

AN EMPIRICAL INVESTIGATION OF SUCCESS STRATEGIES FOR BUSINESSES ALONG THE PRODUCT LIFE CYCLE*

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Since the introduction of the concept of the product life cycle (PLC) some decades ago a great deal has been written on the subject and several empirical studies have been conducted. However, empirical research to date is often limited in scope. It is oriented towards the analysis of the growth and saturation stages and focused primarily on the study of consumer goods. Furthermore, the application of the PLC concept in strategic planning is largely disappointing, the normative orientation of most of this literature being somewhat naive and misleading.

The aim of the present research is to study the efficiency of different strategies for achieving market share and cash flow objectives. This study is performed on different types of businesses producing both consumer and industrial products situated at various stages on the product life cycle: growth, maturity and decline.

A sample of approximately 1100 businesses (217 in the growth stage, 315 in the maturity stage, 569 in the decline stage) is drawn from the PIMS data base. A cluster analysis is run to identify natural groups of homogeneous businesses. For each of the nine identified groups, linear regression models are estimated to study the influence of strategic actions—finance, marketings, production, R & D, personnel—on two criteria of performance: market share and cash flow.

The research indicates that strategies not only depend on the life cycle stage but also are influenced by the goal orientation of the firm—short-term (cash-flow) or long-term (market share)—and that success strategies appear to be contingent upon the business and the environmental characteristics.

(ORGANIZATIONAL LIFE CYCLE; CORPORATE STRATEGY; PRODUCT LIFE CYCLE)

Introduction

Among the contingent theories of strategic management, the product life cycle approach (PLC) holds a leading position. According to the PLC theory (Buzzell 1966; Clifford 1977; Cox 1967; Dhalla and Yuspeh 1976; Doyle 1976; Levitt 1965; Wright 1971) different strategies are adopted at the various phases of a product life. Specifically, a leadership strategy is adopted at the introduction and growth phases and is then followed by the niche strategy at the maturity stage. Finally, when decline sets in, a harvest strategy is implemented.

Over the years the PLC model as a tool for strategic planning has been modified. However, its basic premise—that a given set of strategic actions is associated with each stage—still remains. In representing the evolution of the product through time, the PLC approach can be used prescriptively for allocating efforts and resources among different activities of the multibusiness firm. It can also be a useful tool in choosing and implementing strategic actions dealing with the financial, marketing, production and R & D aspects of the firm as the product moves from one stage to another. At the growth stage, for example, marketing appears to be the key factor (Patton 1959): high marketing intensity (Hofer 1975), high advertising and price (Buzzell 1966), aggressive sales promotion and publicity (Wasson 1974), effective distribution, establishment of a strong brand image and a distribution niche, salaried sales force and channel commitment (Fox 1973). Product differentiation, in terms of design (Wasson 1974; Staudt and Taylor 1976), is also a key element for success. At the maturity stage, low production costs (Staudt et al. 1976; Fox 1973; Wasson 1974) and marketing effectiveness (Clifford 1977) become crucial. For instance, optimizing capacity utilization (Hofer

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1975; Smallwood 1973), increasing the manufacturing process stability (Catry and Chevalier, 1974), routinizing the activities and the marketing search (Fox 1973) and using mass marketing channels (Smallwood 1973) help achieve low costs. At the same time, market segmentation (Levitt 1965; Smallwood 1973; Staudt et al. 1976), line broadening (Staudt et al. 1976) and prevalence of services (Levitt 1965; Staudt and Taylor 1976) contribute to marketing effectiveness. When maturity sets in, a greater standardization (Dean 1950) and a lower product differentiation (Buzzell 1966; Patton 1959) is recommended. However, some authors also find that superior quality (Hofer 1975; Smallwood 1973), price penetration (Buzzell 1966; Clifford 1977; Patton 1959; Wasson 1974) and R & D expenses reduction (Fox 1973) are very important. At the decline stage, a quick exit from the market is usually recommended (Staudt et al. 1976). Thus, milking the activity of all possible profit (Wasson 1974) is the key strategic action. Cost control (Clifford 1977) by cutting marketing expenses (Buzzell 1966; Staudt et al. 1976; Fox 1973; Wasson 1974), specializing the channels (Smallwood 1973), simplifying the production line (Fox 1973), relying on mass production (Forrester 1959), elimination of items not returning a direct profit (Wasson 1974), reducing product differentiation (Forrester 1959; Patton 1959) raising price (Fox 1973; Wasson 1974) and cutting R & D expenses from initial levels (Fox 1973) are all recommended as successful actions. However, other authors (Hall 1980; Harrigan 1980; Porter 1980) also suggest the possible existence of more aggressive strategic stances based on increasing investment and marketing efforts.

Following in the vein of the contingency theories, some researchers stress the importance of other key factors in addition to the product's life stage (Enis et al. 1977; Hofer 1975). They focus on such factors as environmental variables (competition, consumer taste) or business characteristics (type of technology, size of the firm and nature of the product). According to Rink and Swan (1979), research based on the PLC concept requires a multidimensional approach. In formulating and implementing strategies, the nature of the environment is critical. In fact, the firm must match its internal capabilities to the environmental opportunities and threats in order to achieve its goal. Some environments may be more favorable than others. Hence, the strategy which can be selected differs depending on the nature of this same environment. In a similar fashion, the strategic posture of a business greatly influences the type of strategy that a firm can adopt. On one hand, a business activity with a strong strategic posture may favor the implementation of an aggressive strategy. On the other hand, a defensive strategy may be mandated for businesses with a weak strategic posture. Some authors have conducted empirical studies which integrate these elements (environment and business-related characteristics) into one stage of the PLC framework (Harrigan 1980; Thorelli and Burnett 1981). In a more recent study, Galbraith and Schendel (1982) analyze the impact of two main variables—market share rank and market life cycle—on the "strategy-performance" relationship. This was done for two types of businesses—consumer goods and industrial products. Other than these studies, no research has yet been conducted on the effective strategies to implement over the entire life cycle, while simultaneously accounting for environmental and business-related variables.

The firm's strategic behavior may also vary depending on its goal structure. For instance, the pursuit of a longer term goal such as market share strongly influences the strategic actions for a high-growth business. In contrast, a business which is characterized by a low or negative growth is inclined to look for short-term results (Norburn and Miller 1981; Stonich 1981). Under these circumstances, the pursuit of a maximum positive cash-flow and the implementation of the associated strategic actions is mandatory for survival. Organizational goals and performance measures are multivariate and hierarchical in nature. A trade off exists between long-term and short-term goals. Thus, both the goals of market share and cash-flow should be analyzed.

