costs, and profitability consequences of a fast-paced alliance portfolio expansion. Younger alliances are characterized by limited trust, because partners are unfamiliar with one another's processes and systems (Dyer & Singh 1998; Kale et al., 2002; Lavie, 2006). A portfolio consisting of shorter-duration alliances requires firms to invest substantial managerial time and effort in developing partner-specific learning capabilities, to monitor alliance outcomes, to build trust and reputation, and to identify synergies. These developments result in increased managerial resource demands and, hence, higher managerial costs. Mature alliances enable firms to become more familiar with their partners' needs and practices (Kale et al., 2002; Lavie, 2006). Thus, less managerial effort is required for

mature alliances than for younger alliances, in both the task-related and social dimensions of managerial costs (White & Lui, 2005).

Because the managerial resource demands of managing mature alliances tend to be lower than those of managing younger alliances, such firms have a higher capacity to expand their alliance portfolios rapidly while avoiding the pitfalls of time compression diseconomies faced by firms engaged in less-established alliances. Furthermore, the greater availability of managerial resources in firms that sustain a portfolio of longer-duration alliances is likely to make them more capable of reaping the benefits of rapidly expanding their alliance portfolios. Subsequently, this will enable such firms to increase their revenue generation relative to firms that manage less-established alliances. Altogether, we expect these mechanisms to allow firms that have a portfolio of alliances of longer duration to be able to enhance the benefits of speed to increase their revenues, reduce associated managerial costs, and thus achieve higher profitability. Accordingly, we propose the following:

Hypothesis 3: A longer alliance portfolio duration (a) enhances the positive effects of a higher expansion speed on revenue generation, (b) decreases the positive effects of a higher expansion speed on managerial costs, and therefore (c) decreases the negative effects of a higher expansion speed on profitability.

Method

Data and Sample

Our hypotheses were tested on a sample of randomly selected, Israel-based, private and public high-technology firms. High-technology firms are suitable for the current research because the alliance literature frequently focuses on such firms (Kumar & Nti, 1998; Lavie & Miller, 2008; Phelps, 2010; Stuart, 2000). The use of high-technology firms is particularly important for our analysis because the dynamic and intensive alliance formation in this sector enhances the meaningfulness, reliability, and variability of the relationships we wish to test. The sample was derived from the full list of Israel-based high-technology firms constructed by the consulting firm Dolev and Abramovitz Ltd. for the year 2007. The Dolev and Abramovitz data set is recognized as a comprehensive resource for this sector in Israel and includes approximately 400 high-technology firms that have reached the stage at which they sell their products. The data set represents the vast majority of high-tech sectors.[2] We collected data both at the firm and at the alliance level. This approach is essential for testing our framework because it allows us to link revenues, managerial costs, and profitability variations at the firm level to variations related to firms' alliance portfolios. It further allows controlling for both firm- and alliance portfolio–level effects.

Firm-level data—including revenues, number of employees, firm age, and investments attracted—were collected from the Dolev and Abramovitz data set and the Israel Venture Capital (IVC) data set. Dolev and Abramovitz Ltd. is a private company that collects and publishes annual information on Israeli high-tech firms. The IVC data set is another comprehensive source for Israeli high-technology industries.[3] We further used annual financial reports to collect firm-level financial data. These data are readily available for public firms. We were also granted access to key figures in the financial reports of private firms that represent 72% of the sample. Such financial figures include the following: general and

administrative (G&A) expenditures; operational expenses; earnings before interest, taxes, and depreciation (EBITDA); and fixed assets. Finally, we also collected patent data from the U.S. Patent and Trademark Office (USPTO). Because all the sampled firms had substantial sales in the United States, it was important to collect patent data from the USPTO.[4]

Alliance-specific data were collected from the LexisNexis Academic archive and the archives of leading Israeli financial newspapers, such as TheMarker and Globes. These archival sources were used to identify announcements of alliance formation, to identify the governance mode of each alliance agreement, and to find announcements of alliance terminations. LexisNexis Academic was further used to identify the country of origin of each alliance partner. Overall, firm-level data were collected for 147 firms over the 2000-to-2007 period. Basic *t* test comparisons of the 147 participating firms and the 253 nonparticipating firms did not show evidence of nonresponse bias in terms of the average numbers for firm revenues, number of employees, firm age, firm valuation, and industrial classification. Because the sampled firms may have been engaged in alliances established prior to 2000 and to avoid right-censoring bias, our alliance-level data also included data on active alliances established before 2000.

The firm year was used as the unit of analysis because our dependent variables were defined at the firm level (Goerzen & Beamish, 2005; Lavie & Miller, 2008). Data for 1,043 alliance announcements were transformed to alliance year records by replicating alliance records for active periods of alliance duration and by updating all time-variant variables. These records were used to form 895 firm year observations for the 147 analyzed firms by pooling the data for all alliances in a firm's alliance portfolio in a given year.

Measures

The variables required for the current study and their measures are detailed in Appendix Table A1 and are further described below.

