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NEW VENTURES AND LIFECYCLE THEORIES: A FUZZY-SET
APPROACH

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Index

EXECUTIVE SUMMARY1

CHAPTER 1. ORGANIZATIONAL DESIGN IN NEW VENTURES.....5

 1.1 Organization and new ventures.....5

 1.1.1 New venture literature.....6

 1.1.2 New ventures’ measure of performance8

 1.1.3 New ventures’ organization9

 1.2 Life-cycle theory11

 1.2.1 Organizational life-cycle models13

 1.2.2 New ventures in life-cycle theory22

 1.2.3 Critics to lifecycle theories: an evolutionary approach.....27

CHAPTER 2. ORGANIZATIONAL DIMENSIONS’ EVOLUTION THROUGH THE LIFECYCLE37

 2.1 Introduction: a configurational approach.....37

 2.2 Organizational dimensions.....38

 2.3 Method of analysis.....40

 3.2 Organizational dimensions evolution43

 3.2.1 Formalization45

 3.2.2 Decentralization47

 3.2.3 Horizontal differentiation/Specialization.....49

 3.2.4 Vertical differentiation.....51

 3.2.5 Integration52

 3.3 Conclusions: overview of new ventures’ configurations and interrelations between dimensions.....57

CHAPTER 3. EMPIRICAL ANALYSIS63

 3.1 Data description63

| | | |
|--|---|----|
| 3.1.1 | The sample | 63 |
| 3.1.2 | The questionnaire and investigated aspects | 64 |
| 3.1.3 | Performance indicator | 66 |
| 3.1.4 | Descriptive statistics and correlations..... | 67 |
| 3.2 | Fuzzy-Set approach..... | 69 |
| 3.2.1 | Ragin’s theory | 69 |
| 3.2.2 | In numerical terms | 71 |
| 3.2.3 | Implications for this study | 75 |
| 3.3 | Calibration..... | 75 |
| 3.3.1 | Outcome calibration..... | 76 |
| 3.3.2 | Causal variables calibration | 78 |
| 3.3.2.1 | Organization..... | 79 |
| 3.3.2.2 | Strategy | 83 |
| 3.3.2.3 | Environment..... | 84 |
| CHAPTER 4. DISCUSSION AND RESULTS..... | | 87 |
| 4.1 | fsQCA Derivation of solutions | 87 |
| 4.1.1 | The Truth Table | 87 |
| 4.2.1 | Standard analysis option | 88 |
| 4.2.2 | Presentation of results | 91 |
| 4.2 | Description and interpretation of results..... | 94 |
| 4.2.1 | Configurations of new ventures facing a stable environment (1a, 1b and 2): a descriptive approach | 94 |
| 4.2.2 | Configurations of new ventures facing a stable environment (1a, 1b and 2): a lifecycle approach | 97 |
| 4.2.3 | Configurations of new ventures facing a turbulent environment (3 and 4): a descriptive approach | 99 |

| | | |
|-------|---|-----|
| 4.2.4 | Configurations of new ventures facing a turbulent environment (3 and 4): a lifecycle approach | 101 |
| 4.2.3 | Low performance assessment | 102 |
| 4.4 | Conclusions..... | 103 |
| 4.3 | Limits of the research..... | 108 |
| | BIBLIOGRAPHY | 109 |
| | APPENDIX..... | 123 |
| | Appendix 1. Questionnaire framework | 123 |

*“Not to innovate is the single largest reason for the decline of existing organizations.
Not to know how to manage is the single largest reason for the failure of New Ventures”.*
(Peter Drucker)

EXECUTIVE SUMMARY

The central question of organizational theory regards the conditions for ventures success or failure (Porter, 1991). A small branch of research, mainly deriving from organizational ecology studies, is dedicated to the examination of organization survival vis-à-vis its failure. Stinchombe (1965) developed the concept of *liability of newness*, which is related to external processes of resource and legitimacy acquisition from the environment and internal processes of accumulation and leveraging of organizational competences and institutionalization of goals. New ventures show greater difficulty in overcoming these barriers since environmental selection is favored when the organization gains external legitimacy and internal competences.

The first chapter of this thesis is dedicated to the review of the literature exploring new ventures' organization including lifecycle theories, and the second chapter suggests a new overall approach to lifecycle prepositions.

Lifecycle theories, in particular, suggest that “firms have a lifecycle characterized by a consistent transition through recognizable stages of development similar to those of living organisms” (Penrose, 1952, p.806). Indeed, these theories provide taxonomies in terms of “dimensions of environments, industries, technologies, strategies, structures, cultures, ideologies, groups, members, processes, practices, beliefs, and outcomes” (Meyer, Tsui & Hinings, p.1175, 1993) which can be empirically or theoretically derived (McKelvey, 1975). A distinct part of the literature seeks to explain new ventures growth without categorizing this phenomenon into stages of growth as lifecycle theories do (Chrisman, Bauerschmidt & Hofer, 1998; Gilbert, McDougall & Audretsch, 2006). Conversely, lifecycle theories make a bigger effort to explain organizational change throughout time and, even though lifecycle constructs have been strongly criticized, we believe they enable a deeper analysis of organizational change. What lifecycle theorists do is to provide an ideal type to which organizations are prescribed to consistently adhere. The great variety of lifecycle studies and the impossible unification of theory suggest that a different approach to the provision of prescribed characteristics of ventures during time is necessary in order to integrate these theories (Levie and Lichtenstein, 2010). What we suggest is to use a configurational view and the concept of “equifinality” in order to both provide a summary of lifecycle theories and to conduct an empirical study with regard to new ventures. Configurations, in particular, are said to organize

and describe causal relationships between strategic, contextual, and structural factors into coherent typologies in connection with an outcome of interest (Doty & Glick, 1994). Fiss (2007) argued that a valuable method to test configurations is the Fuzzy-Set Analysis which employs the concept of *equifinality* (Katz & Kahn, 1978; Van De Ven & Drazin, 1985) to identify more than one configuration that could equally achieve high levels of firm performance.

In order to offer a configurational view to the lifecycle, in the second Chapter we perform a longitudinal comparison of lifecycle theories regarding five organizational aspects –i.e. Vertical Differentiation, Horizontal Differentiation/Specialization, Centralization, Formalization and Integration. In order to unify the great number of contributions it has been used, as main reference, the literature review of Hanks, Watson, Jansen and Chandler (1993) who suggest a summary of the main models theorized –i.e. Adizes, 1979; Churchill & Lewis, 1983; Kazanjian, 1988; Lippitt & Schmidt, 1967; Galbraith, 1982; Greiner, 1972; Miller and Friesen, 1984; Scott & Bruce, 1987. Through the longitudinal comparison of these authors' work and the subsequent identification of organizational configurations suggested by the literature for each stage, we set the basis for a comparison between new ventures' configurations found in our dataset and the schemes provided by the literature. This comparison is possible due to the common configurational approach behind part of the organizational literature and our empirical assessment.

