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FIRM GROWTH PROFILES (FGPs): TOWARDS AN ACTION-BASED VIEW OF FIRM DEVELOPMENT

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Abstract

The paper presents the concept of the Firm Growth Profile (FGP) which contributes to the creation of a dynamic Resource-Based View theory by explaining how capabilities are developed in path-dependent processes. An FGP represents the pattern of critical actions taken by a firm in different value activities (e.g. R&D, marketing, production and finance) during subsequent periods. It is suggested that the outcomes of a set of actions taken in a given period modify a firm's entire capability set. We also assert that similarities between the environments in which firms operate (i.e. the time during which they operate, their geographical location, industry characteristics and network position) moderate the development of FGPs, leading to similarities in the actions taken by specific groups of firms operating in similar environments. We further claim that variance in firm capabilities is attributable to both inter-FGP and intra-FGP differences. We demonstrate the usefulness of the FGP approach by analyzing the FGPs of four Israeli Enterprise Software firms.

Key words: growth profile, capabilities, capability development, firm heterogeneity, external environment.

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Firm Growth Profiles (FGPs): Towards an Action-Based View of Firm Development

Non-technical Summary

In this paper we investigate the growth profiles of four Israeli software enterprise firms. The term growth profile refers to sequential actions taken by firms in their various functions. More specifically in the current paper we focus of three such functions: research and development, marketing and finance and explore how actions in each of these functions affect the capabilities of firms.

Our analysis reveals that in each of the functions, for all four firms, only 2-3 possible critical actions emerge at each stage, implying that the range of actions these firms take is quite limited. Second, in cases where actions do not overlap, similar actions take place in subsequent stages. An analysis of the four cases reveals that phenomena such as: gradual commitment to foreign markets, targeting small customers first and then targeting larger ones, integrating acquired competitors' systems into the firms' own systems and building a software package based on the detailed specifications of one or a few customers repeat themselves for most of the analyzed firms. Overall, while the concerned firms differ substantially in their applications (developing software for large firms, universities and banks), in their major target market and in their operational natures (software products vs. software services), their development process yields substantial commonalities. This supports our expectation that similarity in external conditions will cause growth profiles to converge. Third, while there are similarities between the four growth profiles, none are identical. If we classify the analyzed firms into case study categories, three growth profiles archetypes may be observed: "moderately leveraged firms", "merged fast-growing home-based firms", and "conservative global slow runners".

Introduction

One of the fundamental issues in organization and strategy research is identifying the factors that influence the development of firms over time. Firm growth has been extensively explored over the last 40 years, following publication of Penrose's (1959) seminal book: "The Theory of the Growth of the Firm". More recently we are witnessing a renaissance in the field, mainly in the emerging literature on firms' dynamic capabilities (Eisenhardt & Martin, 2000; Teece, et al. 1997; Winter, 2003; Zollo & Winter, 2002). The basic premises of the "dynamic capabilities" literature are rooted in the Resource Based View (RBV) of the firm (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). This line of literature essentially suggests that firm growth is shaped by the way that firm resources and capabilities unfold. This unfolding is claimed to be governed by the ability of firms to continuously learn and change, i.e. - their dynamic capabilities.

The RBV and the dynamic capabilities literature stress the idiosyncratic way in which firms develop over time due to path-dependent investments in unique resources. However, we find three major drawbacks in this approach. One is the fact that these theories do not explain **how** capabilities are developed (Foss, 1997) - it is simply assumed that firms do or do not possess specific capabilities (Douglas & Hoopes, 2003). Although the dynamic capabilities literature is endeavoring to create a 'dynamic' RBV theory, its focus is primarily on the mechanisms that lead to change, through raising questions such as: "What are the characteristics of such change?" and "What is the impact of change on firm survival?". Little explanation is offered as to **how** dynamic capabilities actually create new capabilities. The second drawback of the RBV and dynamic capabilities literature is their purely internal focus. As noted by Barney (2001), Porter (1996), Teece (2000) and others, a purely internal focus disregards the limitations that the firm's **external** environment (e.g. the firm's network, the capital market and the nature of the firm's product market) might impose on the creation of new capabilities. More attention should therefore be given to the interaction between the internal and external environments in which firms operate and to this interaction's impact on building capability. Finally, the RBV and dynamic capabilities literature tend to heavily emphasize idiosyncraticity in the development of firms. This idiosyncratic approach

makes it difficult to come up with rigorous firm growth models that explain capability development in terms of more general mechanisms.

The current paper aims to unravel the development of the firm by focusing on firm growth patterns over time. The paper introduces a new perspective regarding the firm development process - the *Firm Growth Profile* (FGP). We define the FGP as: *a pattern of growth common to a cluster of firms that, operating in comparable internal and external contexts, take similar critical actions while retaining a degree of idiosyncraticity.*

The term FGP is used to portray the development of firms in terms of the different critical actions they take. FGPs are expected to be similar for specific groups of firms but may vary for others. The FGP concept extends the RBV and dynamic capabilities approaches to the firm development process through an evolutionary perspective that regards the firm growth process as proceeding from the interaction between internal change mechanisms and external factors. We assert that external factors limit variance in the way firms grow, hence firm development is not a purely idiosyncratic firm-level process, but rather an evolutionary process influenced by the external environment. Accordingly, we would expect to identify groups of firms that operate in a similar way under similar external conditions (for example, when a viable stock exchange exists, many firms are expected to go public) or in specific contexts (e.g. the development of Internet start-ups in the 1990s). In that respect, a specific FGP reflects the common strategic path chosen by a group of firms.

The FGP concept focuses on the actions that constitute specific growth patterns and details how specific actions firms take in a given period turn into capabilities. Hence, by combining firm-specific actions with these actions' impacts on the building of capabilities within specific contexts (e.g. specific markets, periods of time and geographic locations), we are able to explain the creation and evolution of firm capabilities.

In the next section we present a conceptual framework that analyzes the development of firm-specific capabilities by linking the development of capabilities to sequences of actions firms take in four major value activities. Next we use the conceptual

framework to demonstrate how the external environment moderates the development of capabilities and explain why different firms may have similar growth profiles. We demonstrate the applicability of the FGP approach by analyzing the development of capabilities in four Israeli firms from the Enterprise Software industry. The analysis tracks these firms' development from their inception through to the present. Finally we conclude and highlight avenues for future theoretical and empirical research.

The development of capabilities – a conceptual framework

One of the premises of evolutionary economics literature (Dosi et al., 2000; Nelson & Winter, 1982) is that dynamic and interactive firm-specific actions lead to the modification of firm routines and capabilities. These actions are the product of sets of routine or non-routine managerial actions (Nelson and Winter, 1982). Moreover, based on this approach, firm capabilities are considered as sets of high-order routines, implying that capabilities encompass multiple routines and yield an outcome (Dosi et al., 2000). For instance, Winter's (2003: 991) definition of an organizational capability is: *“a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type”*.

This definition captures two major characteristics of organizational capabilities. First, it links the term ‘capabilities’ to a particular type of output. This point is essential to the FGP argument because the outcome of particular actions taken by firms may modify their routines over time (Cohen & Bacdayan, 1994; Levitt & March, 1992). Hence, since capabilities are based on routines (Winter 2000, 2003), it follows that such actions also modify firm capabilities. The evolution of capabilities implies that, during one period of time, firm-specific capabilities may produce one level of a certain outcome (i.e. amount of value created by the firm), while in a subsequent period they may produce a different level of outcome (Helfat & Peteraf, 2003). Second, Winter's (2003) definition implies that management has, at any given point of time, a set of action options to choose from. These actions may lead to modification of firm routines

(Feldman, 2000) or the creation of new strategic assets, and therefore modification of capabilities.

Naturally, there are multiple factors that shape the development of capabilities, for instance: experiential learning, in which the repetition of a routine leads to it becoming more efficient (Argote, 1996), worker-management relations, improvement in the conduct of managerial tasks by means other than learning (e.g. by hiring better qualified managers), capital investments and process innovation (Helfat & Peteraf, 2003). Nevertheless, the current paper focuses on the role of *particular managerial actions* in shaping a firm's routines and consequently its capabilities.

Firm-specific assets and value activity-specific capabilities

To facilitate analysis of the linkage between firms' actions and their capabilities, we focus on four major value activities that firms undertake when producing their outputs: Research and Development (R&D), production (P), marketing & servicing (M&S) and finance (F). While these value activities clearly do not portray the full range of firm activities as captured, for instance, by Porter's (1985) value chain, for the sake of simplicity, and to demonstrate our conceptual framework, we limit ourselves to these four value activities¹. In the following sections, we distinguish between "firm-specific assets" (FS assets) and routines, which reflect the *overall* strategic assets the firm uses to produce products, and "value activity-specific capabilities" (VAS capabilities), which reflect capabilities that produce a particular type of value activity-specific output (e.g. R&D capabilities).