Dependent variables. To capture firm-level revenues, we used each firm's income in a given year. To capture firm-level managerial costs, we used each firm's G&A expenditures.[5] G&A expenditures consist primarily of senior managers' compensation and of other administrative costs incurred at the head office for supporting the senior management (e.g., administrative employees, legal and accounting consulting, communication and travel costs). To further examine the extent to which this measure indeed captures managerial costs, we interviewed the CFOs of 10 random firms in our sample. These CFOs indicated that the costs related to senior managers' compensation and the direct costs of administrative support for such managers typically range between 65% and 80% of the overall G&A expenditures. Hence, the use of G&A expenditures as a proxy for firm-level managerial costs is consistent with our earlier observation that alliance portfolio engagement involves the time and effort of managers as well as administrative support services for such managers. Finally, we captured each firm's profitability through each firm's EBITDA. This measure allows us to avoid potential biases that might arise from different financing strategies, tax treatments, and depreciation rules in different industries.[6]

Independent variables. The expansion speed of a firm's alliance portfolio is operationalized as the number of new alliances that the firm has established in a given year (derived

from alliance announcements) divided by the alliance portfolio size (i.e., the number of partner firms a focal firm has) in that year. This metric has the advantages of capturing a normalized measure of alliance portfolio establishments in a given year relative to the firm's alliance portfolio size, which has been shown in past alliance portfolio research to affect firm performance (Wassmer, 2010).[7] It is noteworthy that firms are less consistent in reporting on alliance termination, whereas many announce alliance creation. We used two alternative ways to overcome this problem.

For 584 alliances (out of the total of 1,043 alliance announcements), we obtained alliance termination dates either from secondary sources or by directly approaching the relevant firms. The average duration of this subset of alliances was 2 years and 10 months. Regarding those alliances for which we could not establish a precise termination date, we followed the procedure conducted by Ahuja (2000) and Phelps (2010) to estimate alliance duration when termination dates were missing. This procedure distinguishes between joint venture (JV) alliances and non-JV alliances. We assumed that JVs with no termination announcements existed until the end of 2007, the last year of our study. Non-JV alliances with no termination announcements were presumed to exist until the end of the last year in which they were documented (in secondary sources) or until the end of the year after the year they were founded, whichever was later (Phelps, 2010). This procedure led to an average alliance duration of 2 years and 8 months. Given that the *t* test of the difference in mean alliance portfolio size when using the two alternative methods of calculating alliances' duration found no significant difference between these alternatives, we followed the second approach for all data in calculating alliance portfolio size in each year.

We followed Laamanen and Keil (2008) and used the standard deviation of alliance engagement speed within the analyzed time frame to measure alliance portfolio expansion regularity. More specifically, we used the inverse of the standard deviation ($1/s$, where s = standard deviation) as our measure. High peaks in a firm's alliance portfolio expansion combined with periods of inactivity result in a relatively high standard deviation and, therefore, low values of the engagement regularity measure. A regular pace of alliance portfolio expansion results in low standard deviation and, therefore, high values of the expansion regularity measure. Given that Hypothesis 2 concerns the advantages of regularity for rapid alliance portfolio expansion, this measure allows us to have a straightforward interpretation of regularity and to estimate its direct effects.

The alliance portfolio duration is measured as the average duration (in years) of each firm's alliance portfolio in a given year (i.e., all alliances that have not been terminated—or deemed to have been terminated—up to the end of a given year). It is computed as the sum of the duration of each firm's existing alliances divided by the number of alliances. The duration of each alliance is calculated as the time elapsed (in years) between the announcement of the alliance and the end of year *t*.[8] The alliance portfolio duration is expected to moderate the effect of the alliance portfolio expansion speed on profitability—as predicted in Hypothesis 3—and may also have a positive direct effect on the dependent variables.

Control variables. Our analysis controls for an extensive number of firm-level and alliance portfolio–level factors that might impact our dependent variables.

We control for firm size (Ahuja, Lampert, & Tandon, 2008), which is operationalized as the log of the number of employees to reduce its skewness. To control for the effects of the firm's tangible resources, our regression models also include a measure of fixed assets.

Another factor that might affect revenues, G&A expenditures, and profitability represents the financial investments made in a firm. We therefore control for total investments (in millions of U.S. dollars) made in each firm by private investors, venture capital funds, corporate venture capitalists, or acquisitions and/or through public offerings. This measure is log-transformed to reduce its skewness.

The yearly numbers of patents for which firms applied (and that were granted at a later stage) are used as a proxy for the possible impact of firms' technological innovations on their revenues, managerial costs, and profitability. The number of patents reflects high-technology firms' innovation output. The literature highlights the superiority of the number of patent citations compared to merely the number of patents as an innovation output measure, because the former reflects the patents' value (Ahuja & Katila, 2001; Grilliches, 1990). However, because patent citations are likely to lag behind the act of technological innovation, we choose the number of patents as our main proxy for innovation output.[9] A firm's level of technological innovation is expected to increase its revenues and profitability, but it may also increase managerial costs.

The degree of diversification may also affect firm profitability (Goerzen & Beamish, 2005). Because the firms in our sample are mostly single-business firms, we control for intraindustry product diversification by calculating the cumulative number of product lines that a firm has in a given year. We also control for the geographic diversification of firms. This measure is operationalized as an entropy measure of their sales across six foreign regions: North America, South and Central America, the European Union, the rest of Europe, Asia, and the rest of the world (Hitt, Hoskisson, & Kim, 1997; Kim, Hwang, & Burgers, 1993). This classification builds on the observation that regional considerations play a significant role in firms' internationalization (Rugman & Verbeke, 2004). It has the further advantage of capturing diversity between regions in terms of geographic, institutional, and cultural distances (Delios & Henisz, 2003; Ronen & Shenkar, 1985). A further control is firm age. This measure captures interfirm heterogeneity in revenues, managerial costs, and profitability that result from maturity differences. Firm age may also account for the observation that high-technology firms reach profitability at relatively late stages of their life cycle (Hart, 1995; Lee, Lee, & Pennings, 2001). Intertemporal trends are controlled for by year effects. Industry effects, representing 11 principal high-technology sectors, are used to control for interindustry variances in revenues, managerial costs, and profitability.