Up to now and to the best of our knowledge no comprehensive analysis on the relationship between strategies, goals, environmental and business characteristics and life stage has been undertaken. In this study, we analyze the efficacy of different strategies for achieving market share and cash flow objectives for different types of businesses (consumer goods and industrial products) and under three stages (growth, maturity, decline) of the product life cycle. We show that strategies not only depend on the life cycle stage but also on the goal orientation (short term: cash-flow or long term: market share) and on the business characteristics.

Methodology

Several steps are covered in this research: (1) the choice of the sample; (2) the identification of the performance variables (dependent variables); (3) the determination of the strategic variables (independent variables); (4) the selection and implementation of the appropriate statistical techniques.

1. *The Sample*

A sample of approximately 1100 businesses (217 in the growth stage, 315 in the maturity stage, 569 in the decline stage) is drawn from the PIMS data base. The unit of analysis is the business as defined in the data base. This is an operating unit which sells a distinct set of products to an identifiable group of customers in

competition with a well-defined set of operating units (Schoeffler 1977). Anderson and Paine (1978) provide a critical analysis of the PIMS data base. Although they show some concern about the quality of the data, they, generally, think that the base is of high quality and reliability. However, one major limitation for the present study of product life cycle is that the data base does not contain observations over a sufficient number of years to permit a dynamic analysis of environmental characteristics, strategy and performance for each business over time. For that reason, a cross-sectional design is preferred over a time series analysis. In fact, following Thorelli and Burnett (1981), we think that it is reasonable to assume that the observed differences in the strategies and performances of the various business life cycle stage groups are similar with observations of businesses in a truly longitudinal design.

The criteria used for the sample selection are the following.

- *Type of Business.* A distinction between consumer goods and industrial products is made, first, because it is one frequently used in research on the PLC. The findings can thus be easily compared with other research conducted in this field. Second, the number of observations which is contained in the data for these types of businesses is larger than the number of observations for other types of businesses (raw materials, services, retail or wholesales products). Third, the sales evolution pattern may be different depending on the type of products. For instance, Cunningham (1969), in a study on consumer and industrial goods, finds that, for industrial goods, the time span tends to be extended and the market more conservative than is the case for consumer goods. Furthermore, in his sample, he observes that some industrial products reveal a cycle-recycle pattern and do not behave according to the classic bell shape function.

- *Size.* Two major distributions of businesses were found. The first one is composed of firms with a corporate size of less than 5000 people. The second one is made of firms whose size was between 9000 and 10000 people. To control the size of the firms in the sample, the second and smallest distribution was eliminated.

- *Product Life Cycle.* In defining the PLC stage, we used both a quantitative and qualitative criterion (see Table 1). The quantitative criterion is the real market growth defined as the average growth rate of the market served by the business, corrected for inflation, over a four-year period. A business with a real market growth exceeding 4.5% is located in the growth area. Within the range 0% and 4.5% the business is considered to be in the maturity stage. Finally, products with a negative real market growth are placed in the declining phase. The qualitative criterion is the perceived life cycle phase as evaluated by the managers of the participating firms in the PIMS program.¹ The growth phase for growing businesses, the maturity phase for maturing businesses and the maturity and decline phases for declining businesses are selected. In fact, many "mature" businesses have highly negative market growth and are, consequently, misplaced in terms of the perceived stage, as Clifford (1977) has pointed out. Both criteria have been used in previous research (Galbraith and Schendel 1982; Torelli and Burnett 1981). By relying on these two criteria we are able to make a consistency check of the decision makers' perception. In fact, we believe that the choice of strategic actions may be influenced by the perception of the competitive situation and, consequently, by the perception of the product life cycle. When there is a lack of agreement between the two criteria, the business unit is dropped for the cases of growth and maturity. In the case of declining businesses the real market growth criteria prevails.

TABLE 1
Businesses along the Product Life Cycle. Research Sample Definition

		REAL MARKET GROWTH			
		- 10	0	+4.5	+35
PRODUCT LIFE CYCLE	Growth			Growth businesses (217)	
	Maturity	Declining businesses (569)	Maturity businesses (315)		
	Decline				

¹Although the life cycle model, which is specified in the PIMS data base, is a four stages one (introduction, growth, maturity and decline), the introduction stage has been excluded from the analysis because of lack of a representative number of observations.

2. *The Businesses Clustering*

As we previously mentioned, success strategies are different depending on the business' strategic posture and environmental conditions. With respect to these two characteristics, the businesses exhibit a great deal of heterogeneity. For that reason, a cluster analysis of the sample is necessary. Theil (1965), Bass, Cattin and Wittink (1977), Schendel and Patton (1978) stress that aggregation of observations, without accounting for their nature and the underlying models, produces incorrect and misleading results. At a highly aggregate level, the results may be completely different from the real phenomenon observed at a more disaggregated level.

Each business has its own characteristics such as the age of the product, the nature of technological change, the type of customer, the organizational relationship, the production process, and so on. These characteristics permit grouping of the businesses and allow us to infer, for each group, the existence of the same strategic behaviors. With this in mind, then, a search for groups of homogeneous businesses in terms of external and internal characteristics is undertaken. To do so, the businesses are divided into six main sets on the basis of the life stage and the nature of the business (consumer goods and industrial goods). A cluster analysis (Schlaifer 1978) is then made to identify the natural groups in each set.