FS assets comprise the stock of assets and routines a firm possesses at a given point of time. Such assets and routines may be tangible (e.g. financial or physical assets), intangible (e.g. technological patents or reputation) or human (e.g. motivation, specialized skills or communication abilities). Based on their FS assets and routines, firms are required to possess and develop capabilities in each value activity. Thus, FS assets and routines determine the capabilities to: create and improve technology and turn it into consumable products (an R&D-specific capability), transform inputs into outputs

¹ Clearly, the same sort of analysis could be conducted with any number of value activities that a given firm executes.

(a P-specific capability), interact with customers through the processes of advertising, sales, distribution and pre- and post-sales services (an M&S-specific capability), and finally, finance the whole operation from product development, through production to marketing and after-sale services (an F-specific capability).

Thus, VAS capabilities reflect the utilization of FS assets and routines in a particular context. For instance, possessing technological know-how (an FS tangible asset), implies that the firm has R&D capabilities to develop a product, P capabilities to manufacture it, M&S capabilities to sell and service it and F capabilities to raise funds based on the financial potential concealed in the patent. Yet another example might be the enrollment of a skillful CEO (an FS human asset) who is likely to improve R&D, P and M capabilities if this CEO brings into the organization more efficient operational and managerial procedures or raises employees' motivation. In addition, F capabilities are likely to be developed if investors' confidence in the prospects of the firm under the leadership of said CEO is strengthened.

This implies that in each period, FS assets and routines enable (at least) four VAS capabilities (i.e. capabilities in R&D, P, M&S, and F). These VAS capabilities comprise a collection of competencies that enables the firm's management to conduct a set of potential actions at its discretion. This set of actions is composed of four types that relate to R&D, P, M&S and F activities. In each of these four value activities, firm management may take critical actions. In the context of R&D activities, firms may take actions to determine the type of technology they develop and the product range based on this technology, to upgrade an existing technology or to develop a new one. With respect to production activities, firms may take actions regarding the scope and scale of their production, the location of production activities (Dunning, 1988) or their choice between "markets and hierarchies" (Williamson, 1975, 1985; Buckley & Casson, 1976). In the context of marketing activities, firms may take actions that result in increasing their product range (Rumelt, 1974, 1982), expanding their customer base, or changing their business model in different markets. Finally, with regard to financial activities, firms may choose whether to finance their operations through self-financing, strategic investors, financial investors, public offerings and so forth. An example of the possible range of R&D, P, M&S and F actions firms may take is demonstrated in Chart 1. The

combination of all types of actions for each of the value activities represents the range of "action sets" available to firms.

[Insert Chart 1 about here]

Critical actions and capability development

We assert that the mechanism by which capabilities are developed arises from the interplay between FS existing assets and routines, VAS capabilities and the managerial decision to modify the firm's position by taking actions in each of the above-mentioned contexts, as depicted in Chart 2:

[Insert Chart 2 about here]

Chart 2 implies that current FS assets and routines enable specific R&D, P, M&S and F capabilities. Given a constant context, each of these VAS capabilities enables the firm to take a particular action(s). Thus, R&D capabilities determine the range of critical R&D actions, M&S capabilities determine critical M&S actions and so forth.

Returning to the example of the firm possessing technological know-how, we assert that this firm's technological capability (an R&D-specific capability) enables it to take measures to upgrade the firm's current technology (an R&D action). Similarly, its marketing capability to introduce the technology into the marketplace allows it to penetrate new markets (an M&S action), and its financial capability to raise funds based on its patent enables it to issue an initial public offering (an F action). Thus, current VAS capabilities determine which critical actions can be taken and which cannot. Inferior R&D capabilities might render the upgrading of current technology quite ineffective, thus leading such a firm to possibly decide to use appropriate technology under license. If a firm's M&S capabilities are not strong enough, its ability to penetrate new markets will be hampered despite any potential technological advantage it may have, and therefore it may prefer to expand its existing markets. Similarly, poor past financial performance may exclude the possibility of issuing an initial public offering (IPO) and

alternative financial leverage measures (e.g. Venture Capital funds) will need to be sought.

The above discussion implies that in each period a given firm takes at least four different specific critical actions (including the decision not to operate in a given context). Once the firm chooses a specific set of critical actions it actually defines the FS assets and routines it will possess in the subsequent period. We assert that since critical actions taken by firms change their stock of assets and routines, such actions create new FS assets and routines. In turn, the above discussion implies that these new FS assets and routines modify the existing set of VAS capabilities. Thus, a set of critical actions in a given period shapes the firm's VAS capabilities in the subsequent period. In this case, the relation between actions and developed capabilities is 'many to many'. Thus, a specific action does not determine one or more specific capabilities (as in a 'one to one' or 'one to many' relationship), nor do many actions determine a single capability (as in a 'many to one' relationship). Rather, a 'many to many' relation between the set of critical actions a firm takes and its new VAS capabilities implies that the combination of several VAS actions is required to enable a firm to develop VAS capabilities in multiple contexts.

Following the example presented above, a firm that chooses to upgrade its technology, penetrate into new markets and issue an IPO will now have a more advanced technological capability (an R&D-specific capability) resulting from the investment in new technology, from a better acquaintance with various market needs and from the increased availability of funds. For the same reasons, it will also be able to penetrate additional markets or enlarge its share in existing markets (M&S-specific capabilities). Finally, it will be able to build upon its superior technology, improved marketing presence and existing funds to further leverage its financial capabilities (an F-specific capability). Had all these actions not taken place, this firm's new FS assets and routines and hence its new VAS capabilities would have been totally different. Overall, this discussion suggests that VAS capabilities are interdependent.

The evolution of firm growth profiles

Two points are noteworthy at this stage. First, at their inception VAS capabilities are expected to result from a firm's entrepreneurs' *initial resource endowment* (Helfat & Lieberman, 2002). Variance in initial resource endowment is likely to lead to the creation of idiosyncratic FS assets and routines (Barney, 1991; Wernerfelt, 1984) and hence to different VAS capabilities. Second, a firm's choice of a specific action set may be irreversible, since each choice will likely lead to the development of a different collection of FS assets and routines. This point of view is consistent with Arthur's (1990) and David's (1989) concept of path dependency and actually implies that firms that chose the "correct" critical actions are expected to develop a competitive advantage due to capabilities that attain a higher level of functionality (Helfat & Peteraf, 2003). However, we argue that it is still possible that two different action sets will yield the same FS assets and routines and therefore similar VAS capabilities. Unlike the traditional view of a single action leading to irreversibility in terms of capability development (Nelson and Winter, 1982; David, 1989; Arthur, 1990), we argue that two different sequences of action sets taken in subsequent periods may lead to similar FS assets and routines, as depicted in Chart 3.

[Insert Chart 3 about here]

Each arrow in Chart 3 represents a possible action set that contains the critical R&D, production, marketing and financial actions undertaken by a given firm. Each diamond represents FS assets and routines. In each time-period between T_0 (the period where the concerned firm was established) and T_6 , the firm can choose between several possible sets of action to be taken in the next period. A sequence of several sets of actions taken in subsequent periods represents a firm growth profile (FGP). Two examples of specific action paths that can be chosen are indicated by the dotted arrows in Chart 3. These two paths represent two FGPs and hence are labeled FGP_1 and FGP_2 . At T_0 , the potential action sets (to be taken during T_1) are determined by and large by the initial resource endowment of the firm's entrepreneurs. During periods T_1 - T_6 the potential action sets available are restricted by the firm's capabilities in each period. The decision to choose a specific action set drives a firm down the tree of choices, and renders unavailable whole series of action sets that branch out from previously rejected choices. While, in some cases, a firm may achieve the same FS assets and routines

through different paths (for instance the FS assets and routines achieved in T_5 in FGP_2 could be realized by choosing path A or B in T_3), in other cases the choice of different paths will result in different FS assets and routines. FGP_1 and FGP_2 comprise different action sets that, following the mechanism of capability development detailed above (see Chart 2), lead to different FS assets and routines in T_6 . Since the value creation potential of *different* FS assets and routines is likely to vary, the choice of a specific FGP may lead to VAS capabilities attaining a higher or lower level of functionality than would have resulted from an alternative FGP.