We control for the potential effect of prior alliance portfolio experience on revenues, managerial costs, and profitability (Anand & Khanna, 2000). Following Gulati, Lavie, and Singh (2009), we use the number of alliances in which each firm was engaged up to the beginning of each year as a proxy for prior alliance experience. In addition, alliance function diversity measures the dispersion of existing alliances across R&D, production, marketing, and customer support activities (Jiang, Tao, & Santoro, 2010). Alliance function diversity should be positively correlated with revenues and profitability because of greater learning and resource complementarity potential (Dyer & Singh, 1998; Gulati, 1999; Jiang et al., 2010; Kale et al., 2002). This measure should also be positively correlated with managerial costs due to greater coordination complexity (Goerzen & Beamish, 2005). Accounting for these alliance portfolio–level measures is likely to increase the reliability of our results because they allow us to test the possible effects of alliance portfolio–level heterogeneity on our dependent variables.

Statistical Method

To overcome potential endogeneity issues, we first take differences in our regression models to control for unobservable model-specific effects and then estimate the model using a generalized-method-of-moments (GMM) approach, thus applying panel random-effect methods. Arellano and Bond (1991) show that the most efficient set of instruments in the absence of serial correlation are found using the lagged values of the dependent variable and the potentially endogenous explanatory variables (i.e., expansion speed, expansion regularity, and duration) from t –2. Therefore, these are the instruments we adopt. Arellano and Bond's dynamic panel model has been shown to produce poor results when there are many independent variables and few periods. In such cases, fewer instruments are available (i.e., because the Arellano and Bond framework uses lags and combinations of time periods and lags to produce instruments), and the number of periods analyzed consequently decreases. Building on the work of Arellano and Bover (1995), who used lagged differences as potential instruments, Blundell and Bond (1998) exploit additional moment restrictions, which substantially improve the performance of the Arellano and Bond GMM estimator in circumstances in which the number of time series observations is relatively small (e.g., in which there are relatively few years of data). Because we have a maximum of eight periods per firm (2000–2007), we adopt the Blundell and Bond extension.

Results

Descriptive statistics and correlations are presented in Table 1. The firms in our sample are fairly young (less than 6 years old on average); they are small to medium sized in terms of their numbers of employees (131 employees on average) and revenues (US$30 million on average). On average, each firm has approximately 10 patents. Because Israel is a fairly small economy, 74% of the alliances are with foreign partners, mainly with U.S. and European firms. Firms have engaged in approximately 1.3 new alliances per year, on average, and the average alliance portfolio engagement regularity is approximately 2.7. The average duration of alliances is 2 years and 8 months (2.66). In a given year, firms have been engaged in an average of over five alliances.

The results of the GMM regressions are presented in Table 2, in which revenues, managerial costs and profitability are tested against the independent and control measures. Models 1 through 4 test the effects on revenues, Models 5 through 8 test the effects on managerial costs, and Models 9 through 12 test the effects on profitability. Models 2 through 4 show that expansion speed has a significant positive effect on revenues, supporting Hypothesis 1a. Models 6 through 8 show a significant negative effect for expansion speed on managerial cost, thus lending support to Hypothesis 1b. Models 10 through 12 show a significant negative effect of expansion speed on profitability, thus supporting Hypothesis 1c. Importantly, we also investigate whether the increase in managerial costs is indeed disproportionate to the increase in revenues, which would lead to a reduction in profitability growth. When comparing the coefficients of expansion speed in Models 2 through 4 (predicting revenues) and Models 6 through 8 (predicting managerial costs), Wald tests show the coefficients for managerial costs are consistently significantly larger than those for revenues ($p > \chi^2 = 0.001$ for all models).[10] Furthermore, when comparing the marginal effect of expansion speed on revenues and managerial costs for the average firm in absolute terms, it is clear that the increase in

Table 1

Descriptive Statistics and Pearson Correlations ($N = 895$)

Variable	*M* (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Revenues (in Million $US)	30.24 (80.12)	—														
2. G&A expenditures (in Million $US)	3.93 (6.15)	0.13**	—													
3. EBITDA (in Million $US)	3.3 (5.17)	.07	.25***	—												
4. Expansion speed	1.29 (0.37)	.08*	.10*	−.07	—											
5. Expansion regularity	2.70 (125)	−.05	−.01*	−.08*	.05	—										
6. Firm size	130.7 (91.15)	.31***	.22***	.23***	.06	.05	—									
7. Tangible resources (in Million $US)	42.57 (59.09)	.14**	.05	.09*	.02	.02	.24***	—								
8. Total investments (in Million $US)	21.07 (16.32)	.32***	.11**	.23***	.03	.02	.15**	.01	—							
9. Patents	10.12 (16.21)	.19***	.13*	.24***	.00	.01	.02	−.09*	.09*	—						
10. Product diversification	6.62 (19.13)	.15**	.15**	.04	.04	.03	.08*	−.01	.01	.07*	—					
11. Geographic diversification	0.82 (0.35)	.09**	.13**	.12**	.01	.02	.15**	.07*	.07*	.01	.02	—				
12. Firm age	5.67 (5.02)	.23***	.11**	.26***	.00	.01	−.16**	.03	.10*	.02	.06	.12**	—			
13. Duration	2.66 (1.01)	.17**	.01	.21**	.03	.02	.18**	−.01	.01	−.05	.02	.00	.26***	—		
14. Alliance portfolio size	5.32 (7.47)	.25***	.19**	.01*	−.07*	.05	.01	−.04	.03	.06	.03	.02	.22***	.25**	—	
15. Alliance experience	5.96 (4.91)	.19**	.18**	.08*	.19**	.17**	.29***	.18**	.09*	.08*	.30***	.06	.02	.26**	.00	—
16. Alliance function diversity	0.49 (0.21	.11*	.08*	.05	.08*	.00	.14**	0.03	.04	.03	−.02	.01	−.12**	.17**	.18***	−.10*