In the empirical part of this thesis, we analyze a sample of 96 new ventures and apply the concept of *equifinality* through the fsQCA approach (Ragin, 2008) in order to find which configurations are exhibited in our dataset in terms of organizational dimensions. The fsQCA methodology (Ragin, 2008) is extensively explained in Chapter 3 which provides also information regarding the process of calibration of causal variables employed –i.e. measures of organizational design, strategic orientation and turbulence of the environment. As a measure of performance we use a measure of sales growth and we observe that four configurations lead to a high level of performance. Chapter 4 is dedicated to the analysis of findings as stand-alone results and to the comparison of the existing literature to them.

In our study, we assess that there are multiple configurations suitable for new ventures and, not only organizational design depends on different environmental conditions and strategies pursued, but also on the particular pattern of organizational design components themselves. Therefore, we challenge the idea, suggested by lifecycle theories, that there is only a unique

possible configuration in a predetermined stage. The ultimate goal of “equifinality” is indeed the assessment of configurations and ultimately the display of the bundle of multiple components playing a role for the performance of the organization, seen as different ways to achieve the same outcome.

More precisely, our findings suggest that, among new ventures competing in a niche market, two situations can be separated: configurations appropriate for firms facing a stable environment and configurations appropriate for firms facing a turbulent environment. Regarding the first set of configurations, we found that there are two configurations suitable for stable environments that we named Bureaucratic Control and Flexible Centralization types. Regarding structures suitable for turbulent environmental conditions, we found two possible configurations that we named Informal Decentralization and Formal Centralization. When facing a stable environment, organizations focus either on hierarchical control and formalization or on centralization of decision-making processes together with flexible specialization of roles and absence of formalization. When firms face turbulent environments, instead, our findings suggest that they commonly exhibit no vertical differentiation, high horizontal differentiation, and differ in terms of centralization and formalization. Therefore, in turbulent environments, either firms are both centralized and formal (Formal Centralization) or are both decentralized and informal (Informal Decentralization), advocating substitution mechanisms between formalization and decentralization.

Only the first two configurations are clearly linked to frameworks prescribed by the organizational literature and lifecycle theories. The Bureaucratic Control structure is similar to the “mechanistic structure” (Burns & Stalker, 1961) suggested with regards to stable environments and the Flexible Centralization is similar to the “simple structure” (Mintzberg, 1979). Both configurations are provided as the typical configurations assumed by new ventures in the first two macro-stages of the lifecycle identified in Chapter 2. The last two configurations, instead, are in some sense new and do not find support in any of the lifecycle theories. These findings support the fact that lifecycle theories, which have been developed between the 60s and the 80s, well describe a situation in which the environment is stable but poorly illustrate the actual situation of new ventures facing turbulent environments. In conclusion, we highlight the need to re-evaluate the classical theories provided by Burns & Stalker (1961) with regards to new ventures facing a turbulent environment, that do not always show a classic “organic structure”; ultimately supporting the work of Sine, Mitsuhashi and Kirsch (2006).

CHAPTER 1. ORGANIZATIONAL DESIGN IN NEW VENTURES

This chapter aims at identifying the main theories that explored new ventures' organizational and structural aspects. Section 1.1 presents theories regarding new venture growth, appropriate measure for their performance and organizational studies dedicated or applicable to them. Section 1.2 intends to investigate the main organizational lifecycles theories, focusing in particular on theories that provide specific models suitable to new ventures. Lastly, critics on the lifecycle construct are presented.

A distinct part of the literature described at the beginning of this chapter seeks to explain new ventures growth without categorizing this phenomenon into stages of growth as lifecycle theories do. However, lifecycle theories make a bigger effort to explain organizational change throughout time. Even though these constructs have been strongly criticized, they submit a deeper analysis of organizational change which enables a longitudinal comparison of lifecycle theories regarding five organizational aspects in the second chapter. In this way I set the basis for an empirical assessment, which permits to compare new ventures' configurations found in our dataset with the schemes provided by the previous literature.

1.1 Organization and new ventures

The literature on organizational design has encountered the challenge of dividing firms' task into specialized and convenient jobs to be coordinated for the firm ultimate benefit (Mintzberg, 1979). More specifically, there are three main classes of organizational fundamentals (Nadler & Tushman, 1997): structural elements, systems and processes, and grouping. The first refers to formal relations which connect decision makers, the second refers to the guide pre-established for decision making and the third refers to the aggregation of multiple responsibilities into units. The main assumptions behind organizational design are that decisions taken on one task may affect also other tasks and coordination is therefore considered of key importance; also, since the human being is considered limited in his managerial ability (Simon, 1957), the whole organizational system and its interactions is valued more than the single task or individual. This Section seeks to connect organizational literature to the study of new ventures. A first paragraph is dedicated to the literature that

explores the phenomenon of new ventures and in particular the study of their probability of failure, and the factors that are believed to influence their success such as the characteristics of the entrepreneur, resources, industry and strategy. A second paragraph is dedicated to the means used by the literature to measure new venture performance, which is useful for the empirical assessment of new venture performance in Chapter 3. The last paragraph describes the contributions of organizational theories to the study of new ventures and the role played by organizational structures in a new venture's success.

1.1.1 New venture literature

The central question of organizational theory regards the conditions for ventures success or failure (Porter, 1991). A small branch of research, mainly deriving from organizational ecology studies, is dedicated to the examination of organization survival vis-à-vis its failure. Stinchombe (1965) developed the concept of *liability of newness*, which is related to external processes of resource and legitimacy acquisition from the environment and internal processes of accumulation and leveraging of organizational competences and institutionalization of goals. New ventures show greater difficulty in overcoming these barriers since environmental selection is favored when the organization gains external legitimacy and internal competences. Some authors (Fichman and Levinthal, 1991) challenged the idea of a monolithic decline in the probability of failure with time proposed by the liability of newness hypothesis. They advanced the *liability of adolescence* hypothesis which recognizes that the organization has an initial grace period in which it does not face the risk of failure because its performance cannot be already judged since every organization is provided with an initial amount of resources such as stock and takes some time in establishing relations with its clients, other organizations, and creditors, and during this period there are not enough elements to determine if the new venture's performance is satisfactory. After the adolescence period, the probability of failure increases and after the first positive assessment of performance the probability of failure decreases with time. Authors have also distinguished the phenomenon of the liability of newness from the *liability of smallness* (Freeman, Carroll & Hannan, 1983). Indeed, with a lack of managerial and financial resources and the subsequent impossibility to increase in size, the probability of survival of a new venture is reduced.