The FGP argumentation is consistent with the idiosyncratic notion of the RBV, which conceives idiosyncraticity to be the basis for sustainable competitive advantage. This view is explicitly portrayed in Chart 3, which illustrates that FS assets and routines enable the firm to choose from specific critical action sets. Two firms with identical assets that choose different action sets will subsequently create different assets and routines and hence different VAS capabilities. Since some actions are expected to be irreversible, path dependency will be created and, subsequently, so will idiosyncraticity in VAS capabilities. Since the FGP of a firm that attains a competitive advantage is revealed only *ex-post* (Peteraf, 1993), firms that did not choose the "correct" sequence of action sets may find it impossible to imitate such an FGP. This, in turn, is likely to make FS assets and routines unique and inimitable (Barney, 1991) and can thus lead to the creation of a sustainable competitive advantage. Moreover, even if, at a *coarse* level, several firms may have the same FGP, at a *finer* level, the idiosyncratic nature of each action can create different sets of capabilities that reflect the variance in firm-specific routines and dynamic capabilities (Teece, et al., 1997). For instance, two firms could introduce a radical technological innovation in their field, but if one firm's technology is superior to that of the other, then this firm is expected to develop VAS capabilities having a higher level of functionality. Overall, we expect the variance in VAS capabilities to be partly explained by the different FGPs followed by different clusters of firms (i.e. inter-FGP differences), and partly by fine-level differences between firms having the same FGP (i.e. intra-FGP differences).

Growth profiles – the moderating role of the external environment

The previous sections dealt with the question of **how** capabilities are developed by introducing a mechanism whereby assets and routines enable capabilities that allow a set of actions to be undertaken and so enable the creation of new assets and capabilities.. However, we still have not addressed two major attributes of FGPs: one is the role of the external environment in shaping FS assets and routines as well as VAS capabilities and the second is our expectation that groups of firms will have similar FGPs. These two issues are in fact interrelated.

We argue that the sets of possible actions available to firms are not only shaped by their VAS capabilities, but also by their external environment. For instance, the development of communication technologies clearly opens up new opportunities and thus affects firms' capabilities to develop, manufacture and market products. Communication technologies may enable the development of products in multiple distant locations (an R&D action). They may also allow the transfer of production (a P action) to countries that enjoy location advantages (Dunning, 1988, 1993; Porter, 1990), or may facilitate after-sales servicing from distant locations through use of real-time interfaces (an M&S action). They are also likely to decrease the barriers to a firm being traded on a foreign stock exchange (an F action), since communication technologies ease the flow of information. Thus improved communication technologies may potentially lead to better R&D-, P-, M&S- and F-specific capabilities. In a similar vein, an economic recession that impacts global demand (or even demand in a few major markets) for a good or service will naturally also impact the world's capital markets. This will clearly affect the set of actions firms can take (e.g. their ability to penetrate new markets, introduce new products, raise capital) and, thus, according to our above discussion, will eventually affect VAS capabilities.

The fact that environment is expected to have a substantial impact on the development of capabilities and subsequently on the variety of action sets available to firms, implies that the whole discussion of capability development must also relate to external contexts. We should therefore not treat the concept of the FGP as a general one, but rather as a concept that is bounded by the external conditions of the firm. At any

given time, external conditions may allow or preclude a firm from taking specific actions. For example, in periods of high interest rates or recession a firm may not be able to issue a public offering, even if it has the capabilities to take such an action. Similarly, if a firm has a technological innovation that arrives prematurely to the market this could prevent the firm from taking further R&D, M&S, P and F actions, despite its technological superiority. Hence, we expect that external environmental conditions will tend to impose a degree of conformity on the growth profiles of firms exposed to those conditions, as they face similar opportunities and constraints in their potential choice of actions and, subsequently, in the nature of their capabilities.

Two fundamental questions then arise: (1) which elements of the environment have the most substantial impact on the nature of FGPs? Four such elements come to mind: time frame, geographical location, firm networks, and industry/market; And (2), to what extent are FGPs bounded by the external environment?

The time frame in which specific firms operate is naturally expected to have some impact over these firms' FGPs, however we may still be able to identify firms that operate in different time periods yet have similar FGPs. For instance, the FGPs of firms that operate in periods during which radical technological revolutions occur (e.g. the different periods that saw the invention of motor vehicles, television sets, computers or the introduction of the Internet) might be similar. The same argument applies to firms that operate during a similar phase of technological design development (Dosi, 1982) or of product life cycle (Vernon, 1966), and to firms whose products involve the same type of innovation (Christensen & Raynor, 2003) or that operate during similar high or low periods on the stock exchange.

The central role of geographical location in affecting firm development and capabilities has been discussed extensively in strategic management and international business literature (e.g. Dunning, 1988; Guillen, 2000; Johanson & Vahlne 1977, 1990; Porter, 1990) and reflects a country's comparative advantages, governmental policies, economic conditions, demographics etc. However, it may be the case that accelerated globalization, resulting from advances in communication and transportation, from liberalization in the trade of goods, services and capital, and from the homogenization of

world markets (Levitt, 1983), will lead to situations in which firms originating in different locations have similar FGPs (e.g. Internet start-ups in the late 1990s originating from different countries).

Firm networks play a mixed role. They affect the development of firms by providing them with opportunities to leverage their resources (Ahuja, 2000; Baum et al., 2000; Gulati, 1995, 1999; Lavie, 2004; Lee et al., 2001; Nohria, 1992). However, they also confine the development of capabilities and lead to less adaptability and to competitive disadvantage because of the inability of firms to safeguard the leakage of valuable resources and differentiated structural positions within networks (Lavie, 2004; Gnyawali & Madhavan, 2001).

Industry/market characteristics should probably be a major determinant of the context in which firms grow, as noted by Porter (1980), McGee & Thomas (1986) and many others. The work of Teubal & Avnimelech (2003), who found different FGPs for two very successful firms in the data security sector in Israel, is an example of implementing the FGP approach at the industry level. On the other hand, it may be that the impact of market factors (e.g. the economy as a whole, the capital market, technological developments etc.) will outweigh industry characteristics and lead to similar FGPs for firms from different industries. The overall impact of time period, geographical location, network position and industry/market characteristics on the development of FGPs and their likeness to each other is therefore still obscure.

We can demonstrate the contrasting impacts that these four elements of the firm's environment can have on FGPs by focusing on the role of the firm's industry. Industrial organization has long been part of strategic management literature (e.g. McGee & Thomas, 1986; Porter, 1980), where industry-specific competitive forces are often claimed to yield differences in firms' potential for value creation and therefore profitability. However, we claim that at a coarse level of analysis, it may be that firms originating in different industries have similar FGPs. For instance, a Biotech start up may have a similar FGP to that of a Hardware start up if both firms go through the following five stages: (1) basic R&D, (2) product development, (3) market penetration, (4) development of the next product generation; (5) entrance into additional markets. In each

of these stages, the two firms can take similar actions that modify their capabilities accordingly. Thus each such stage represents, in fact, a critical action set, as discussed in the previous section, and demonstrated in Chart 4.

[Insert chart 4 about here]

Chart 4 is based on the reasoning of Chart 2, although it only portrays the links between actions in subsequent periods (i.e. the FGP), rather than detailing the full linkage between current assets and routines, capabilities, actions and on to new assets and routines and new capabilities. Chart 4 depicts an FGP that Biotech or Hardware start-ups could potentially share in common, with the similarity stemming from the similar critical actions that these firms face in the different periods. Chart 4 also indicates how specific actions in R&D, P, M&S and F enable new actions in the next period. The chart shows that technology is not only turned into products, but also impacts the firm's ability to find strategic partners and to raise external funds. M&S actions (e.g. collaborating with a strategic partner) are shown to enable the development of additional products, increase production volume and raise more capital. P actions enable future development of products (e.g. process innovation to make the product cheaper and easier to produce) and increase production capacity. Finally, F actions are developed over time and enables the firm to expand its R&D, P and M&S actions. The chart also indicates (albeit indirectly) the constraining nature of a given set of capabilities. For instance, an IPO is possible only at T_4 when a firm has both a proven product and a sales record. In a similar vein, internationalization of production (T_5) is conducted only once the firm has issued an IPO, has agreed on cooperation in M&S with its strategic investor in order to reach larger volumes of sales, and has exhausted the capacity of its home plant. It is quite clear that, although Biotech and Hardware are different industries whose value activities would substantially differ under a finer grained analysis, they can have a similar FGP that includes the same R&D, P, M&S and F actions, and thus are likely to possess similar VAS capabilities. Thus a given FGP will not necessarily be industry specific, but rather, may be common to some firms from several different industries, without being appropriate to all members of those industries.