To assess the stability of the groupings, three different clustering methods are used. The first one is the "nearest-neighbor" method which aims to maximize the minimum between-cluster distance. The second one is the "progressive-threshold" method (Wishart 1969) where the distance from each business to its k th nearest neighbor sets up a new threshold for ordinary nearest-neighbor mergers. If the business being processed is within the threshold of an already existing cluster it is clustered with it; if not, it becomes the center of a new cluster. After all businesses are analyzed the remaining groups are clustered by the "nearest-neighbor" algorithm. The third method is the "unimodal" method (Gitman and Levine 1970) which makes two separate analyses of the businesses in order of decreasing density. In the first analysis, points which represent local maxima of the density function are identified. Then in a second analysis, the method takes the local maxima as cluster nuclei and merges the other point in order of decreasing density according to the nearest neighbor procedure. To select the appropriate number of clusters, the program "Clustr" of the PIMS' AQD statistical package provides a "dendrogram", which is a diagram describing the contents of the clusters existing at each stage of the merging process. The businesses in each cluster are listed in order of decreasing density. The inspection of the plot, which gives the number of clusters as a function of a density index, allows us to empirically determine the level at which the clustering should take place. Although the three different methods lead to slightly different business clustering, the natural groups which are identified are quite stable under the three procedures.²

Seventy-four contingency variables dealing with environmental and business-related elements are used for the clustering. These variables fall into six main groups:

1. *Products and service related variables;*
2. *Users and customer related variables;*
3. *Company relationship related variables;*
4. *Supplier related variables;*
5. *Production process related variables and*
6. *Market and competition related variables.*

Table 2 gives a summary of the main contingency variables. Nine homogeneous groups³ are obtained. Within each consumer and industrial goods group and for each stage of the product life cycle χ^2 statistics for the nonmetric variables and T tests for the metric variables are calculated to characterize the nine clusters. The composition and the characteristics of the groups are shown in Table 3.

3. *The Variables*

• *Dependent Variables.* Two dependent variables measuring performance have been selected. These variables are chosen from a set of 19 variables which could be adopted as performance indicators. These two variables have been selected because: (1) they appear frequently in the literature as measures of performance (Bass 1969, Buzzell and Wiersema 1981, Montgomery and Silk 1972); (2) they are fairly well approximated

²Another method for selecting the final clusters could have been used—the "geometrical-algebraic" method of Miller and Friesen (1980). This approach was not adopted due to lack of appropriate software.

³The cluster analysis has led to the elimination of 14 very small groups having just a few observations (between 2 and 29).

TABLE 2
Contingency Variables

Products and services related variables	Users and customers related variables	Company relationship related variables	Supplier related variables	Production process related variables	Market competition related variables
Real Market Growth	% individual end user:	% purchased from company components	% sales to business, big-3 suppliers	% produced in small batches	Corporate size
Age of product	% manufacturer end user	Transfer profit per 1 \$	Alternative sources of supply	% produced on assembly line	Number of competitors
Product patents	% institutional end user	% sales to company component	Suppliers integrated forward	% produced by continuous process	Exit of competitors
Processes patents	% contractor end user		Material cost growth	% produced-not manufactured	Average market share
Technological change	% government end user			Lack of personnel	Market share rank
Development time	Number of immediate customers			Plant capacity limitation	Working capital and other assets/employees
	End user fragmentation			% employees unionized	Industry instability
	Purchase frequency (end user)				Industry concentration
	Typical purchase amount \$ (end user)				Industry value-added/employee
	Importance of auxiliary services to end users				Capacity/served market
					Market Share, top 3 competitors
					% change market share, top 3 competitors
					Total market share instability
					Competitors' new products (% sales)
					Competitors' new products change
					Price acceleration

TABLE 3
The 9 Groups of Homogeneous Businesses

LIFE CYCLE	GROWTH		MATURITY	
Business	Industrial Goods	Consumer Goods	Industrial Goods	Consumer Goods
GROUP	GROUP 1	GROUP 2	GROUP 3	GROUP 4
Sample size	111	52	107	135
Capital goods	32%	N.A.	46%	N.A.
Components	68%	N.A.	54%	N.A.
Durable goods	N.A.	60%	N.A.	42%
Non durable goods	N.A.	40%	N.A.	58%
Group characteristics	This group is composed of businesses run by small independent leading firms evolving in an increasingly concentrated, competitive and growing industry. They serve a concentrated market of manufacturers and contractors and face high technological changes and sectoral instability. <i>Fast industry growth</i> <i>Small corporate size</i> <i>Leading business</i> <i>Low vertical integration</i> <i>Customer concentration (manufacturers and contractors)</i> <i>Industry concentration</i> <i>Low suppliers bargaining power</i> <i>High technological change</i> <i>High entry of competitors</i> <i>High industry instability</i> <i>Intensive product innovation</i> <i>High importance of auxiliary services</i> <i>Young products</i> <i>Product and process patents.</i>	This group is composed of businesses run by small vertically integrated firms evolving in a growing industry dominated by a few leaders. They serve a very fragmented markets of individual end-users and contractors and face strong competition. <i>Fast industry growth</i> <i>Small corporate size</i> <i>High backward vertical integration</i> <i>Market fragmentation (Individual end-users and contractors)</i> <i>Low competitors concentration</i> <i>Low suppliers bargaining power</i> <i>High entry and exit of competitors</i> <i>Low change of the leading competitors' market share</i> <i>High competitors' new products</i> <i>Young products</i> <i>No product and process patents.</i>	This group is composed of businesses run by small independent leading firms evolving in a low growth industry. They serve a concentrated market of manufacturers and face slow technological changes and high sectoral instability. <i>Slow industry growth</i> <i>Small corporate size</i> <i>Leading business</i> <i>Low vertical integration</i> <i>Customers concentration (manufacturers)</i> <i>Low suppliers bargaining power</i> <i>Low technological change</i> <i>High entry and exist of competitors</i> <i>Industry instability</i> <i>Price warfare</i> <i>No patents</i>	This group is composed of businesses run by small independent leading firms evolving in a low growth industry. They serve a fragmented market of individual end-users and face slow technological changes and high sectoral instability. <i>Slow industry growth</i> <i>Small corporate size</i> <i>Leading business</i> <i>Low vertical integration</i> <i>Customers fragmentation (individuals)</i> <i>Low suppliers bargaining power</i> <i>Low technological change</i> <i>High exist of competitors</i> <i>Industry instability</i> <i>Old products</i> <i>Low competitors' new products</i> <i>No product or process patents</i> <i>Price warfare</i>

by a normal distribution in the sample of businesses which are analyzed⁴; and (3) they are not correlated between each other and are significantly correlated with other known performance variables (Table 4).

The dependent variables are:

—% change market share: P1,

—Cash-flow/revenue: P2.

As already discussed, the choice of either market share or cash-flow as the business objective may be determined by the orientation of the firm. On one hand, building up a market share is usually motivated by a long-term strategic orientation. On the other hand, increasing cash-flow is motivated by a short-term financial objective. The use of these two dependent variables provides insight into which strategic actions should be implemented depending on the decision horizon selected.