Conversely, the study of new ventures' success is a self-standing field of study which addresses different elements that play a role in explaining how a new venture obtains viability through growth. Many models have been developed to take into account all the elements that concur in the growth of a new venture. One of the most known is Sandberg's model of new venture's performance (1986) which indicates three components that affects performance: industry structure, entrepreneur and strategy. Chrisman, Bauerschmidt & Hofer (1998) have later extended this model by including also resources, processes, organizational structure, and systems. In their literature review, Gilbert, McDougall & Audretsch (2006) identify the most important constituents of the literature dedicated to new ventures' growth as: "entrepreneur characteristics, resources, strategy, industry, and organizational structure and systems" (p.928). Here, I summarize the first four elements, while Paragraph 1.1.3 is dedicated to the last point concerning new ventures organization.

New ventures' theorists have originally explored the figure of the entrepreneur (Baumol, 1968; Schumpeter, 1934), even if the entrepreneur cannot be considered as the organization itself (Katz & Gartner, 1988). In particular, the entrepreneur's characteristics such as his education (Sapienza & Grimm, 1997), values (Adams, & Wiebe, 1989) or his prior entrepreneurial or industry-related experiences are believed to influence the ability of the entrepreneur to obtain resources and know how to use them (Kirzner, 1983). In the case new ventures have a founding team, its heterogeneity is seen as catalyst of disagreements inside the team which on one hand can decrease the phenomenon of "groupthinking" (Lant, Milliken & Batra, 1992) but on the other hand can lengthen the decision making process (Miller, Burke & Glick, 1998).

A second element investigated in the new venture literature is the bundle of resources necessary to pursue objectives of growth, they are said to generate important competences for the venture (Chandler & Hanks, 1994). The types of resources that the literature explores in order to explain new ventures growth are mainly financial and human capital resources (Cooper, Gimeno-Gascon & Woo, 1994). The first type of resource is considered to directly increase employment and sales growth, because it acts as a time buffer that provides flexibility in achieving strategic results (Zahra, Nielsen & Bogner, 1999). The second type of resources concerns the expertise of employees which is said to be positively correlated with start-up growth (Chandler & Hanks, 1994).

A third part of the literature focuses on new ventures' strategy. It seems that new ventures with a focused a single-product strategy show higher growth in the long term while in the short term a differentiation strategy works better (Gilbert, McDougall & Audretsch, 2006). Others investigated the role of differentiated or focused strategies connected to the time of market entrance, the first strategy works for early entrants while the second for late entrants (Sandberg & Hofer, 1987).

Lastly, the literature has investigated the role that the industry context plays in new ventures' growth. Studies asserted that strategic alliances, emerging and growing markets, low level of the competition, and low hostility of the environment paly are positively correlated with new ventures' growth (Castrogiovanni, 1991; Sandberg &Hofer, 1987; Zahra, Nielsen & Bogner, 1999).

1.1.2 New ventures' measure of performance

It has been appointed that new ventures' performance depends on the same factors on which the performance of more established organizations is based, with the difference that some elements play a more important role in new ventures that in established firms (Chrisman, Bauerschmidt & Hofer, 1998). In their literature review, Gilbert, McDougall & Audretsch (2006) suggest that two important indicators for growth are *sales* and employment growth rates. The first is the most common measure of new ventures' growth (Murphy, Trailer & Hill, 1996) and it indicates an increasing acceptance of the new products and services by costumers and the potential for reinvestment of earnings. Some authors also suggest *market share growth* as an alternative measure for acceptance which depends on external industry dynamics (Kerin, Varadarajan & Peterson, 1992). On the other hand, *employment growth*, indicates that the company has expanded the scope of operations by enlarging its human capital (Gilbert, McDougall & Audretsch, 2006). This measure overcomes the limits of using *sales growth* as an indicator of performance when the company does not have products or services ready to be sold; for example, in the case of high-technology industries. Indeed, these companies may spend more years to complete the development phase.

1.1.3 New ventures' organization

New ventures are recognized to show both a high degree of vulnerability and a superior ability to adapt (Katz & Gartner, 1988). They also differ in terms of structural requirements when compared to mature organizations (Quinn & Cameron, 1983). The singularity of young organizations is seen by population ecologists as originated by the duality of entrepreneurial fast-changing processes typical of new ventures and the lack of organizational routines that on one hand decreases the ability to adapt to the environment but on the other hand increases the structural reliability which enables new ventures to respond to turbulent environments (Hannan & Freeman, 1984; Selznick, 1957). Burns and Stalker (1961) suggest that in turbulent environments organizations show an organic structure where no formal tasks are defined and coordination and mutual adjustment support quick change and response to emergent needs, as opposed to the mechanistic structure that better applies to static environments since it enhances vertical coordination and formalization of tasks. However, some have argued that the contingent view of Burns and Stalker does not clearly apply to new ventures and has been empirically tested majorly on data regarding mature organizations. In particular, Sine, Mitsuhashi and Kirsch (2006) in their study conducted on 1,024 firms have found that new ventures performance is positively correlated to formalization, functional specialization and administrative intensity exhibited in founding teams. Already Stinchcombe (1965) had pointed out that a lack of structure formalization in the beginning could cause role ambiguity and therefore imply a disadvantage of new ventures vis-à-vis more established organizations. Indeed, coordination costs, legitimacy with external actors and decision making promptness are affected (Mintzberg, 1979; Eisenhardt & Schoonhoven, 1990). The duality here described is well expressed by Chrisman, Bauerschmidt & Hofer's hypothesis:

"In a venture's early stages of growth, flexibility of organizational structure, processes, and systems has a negative effect on its probability of survival, but a positive effect on its probability of success" (p.20, 1998).

In conclusion, the structural features of new ventures enable the development of systems and processes that match the realized strategy and support its long-term success (Mintzberg, 1978), also because the initial culture which is unique to the new venture is perpetuated through its initial structuring activities (Bouwen & Steyaert, 1990). However, the same elements which ensure the future success of a new venture can become some sort of liability

in the short-term since they increase the rigidity of responses to the environment and limit the entrepreneurial agility of new ventures processes.