*$p \leq .05$.
**$p \leq .01$.
***$p \leq .001$.

Table 2
Arellano and Bond (1991) GMM Regression Models ($N = 895$)

	Revenues				Managerial Costs				Profitability			
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Expansion speed		.03** (.01)	.03** (.01)	.03** (.01)		.35** (.10)	.35** (.08)	.35** (.11)		−.03** (.01)	−.03** (.01)	−.03** (.01)
Expansion regularity			.06** (.02)	.05** (.02)			−.38** (.11)	−.38** (.11)			.04** (.01)	.04** (.01)
Duration			.08* (.04)	.08* (.03)			−.21** (.07)	−.22** (.06)			.11** (.03)	.11** (.04)
Expansion Regularity × Expansion Speed				.12 (.10)				−.21* (.08)				.01* (.00)
Duration × Expansion Speed				.04 (.05)				−.12* (.05)				.01* (.00)
Firm size	.22* (.09)	.22* (.08)	.23* (.09)	.22* (.08)	.12 (.12)	.15 (.13)	.12 (.10)	.13 (.13)	.06 (.06)	.05 (.04)	.05 (.05)	.06 (.06)
Tangible resources	.14 (.08)	.14 (.09)	.13 (.08)	.14 (.108)	.05 (.11)	.05 (.11)	.06 (.10)	.06 (.01)	.12 (.09)	.12 (.09)	.12 (.11)	.12 (.10)
Total investments	.25*** (.04)	.24*** (.05)	.28*** (.06)	.26*** (.04)	.35** (.09)	.36** (.1)	.37** (.12)	.36** (.12)	.06** (.02)	.06** (.02)	.07** (.02)	.07** (.02)
Patents	.30** (.07)	.30** (.07)	.30** (.07)	.33** (.07)	.02 (.05)	.02 (.05)	.02 (.03)	.02 (.02)	.22** (.07)	.21** (.06)	.21** (.07)	.21** (.06)
Product diversification	.26* (.12)	.25* (.12)	.25* (.12)	.27* (.13)	.51*** (.12)	.50** (.13)	.49** (.13)	.50** (.13)	.05 (.10)	.05 (.09)	.05 (.09)	.04 (.08)
Geographic diversification	.20*** (.04)	.21*** (.04)	.21*** (.06)	.20*** (.04)	.20** (.06)	.20** (.06)	.20** (.06)	.21** (.06)	.02** (.00)	.02** (.00)	.02** (.00)	.02** (.00)
Firm age	.13* (.06)	.14* (.06)	.14* (.06)	.15* (.06)	.21* (.09)	.21* (.09)	.21* (.09)	.21* (.08)	.15 (.10)	.15 (.09)	.15 (.09)	.15 (.10)
Alliance experience	.17 (.10)	.16 (.09)	.17 (.10)	.16 (.09)	−.13 (.10)	−.13 (.10)	−.14 (.08)	−.14 (.08)	.13 (.10)	.13 (.08)	.13 (.09)	.14 (.01)
Alliance function diversity	.13*** (.02)	.13*** (.02)	.12*** (.02)	.13*** (.02)	.10** (.05)	.11** (.04)	.11** (.04)	.118** (.04)	.02* (.01)	.03* (.01)	.03* (.01)	.02* (.01)
Industry	+	+	+	+	+	+	+	+	+	+	+	+
Year	+	+	+	+	+	+	+	+	+	+	+	+
Sargan test (Prob > χ^2)	.30	.34	.31	.33	.30	.40	.33	.36	.21	.32	.31	.36
Second-order serial correlation (Pr > Z)	.27	.32	.50	.51	.29	.41	.49	.56	.40	.44	.59	.57
Wald test	402.15	417.30	469.85	471.28	362.44	455.76	478.69	504.41	366.81	467.34	479.96	508.21

Note: Intercept is not shown. Standard errors in parentheses. GMM = generalized method of moments.
*$p \leq .05$.
**$p \leq .01$.
***$p \leq .001$.

sales in Model 4 (0.04 × 30.24 = US$1.21 million) is always smaller than the increase in managerial costs in Model 8 (0.35 × 3.93 = US$1.37 million). Together, these results indicate that increases in expansion speed lead to greater increases in managerial costs than revenues. This outcome substantiates our point that it is the increase in managerial costs that hampers profitability, despite the increase in revenues.