• *Independent Variables.* Two sets of independent strategic variables have been selected over 98 variables representing different strategic actions. The first set is composed of 10 variables. These variables are chosen for the following reasons: (1) they represent the different management functions (finance, production, marketing, personnel and R&D), and (2) because of their low correlation between each other and their strong correlation with other variables having the same meaning (Table 5).

⁴ROI and ROS could have been used. However they could not reasonably be approximated by a normal distribution.

TABLE 3 (continued)

LIFE CYCLE	DECLINE				
	Industrial Goods		Consumer Goods		
Business					
GROUP	GROUP 5	GROUP 6	GROUP 7	GROUP 8	GROUP 9
Sample Size	59 OBS	101 OBS	151 OBS	36 OBS	187 OBS
Capital Goods	61%	37%	44%	N.A.	N.A.
Components	39%	63%	56%	N.A.	N.A.
Durable goods	N.A.	N.A.	N.A.	33%	51%
Non-Durable goods	N.A.	N.A.	N.A.	67%	49%
Group Characteristics	This group is composed of businesses run by large vertically integrated leading firms evolving in a declining industry. They serve a market of manufacturers and contractors and face low technological changes and low sectoral instability. Negative industry growth Large corporate size Leading business High vertical integration High suppliers bargaining power Low technological change Low competitors exit Low industry instability High importance of auxiliary services Old products High cost growth Price warfare	This group is composed of businesses run by large vertically integrated leading firms evolving in an increasingly concentrated and declining industry. They serve a concentrated market of manufacturers and face high sectoral instability and overcapacity. Negative industry growth Large corporate size Leading businesses High vertical integration Customers concentration (manufacturers) High competitors entry and exit High industry instability Over capacity Industry concentration Process patent High cost growth	This group is composed of businesses run by small independent leading firms evolving in a fragmented and declining industry. They serve a market of manufacturers and face low industry instability and overcapacity. Negative industry growth Small corporate size Leading businesses Low vertical integration Low industry concentration Low competitors entry Low industry instability Over capacity No process patent High cost growth	This group is composed of businesses run by large independent leading firms evolving in a concentrated and declining industry. They serve a fragmented market of individual and face low sectoral instability. Negative industry growth Large corporate size Leading businesses Low vertical integration High industry concentration Low customers concentration (individuals) Low competitors entry and exit Old products Low technological change Low competitors' new products No product patent Price warfare	This group is composed of businesses run by small independent leading firms evolving in a fragmented and declining industry. They serve a fragmented market of individuals and face high sectoral instability and technological change. Negative industry growth Small corporate size Leading businesses Low vertical integration Low industry concentration Low customers concentration (individuals) High competitors entry and exit High industry instability Patent on product Relatively high technological change.

TABLE 4
Correlation Matrix of the Dependent Variables and their Correlates

	% Change Market Share	% Change Total Revenue	% Change Relative market Share	Market Share Change	Real Sales Growth	Cash Flow/ Revenue	ROS	ROI	Cash Flow/ Invest
% Change Market Share	1	0.5536	0.8807	0.7990	0.5535	-0.2614	-0.0092	0.0038	-0.2411
% Change Total Revenue		1	0.5210	0.4187	0.8624	-0.3453	0.0792	0.0912	-0.3226
% Change Relative Market Share			1	0.8011	0.5289	-0.2506	-0.0217	-0.0093	-0.2428
Market Share Change				1	0.4105	-0.1654	0.0369	0.0356	-0.1628
Real Sales Growth					1	-0.3345	0.0247	0.0391	-0.3093
Cash Flow/ Revenue						1	0.5190	0.5490	0.9122
ROS							1	0.8314	0.5267
ROI								1	0.6592
Cash Flow/ Investment									1

TABLE 5
Correlation Matrix of the Independent Variables

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
S1	1	0.0244	0.0280	-0.0081	0.0035	-0.0126	-0.0240	-0.1120	0.0341	0.0311
S2		1	0.3735	0.0755	0.0836	0.4264	0.2730	0.0048	-0.1231	0.0576
S3			1	-0.3689	-0.1426	-0.1102	-0.0321	0.0664	0.1696	-0.0283
S4				1	-0.0588	0.2012	0.0906	0.0743	-0.1825	0.0695
S5					1	0.0348	-0.0190	-0.1091	-0.0918	0.0001
S6						1	0.3463	0.0270	-0.1437	0.0485
S7							1	0.0443	-0.0303	0.0313
S8								1	0.0357	0.0198
S9									1	-0.0140
S10										1

The ten independent variables⁵ are:

- in finance : —corporate debt/equity (S1)
—% change investment/revenue (S2)
—inflation corrected
investment/revenue change (S3)
- in production : —% change capacity utilization (S4)
—investment/employee (S5)
- in marketing : —% change sales force expenses/revenue (S6)
—% change advertising and promotion
expenses/revenue (S7)
—marketing expenses/revenue (S8)
- in R & D : —R & D expenses/revenue change (S9)
- in personnel : —relative compensation change (S10)

⁵Some variables are expressed in absolute values (S1, S5, S8). Some correspond to changes defined as the difference of the absolute values between periods t and $t-1$ (S3, S9 and S10). Finally, % change is defined as: $100[(S_t - S_{t-1})/S_{t-1}]$ (S2, S4, S6, S7).

The second set of independent variables is composed of 10 strategic factors. These factors are the result of a factor analysis made to reduce the 98 variables to a smaller number of composite strategic variables or factors. Eigenvalues over 1 have been found for the 10 estimated factors which have accounted for 36% of the communality among the 98 variables. Table 6 gives the variable loadings for each factor. We believe that each factor represents a set of actions dealing with a specific strategic orientation which could not be captured with a single, isolated variable. This reliance on composite variables is based on a view of the firm's strategy as a combination of several major decision axes.

The ten factors are:

- Asset Management (F1)*
- Investment Effort (F2)*
- Capital Intensity (F3)*
- Distribution and Communication Policy (F4)*
- Sales Policy (F5)*
- Differentiation Policy (F6)*
- Product Strategy (F7)*
- Pricing Strategy (F8)*
- R & D Policy (F9)*
- Marketing Mix Strategy (F10)*

4. Testing Procedures

To evaluate the relationship between the different strategic actions and the variables representing the business' performance—market share change and cash flow level—a cross-sectional regression analysis is performed for each of the nine groups. A different linear additive model is used for each of the nine groups. Although theoretically, percent change in market share should exhibit nonlinear behavior, it is difficult to propose an a priori function to describe the market share change. To address this problem, the pre-existing market share is controlled. In fact, this variable is used as one of the criteria for the clustering of the businesses into the nine homogeneous groups. Furthermore, such models are often used in research (Bass, Cattin and Wittink 1977; Buzzell and Wiersema 1981; Farris and Reibstein 1979; Hambrick 1983; Hambrick and Schecter 1983; McMillan, Hambrick and Day 1982; Schendel and Patton 1978) to determine the influence of strategic actions on performance criterion such as market share, cash flow or ROI.