The literature has also explored how the organizational structure changes during transitions. Ranson, Hinings and Greenwood (1980) developed a methodological model which aims at explaining the process of structuring of organizations over time. The model integrates three elements: *provinces of meaning*, *power dependences* and *contextual constraints*. Indeed, organizations shape strategic purposes by using interpretative schemes and build their structure as tools that outline the power dependencies inside the organization; they also depend on contextual exigencies such as technological innovation for the adaptation of the structure through time. Hofer & Charan (1984) suggested that phases of transitions where ventures meet new challenges and needs involve a realignment of the organizational structure, systems and processes and are a major cause of failure after the first start-up phase is overcome. This argument is vastly explored by organizational lifecycle theories which are addressed in the next section.

Most recent works have investigated if “new forms of organizing” need a new theorizing since the main theories of organizations date back to two twenty years ago. Authors suggest that new organizations (such as Wikipedia, Oticon and Open Source Software Development) address the same universal problem that organizations have always faced but sometimes in a novel way, usually attributable to existing organizational theories (Puranam, Alexy & Reitzig, 2014). In particular, the challenges that all organizations face are: the *division of labour* and the *integration of efforts*. The first is referred to the planning of the actions necessary in order to achieve the goals into tasks and sub-tasks to which agents are assigned through provisions of authority and specialization. The second is referred to the motivation of agents through the specification of rewards and the allocation of information through established channels. In accord to Greenwood & Miller (2010), the authors suggest that “new forms of organizing” can be addressed by using existing theories. As an example, they compare Open Source Software Development with Propriety-based Software Development and recognize the lack of formal relationships such as contracts that define the membership of an agent and its contribution to the organization in the first form. However, they notice that Weber had already advanced the idea that authority can derive from non-contractual relationships. Even if these studies do not refer directly to new ventures, they are relevant for our analysis since they provide a mean for analyzing samples of present organizations by applying theories we already know. More importantly, they ensure that lifecycle theories can be applied or at least

compared to our sample of high-technology companies as carried out in Chapter 4 of this thesis.

1.2 Life-cycle theory

Organizational literature has investigated the life-cycle paradigm since the early fifties and sixties with the first model of Chandler (1962). As today, many frameworks have been proposed, they amount to more than 100 (i.e. Abetti, 2000; Adizes, 1979; Baird & Meshoulam, 1988; Bailey & Grochau, 1993; Beatty & Ulrich, 1991; Beverland & Lockshin, 2001; Block & MacMillan, 1985; Chandler 1962; Churchill & Lewis 1983; Cosier, 1991; Dodge & Robbins, 1992; Dodge, Fullerton & Robbins, 1994; Eggers, Leahy & Churchill, 1994; Filley & House, 1969; Flamholtz, 1986; Galbraith 1982; Gilbert, McDougall & Audretsch, 2006; Greiner, 1972; Gudmundsson, 1998; Gupta & Chin 1993; Hasenfeld & Schmid, 1989; Katz & Kahn, 1978; Kazanjian & Drazin 1990; Kimberly, 1979; Lippitt & Schmidt, 1968; Miles & Snow 1978; Miller & Friesen 1984; Mitra & Pingali 1999; Shim, Eastlick & Lotz, 2000; Smith, Mitchell & Summer, 1985; Scott & Bruce 1987; Steinmetz 1969; Terpstra & Olson, 1993; Tyebjee, Bruno & McIntyre, 1983; Tushman, Newman & Romanelli, 1986; Rutherford, Buller & McMullen, 2003; Van de Ven, Hudson & Schroeder, 1984; and others).

In order to unify the great number of contributions I used, as main references, the literature review of Quinn and Cameron (1983) that suggests a summary of the main models theorized in the period between 1967 and 1979; the literature review of Miller and Friesen (1984), which propose a five-stages summary model; and the review of Hanks, Watson, Jansen and Chandler (1993) which integrated some more recent theories and proposes an empirically-based lifecycle paradigm. Finally, the work by Phelps, Adams & Bessant (2007) serves both as a valid review of the most recent literature on lifecycle and as a new proposition of a dynamic model different from the organismic paradigm.

The summary model of Hanks et al. has been used in this thesis as the overall framework to compare lifecycle theories for three relevant reasons: first for the inclusion of most relevant works; second, for the organizational perspective through which the authors have built the model; and third, for the focus on the high-technology sector. The last two reasons are particularly relevant for this study because of the organizational approach used and the type of

organizations (high-technology) included in the sample that will be later investigated. The works by Kazanjian (1988), Galbraith (1982), Block and MacMillan (1985) and Burgelman (1984) have been considered because they focus in particular on the lifecycle of new ventures, another phenomenon that this thesis tries to investigate.

Lifecycle theories suggests “a prescribed mode of change” of a single entity (Van de Ven & Poole, 1995, p.522). Indeed, many dimensions of an organization can be described in relation to their evolution through progressive stages, such as “cognitive orientations of organizational members, organizational structure, environmental relations” (Quinn & Cameron, 1983, p.33), size of the organization, centralization, formalization, specialization (Hanks, Watson, Jansen & Chandler, 1993), resources and capabilities (Lichtenstein & Brush, 2001). These types of transitions that take place in the organization cannot easily be reversed (Miller & Friesen, 1984). Lifecycle theories provide that “firms have a lifecycle characterized by a consistent transition through recognizable stages of development similar to those of living organisms” (Penrose, 1952, p.806). This construct is a “model of the overall process” (Greiner, 1972, p.56) and it is useful to give an indication of the developmental nature of the organization that evolves and changes with time generally through: birth, growth, maturity, revival and decline (Miller & Friesen, 1984). The number of stages identified by the most common theories range from three (Smith, Mitchell & Summer, 1985) to ten (Adizes, 1979). Quinn & Cameron highlighted the characteristics common to almost all models: “the stages are (1) sequential in nature, (2) occur as a hierarchical progression that is not easily reversed, and (3) involve a broad range of organizational activities and structures” (1983, p.33). However, the progression is not always seen as linear, as Miller and Friesen (1984) suggested, the firms can skip one stage or more and can return to a precedent stage or, as Hanks (1990) suggested, during stages of growth the organization can experience phases of decline or stagnation. The rationale behind the identification of a path through life-cycle stages is addressed heterogeneously in the literature: Chandler (1962) points that an organization evolves by searching new growth opportunities, while Romanelli and Tushman (1986) see the evolution of an organization as a response to technology shifts in the industry rather than to matters of growth. The process has also been studied from a dialectical perspective: Greiner (1972) viewed the organizational growth as a process of revolutions caused by internal management crises related to problems of coordination, leadership and control; similarly, Kazanjian (1988) described how changes in response to dominant problems that the organization faces imply an evolution through life-cycle stages.