Next, Models 3 and 4 indicate that a more regular expansion of alliance portfolios positively affects revenues, but the interaction between regularity and expansion speed (Model 4) is insignificant, indicating that Hypothesis 2a is not supported.[11] Models 7 and 8 show that a more regular expansion of alliance portfolios negatively affects managerial cost, and its interaction with expansion speed (Model 8) is negative and significant, thus supporting Hypothesis 2b. Finally, Models 11 and 12 show that a more regular expansion of alliance portfolios positively affects profitability, and its interaction with expansion speed (Model 12) is also positive and significant, thus supporting Hypothesis 2c. Overall, these results show that greater regularity does not allow firms that rapidly expand their alliance portfolios to increase their revenues more than firms that also expand their alliance portfolio rapidly but not in a regular way. Yet greater regularity enables firms that expand rapidly to reduce their managerial costs more than firms that expand their alliance portfolios rapidly but irregularly. This phenomenon, in turn, enables the former group of firms to have higher profitability than the latter group of firms.

Finally, Models 3 and 4 further indicate that longer duration of alliance portfolios positively affects revenues, but the interaction of longer duration and expansion speed (Model 4) is insignificant. Hence, Hypothesis 3a is not supported. Models 7 and 8 show that duration negatively affects managerial cost, and its interaction with expansion speed (Model 8) is negative and significant, which supports Hypothesis 3b. Finally, Models 11 and 12 show that duration positively affects profitability, and its interaction with expansion speed (Model 12) is also positive and significant, thus supporting Hypothesis 3c. As in the case of alliance expansion regularity, these results indicate that firms with more mature alliances that expand their alliance portfolios rapidly are not able to increase their revenues more than firms with younger alliances that rapidly expand their alliance portfolios. Yet the former group of firms may expand rapidly and bear lower costs than the latter group and subsequently increase their profitability.

Overall, we conclude that both alliance portfolio expansion regularity and duration can reduce the managerial costs resulting from rapid alliance portfolio expansion. Yet they do not contribute to an increase in revenues when alliance portfolios are rapidly expanded. A possible explanation for the fact that Hypotheses 2a and 3a are not supported may be that, unlike managerial costs (which are under the firm's control), revenues depend on external factors, such as market conditions and competitors' actions. Because it is difficult to control for the effects of a multiplicity of external factors, they may mask the moderation effects of engagement regularity and duration.

Models 1, 5, and 8 present the effects of firm- and alliance-level control variables on the dependent variables. Total investments, patents, geographic diversification, and alliance function diversity are found to be significantly associated with all the dependent variables. Firm size is also positively associated with revenues. The models provide support for our regression specifications in terms of their Wald statistics. The Sargan tests (Blundell & Bond, 1998) confirm the validity of the instruments, and the null hypothesis of no serial autocorrelation of the residuals is also retained. Wald tests further show that all models that include

our independent variables are more significant than those models that include only the control measures (Models 1, 5, and 8) at the $p > F = 0.01$ level.

Robustness Tests

To test the robustness of our results, we conduct several additional analyses, the first of which is a more direct test of our argument that managerial costs increase more than revenues as a result of rapid alliance portfolio expansion. Although we use profitability to capture the effects of speed, regularity, and duration on revenues deducted from costs, this measure also includes additional cost components that make profitability cruder for this paper's purpose. We therefore construct a measure that deducts managerial costs from revenues per firm and year and run all our models with this measure as the dependent variable.[12] The new results remain consistent with those presented in Models 9 through 12 in Table 2. We also use market value and return on sales as alternative operationalizations for firm performance (Farjoun 1998; Goerzen & Beamish, 2003, 2005).[13] The results using these alternative performance measures remain similar to those presented in Models 9 through 12 in Table 2.

Second, to further test the argument that faster expansion generates revenues through the enhanced effect of alliance portfolios on product differentiation and product scope expansion, we use patents and product diversification as dependent variables rather than as controls. The results of these models show that expansion speed is indeed positively associated with both product diversification and patents, thus corroborating our argument. When we use expansion regularity and duration as moderators for the effect of expansion speed on product diversification, we find positive and significant moderating effects. These results are in line with Hypothesis 2a, which was not supported when revenues was used as the dependent variable. When we use expansion regularity and duration as moderators for the effect of expansion speed on patents, we find no significant moderating effects, consistent with our core results.

Third, we examine the existence of curvilinear effects by squaring the key constructs (expansion speed, expansion regularity, and duration). Among other considerations, this investigation is conducted due to the study of Shi and Prescott (2012) showing that the expansion regularity of acquisitions and alliances has an inverted *U*-shaped relationship with firm performance (Tobin's Q). We find insignificant effects for all squared measures. Moreover, we examine whether some effects of expansion speed, expansion regularity, and duration might be mitigated when repeated alliances are included (Goerzen, 2007; Goerzen & Beamish, 2005). We therefore reestimate the models while excluding repeated alliances from the sample. This reestimation does not change the results. We also test whether the number of repeated alliances moderates the effects of expansion speed. The rationale for this is that when firms have many repeated alliances, their enhanced familiarity with their partners may reduce managerial costs. The role of repeated alliances, however, is insignificant both for its main and moderating effects, most likely because of the low number of repeated alliances in our sample (only 0.72 on average). Tests of the moderating effect of alliance experience also yield no significant results.