The specification of those models is made as follows. First, because not all independent variables are systematically related to the performance variable, a selection of the models best fitting data within each group is made. In selecting each model, we aimed at eliminating variables which consistently lack predictive power and which had statistically insignificant parameters. The reduction of a model to a few significant factors has the advantage of facilitating interpretation and comprehension of the relationship between the independent and the dependent variables. A partial regression model was chosen over a full one when it minimized the sum of the squared residuals.⁶

Second, in assessing the impact of one variable relative to another the potential effect of outliers, or extreme values, may be decisive. These outliers may represent observations having a distinct pattern of relationship between independent and dependent variables, a pattern which is different from the "true" pattern underlying most of the other observations. A check was performed to determine the potential effect of these extreme values. Specifically, regression coefficients were re-estimated using samples which excluded observations whose observed market share change and cash-flow values differed substantially from the predicted values. Residuals for each observation—that is, the difference between the actual value of the dependent variable and its regression predicted value—were computed. The larger the residual, the less effective the regression model is in matching the actual value of the dependent variable.

⁶We chose the models which had the lowest value of the Cp Mallow's coefficient (Weisberg, 1980). The Cp coefficient is defined as:

$$C_p = \frac{RSS_p}{RSS_k'} (n - k') + 2(p + 1) - n \quad \text{where}$$

RSS_p = sum of squared residuals of the partial model,

RSS_k' = sum of squared residuals of the full model,

n = number of observations,

$k' = k + 1$,

k = number of variables in the full model,

p = number of variables in the partial model,

The lower the Cp value, the better the partial model. In any case, a partial model was preferred to the full model when $C_p < k'$. These criteria hold when F value < 2 . This indicated that there is no significant difference between the predictive power of the full model and the partial one at a $p = 0.01$ level.

TABLE 6
Strategic Factor's Variables Loadings

F1 Assets Management	F2 Investment Effort	F3 Capital Intensity	F4 Distribution and Communication Policy	F5 Sales Policy
% change Purchase/Revenue	Inflation Corrected Investment/Revenue Change	Investment/Employee (Average)	Total Marketing Expenses/Revenue (Average)	Sales Force Expenses/Revenue (Average)
% change Added Value/Revenue	Inflation Corrected Investment/Value Added Change	Investment Intensity (Average)	Promotion Expenses/ Revenue (Average)	Sales People/ Employee (Average)
% change Manufacturing + Depreciation/Revenue	Investment Intensity Change	Inflation Corrected Investment/Revenue (Average)	Advertising + Promotion Expenses/ Revenue (Average)	Number of Immediate Customers
% change Net Receivable/Revenue	Mechanization Change	Gross Book Value/ Revenue (Average)	Media Advertising Expenses/Revenue (Average)	% concentration of Purchases
% change Finished Good/Revenue	Inflation Corrected Gross Book Value/ Revenue Change	Mechanization (Average)	% sold to end users	
% change Raw Material + Work in Process Inventory/Revenue	Inflation Corrected Gross Book Value/ Revenue Change		% sold to wholesalers	
% change Working Capital/Revenue			% sold to retailers	
% change Net Book Value/Revenue				
% change Investment/Revenue				
% change Real Capital Growth				
% change Inflation Corrected Investment				
% change Inflation Corrected Assets				

TABLE 6 (continued)

F6 Differentiation Policy	F7 Product Strategy	F8 Pricing Strategy	F9 R & D Policy	F10 Marketing Mix Strategy
Relative Product Differentiation (Average)	Relative Product Quality	Selling Price Growth	Product R & D Expenses/Revenue (Average)	Total Marketing Expenses/Revenue Change
0.45	0.40	0.76	0.57	0.48
Relative Product Quality (Average)	Relative Price Change	Weighted Cost Growth	Process R & D Expenses/Revenue (Average)	Promotion Expenses/Revenue Change
0.57	- 0.54	0.71	0.38	0.61
Relative Product Breadth	Relative Direct Cost Change		Total R & D Expenses/Revenue (Average)	% change Advertising and Promotion
0.56	- 0.34		0.81	0.60
Relative Types of Customer served	Relative Product Value Change			Expenses/Revenue % change Sales Force Expenses/Revenue
0.54	0.93			0.33
Relative Number of Customers	Price Difference Change			Relative Sales Force Expenditures Change
0.61	- 0.54			0.26
Relative Size of Customers	Relative Product Image Change			Advertising Expenditures Change
0.34	0.32			0.34
Relative Vertical Integration	Relative Quality of Customer Services Change			Relative Sales Promotion Expenditures Change
0.40	0.23			0.33
Backward (Business) Relative Vertical Integration				
0.38				
Backward (Company) Relative Vertical Integration				
0.27				
Forward (Business) Relative Vertical Integration				
0.25				
Forward (Company)				

TABLE 7
Impact of Strategic Action on Market Share

			STRATEGIC VARIABLES									
			S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
GROWTH	IG	Group 1 (111)	-0.122 c	0.471 a	-0.470 a	-0.148 c		0.172 b				
	CG	Group 2 (52)		0.360 a		0.461 a				0.216 c		
MATURITY	IG	Group 3 (107)		0.258 a		0.436 a		0.310 a				
	CG	Group 4 (135)		0.572 a	-0.382 a	0.312 a	-0.192 a					
DECLINE	IG	Group 5 (59)		0.156 c	-0.245 a	0.180 b		0.118 c	0.153 c		-0.133 c	-0.216 b
		Group 6 (101)	-0.128 c	0.266 a	-0.202 b	0.232 a	-0.153 c	0.220 b	0.153 c	0.131 c		
		Group 7 (151)	0.106 c	0.414 a	-0.345 a	0.107 c		0.126 b	0.100 c	0.109 c	0.105 c	0.144 b
	CG	Group 8 (36)			-0.583 a			0.342 b		0.384 b	0.276 c	
		Group 9 (187)		0.298 a	-0.157 b	0.188 a		0.123 c	0.111 c		-0.155 c	-0.147 b

Significant for $a = .001$, $b = .010$, $c = .050$

IG = Industrial Goods

CG = Consumer Goods

Because miscoded data are always a problem in data base use and because of distortions due to ratio variables, PIMS' standard procedure of eliminating the 5% of the observations with large absolute residuals (2.5% having large positive residuals and 2.5% having large negative residuals) has been followed. We have assumed that the remaining 95% of observations were not significantly different from the original population in terms of business related and environmental characteristics. This procedure was implemented for the nine groups. Generally, the predictive power of the model was improved. In some cases, the pattern of the equation was changed; that is some statistically significant coefficients became nonsignificant and vice-versa.