Very little empirical research is present to validate life-cycle models (Miller & Friesen, 1984). Hanks et al. challenged the construct of “traditional typological models [that] have tended to suggest a parsimonious sequence of growth stages [by] employing a taxonomic methodology [that] reveals a greater level of complexity in the pattern of growth-stage configurations [distinguishing between] old small firms from start-up firms” (1993, p. 24). The study on 176 high-technology firms revealed two clusters of firms that represented two stages that did not fit in the traditional lifecycle theories: small old firms in which owners decided to keep a small company because of the limited growth of the firm or because of the little market niche that the firm serves, and firms in which the disengaged owner decides to maintain the status quo, pursuing activities with derived funds.

For the purpose of this thesis, I will first provide a description of the most important classical lifecycle theories. Therefore, I will focus on the theories that recommend a specific lifecycle construct for new ventures. I will then assess critics to the lifecycle paradigm by mentioning two alternative “evolutionary” theories and, in the second chapter, I will longitudinally review the literature focusing on what has been said on the organizational features overall and for what concerns the first stages of growth.

1.2.1 Organizational life-cycle models

Table 1 presents a comparison of different lifecycle models, which were mostly summarized by Hanks et al. (1993). I added to this model some more recent theories that were reviewed in order to fit the summary model proposed by the authors (i.e. Block & MacMillan, 1985; Burgelman, 1984).

| | | | | | | |
|---|--|-------------------|-----------------|-----------------|----------------------------|---------------|
| S U M M A R Y M O D E L S | Hanks, Watson, Jansen & Chandler (1993) | START-UP STAGE | EXPANSION STAGE | MATURITY STAGE | DIVERSIFICATION STAGE | DECLINE STAGE |
| | Miller & Friesen, 1984 | 1.Birth | 2.Growth | 3.Maturity | 4.Revival | 5.Decline |
| | Quinn & Cameron, 1983 | 1.Entrepreneurial | 2.Collectivity | 3.Formalization | 4.Elaboration of Structure | |

| | | | | | | |
|---|---|---|---|---|------------------------------------|---|
| C L A S S I C A L | Adizes, 1979 | 1.Courtship 2.Infancy | 3.Go-Go 4.Adolescence | 5.Prime 6.Stable | | 7.Aristocracy 8.Early Bureaucracy 9.Bureaucracy 10.Death |
| | Greiner,1972 | 1.Creativity | 2.Direction | 3.Delegation | 4.Coordination 5.Collaboration | |
| | Flamholtz, 1995 | 1.New venture | 2.Expansion | 3.Professional ization 4.Consolidation | 5.Diversification 6.Integration | 7.Decline |
| | Lippitt & Schmidt, 1967 | 1.Infancy | 2.Youth | 3.Maturity | | |
| | Churchill & Lewis, 1983 | 1.Existence 2.Survival 3(D).Success-Disengagement | 3(G).Success-growth 4.Take-Off | 5.Resource Maturity | | |
| | Scott & Bruce, 1987 | 1.Inception 2.Survival | 3.Growth 4.Expansion | 4.Maturity | | |
| M O D E L S | Smith, Mitchell & Summer, 1985 | 1.Inception | 2.High Growth | 3.Maturity | | |
| | Galbraith, 1982 | 1.Proof of Principle/Prototype 2.Model Shop | 3.Start-Up/Volume Production | 4.Natural Growth | 5.Strategic Maneuvering | |
| | Kazanjian, 1988 | 1.Conception & Development 2.Commercialization | 3.Growth | 4.Stability | | |
| | Block & MacMillan, 1985 | 1.Concept and product testing 2.Prototype 3.First financing 4.Initial plant test 5.Market testing | 6.Production start-up 7.Bellwether sales 8.First competitive action | 9.First redesign/redirection 10.First price change | | |
| N E W V E N T U R E S M O D E L S | Burgelman, 1984 | 1.Definition | 2.Impetus | | | |

Table 1. Source: Personal re-elaboration of Table 2 (Hanks, Watson, Jansen & Chandler (1993, p.10)

The logic behind the condensed model by Hanks et al. is that organizations develop through five common stages: *Start-Up*, *Expansion*, *Maturity*, *Diversification* and *Decline*. The aggregate of five stages seems to be well accepted between academics. Many authors

provided a five stages model in the first place (Galbraith, 1982; Greiner, 1972; Lester & Parnell, 1999; Miller & Friesen, 1984; Scott & Bruce, 1987) and others validated the hypothesis that five stages would well encapsulate the common characteristics of both small and established companies, making the “model relevant for all organizations” (Lester, Parnell & Carraher, 2003, p.341). Hanks et al. provided a definition of a life-cycle stage as a “unique configuration of variables related to organization context and structure” (1993, p.7). More specifically, with time firms increase in size and age, and show the highest growth during Expansion and Diversification stages. Also, the structure evolves from simple through functional and then divisional, decision making becomes more decentralized, and the organization increases formalization and specialization.

Not all the models refer to organizational factors such as formalization, specialization, decentralization and structure; these elements are addressed specifically in the second chapter of this thesis where I provide a longitudinal view on lifecycle studies that prescribed specific characteristics in terms of structure. In fact, the models suggested in the lifecycle literature address much broader issues and represent different points of view on the complex phenomenon of the development of an organization over time, such as the interaction with the industry, the resources necessary for management, the application of theories concerning personality development to the organization’s evolution (Lippitt & Schmidt, 1967). Here, I summarize one by one the works of authors that contributed the most to the development of lifecycle theory -i.e. the models here presented have been cited by other authors as baseline for subsequent theories or have been appointed in the literature as significant contributions.

Adizes, 1989

Four roles -productive, administrative, entrepreneurial, and integration- are performed by an organization with different emphasis during various stages. The author provides some specific treatments that help organizations to survive in a specific stage and pass to the next one. The organizational passages proposed are ten: *Courtship Stage, Infant Organization, Go-Go Stage, Adolescent Organization, Prime Organization, Mature Organization, Aristocratic Organization, Early Bureaucracy, Bureaucracy and Death*. During the *Courtship Stage* the entrepreneurial role represents the fuel of the organization; the entrepreneur is excited and committed to the business idea. A treatment for this delicate stage provides to establish an advisory board with few professional figures –because of the limited budget- that would support the founder without constraining him to some choices. The entrepreneur should then learn “to do” and during the *Infant Organization* stage the emphasis is on production.