Furthermore, we replace our measure of technological innovation with the number of patent citations in each period as reported by the USPTO and with the level of R&D expenditures. These alternative measures, once again, yield similar results. Next, we test whether the results are affected by the governance mode of alliances (licensing, JV, outsourcing,

distribution agreements, and OEM agreements) and specific functions of alliances (R&D, production, marketing, and customer support) by running separate regressions for such subgroups. No significant effects are found. We also add controls for the share of alliances in the alliance portfolios of firms with specific governance modes and for the share of alliances pertaining to a given function. This allows us to examine whether alliance portfolios that are biased toward a specific governance mode or function affect our results. No significant effects are found in these cases either.

In addition, we test whether additional alliance portfolio diversity measures—such as partner industry, partner nationality, or governance mode diversity (Jiang et al., 2010)—affect our results. The effects are insignificant for these measures. Additionally, given the possible effect of uncertainty on alliance portfolio expansion moves (Koka, Madhavan, & Prescott, 2006), we follow the procedure described in Beckman, Haunschild, and Phillips (2004: 265) for the subsample of public firms (41 firms represented by 251 firm year observations). Here, we test whether the addition of firm-specific uncertainty and market uncertainty might also affect our results. The results remain consistent for this subsample, while the significance of the independent variables is approximately 5%, most likely due to the smaller sample size. Finally, we lag all independent variables and controls by 1, 2, and 3 years relative to the dependent variables. This allows us to test for whether time lags change the effects of expansion speed, regularity, and duration. The results remain consistent with those presented in Table 2, although the significance level decreases as the time lag increases.

Discussion and Conclusion

Theoretical Contributions and Implications

This study advances the view that the speed at which firms make strategic moves (such as alliances, mergers, acquisitions, and new market entry) has a significant direct effect on their profitability over and above the actual outcome of the strategic moves themselves. Although firms' ability to enhance their profitability should be positively related to their ability to respond rapidly to changing environments by quickly making new strategic moves (Teece, 2007), the emerging literature on temporal effects and time management largely suggests that fast-paced strategic moves have negative profitability consequences (Klarner & Raisch, 2013; Vermeulen & Barkema, 2002). The present study distinguishes between the effects of expansion speed on revenue generation, managerial costs, and profitability. It therefore contributes to prior research that has not explicitly considered whether decreases in profitability are driven by the effects of speed on the firm's ability to capture new revenue streams or by its effects on managerial costs.

This distinction allows us to examine the exact factors that determine how quickly firms should make new strategic moves and identify how firms that undertake strategic moves quickly can accelerate revenue generation while minimizing costs. Although a higher speed of strategic moves, such as alliance portfolio expansion, increases both revenues and managerial costs, our findings reveal that the increase in managerial costs is disproportionately high relative to contemporaneous increases in revenues, leading to an overall reduction in firm profitability. Therefore, ignoring the distinction between the effects of fast-paced strategic moves on revenue generation and managerial costs could be a major shortcoming in understanding what factors allow firms to make rapid strategic moves in a manner that

maximizes their profitability. This view is consistent with recent work on temporal effects that suggests scholars should focus on time management and its underlying performance consequences (Shi & Prescott, 2011).

We further advance the literature on the speed of strategic moves by explaining how the profitability consequences of such speed are influenced by the moderating effects of expansion regularity and the duration of existing strategic engagements. The extant literature (Laamanen & Keil, 2008; Shi & Prescott, 2012; Vermeulen & Barkema, 2002) has treated rhythm separately from speed but has neglected the role of duration. Instead, we show that expansion speed should be considered alongside expansion regularity and the duration of existing strategic engagements when firms make new strategic moves. A key insight of our study is that firms that combine rapid and regular strategic moves profit more than firms whose expansion is irregular. We argue that firms can become more profitable by being better prepared for such moves, by reducing the possibility of overstretching resources and capabilities in peaks of expansion, and by improving their responsiveness and adaptation. A more regular expansion may enable firms to create a temporal map and manage the expansion process more efficiently (Klarner & Raisch, 2013; Shi & Prescott, 2011). More regular expansion thus allows firms that make fast-paced strategic moves to increase revenue generation, control managerial costs, and become more profitable.

Furthermore, although the importance of time compression diseconomies has long been recognized in the literature (Dierickx & Cool, 1989), our study explains how regularity helps firms to make rapid strategic moves while reducing the negative consequences of time compression diseconomies. This finding is consistent with recent insights into the role of regularity (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2012). It further contributes to the "change-stability" debate (Beckman et al., 2004; Klarner & Raisch, 2013) by suggesting that an effective way to balance a firm's need for fast-paced strategic moves and optimal profitability is to regularly undertake such moves.

The negative profitability consequences of speed are also moderated by the duration of the existing strategic engagements of firms. We argue that existing strategic engagements that are mature place fewer demands on managerial resources. They therefore reduce managerial costs and allow a higher capacity for fast-paced expansion. These results, together with the findings regarding the role of regularity, underscore important contingencies that enable firms to expand quickly while reducing negative profitability consequences. In both cases, the effect on managerial costs enables a more rapid expansion (compared with the effect on revenues, which is insignificant), further emphasizing the importance of distinguishing between the revenue generation and managerial costs of strategic moves.