Preliminary exploratory study

We conducted an exploratory study of the proposed conceptual framework based on four case studies of Israeli firms from the Enterprise Software industry. This study is naturally confined in its ability to identify the impact of the external environment since all four firms belong to the same industry, were incepted at around the same time and originated in the same country. However, it enables us to portray the development of firms' different FGPs over time according to their subsequent actions and developed capabilities. In line with Eisenhardt (1989), we consider a case study methodology to be appropriate to this stage of our research, as it seems practically impossible to truly identify the linkage between actions and capabilities without a deep understanding of each firm's development and the managerial decision-making processes that accompanied it.

The Israeli Enterprise Software industry consists of 104 firms (figures from early 2003) that develop software to support the basic infrastructural processes of firms in five major categories: (1) customer relations management, (2) e-business, (3) software design, (4) operational tools and (5) management tools. We chose to focus on this industry for three reasons: First, the industry's boundaries are well defined in terms of the technology used (Dolev & Abramovitch, 2003). Second, this industry is very diverse with regard to firm size, history and success. Third, we felt that our knowledge of the Enterprise Software sector is adequate to enable us to understand the contexts within which Enterprise Software firms operate.

We analyzed the FGPs of four firms in terms of their actions and VAS capabilities in subsequent periods from their inception to date (2004). To facilitate data collection our analysis was focused on the linkage between VAS actions and capabilities and has not aimed to explicitly identify FS assets and routines that intermediate this linkage. For reasons of business confidentiality, we refer to these firms as: alpha, beta, gamma and delta. The process of data collection included interviews with the firms' senior management (VPs or CEOs). In each firm, at least one person who has been with the firm from its inception was interviewed. The interviews were recorded and then transcribed by a professional transcriber. Additional data on each firm were collected

from other sources such as the firms' web sites and from the archives of economic newspapers (principally "Globes", the leading economics newspaper in Israel, which contains archival data back to 1996). The FGP of each firm was then determined independently by each of the two authors. There were only minor discrepancies between these initial FGPs, which we discussed in arriving at a final agreed FGP. This procedure was intended to increase the internal validity and reliability of the analysis. However, due to the nature of the selected cases (only four firms from a single country and industry) we do not consider the procedure sufficient to assure this study's external validity.

The FGPs of each of the analyzed firms are presented in the Appendix. The data are presented in such a manner as to retain the firms' anonymity. The FGPs contain a brief background on each firm and a description of these firms' actions in R&D, M&S and F activities² and the capabilities that were created as a result of these actions.

Chart 5 offers an overall view of the FGPs detailed in the Appendix. Chart 5 presents the various critical actions taken by each of the four analyzed firms based on their initial resource endowment and contains up to six major stages. While its analysis is somewhat coarser grained than the individual FGPs prepared for each firm, and while the time elapsed between stages differs from one firm to another, Chart 5 has several intriguing implications. First, for all four firms, each of the value activities (R&D, M&S, F) includes only 2-3 possible critical actions at each stage, implying that the range of actions these firms could take was quite limited. Second, significant parts of the firms' FGPs in R&D, M&S and F overlap and, in cases where they do not overlap, similar critical actions take place in subsequent stages. An analysis of the four cases reveals that phenomena such as: gradual commitment to foreign markets, targeting small customers first and then targeting larger ones, integrating acquired competitors' systems into the firms' own systems and building a software package based on the detailed specifications of one or a few customers repeat themselves for most of the analyzed firms. Overall, while the concerned firms differ substantially in their applications (developing software for large firms, universities and banks), in their major target market (gamma is much

² Production is excluded, since it is not part of the typical value chain of a software firm.

more focused on the Israeli market than the other firms) and in their operational natures (software products vs. software services), their development process yields substantial commonalities. This supports our expectation that similarity in external conditions will cause FGPs to converge. Third, while there are similarities between the four FGPs, none are identical. If we classify the analyzed firms into case study categories, three FGP archetypes may be observed: alpha may be labeled the "moderately leveraged firm", gamma may be labeled the "merged fast-growing home-based firm", and beta and delta may be labeled the "conservative global slow runners".

[Insert Chart 5 about here]

Discussion and conclusion

The FGP concept presented in this paper opens the "black box" of capabilities and explains one of the ways in which they are created through an evolutionary process. This evolutionary process portrays the mechanism as being "current assets and routines → current capabilities → critical actions → new assets and routines → new capabilities", that is, that current assets and routines define current capabilities, which enable a set of critical actions in turn leading to the creation of new capabilities. We expect that only those firms that take the "correct" critical actions create capabilities that enable them to sustain their competitive advantage. Moreover, we argue that in each period, a firm's actions and capabilities should be conceived as large sets connected to each other via a "many to many" relationship. This implies that the impacts of multiple simultaneous actions (e.g. in research & development, production, marketing & servicing and finance operations) affect the development of each and every capability.

Our FGP concept also accounts for the moderating impact of the external environment on the sequence of critical action sets firms can take. We assert that FS assets and routines. VAS capabilities and actions (in research & development, production, marketing & servicing and finance operations) are expected to converge to some extent as a result of the external environment in which firms operate. Thus, our conceptual framework enables us to show how capabilities are developed and to link this development to the external environment, all within a generalized model that allows for

the development of firm idiosyncraticity while recognizing the commonalties shared by firms.

We believe that the FGP concept overcomes several major drawbacks of the RBV and dynamic capabilities literature. First, it conceptualises the way in which capabilities are created and modified by focusing on certain critical actions that shape firms' growth paths, enabling groups of firms to share the same general FGP. Recognizing that the decision to take a specific action enables certain subsequent moves while precluding others, the FGP concept conceives of firms as progressing along a branching 'tree' of alternative actions. This implies that firms' choices introduce path dependency into their development process (Arthur, 1990; David, 1989). If certain FGPs lead to different possible sets of actions and outcomes, they are likely to yield different levels of created value. The fact that the variance in created value is revealed only *ex-post* makes it difficult for one firm to imitate another firm's growth path. In addition, the FGP concept extends the traditional RBV approach by providing an evolutionary perspective on the process of firm development, and contributes to the creation of a dynamic RBV theory by explaining how capabilities are developed in path dependent processes.

Second, the FGP concept suggests that the external business environment is likely to moderate the development of a firm's capabilities. Hence, it links the internal modification of capabilities with the external factors that shape this change. The relative impact that the time period in which firms operate, their geographical location, network position and industry characteristics have on capability development is still unclear. However, we believe that similar external conditions are likely to lead to similar FGPs, at least at a coarse level of analysis. In this respect, our approach differs from the traditional RBV approach, which essentially argues that the firm development process is idiosyncratic. Moreover, according to the FGP approach, firm development does not stem solely from firms' idiosyncratic characteristics and industries, but rather from a combination of internal and external factors. Thus we attenuate the purely internal focus of the RBV by incorporation of what might be called a Market Based View, which essentially refers to the impact of the external environment on capabilities development. In this respect, our synthetic example of a shared FGP for a Biotech and a Hardware firm

suggests that FGPs may cut across industry boundaries. While the direct impact of the external environment clearly requires more theoretical refinement and empirical validation, we believe that our approach is the first step in enabling us to better understand to what extent and in what contexts different factors shape the development of the firm.

We conducted an exploratory study of the FGP concept through an in-depth analysis of the growth profiles of four Israeli Enterprise Software firms from their inception through to the present. While the external validity of this study is naturally limited, we were able to track the sequences of "capabilities→ actions→ capabilities" for these firms. Our results show a certain degree of commonality between the firms' FGPs (notwithstanding the fact that they target totally different types of customers), and suggest that timing (the 1990s), location (Israel) and industry (Enterprise Software) have a unifying impact on FGPs. Certainly, considerably more empirical work needs to be undertaken to refine the FGP concept and to better evaluate the impact of external factors on firm development. Although it is extremely important that this be the next task, it will not be easy to perform, as it requires a longitudinal study of firm development and the collection of extensive data on R&D, production, M&S and financial actions over relatively long time periods. Such empirical work should combine case study and quantitative analyses. For both methodologies it is reasonable to expect that data collection will be easier for critical actions than for the more intangible notion of capabilities. In this respect, interesting examples of relevant case study analyses are those of Teubal & Avnimelech (2003) on Israeli data security firms or a somewhat more dated analysis by Mintzberg & Waters (1982), which portrays 60 years in the development of a Canadian retail chain. An example that looks at growth profiles of French biotech firms, analyzing a large sample of firms, can be found in the recent work of Mangematin et al. (2003). Studies that compare the FGPs of firms from many different periods, geographical locations, networks and industries are clearly still missing.