Moreover, the entrepreneur should take important decisions firstly regarding capital but at the same time, he should not let the overwhelming work obscure the long-term opportunities that would wake up his entrepreneurial spirit. In the *Go-Go Stage* the founder should seek for new opportunities simultaneously and usually a lack of experience and an excess of personification into every policy will make him fall into the so-called “founder’s trap”. During this phase, only a bigger role of the administrative task can benefit the organization, which becomes then *Adolescent*. During this phase, there could be some tensions between partners and the figure of a consultant could help the organization to establish some administrative procedures in order to achieve some stability. The next stage is represented by the *Prime Organization* which is result-oriented, efficient and still willing to take entrepreneurial challenges. However, the aging process toward maturity eventually takes place because of the change in top management aspirations and a non-clear structure of authority, resulting into an impasse. Aspirations are defined as “a function of disparity between the desired and the expected, if what management desires is higher than what it expects to achieve there will be energy and aspiration for change” (p.9). *The Mature Organization* views a decline of the entrepreneurial role and an increase of the integration role. Therefore, the “sense of urgency” is lost, formalization increases, and consequently the orientation toward results declines; the organization becomes *Aristocratic*. During this phase, the organization is paralyzed in the past, puts efforts on increasing the administrative system, and growth is usually achieved only through inorganic avenues or by raising prices of products. A treatment in this phase should re-establish team working that would generate a new decision-making process. If this is not achieved, the organization will go toward a *Bureaucracy*, where people are concerned to maintain their personal interests in the organization and to bypass the administrative system. Rules and procedures gain more importance than the orientation toward results and very little gets done in the end. The only treatment that can be applied during the stage of *Early Bureaucracy* is the “surgical treatment”, meaning that managers with negative attitude should be replaced. The final stage is *Death*, where no organizational role is active anymore.

Greiner, 1972

The model developed by Greiner “serves as an important baseline in the field” (Hanks et al., 1993, p.6) and it has been cited by 21 later models (Levie & Lichtenstein, 2010). As companies grow in age and size, they are deemed to pass through phases of evolutionary growth and revolution. Managers have a central role during revolutionary periods because they should overcome crisis by establishing new organizational practices that would be the

base for managing the subsequent evolutionary phase. The first phase is based on *Creativity*, meaning that the entrepreneur develops from scratch a new product or a market. The communications inside the nascent organization are informal and frequent; people are motivated to work usually for an ownership benefit in the future and the management is extremely reactive to responses of the market. With time, the organization will require additional production, knowledge, employees and capital. At this point, disagreement between leaders is likely to arise and the so-called *crisis of leadership* occurs. Only through the figure of a strong manager, the organization can survive the first stage and pass to the second ruled by *Direction*. Here a functional structure emerges and hierarchy grows, with consequent increased formal communication and standardized tasks such as accounting systems, incentives and budgets. Excessive centralization increases the risk of a *crisis of autonomy*, therefore managers should learn to move toward a *Delegation* phase where the organization is decentralized and managers “have greater authority and incentives, are able to penetrate larger markets, respond faster to customers, and develop new products” (p.62). The next revolutionary phase is the so-called *crisis of control* that results from the attempt of top management to return to a centralized organization. A solution can be the use of *Coordination*: using formal systems and procedures, managers should communicate to headquarters that carefully allocate capital to different product groups. Afterwards, managers start to complain about the increased bureaucracy and there is a lack of confidence between headquarters, line managers and staff people. The organization finds itself in a *red-tape crisis*. This type of crisis can be overcome only through an evolutionary period of *Collaboration*. Management should work in interdisciplinary teams and the focus should shift to find new solutions to existent problems and to experiment new practices. Formalization is reduced and normally the organization assumes some elements of a matrix structure to emphasize collaboration and real-time flux of information. The crisis that companies encounter during this phase has been identified by Greiner subsequently to his first theorization of the model; he suggested an *internal crisis*, the “one of realizing that there is no internal solution, such as new products, for stimulating further growth. Rather the organization begins to look outside for partners or for opportunities” (1998, p.65).

Churchill & Lewis, 1983

The authors propose a framework that derives from the Greiner’s model (1972). This five-stage model is conceived to describe the small businesses changes in size, diversity, and complexity through time. The first stage is the stage of *Existence*. The organization is simple

and the owner usually supervises all the activities. The main challenges for the firm are the obtaining of customers and the ability to deliver the products or service. If the organization becomes a “workable business entity” (p.37), it passes to the next stage –*Survival*. During this stage, the organization retains a simple form and the owner is concerned about short-term activities that are needed in order to stay in the business, grow and eventually generate returns. The third stage –*Success* is divided into two sub-stages: *III D* and *III G*. The *III D* stage refers to the owner’s disengagement with the firm and a possible forthcoming sale of the company, merger or acquisition by another company. The management is divided into functions and the planning activities consists of operational budgets. The firm can pass to the next stage only if it is able to adapt to the changing environment. The alternative sub-stage is the *III G* stage, which reflects instead the owner’s involvement into the strategic long-term planning of the firm. Operational budgets are still important since the organization should achieve profitability to re-invest in future growth. Moreover, professional management is hired. The next stage is the *Take-Off* stage. At this point the firm starts to be organized into divisions and the decisional power is decentralized, normally new owners enter the firm as stockholders. The management composition is renewed and its main activities are delegation of responsibility and cash flow generation and continuance through time. The last stage is called the *Resource Maturity* stage. A company in this stage “has the staff and financial resources to engage in detailed operational and strategic planning. The management is decentralized, adequately staffed, and experienced. The owner and the business are quite separate” (p. 41). The risk during this phase is the ossification of the business, which consists in lack of innovation and risk avoidance.

Scott & Bruce, 1987

The framework proposed by Scott and Bruce is based on the Greiner’s concept of crisis and it is a progression of the model developed by Churchill and Lewis. The authors suggest that not all the surviving businesses turn out to be large businesses; indeed, some businesses remain small and the suggested model seeks to explore the characteristics of their lifecycle. The first phase is *Inception*. The founder plays a central role and brings the main values and functional orientation into the business based on his personal beliefs and basic skills. The business efforts are dedicated to the development of a commercially viable product and the delivering of positive cash flows. The achievement of profitability is a likely point of crisis because it would require a different management approach and a change in the organizational structure as the activities increase. To handle this, the organization should increase its formalization.