Our findings challenge the established view that fast-paced strategic moves negatively influence profitability because firms cannot quickly absorb the benefits associated with such moves (Vermeulen & Barkema, 2002). This view typically suggests that constraints on absorptive capacity and cognitive scope (Cohen & Levinthal, 1990; Zahra & George, 2002) limit firms' ability to capture the benefits of fast-paced strategic moves and to identify complementarities that will increase revenues. By contrast, our findings indicate that a higher speed of strategic moves, such as alliance portfolio expansion, increases the benefits that firms can get out of their alliance portfolio in terms of expanding their product differentiation and product scope and, in turn, generates more revenue.[14] Making strategic moves at a higher speed increases revenues by enabling firms to accumulate new resources, achieve greater

flexibility, and adapt to changing environments. The overall effect of speed on firm profitability is indeed negative, but this result is driven not by the firm's inability to capture the revenue generation benefits of fast-paced strategic moves but by the significant increases in managerial costs that accompany this faster pace.

In that respect, another key contribution of this study is examining how temporal constructs, such as speed, regularity, and duration, affect a fundamental problem in alliances: the cost of managing such agreements. Even when alliance partners trust one another and are not confronted with the opportunistic behavior of their partners (Williamson, 1985), alliances involve significant managerial costs in terms of coordination and integration mechanisms (White & Lui, 2005). Managerial costs are therefore a salient feature of hybrid forms of governance. Although our analysis focused on the context of alliances, managerial costs may, in fact, be a crucial component when firms make other types of strategic moves. For instance, acquisitions require managerial efforts in identifying and evaluating target firms, reaching acquisition agreements, and integrating acquired firms with the parent company. Entering foreign markets requires substantial managerial effort in selecting target markets, deciding the appropriate timing and entry mode, and establishing collaborations in the target country. Likewise, diversification into new business areas can consume significant managerial time and effort to establish new operations in an unfamiliar industry. Our findings therefore indicate that when fast-paced strategic moves are considered, the role of managerial costs is pivotal in determining whether such moves will enhance or reduce firm performance.

This study also contributes to the literature on the profitability implications of alliances (e.g., Ahuja, 2000; Baum, Calabrese, & Silverman, 2000; Goerzen & Beamish, 2005; Lavie & Miller, 2008). A significant insight offered by this study is that the benefits and costs of alliances depend not only on the attributes of alliance portfolios but also on differences in the alliance portfolio expansion process. This finding suggests that two firms may end up with apparently similar portfolios of alliances and collaborate with similar partners but experience different profitability because they build their portfolios at different speeds, with different regularities, and for different durations. A key implication is that understanding how differences in firm-level profitability consequences of alliances involves considering how alliance portfolios are developed over time. Slower alliance portfolio expansion speeds enable firms to achieve higher profitability because they avoid sharp increases in the managerial costs associated with such expansion. By contrast, a fast buildup of alliance portfolios results in time compression diseconomies, thereby increasing the managerial costs associated with alliance portfolio expansion. Yet, although a higher alliance portfolio expansion speed by itself will most likely hamper firm profitability, firms that keep a regular expansion rhythm and sustain mature alliances in their portfolio can reap the benefits of a higher speed (in terms of revenue generation) while substantially reducing the cost disadvantages of speed. Because the buildup speed, regularity, and duration of alliance portfolios vary significantly across firms, empirical analyses that ignore the time-dependent processes in which alliance portfolios are developed may be incomplete explanations of profitability outcomes.

Managerial Implications

Our study demonstrates how and why the speed at which strategic moves are made influences the returns of these moves. The speed of new strategic moves cannot be rushed, because new initiatives require significant managerial attention and resources over a limited time

frame. Prior research has suggested that managers of firms that expand quickly should be concerned with their ability to absorb and appropriate the benefits associated with such new strategic moves (Cohen & Levinthal, 1990; Vermeulen & Barkema, 2002; Zahra & George, 2002). Instead, our findings show that managers should shift their attention to controlling managerial costs. This shift is in fact largely what determines the extent to which firms will profit (or not) from their new strategic moves.

Managers should bear in mind that it is not only speed that must be monitored but also the regularity of new strategic moves and the duration of existing ones. Greater regularity allows firms not only to prepare successfully and adapt to new moves but also to limit the overstretching of managerial resources. Managers can benefit from a more rapid speed in their strategic moves by maintaining a regular pace. Likewise, strategic endeavors of longer duration require less attention, thus giving firms the opportunity to better pursue rapid expansion without substantially increasing managerial costs. In so doing, they may reap the revenue-enhancing benefits of rapid strategic moves while reducing the negative cost consequences associated with such moves.

These contingencies are particularly important for firms that compete in dynamic industries and have little choice with respect to slowing down their rates of expansion. Institutional pressures for rapid expansion can be strong in dynamic sectors, but managers should bear in mind that firm profitability depends on the careful timing of their strategic moves rather than solely on their ability to keep up with their competitors' expansion. This timing may enable managers to build new sources of competitive advantage that derive from the effective management of time. As Shi and Prescott (2011) suggest, managers engaged in new strategic moves should behave as experienced chess players who visualize the game as a series of well-timed sequential moves.

Limitations and Future Research Avenues

Our analysis has a number of limitations, some of which may lead to opportunities for future research. First, all firms in the data set originate from a single country. Thus, country-specific characteristics, such as the cultural distance from foreign alliance partners and the costs implied by such distance (Lavie & Miller, 2008), may affect the results. Likewise, specific socioeconomic factors, such as business culture and managerial backgrounds, may also affect our findings by influencing firms' expansion speed. In addition, the sectorial distribution of Israeli high-technology industries is biased toward specific areas, such as capital equipment, medical devices, telecommunications, and information technology. The revenues and managerial costs of alliance portfolio expansion in these sectors do not necessarily represent those found in other sectors. Moreover, the fact that our sample consists of fairly young and relatively small high-technology firms implies that the profitability implications of these firms' alliance portfolios might differ from those for more established firms that can use their experience and size to weather the negative effects of greater alliance portfolio expansion speeds. Thus, future analyses of larger and more mature firms originating in multiple countries and industries should enhance the external validity of our results.