The FGP concept is in fact complementary to the concept of dynamic capabilities (Teece et al., 1997, Eisenhardt and Martin, 2000). While discussion of dynamic capabilities focuses on the nature of the organizational routines that constitute such capabilities (Eisenhardt and Martin, 2000, Zollo and Winter, 2002; Winter, 2003), the

unit of analysis for FGPs is the *action* that leads to the change in firm assets, routines and capabilities. Actions may either be a product of dynamic capabilities (e.g. learning) or of non-routinized managerial decisions (Nelson and Winter, 1982). The FGP concept ignores the question of what triggered an action, and instead explores the ability of a firm to take a set of actions (according to its capabilities) and these actions' impacts on the development of new capabilities.

One phenomenon that is discussed by the dynamic capabilities literature but that cannot be explained by the FGP concept is the *recombination* of internal and external capabilities to create competitive advantage (Teece et al., 1997). This recombination changes the current position of firms and creates a new growth potential without the need for critical actions as an intermediating variable. Thus, while the dynamic capabilities literature focuses on the role of capabilities reconfiguration in shaping firm growth, the FGP concept highlights the role that management's deliberate actions, based on a firm's existing set of capabilities, have in shaping such growth. Combining these two complementary approaches is therefore necessary to establish what part of the variance between firms' capabilities should be attributed to inter-FGP differences and what part is the result of intra-FGP ones

Naturally, the present framework is just a first step in improving understanding and modeling of capability development. The FGP concept raises various issues regarding the development of firms that are clearly left unanswered in the current paper. One question is whether more "successful" FGPs can be identified *ex-ante* so that prescriptions for superior FGPs could be given to firms that operate in similar external environments or whether such "successful" FGPs can be only identified *ex-post*. Here our expectation is that a chosen FGP should also correlate with a certain "window of opportunity" in the marketplace to lead to superior performance. Other questions include: To what extent can FGPs explain variance in the performance of different firms? What exactly are the external factors that lead different firms to choose a similar growth profile? Can two different FGPs lead to sustainable competitive advantage, or is there one superior FGP for firms operating within a given context? What are the time frames within which firms take critical actions? Are they fixed? Do they change between industries? Do they change according to the age or origin of firms? What defines the

boundaries of each time period? How do competitors' moves affect the critical action choices facing firms with a given set of capabilities? How does managerial-bounded rationality affect such choices of critical actions? Answering these questions is important in order to improve our understanding of firm development, the possible linkage between FGPs and the creation of value, and the joint impact of both dynamic capabilities and FGPs on achieving sustainable competitive advantage.

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Appendix

The FGP of alpha

Background

Alpha was established in the early 1990s. It develops software that manages the maintenance and support processes of capital equipment and complex products (such as jet engines, construction machinery, automobiles and telecommunications equipment) from initial installation through to operation, using a sophisticated product encyclopedia.

Initial resource endowment

R&D capabilities: The founders of alpha had extensive experience as system analysts in various large-scale projects in the Israeli Defense Forces and the Ministry of Defense. This experience was focused on designing information systems that can sophisticatedly structure large amounts of diverse information arriving from multiple sources.

M&S capabilities: virtually none.

F capabilities: virtually none.

Stage 1 – preparation for operations (duration: first 2 years from inception)

Actions

R&D actions: Developing the first version of the software in Israel.

M&S actions: Obtaining a single foreign customer and designing the software in accordance with this customer's specifications.

F actions: Raising funds from Israeli VCs and "Angels" (private investors who are leading figures in the Israeli software industry)

Created capabilities

R&D capabilities: extensive knowledge regarding the first version of the software and ability to pursue further R&D activities based on the raised funds.

M&S capabilities: Limited M&S experience, but one instance of proof that the product can be sold.

F capabilities: Success in initial fund raising made it easier to raise additional funds since it improved the firm's reputation and enabled alpha's management to cite the experience of the first investors.

Stage 2 – expanding customer base (duration: 2 years)

Actions

R&D actions: Israel-based operations to develop new versions of the original software.

M&S actions: Rapid expansion into foreign markets and sales to worldwide customers within a single industry. Strengthening M&S efforts through Israel-based M&S headquarters.

F actions: Additional fund raising from Israeli VCs.

Created capabilities

R&D capabilities: better familiarity with customers' needs and experience in more efficient software development. Ability to continue R&D activities based on available funds.

M&S capabilities: Experience in foreign pre- and post-sales interactions with customers (M&S experience). A track record of sales and available funds facilitate future M&S activities.

F capabilities: Financing operations based on the funds that were raised and sales revenues. A sales track record made it easier to raise additional funds.

Stage 3 – Moving headquarters and M&S to the US (duration: 3 years)

Actions

R&D actions: Moving from an "application" concept to a "platform" one by making the software a modular platform that can be tailored to specific customer needs and that has built-in interfaces with other common software used by businesses (e.g. ERP systems)

M&S actions: Relocation of M&S infrastructure to the US. Continued worldwide sales to customers from various industries (sales volume doubled in this period).

F actions: Additional fund raising from Israeli VCs to support the move to the US and the change in the product orientation.

Created capabilities

R&D capabilities: knowledge of how to develop a modular platform (rather than a specific product), which was financed by raised funds.

M&S capabilities: Increased market potential due to the move to a platform concept. Improved interactions with customers (because of the move to US) led to increasing sales volumes. Available funds enabled the firm to relocate to the US.

F capabilities: Financing operations through the funds that were raised and sales revenues.

Stage 4 – Standardizing the product (duration: 2 years)

Actions

R&D actions: Continued development of additional versions of the software focusing on core elements of the software and less on peripheral technological applications. Incorporating the complementary technological know-how of a purchased competing firm.

M&S actions: Continued market expansion (sales double once more in this period but were then somewhat reduced due to an overall market recession). Buying a competitor that has a complementary market base.

F actions: Substantial fund raising from VCs and investment funds.

Created capabilities

R&D capabilities: Better development efficiency due to focus on core elements, additional funds available and the complementary technology obtained through the purchase of alpha's competitor.

M&S capabilities: Additional funds, established reputation and the elimination of a competitor enable improved M&S capabilities.

F capabilities: A large positive equity that, together with a positive cash flow, enables further growth.

Stage 5 – Becoming an OEM supplier (duration: 3 years)

Actions

R&D actions: Changing the focus from a "platform" to that of being an essential part of any organizational information system, which means that leading OEM integrators (IBM, SAP) install alpha's system as an integral part of any system they install.

M&S actions: Continued market expansion (annual sales increase by 20% compared to the peak in the previous stage). The establishment of OEM agreements.

F actions: self financed through a positive cash flow.

Created capabilities

R&D capabilities: knowledge in developing interactive software that has interfaces to most popular organizational information systems.

M&S capabilities: Reduced costs and increased efficiency of M&S activities through the leverage of the M&S infrastructure of OEM integrators.

F capabilities: A large positive equity that, together with a positive cash flow, should enable future growth.

The FGP of beta

Background

Beta was established in the mid 1980s. It develops software that manages a major university unit (that exists also in other institutions) and supports various processes that are part of this activity through a specialized software package. The basic version of the software was developed over several years in one of Israel's universities and then was transferred to beta's entrepreneurs in return for royalty payments.

Initial resource endowment

R&D capabilities: Unique knowledge of software containing a substantial programming investment, and a team of experienced programmers that developed this software.

M&S capabilities: Previous M&S experience of the leading entrepreneur in the Israeli software industry plus a joint decision of all Israeli universities to adopt the system.

F capabilities: Financing operations based on capital assets of the entrepreneurs, who also have experience in fund raising.

Stage 1 – local operations (duration: 3 years after inception)

Actions

R&D actions: Developing the first version of the software in Israel using an R&D subsidiary, owned jointly with one of Israel's universities.

M&S actions: commercialization of the basic product version to other Israeli educational organizations and institutions.

F actions: Self financed.

Created capabilities

R&D capabilities: Programming knowledge of a unique and sophisticated software package (rather than tailor-made software) that meets the needs of Israeli universities.

M&S capabilities: Very limited foreign M&S experience, monopoly status in Israel (gives the firm a proven track record of sales).

F capabilities: limited to the private financial resources of the entrepreneurial team.

Stage 2 – Penetrating Europe (duration: 2 years)

Actions

R&D actions: Modification of the basic software package in order to meet European standards, based on a detailed specification given by a European university that was a prospective customer.

M&S actions: First sales to two universities in Europe. M&S activities are located in Israel. Purchase of a failing European competitor.

F actions: Self finance of R&D and M&S activities.

Created capabilities

R&D capabilities: knowledge in developing a more standardized product that meets both Israeli and European standards.