The second stage is the *Survival* stage. During this stage, the firm still has a single product line and the main issue is to receive adequate financing both from banks and from creditors. The returns are still marginal and the main risks are: uncontrolled growth and overtrading, failure of delegation during the expansion in different distribution channels, increase of the competition which brings the need for economies of scale –if the firm wants to compete on prices- and the renewed necessity of having formalized control and budgetary systems. The third phase is *Growth*. The organizational structure should put emphasis on formalization and coordination of functional managers. The risk here is represented by the entry of large competitors; in this case the company should be able to compete on different market or products while if it only fights for the actual market share, it is destined to remain in this stage. However, the expansion into new activities requires financing, coordination, and an initiation of decentralization. The fourth stage is the *Expansion* stage. The authors suggest that during this stage an opening to new partner is inevitable, and also that “budgetary control, regular management reports and decentralized authority accompanied by formalized accounting systems are the order of the day” (p.50). These two points are very similar to what Churchill and Lewis (1983) suggested in the Take-Off stage of their model. The initial founder should be able to step back and let professional managers play the company politics and enhance their proactivity on the identification of new customer needs by adapting product and thus maintaining a competitive advantage. The success of the firm during this stage depends also on the specific industry growth. The final stage is *Maturity*. The authors suggest an approach to this phase different from the classical lifecycle theories; they say that the firm continue to grow during maturity and, instead, it could start to become a larger business. Here the management faces activities such as marketing efforts, innovation and plant upgrading. Innovation, in particular, is a viable guarantee against price competition and productivity pressures. Sometimes long-term financing is required during this stage. Moreover, shareholders put pressure on managers to ensure further growth and the figure of the entrepreneur should think about his succession.

Smith, Mitchell & Summer, 1985

The work of Smith et al. assess how management priorities change during lifecycles and how much relevance they assume depending on the stage. Their study is relevant since it adds to the already present lifecycle theories some considerations on the top management perspective. The type of information that managers use when they search to solve problems reflect three top management priorities regarding: *technical efficiency, organizational coordination and*

political support. Indeed, for their study Smith et al. asked 27 CEOs to evaluate the importance of each of three hypothetical folders of information they could use to take decision in a scenario in which they should take decisions about how to develop a new product. Each folder contained information that are valued differently depending on which priority the management has. Therefore, the authors classified top management priorities along three different stages: *inception*, *growth* and *maturity*. During the first stage, top management is concerned about establishing relationships with suppliers of critical resources and making the organization profitable. For this reason, during this phase the technical efficiency priority has a bigger role. Suppliers give their support on the basis of a firm's ability to meet expectations on future performance and therefore managers would be results-oriented and will seek to maintain support from suppliers. As the firm evolves toward the second stage of high growth, top management has to address the increase of demand and the structural complexity of the organization. Indeed, managers should prioritize the organizational coordination and "must focus on whole organizations and systems rather than on particular problems or functions in order to achieve coordination and communication among various units" (p. 804). During the last stage –*maturity*– normally the management search to maintain the status quo or restructure in order to achieve new growth. Two top management priorities assume primary importance: technical efficiency and political support. The first concerns the management attempt to re-gain resources and legitimacy as growth slows and supplier can threat a withdrawal of support. The second regards the efforts toward the maintenance of subordinates' support in order to increase management legitimacy and influence on "existing structures [...], implement change and prepare organizations for future growth" (p.805).

Lippitt & Schmidt, 1967

Lippitt and Schmidt advanced one of the earliest lifecycle models that has been used as main reference in 10 successive models (Levie & Lichtenstein, 2010). They suggest that organizations develop through three stages: *infancy*, *youth* and *maturity* and, for each phase, they identified two managerial concerns that should be met in order to avoid undesirable pitfalls. At *Infancy* the entrepreneur/s create an operating system by taking the risk of losing time, reputation and money into the new corporation. Moreover, the company should be able to "survive as a viable system" (p.23) through the sacrifice of what the entrepreneur has chosen to risk and the managerial commitment to the new organization. *Youth* is the stage in which companies should gain stability and reputation. The former is achievable through a

rigorous internal organization and discipline while the second regards the search of the organization for external approval by attracting good employees and clients. During this phase, there will be some turnover and new personnel will show a different commitment to the organization in respect to that of the founders. The last stage is *Maturity*, where the organization tries to maximize its unique abilities by searching for new opportunities where to apply them –i.e. diversification of the business. Moreover, the firm also seeks to gain public respect and contribute to society and personal achievements of employees.

Flamholtz, 1995

The model was first developed in 1987 and it consists in seven stages. He identified the approximate sizes in revenues at which organizations pass to the subsequent stage and examined which were the consequences of the evolution through stages for human resource and corporate management. During the first stage –*New Venture*- the major management concerns regard the survival of the firm. Indeed, the definition of the market and the development of the product. If the firms completes these tasks, it will reach the *Expansion* stage. Normally the sales revenues will range from 1 million \$ to 10 million \$ and the growth will be exponential. The organization is still informal and the management should prioritize the development of organizational resources that would enable the firm to compete successfully in the future; human resources are a particularly critical asset. Moreover, many problems can arise in the day-to-day activities such as gaps in the exchange of information, which induce a loss of time, or a high turnover and difficult control of the personnel, or bad inventories' management. This is why a focus on operational systems such as “accounting, billing, collection, advertising, personnel recruiting and training, sales, production, delivery, and related systems” (Flamholtz, 1995, p.42) is important. During the third step, *Professionalization*, when the firm reaches around 10 million \$ in revenues, it should increase its level of formalization. Therefore, there should be a definition of roles and responsibilities and a workable system for the management control and development. Performance appraisals could be a control tool useful to influence people's behavior toward the achievement of organizational objectives during this stage. People should also acquire new skills and capabilities such as motivation, control, leadership and planning abilities. The next stage is *Consolidation*. Typically the firm reaches 100 million \$ in revenues and this is the moment for a second big incoming of personnel. The issue is that, when at the beginning it was simple to transmit the kernel values of the firm to new members through socialization processes, now it is no longer an adequate system. The management should put in place some formal systems

to transmit the corporate culture. The fifth stage is *Diversification*. In order to achieve further growth, the firm should introduce new products or services, in some ways advancing the entrepreneurial spirit of the first stages. However, some organization could be unsuccessful in proposing new differentiated products or services to the market. The sixth step is *Integration*. Even if the firm is composed by different and separate businesses, the management should be able to integrate those units and maintain at the same time the benefits of decentralization. The organization requires, therefore, to focus on management and operational systems, corporate culture and organizational resources. Management systems refer to the overall planning of people development inside the organization and it include control systems, while operational systems refer to the day-to-day activities, which at this moment could be overly complicated by bureaucratic mechanisms. During the last stage, the organization should deal with ‘aging symptoms’ possibly through the contemporary management of the six key ‘areas of development’ concerning: management systems and operational systems, acquisition and development of organizational resources, development of product and services and corporate culture.