Third, in several cases, independent variables showed some degree of collinearity. Collinearity causes problems in regression analysis because it makes the interpretation of the actual impacts of the individual variables quite difficult. One approach to this problem is to eliminate some of the variables and to keep only the noncorrelated variables. However, a problem of variables selection remains. When variables exhibited collinearity, we proceeded as follows: (1) we ran several regression analyses with only the noncorrelated variables. If one of the variables had a nonstatistically significant relationship with the dependent variable, that variable was eliminated; (2) when the correlated variables continued to have a significant relationship in their respective partial models, a closer analysis was undertaken. When variables bore similar concepts (percentage change in investments and point change of inflation-adjusted investment, for example) only that variable which appears to best capture the effect on performance was retained in the final model; (3) finally, if the correlated variables represented different concepts (sales force change and investment/employee, for example), we kept the variables in the final model.⁷ This is because their elimination would not have made sense from a conceptual point of view. The equation parameters have been estimated and found to be significant at 0.001, 0.01 and 0.05 levels of significance.

Results

The first observation we can draw from the results (Tables 7 and 8) concerns the divergent orientations that strategic actions may take depending whether one uses market share or cash-flow as the performance

⁷ As a general rule, the highest correlation between strategic variables representing different concepts and which has been tolerated was 0.42. For example, in group 1, the correlation between S2 (Investment) and S6 (Sales Force) was 0.40 and the relationship of both variables with the market share change was significant.

TABLE 7 (continued)

FACTORS OR COMPOSITE STRATEGIC VARIABLES										R2	F
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10		
0.748 a	-0.205 a					0.138 b		-0.168 b		0.551	24.28a
0.757 a			-0.256 a	0.389 a						0.670 0.616 0.730	50.15a 24.10a 40.56a
0.824 a	-0.450 a		-0.057		-0.047	0.107 b	-0.329 a		0.049	0.647 0.868	59.29a 87.09a
0.873 a	-228 a						-0.410 a			0.664 0.846	61.35a 228.80
0.579 a	-0.319 a		0.123 c		0.113 c		-0.231 a		0.100 c	0.764 0.836 0.516	22.25a 41.54 11.58a
0.699 a	-0.251 a					0.147 c	-0.382 a			0.596 0.643	33.19a 26.62a
0.684 a	-0.250 a				-0.177 a				0.153 b	0.623 0.535 0.668 0.482	57.06a 8.35a 14.59a 22.62a
0.585 a	-0.758 a		-0.240 c	0.202 c							
0.749 a	-0.142 a						-0.420 a	0.206 a	0.167 a	0.676	71.98a

criterion. This suggests that a trade off exists between the two objectives. For instance, market share increase is associated with investment and assets increase. In contrast, cash-flow improves as investment and assets are cut.⁸ This is a general result, valid for all groups regardless of their stage in the life cycle or the type of business. Another result which illustrates this point is the opposite influence of marketing expenses on the two performance criteria. On one hand, increased marketing effort tends to improve market share. On the other hand, marketing expense reduction tends to improve cash-flow.

The other actions such as marketing expense reduction (Groups 2, 3, 4, 6, 7 and 8) and compensation cuts (Groups 2, 4, 5 and 8) also contribute to cash flow increase. It should be pointed out that these actions are not strictly associated with the latter stages of the life cycle as suggested by the PLC literature but may be quite efficient for growing activities as well (Group 2.)

The second observation deals with the shift in the strategic focus along the life cycle. For instance, when looking at the market share criterion one notices that the sales force is very important at the early stages (Groups 1, 2 and 3). Then, as maturity and decline set in, a greater importance is assigned to price cutting strategies (Groups 3, 4, 5, 6 and 9). For decline, advertising, promotion and marketing expenses supplement these actions (Groups 5, 6, 7, 8 and 9). Also, efforts in R&D are quite effective for the later stages (Groups 7, 8 and 9) to the extent that they may be used in product "rejuvenation". When looking at the cash-flow performance measures, successful strategies call for different actions. For instance, at the early stage of business life, imitation supported by an advertising and promotion effort for the industrial goods (Group 1) and cost cutting associated with high price for the consumer goods (Group 2) improve cash-flow. For maturing and declining businesses, a differentiation strategy is quite successful (Groups 3, 4, 6, 7, 8 and 9).

⁸One could argue that the impact of investment and assets reduction on cash flow is quite obvious from simple accounting concepts. This would be true if we were just considering the cost side of the cash flow equation. However, assets and investment reductions may also have a pervasive effect on income and, consequently, on cash flow. In the short term, then, the benefit derived from cost reduction is not offset by loss of income due to lower investment. But in a longer term perspective such action could be detrimental to profitability because of loss of income.

TABLE 8
Impact of Strategic Actions on Cash-Flow

			STRATEGIC VARIABLES									
			S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
GROWTH	IG	Group 1 (111)		- 0.604 a						0.111	0.090	
	CG	Group 2 (52)			- 0.789 a	- 0.397 a						- 0.154 c
MATURITY	IG	Group 3 (107)	- 0.273 a	- 0.699 a	0.213	a					0.051	
	CG	Group 4 (135)		- 0.612 a		0.170 b			- 0.133 c	0.114 c		- 0.126 c
DECLINE	IG	Group 5 (59)	- 0.248 b	- 0.606 a		0.140					0.264 b	- 0.190 c
		Group 6 (101)	- 0.237 a	- 0.376 a			- 0.358 a	- 0.105 a				0.220 a
		Group 7 (151)	- 0.099 c	- 0.510 a		- 0.98 c		- 0.184 a		- 0.163 a		
	CG	Group 8 (36)	0.315 a		- 0.429 a		- 0.157 b			- 0.219 a		- 0.166 b
		Group 9 (187)		- 0.517 a				- 0.095 c		0.160 b		

Significant for $\alpha = 0.001$, $b = 0.010$, $c = 0.050$

IG = Industrial Goods

CG = Consumer Goods

In some cases, this strategy may also be effectively combined with an R&D effort (Groups 4, 5, 7 and 9). Another characteristic which is common to the maturing and declining businesses is the decrease in financial leverage (Groups 3, 5, 6, 7 and 8). When the business is maturing or declining a lower debt-to-equity level has a positive impact on cash flow. This might be explained by the fact that a less risky financial posture can be adopted when market growth starts to slow down.