M&S capabilities: limited experience in foreign sales, a modest track record of foreign sales. Ability to buy a failing competitor through available funds.

F capabilities: Financing operations based on sales revenues. A track record of sales makes it easier to raise external funds.

Stage 3 – Conquering Europe (duration: 8 years)

Actions

R&D actions: Further adaptations of the software package to fit the requirements of additional European customers (e.g. in Germany).

M&S actions: Relocating M&S activities to 3 subsidiaries in Europe and rapidly penetrating the European market (beta sells its software in almost all European countries)

F actions: Self finance of R&D and M&S activities.

Created capabilities

R&D capabilities: Knowledge in developing a standard product that can be fitted to the requirements of multiple customers.

M&S capabilities: Vast experience in foreign sales and reputation that was gained through the high quality of the software and a substantial track record of foreign M&S activities in Europe.

F capabilities: Financing operations based on sales revenues. A track record of sales makes it easier to raise external funds.

Stage 4 – Failure to penetrate the US market (duration: 2 years)

Actions

R&D actions: Relatively minor adaptations of the software package to fit the requirements of American customers.

M&S actions: Trying to expand activity in the American market by targeting large as well as small universities.

F actions: Raising funds from an Israeli VC.

Created capabilities

R&D capabilities: Knowledge in developing a standard product that can be fitted to the requirements of European and American universities. Ability to enhance R&D activities using raised funds.

M&S capabilities: Some experience in M&S in the US, however limited success in attracting customers makes M&S capabilities quite weak.

F capabilities: Financing operations based on sales revenues and raised funds. Experience in external fundraising and a track record of sales should make it easier to raise additional external funds.

Stage 5 – Market expansion in the US (duration: 2 years)

Actions

R&D actions: Adaptations of the software package to fit the requirements of American customers. Opening an R&D subsidiary that could easily react to the demands of American customers.

M&S actions: Penetrating the American market through sales to relatively small universities. Establishing an M&S subsidiary in the US.

F actions: Financing activities through the funds that were raised and sales revenues.

Created capabilities

R&D capabilities: Knowledge in how to develop a product that fits the requirements of multiple American universities through close interaction with American customers.

M&S capabilities: Improved interaction with American customers, vast experience in M&S activities and a strong market position in the US. Success with small universities should make penetration into larger ones easier.

F capabilities: Accumulated revenues plus external funds raised support R&D and M&S activities. Beta's track record of sales and fund raising experience makes the raising of additional external funds a feasible option.

Stage 6 – Entering Australia and developing the product range (duration: 2 years)

Actions

R&D actions: product diversification by developing 3 additional related applications that can be used in universities.

M&S actions: Opening an M&S subsidiary in Australia.

F actions: Financing activities through sales revenues.

Created capabilities

R&D capabilities: Multifaceted knowledge in developing a diversified product that meets the many needs of universities worldwide.

M&S capabilities: An M&S infrastructure scattered around the world and worldwide reputation that should facilitate further sales.

F capabilities: A large positive equity that together with a positive cash flow should enable further growth. Beta's reputation makes the raising of additional external funds a feasible option.

The FGP of gamma

Background

Gamma was established in the late 1990s from the merger of 6 Israeli software firms that specialized mainly in software projects and services in the Israeli market. Gamma provides software services (application development, outsourcing) and sells infrastructural software products (mostly imported) to a wide range of industry segments.

Initial resource endowment

R&D capabilities: the knowledge to develop tailor-made applications and turnkey projects for a diverse range of customers. Experience in IT (Information Technology) outsourcing.

M&S capabilities: The customer bases and reputations of the merged firms. Experience in selling ready-made software packages and in providing customers with programming staff.

F capabilities: Financing operations through the resources of a private foreign family and foreign investment fund that controlled gamma after the merger. The experience of the merged firms and of the owners facilitates raising external funds or loans.

Stage I –Reorganization and operations in the domestic market (duration: 4 years)

Actions

R&D actions: Reorganization and recombination of existing R&D teams into one team. Activities are mainly minor modifications of programs, adaptations to customers' needs and turnkey software projects.

M&S actions: Reorganization and recombination of existing M&S teams into one team.

M&S activity focused mostly in Israel (85% of the firm's activity).

F actions: Plans for an IPO in the US were cancelled because of the stock exchange crisis. High leverage through bank loans.

Created capabilities

R&D capabilities: Experience in IT outsourcing and the development of tailor-made software supports financially leveraged activity.

M&S capabilities: Strong hold in the Israeli domestic market in both products and services. Gaining experience in merging 6 independent M&S units into a single unit.

F capabilities: Financing operations based on the owners' private sources, sales revenues and bank loans. The ability to further leverage activities through bank loans.

Stage 2 –Penetration into Foreign markets (duration: 1 year)

Actions

R&D actions: Absorbing complementary know-how from purchased foreign subsidiaries.

M&S actions: Purchasing subsidiaries in the Czech Republic and India in order to cater to these markets. These subsidiaries have other subsidiaries in the US, the Far East, and East Europe. Sales grew substantially (by 35% from previous stage's peak).

F actions: Purchases financed mainly by an investment firm belonging to one of gamma's owners in return for an additional share allocation in gamma. Sales revenues and bank loans (which are about 40% of annual revenues) finance the rest of the activities.

Created capabilities

R&D capabilities: Gaining experience in foreign IT outsourcing, development of tailor-made software, turnkey projects and adaptation of products. Accumulating experience in the adaptation of products and the recombination of multifaceted knowledge sources.

M&S capabilities: Experience in foreign M&S activities, creating reputation and reaching a critical mass of customers that enables the firm to acquire larger scale customers.

F capabilities: Financing operations based on high revenues from sales. High sales revenues and management experience create potential for further leverage and for an IPO.

Stage 3 – IPO and expansion in foreign markets (duration: 1 year)

Actions

R&D actions: slight adaptations of products and the execution of new development and outsourcing projects.

M&S actions: Expansion of activities in foreign markets through purchased subsidiaries (35% of the sales are foreign sales). The US is the firm's major market. Good experience in merging with foreign software vendors and services providers.

F actions: A successful IPO on the NASDAQ (raised about \$150M).

Created capabilities

R&D capabilities: Solid and fairly unique experience in foreign IT outsourcing, development of tailor-made software, turnkey projects and adaptations of products. Experience in recombination of multifaceted knowledge sources. R&D activities can be enhanced by available funds.

M&S capabilities: Experience in foreign M&S activities, increased reputation and the ability to serve customers worldwide. M&S activities can be enhanced by available funds.

F capabilities: High surplus funds through IPO enable to accelerate future growth.

The FGP of delta

Background

Delta is a subsidiary of a leading Israeli software firm. Delta develops a specialized system that is required in most established banks. The software development started as a tailor-made programming project of the parent firm for one of Israel's leading banks, and this eventually led to development of a system that could be sold to other banks as well. The parent company decided to spin-off this activity and delta was established as a foreign subsidiary in the early 1990s.

Initial resource endowment

R&D capabilities: Developing the first version of the software (in Israel) so it would meet the requirements of standard package software for foreign banks (an English

interface and adaptation to international standards) and later knowledge in adapting this software to the specific needs of a Hong Kong branch of a British Bank.

M&S capabilities: Strong domestic M&S experience of the parent company in Israel. Limited foreign M&S experience at a Hong Kong branch of a British bank.

F capabilities: Financing operations through the resources of the parent company owned by a wealthy foreign family. Parent's reputation should enable external fund raising, but the conservative investment policy of the owners excludes this option.

Stage 1 – Expansion throughout the Pacific Rim (duration: 2 years)

Actions

R&D actions: Continuing to modify the product according to customers' specifications.

M&S actions: Establishing an M&S subsidiary in Hong Kong and expanding sales to other banks in Hong Kong, Thailand, the Philippines and Singapore (about 8 banks).

F actions: Self financed by parent company and accumulated sales revenues.

Created capabilities

R&D capabilities: Vast programming knowledge and efficiency in unique and sophisticated banking software that incorporates the specifications of multiple customers.

M&S capabilities: Improved pre- and post-sales interaction with customers in the Pacific Rim. Reputation gained through a sales track record.

F capabilities: Operations' financing is limited to the private sources of the parent company and cash flow (mainly because of owners' policy).

Stage 2 – Penetrating into Europe (duration: 2 years)

Actions

R&D actions: Increasing the software's scope by the purchase of an American software firm with complementary know-how.

M&S actions: Avoiding penetrating into countries that have a historical financial heritage (Switzerland, UK, France and Germany) and entering more “peripheral” countries from the Mediterranean, Scandinavia, and the Czech Republic. This was initially done (without success) via local subsidiaries and local representatives, and was

rapidly changed to a joint venture (JV) approach with firms that develop other systems for banks.