From a broader perspective, this study has focused on the effects of a specific strategic move (alliances) on revenue generation, managerial costs, and profitability. Each strategic move differs from others in terms of revenue-generating and cost-escalating patterns,

resource demands, and the durability of its effects. It is therefore important to replicate the current study to cover other strategic moves, such as mergers and acquisitions, and entry into new markets and business segments. In addition, although we have focused on the speed and moderating effects associated with new strategic initiatives, future studies can extend the analysis to capture the effect of speed on revenue generation, managerial costs, and profitability when strategic initiatives are dissolved (see Klarner & Raisch, 2013). It is also worth examining alternative measures of performance as means to enhance our understanding of the variability in the consequences of the speed of making new strategic moves. Finally, although our analysis focused on each firm's own speed of making strategic moves, its effects may also depend on competitors' speed. An interesting avenue for future research would be to collect data to examine the effect of a given firm's speed of making strategic moves relative to the average speed of its competitors.

Appendix

Table A1
Description of Variables and Measures

Variable Name	Variable Description
Revenues	For each firm *i* at year *t*, revenues is measured using the following logarithmic function: ln(revenues$_{i,t}$), where revenues$_{i,t}$ represents the overall income of firm *i* in year *t*.
Managerial costs	For each firm *i* at year *t*, managerial costs is measured using the following logarithmic function: ln(G&A$_{i,t}$), where G&A$_{i,t}$ represents the general and administrative expenditures of firm *i* in year *t*.
Profitability	For each firm *i* at year *t*, profitability is measured by EBITDA$_{i,t}$ which represents the earnings before interest, tax, and depreciation of firm *i* in year *t*.
Expansion speed	The number of new alliances that the firm has established in a given year *t* divided by the total number of partner firms in its alliance portfolio.
Expansion regularity	1/*s*, where *s* = standard deviation of the number of alliance portfolio expansions in the analyzed time frame.
Duration	The average duration (in years) of each firm's existing alliances in a given year *t*.
Firm size	Ln(LAN) of the number of employees at the end of year *t*.
Tangible resources	Firm *i*'s fixed assets in year *t* (in millions of U.S. dollars).
Total investments	Ln(LAN) of total investments (in millions of U.S. dollars) made up to a given year *t*.
Patents	Number of patents applied at year *t* (granted patents only).
Product diversification	Number of products marketed by firm *i* in year *t*.
Geographic diversification	Sales dispersion across different regions. The entropy measure is defined as $\Sigma[P_j*\ln(1/P_j)]$ where in each year *t* P_j is the proportion of sales attributed to region *j* (out of total sales) and $\ln(1/P_j)$ is the weight given to each region.
Firm age	Age of firm *i*.
Alliance experience	The number of alliances in which the firm has participated prior to year *t* (since the firm's inception).
Alliance function diversity	The dispersion of existing alliances across R&D, production, marketing, and customer support activities in a given year *t*. The entropy measure is defined as $\Sigma[P_j*\ln(1/P_j)]$, where P_j is the proportion of alliances of a given function *j* (out of total existing alliances) and $\ln(1/P_j)$ is the weight given to each function.

Notes

1. As Shi and Prescott (2012) show, overregularity may also hamper performance. We address this issue in the robustness tests.

2. These sectors include the following: capital equipment, medical devices, telecommunications, enterprise software, storage and data centers, homeland security, multimedia and broadcasting, cellular, chip design, the Internet, and electronics.

3. As such, formal publications of the Israeli Central Bureau of Statistics concerning high-tech industries in Israel are based on data from this source.

4. With respect to the total sales of firms in our sample, 58% were in the United States.

5. We used logarithmic transformations to reduce the skewness of our measures for revenues and managerial costs.

6. Alternative measures of firm performance, namely, returns on sales (ROS) and market value, were also used in the robustness tests for comparison purposes.

7. This approach reflects the view that adding two alliances to a portfolio of 10 alliances is likely to have different effects than adding two alliances to an alliance portfolio of three alliances.

8. Per the methodology of Ahuja (2000) and Phelps (2010) described previously.

9. We did use patent citations as an alternative proxy for innovation output in the robustness tests.

10. In Models 4 and 8, we also account for the fact that expansion speed also has an interaction term.

11. Note that larger values of expansion rhythm represent a more regular expansion rhythm of alliance portfolios.

12. We are indebted to an anonymous reviewer for this suggestion.

13. Market value depends on the investments that were made in the firm (either by private investors, venture capital funds, corporate venture capitalists, acquisitions, or public offerings) and the resulting ownership percentages ("after-the-money" valuation). For instance, if an investor has invested US$1 million in a firm and has received 10% ownership, this firm's market value is US$10 million. ROS represents the ratio of firm earnings before interest, tax, and depreciation to its revenues in a given year *t*.

14. In our robustness tests, we explicitly show that alliance portfolio expansion speed is positively associated with greater product diversification and patent output.

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