A third observation is that strategic behavior might vary with the type of business. For instance, Group 1 adopts a differentiation policy in terms of product quality and service in order to improve its market share. This choice of a differentiation policy might be explained by the fact that we deal with a group of industrial products which are not first on the market, although they have a good market share position. When cash flow becomes the objective, it seems that a strategy of imitation coupled with a marketing effort is more effective. A strategy of imitation seems to be well adapted to these small independent firms which may react rapidly to high technological change. Also, it is less costly than the differentiation policy and might, consequently, contribute to cash-flow improvement. However, the handicap of a firm relying on such a strategy is that it is always a second-comer on the market. To balance this handicap, the firms in Group 1 tend to develop an aggressive marketing strategy which aims to compensate for the lack of product differentiation.

Group 2 is composed of consumer products whose differentiation is of lesser importance. For that reason, the firms rely on a marketing oriented action—sales force—to improve their position on the market. This group of businesses, which belong to vertically integrated firms, maximizes its cash flow by raising prices. We think that this policy is possible, first, because of the special relationship that these firms may enjoy with their parent companies and, second, because of the fragmented nature of the market.

Like the industrial businesses of Group 1, Group 3 also relies on a niche strategy based on differentiation in terms of product quality, price and service to improve its market share. In fact, we think that its industrial customers tend to spend more time in shopping around to discover the best supplier in this highly competitive market. In this environment, characterized by price warfare and sectoral instability, the successful business is the one which provides the best product at the lowest price. In this industry, where market price is pushed down and where technological evolution is slow, cash flow is increased by a better use of the firm resources and by a cost cutting strategy. However, to generate enough income and because of the industrial nature of the products, a differentiation policy is also implemented.

Group 4, which serves a fragmented and maturing market of consumers, mostly relies on a very aggressive price cutting strategy. Market share gain, in an industry of aging products, characterized by slow technological change and slow growth, is achieved thanks to the exit of weaker competitors. The competi-

TABLE 8 (continued)

FACTORS OR COMPOSITE STRATEGIC VARIABLES										R2	F
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10		
-0.568 a	-0.180 b	-0.323 a	0.175 b			-0.186 b		-0.108	-0.053	0.427	25.06a
-0.583 a	-0.528 a			-0.145 c			0.324 a			0.563 0.679 0.728	18.04a 31.80a 29.40a
-0.377 a	-0.368 a	-0.151 b			0.160 b			-0.154 b	-0.137 c	0.605	36.83a
-0.569 a	-0.177 a	-0.255 a		0.050	0.207 a			0.191 a	-0.170 b	0.721 0.565 0.618	40.45a 31.43a 27.93a
-0.598 a		-0.322 a	0.103			0.183 c				0.524	10.29a
	-0.440 a			0.085	0.127	0.136	-0.181 c	0.094	-0.213 b	0.484 0.612	11.98a 28.07a
-0.742 a	-0.218 a			-0.166 a	0.129 b			0.106 c	-0.049	0.373 0.630 0.683	7.38a 46.65a 39.15a
	-0.476 a		0.195 a	-0.353 a	0.130 c	0.179 b		-0.183 b	0.120 c	0.920 0.916	64.59a 40.76a
-0.393 a	-0.165 a	-0.273 a			0.342 a	-0.070	-0.146 b	0.214 a	a	0.462 0.586 0.676	49.83a 34.40a 71.98a

tors' exit is accelerated by the implementation of the low price strategy. When cash flow is maximized, this strategy is not used anymore. Only cost cutting actions are efficient. However, due to the harshness of the competition in this industry, income has to be preserved. For doing so, differentiation seems to be quite effective and less costly than a strategy based on lower prices. Along the same lines, differentiation seems to improve the market and the financial performance of the industrial businesses of Group 5. However, in this declining industry, an aggressive strategy, based on marketing efforts and price cuts, seems to be mandatory to improve the firm's position on the market. High cash flow is achieved through the usual cost cutting and debt reduction actions.

Group 6, which is composed of industrial businesses belonging to large integrated firms, relies on the same strategy as Group 5 to achieve high market share. However, cash flow maximization is achieved by other means. In fact, Group 6 is composed primarily of industrial components firms which tend to rely on a price cutting strategy to increase their cash flow. This strategy aims at achieving high production volume followed by cost reduction due to learning effects.

Group 7 is composed of businesses belonging to weaker industrial firms than was the case for Groups 5 and 6. Due to this relative weakness, a defensive strategy of imitation backed by the usual marketing actions is implemented to improve the market position. However, in the present case, imitation without an aggressive marketing effort does not seem to provide enough income to maximize cash flow. It has to be replaced by a niche strategy based on differentiation.

Groups 8 and 9, composed of consumer oriented businesses, do not rely on differentiation to achieve high market share. However, developmental research seem to be quite effective and can be used as a way of rejuvenating the market. An aggressive marketing strategy backs up this development effort. Group 9 differs from Group 8 insofar as the implementation of a price cutting policy is concerned. In fact, businesses of Group 9 are evolving in very unstable and declining industries characterized by high competition. Market share gains seem to be achieved by the implementation of an even more aggressive strategy. Finally, it seems that cash flow maximization is achieved by cost-reduction actions and by a differentiation policy to secure income. However, Group 9 which evolves in a very difficult environment has to reinforce its differentiation policy with more aggressive techniques such as price cutting, advertising and promotion. It seems that the sensitivity of demand with respect to price and marketing expenditures is very high for this last case. The businesses in this group will be more financially damaged by the loss of income associated with high price and low marketing efforts than they will be with lower margin and higher marketing expenses.