F actions: Self financed by parent company.

Created capabilities

R&D capabilities: Increased programming knowledge of unique and sophisticated bank software with multiple modules that can be adapted to the needs of specific banks. Knowledge in how to integrate software systems into a unified system.

M&S capabilities: Foreign M&S experience in Europe and the development of an M&S reputation.

F capabilities: Financing of operations is limited to the private sources of the parent company. Knowledge and reputation to raise external funds exist, but precluded by owners.

Stage 3– Expansion in Europe (duration: 3 years)

Actions

R&D actions: Increasing the software's scope through a JV with a British software firm with complementary know-how. Conducting minor development activities in the UK (most R&D activity is still in Israel).

M&S actions: Penetration into European countries that have a historical financial heritage (Switzerland, UK, France and Germany) by using the JV British firm as its M&S front in Europe.

F actions: Self financed by a positive cash flow.

Created capabilities

R&D capabilities: Increased programming knowledge of unique and sophisticated bank software with multiple modules that meet European banks' demand. Further knowledge of how to integrate software systems into a unified system.

M&S capabilities: Extensive foreign M&S experience in Europe, increased reputation and improved interactions with European customers during pre- and post-sales activities.

F capabilities: limited to the private sources of delta.

Stage 4– Penetration into the US (duration: 5 years)

Actions

R&D actions: Increasing the software's scope through acquisitions of relatively small American software firms with complementary know-how. Conducting minor development activities in the US (most of R&D is still in Israel).

M&S actions: Penetration into small banks and then larger ones based on two acquired software firms that are responsible for M&S activities on the East and West Coasts.

F actions: Self financed by a positive cash flow.

Created capabilities

R&D capabilities: Increased programming knowledge of unique and sophisticated banking software with multiple modules that meet the demands of American customers.

M&S capabilities: Extensive foreign M&S experience in the US, increased reputation and improved interactions with American customers during pre- and post-sales activities.

F capabilities: Financing of operations is limited to the sources of delta.

Stage 5– Penetration into the Rest of the World (duration: 4 years)

Actions

R&D actions: Minor improvement of the software.

M&S actions: Penetration into South Africa (handled by British JV), Latin America (handled by one of the American subsidiaries) China and Israel (beyond the initial Israeli customer - handled by the parent company).

F actions: Self financed by a positive cash flow.

Created capabilities

R&D capabilities: Increased programming knowledge and experience.

M&S capabilities: Extensive worldwide M&S experience and increased reputation.

F capabilities: Financing of operations is limited to the sources of delta.

Chart 1 – A possible range of value activity-specific actions

Value activity	Possible action decisions
R&D	<ul style="list-style-type: none"> - Type of R&D activity: no R&D activity, incremental, radical. - Output type: component, product, platform. - Degree of internalization: exclusively in-house, outsourcing, strategic alliances - Location of R&D: at home, in close proximity to foreign markets, in knowledge-abundant host countries
Production	<ul style="list-style-type: none"> - Output type: component, product, platform. - Degree of internalization: exclusively in-house, outsourcing, strategic alliances - Location of P: at home, in close proximity to foreign markets, in resource-abundant host countries
Marketing & Servicing	<ul style="list-style-type: none"> - Type of entry mode: direct exports, via agents, via distributors, OEM, licensing, franchising, strategic alliances (equity/non equity based), wholly owned sales subsidiaries (greenfield/mergers & acquisitions) - Geographical distribution of markets: North America, Europe, South East Asia, Rest of the world. - Product positioning.
Finance	<ul style="list-style-type: none"> - Source of capital: self financing, private investors, institutional investors, bank loans, venture capital funds, strategic investors, public offering. - Geographical source of capital: US, Europe, South East Asia, Other. - Degree of financial leverage.