TABLE 9
Summary of the Results
Success Strategies Along the Product Life Cycle

PERFORMANCE CRITERIA		GENERAL ACTIONS	GROWTH		MATURITY		DECLINE				
			Group 1 (Industrial)	Group 2 (Consumer)	Group 3 (Industrial)	Group 4 (Consumer)	Group 5 (Industrial)	Group 6 (Industrial)	Group 7 (Industrial)	Group 8 (Consumer)	Group 9 (Consumer)
MARKET SHARE CHANGE	Investment increase (at a decreasing rate)		Differentiation (in terms of quality, product, value, price)		Differentiation			Differentiation	Imitation	R & D effort	R & D effort (at a decreasing rate)
	Capacity utilization increase		Sales Effort	Sales Effort	Sales Effort		Marketing Effort (in terms of advertising and promotion)	Marketing Effort (in terms of advertising and promotion)	Marketing Effort (in terms of advertising and promotion)	Marketing Effort (in terms of sales and, at a decreasing rate, in terms of advertising and promotion)	Marketing Effort (in terms of advertising & promotion)
	Assets increase		Industrial flexibility		Price cut	Price cut	Price cut	Price cut			Price cut
CASH FLOW	Investment decrease		Imitation		Differentiation	Differentiation and R & D Effort	Differentiation and R & D Effort		Differentiation and R & D Effort	Differentiation	Differentiation and R & D effort Advertising & promotion
	Assets decrease		Marketing effort (in terms of advertising and promotion)	Marketing expenses cut (in terms of sales effort).	Marketing expenses cut	Marketing expenses slow down (in terms of advertising and promotion)		Marketing expenses cut	Marketing expenses cut (in terms of sales)	Marketing expenses slow down (in terms of sales)	Sales effort cut
				Compensation cut	R & D expenses cut	Compensation cut	Compensation cut	Compensation increase		Compensation cut	Financial leverage increase
				Industrial flexibility	Capacity utilization improvement	Capacity utilization improvement	Financial leverage decrease	Financial leverage decrease Price cut	Financial leverage decrease	R & D cut	Price cut
			Price increase		Financial leverage decrease						

A final observation concerns the structure of the relative impact of the independent variables on performance. This structure is found to differ among the various life cycle stages. This suggests that the intensity of the relationship varies along the life cycle and that for resource allocation purposes this intensity should be taken into consideration. In the earlier stages, for instance, firms may rely principally on investment and capacity utilization actions. In the decline phase, a wider choice of strategic actions is possible. For instance, financial actions might accompany other actions such as sales force expenses (S6) and advertising and promotion (S7) increases.

Table 9 gives a summary of the preceding comments and describes the main strategic actions along the life cycle.

Conclusion and Discussion

In this study, a cross-sectional regression analysis of two categories of businesses—consumer goods and industrial products—is made. A search for general relationships between strategic actions and performance variables is undertaken. The analysis is performed over the different stages of a product life cycle—growth, maturity and decline—for clustered groups of similar businesses.

This study is different from earlier research in the following respects:

- it takes into account a more comprehensive set of independent variables;
- it looks at businesses clustered into homogeneous groups on the basis of their life cycle stage, similar business-related characteristics, and similar environments;
- it investigates two different types of performance variables—market share and cash flow.

The findings may be summarized as follows: (1) a trade-off exists between the more long-term oriented measure of performance, market share increase, and the short-term measure of performance, cash flow; (2) there is a set of strategic actions which are effective in improving the performance for all groups. This suggests that these actions are not contingent on environmental conditions, business related characteristics (strategic posture and type of business) or life cycle stage; (3) there exists a set of strategic decisions which depend on the PLC phase; (4) there are strategic actions whose effectiveness depends on the type of business; and, finally, (5) a changing pattern in the relative importance of specific strategic impacts on performance is observed in the course of the product life cycle.

No unique success strategy is associated with each stage. In fact, the different sets of strategic actions called for in any particular life cycle stage may contradict each other depending on the performance criterion used—market share or cash flow. Therefore, it is necessary to determine at which objective the company is aiming for a given business before deciding on the right actions to implement.

Although no unique strategy for each life phase exists, some actions seem to be more effective than others depending on the stage of the life cycle. For instance, when market share is adopted as performance criterion, sales effort is more efficient at the early stage of the life cycle than at the later stage. In contrast, price cutting may be the right decision for businesses at a later stage in their life cycle. Nevertheless, the stage does not provide a complete explanation for a given strategy-performance relation. For instance, a differentiation strategy seems to be more strongly associated with the nature of the business than with the stage itself.

In fact, when market share is used as the performance criterion, differentiation leads industrial businesses to success regardless of their stage in the life cycle. This result, as well as others already discussed in the present study, challenges many of the recommendations found in the strategic planning literature based on the PLC theory. Different patterns of strategic choices are observed. These diverse patterns are related to a number of business characteristics including the life cycle stage as well as business related and environmental variables. This observation reinforces our belief that any inference drawn from aggregated data should be made with extreme care and that only results derived from disaggregated data—as is the case for the present research—permit varied inferences concerning success strategies.

The results also provide guidance to decision makers inasmuch as they identify the effective strategic actions as a function of the life stage and the business characteristics. By identifying the stage, the competitive posture, the nature of the environment and the objective, the decision-maker can select the appropriate strategic actions and evaluate their impact on performance.

This research has several limitations. First, though the results indicate significant associations between the strategic variables (the independent variables) and the performance variables (the dependent variables), they fail to provide insight into causality. However, this problem should be overcome thanks to: (1) a more careful conceptual assessment of the relationships, and (2) the implementation of a more hypothetic-deductive research approach. Another major limitation is that the analysis has been undertaken on cross-sectional data and does not take into account the time lag that we would expect to observe between the implementation of a strategic action and its impact on performance. Nevertheless, we think that the observations made in the research reveal general strategic tendencies which are grounded upon past actions and, consequently, already, reflect the dynamics of the relationships.

By challenging some of the generally accepted normative statements proposed by the strategic planning literature, this research throws new light on applications of the PLC theory. However, some avenues of

future research need to be pursued; the most important of these is a better identification of success strategies according to business characteristics. In fact, only a few groups of businesses are explored in each stage of the life cycle. Further investigation needs to be undertaken to identify strategic actions associated with different sets of businesses. These, for example, could be classified along two major dimensions: competitive posture and environmental outlook. The identification of these strategies will complete the present results and would greatly enhance the usefulness of the PLC approach as a strategic planning tool.⁹

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