Chart 2 - Critical actions and capability development

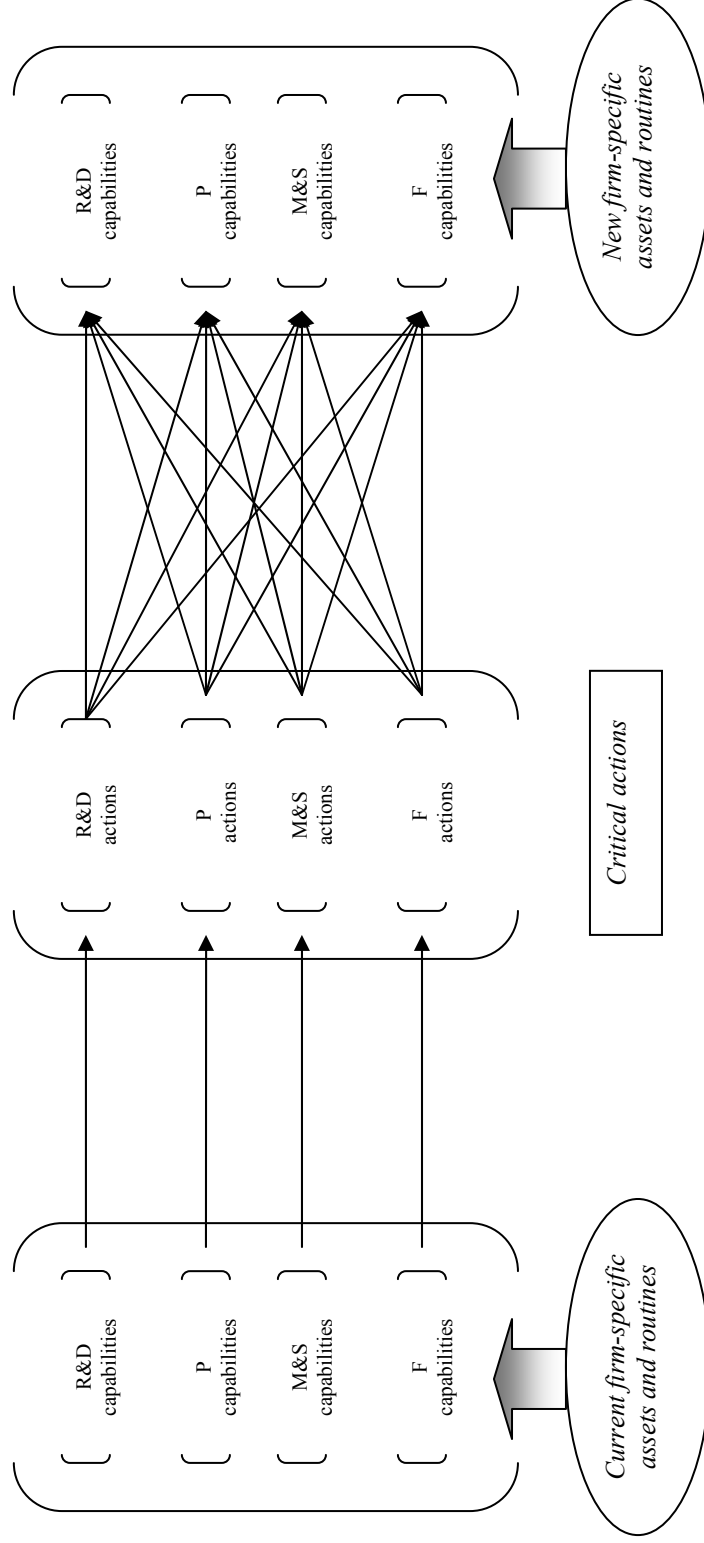


Chart 3 – Irreversible Critical Actions along the Firm's Growth Profile

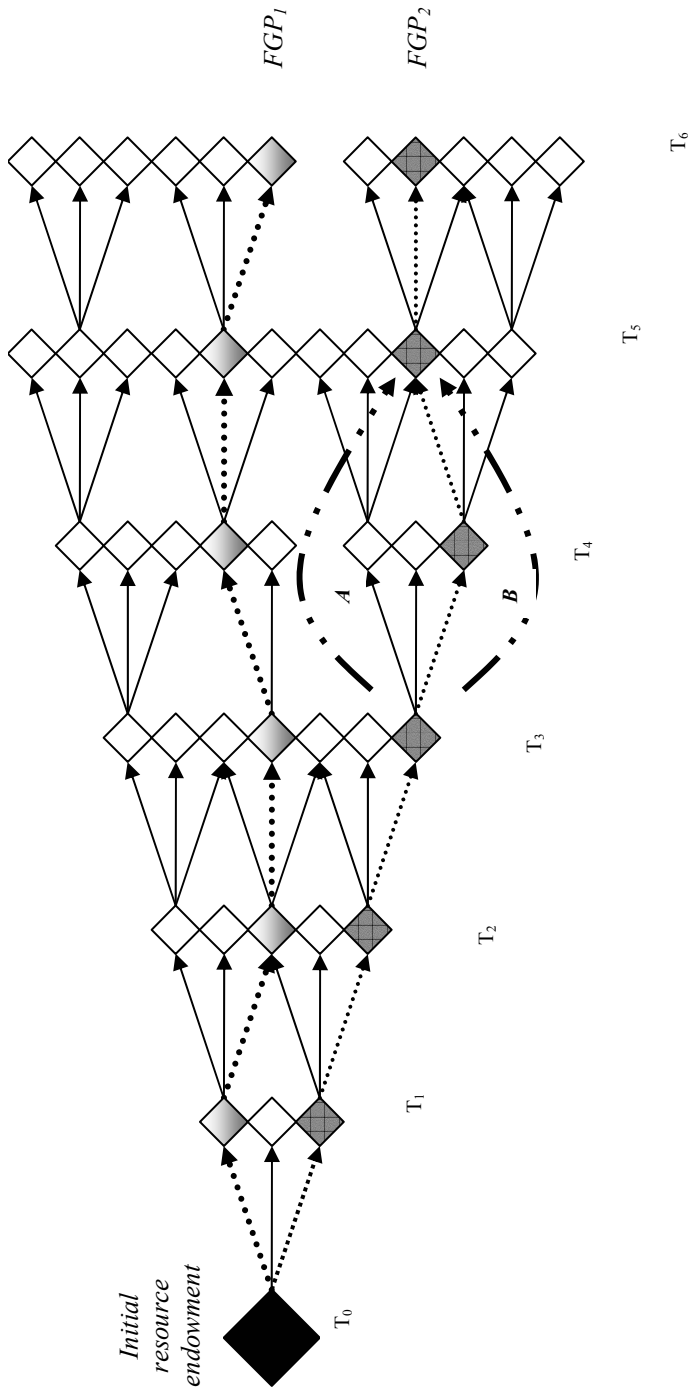


Chart 4 – A specific possible FGP for Biotech and Hardware firms

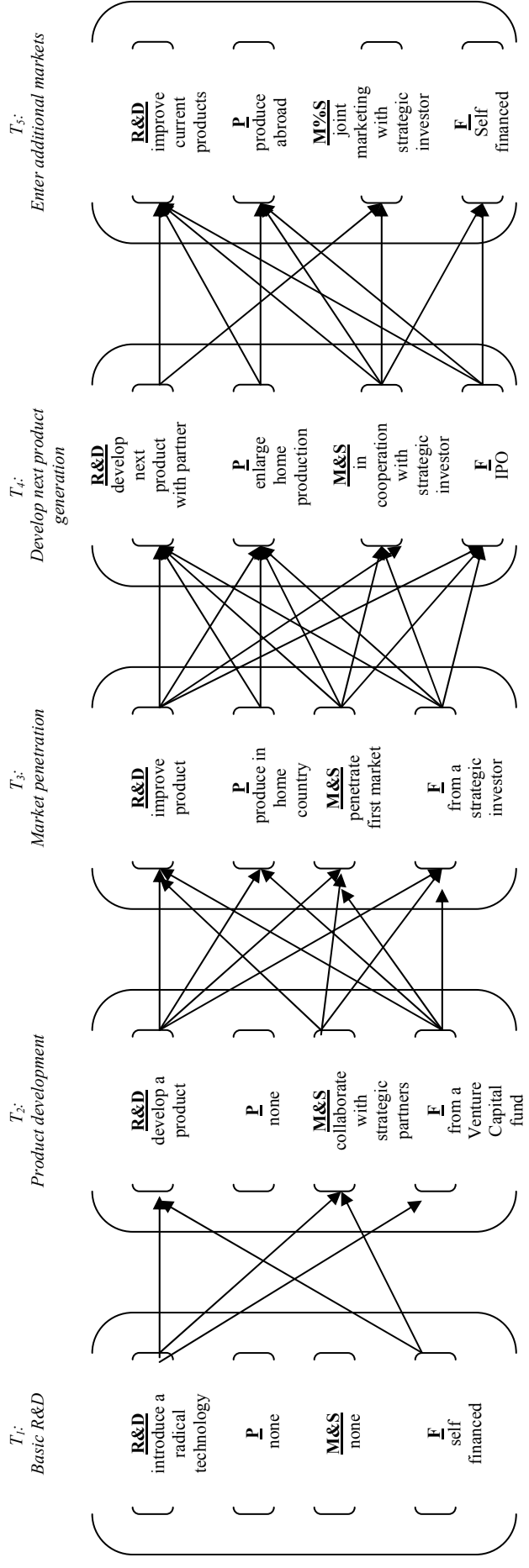
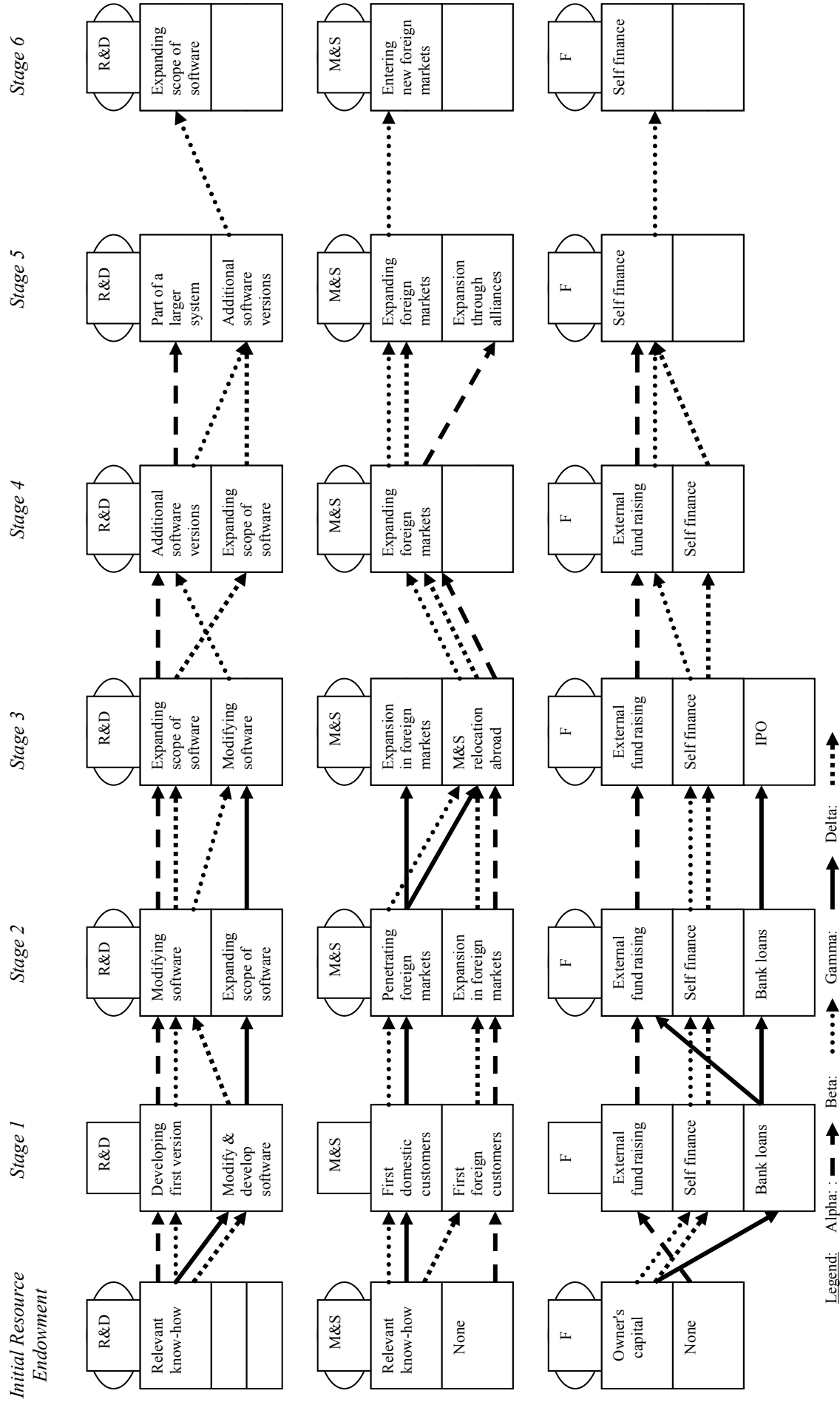


Chart 5 - Four FGPs in the Israeli Enterprise Software Industry



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