1.2.2 New ventures in life-cycle theory

As Quinn & Cameron suggested, during the seventies there “has been a tendency to generate studies which focus on mature rather than new organizations” (1983, p.33). Nevertheless, two early authors of lifecycle theory -Down (1967) and Lippitt & Schmidt (1968)- collocate in the first lifecycle phases the concern of the newborn enterprise to reach a *survival threshold*. For Down this concept was connected to the legitimization of the venture from the external environment and the obtaining and stabilization of resources, for Lippitt and Schmidt it was more connected to the figure of the entrepreneur who should be willing to take risk and responsibility of the new venture and be able to do the right choices in terms of leadership, capitalization and markets. These concepts are similar to the previously mentioned Stinchcombe’s (1965) *liability of newness* which refers to the bigger risk of failure of new organizations compared to the older ones due to the difficult competition with established organizations and the lack of legitimacy. Some authors “argue that planning for new enterprises differs fundamentally from planning for existing companies, given the inherent instability of start-ups” (Block & MacMillan, 1985, p.184). Following this line of thinking, new ventures should have a dedicated lifecycle model different from those models that

describe the overall development of bigger firms. The extensive literature dedicated to new venture creation has been already mentioned in Section 1.1; here I describe the work of authors who have proposed life-cycle models to specifically describe the phenomenon of new ventures.

Galbraith, 1982

Galbraith focused his research on high-technology new ventures and developed a model that would help managers to “overcome the bias of not thinking stagewise” (p.70), referring to the fact that an organization develops around a business idea and, when the business idea evolves, the organizational design should change too in order to reach a new congruence. The first stage is named the *proof-of-principle* stage and regards the invention of a device starting from the entrepreneur business idea. During the second stage -the *prototype* stage- the engineering team starts to be concerned also about the manufacture of the device. The first two stages can be associated at an organizational level. Indeed, people who join the organization have the common characteristics of being willing to: implement their own ideas, receive an equity reward, acquire experience and work in an informal climate. However, while it increases in size the organization requires leadership and structure; normally people resist to that change because it would erode the autonomy for which they joined the organization. If the management is able to “think stagewise”, the figure of a leader would promote change and integration of tasks, structure and people. The subsequent stage is the *model-shop* stage in which the product is tested and many market and quality tests are run. New specialized employees are hired and, therefore, a structure starts to be delineated through hierarchy and functions. However, venture managers still think that there should be no structure due to the success of the organization in past stages. Thus, decision processes remain informal and recruiting is done on the same basis as during the previous stages: non-bureaucratic climate and rapid promised advancement. The roles of venture managers should shift from inventing the product to managing, scheduling and directing people. The next phase -*start-up*- begins to invest big amounts of capital in production and distribution of large volumes. The focus is operation, no longer invention. For this purpose, management should add new functions and new people to the organization. Here the management encounter a dominant problem connected to the reluctance to create a structure in the previous stage. Hence, when new functions are added, the hierarchy increases and new people are required to fill the level between venture managers and functional managers. However, people who were promised an advancement are not ready to fill those positions and bringing someone external can create

complaints. Subsequently, the already centralized organization becomes more business-oriented while the communication starts to be formalized, but the organization still need administrative systems. A demand for multi-functional and professional management arise. The venture enters a phase of *natural growth*, aligned with the growth of the industry. To reduce competition and reinvest returns from the market, the organization should set off a second-generation line of products. Some decentralization should occur for the organization to be able to manage this product diversity, some figures such as project managers and cross-functional teams would be useful for this purpose. Here the administrative and budgetary system is unquestionably required in order to make the organization able to manage multiple lines of products in a financially effective way, and cross-functional teams should augment in number. If the management is able to develop these systems, the organization is ready to enter the *strategic maneuvering* stage. When the natural growth ends, the organization should search for a market niche in which it could remain viable. In addition, the management should take part in some strategic choices such as the decision to vertically integrate or diversify and decision to grow through organic approaches or inorganically -i.e. through mergers and acquisitions. Decentralization of operating decisions and long-term planning have a central role in order to let the management spend time on strategize and find new growth paths. The structure in this phase can be similar to a matrix or to a divisional structure based on profit centers.

Galbraith in his study provides a range of sizes that normally the organization achieves at each stage: the proof-of-principle stage involves only a bunch of technical people, in the prototype stage the number increases to about twenty-five people, in the model shop stage size is around 50 to 100, during the start-up phase it increase to around 1000, 1500 to 2000 during the natural growth phase and the last phase does not indicate a specific size.

Burgelman, 1984

Burgelman conceptualizes a model which is thought to describe the internal corporate venturing process (ICV). This is not a specific stage model but I believe it is an important specification of how internal corporate ventures differ from independent new ventures. The main peculiarity of the growth of a firm inside the corporate context is suggested to be the simultaneous advancement of strategic activities at multiple management levels. The model is based on the findings of Galbraith and on comparative analysis of six cases of ICV. The

resulting framework is a “process model” since it is intended to allow managers to understand the interplay between problems regarding core and overlaying processes at three corporate management levels (top management, middle management and venture leader). The core processes of an ICV project are similar to two temporarily differentiated stages: *Definition* of the new business, and *Impetus* or gain of importance of the project inside the corporation. While the overlaying process, which regard the determination of the *strategic context* and the *structural context*, cannot be expressed in a temporary order because are transversal.

Kazanjian, 1988

The Kazanjian’s model is cited as a source from 11 later models. The subjects of this study are “technology-based new ventures” –i.e. TBNVs. The technological component has, therefore, a crucial role in the strategy definition and in key activities and skills that the organization might develop. The model has been tested empirically through a longitudinal study on 105 companies by Kazanjian and Drazin (1990). The logic behind the linear progression through different stages is similar to the one identified by Greiner (1972) in the sense that the organization is believed to face “dominant problems” and to initiate organizational change in order to solve them. Differently from Greiner, Kazanjian recognizes dominant problems arising in the organization as connected to the product and the technology itself and not to internal problems of social interaction. Moreover, Kazanjian suggest an identification of problems in advance, which differs from the subsequent reaction by management proposed by Greiner. The first phase –*Conception and Development*– is centered on the creation and development of a technology or a product. There is no structure nor formality during this stage. The founding entrepreneur normally directs almost all the activities around the creation of the new business idea and its acceptance by financial sponsors and, for this purpose, a dominant problem consists in the development of a prototype. During the next phase, the major focus is the *commercialization* of the product itself. Some organizational functions such as manufacturing and engineering are created, however, there is no formal structure and the communication remains informal. Ownership is restricted to a single owner or a limited number of partners. The subsequent stage represents a period of *growth* and constant change. The goal is to produce, sell and distribute products while remaining effective and efficient in order to attain profitability. The organization starts to hire specialized employees, and hierarchy along with functional specialization increase. Later, the growth will slow alongside the market growth rate and the organizations enters a period of *stability*. In order to reach further growth, the firm should look at the development

of second-generation products. Regarding structure, “The venture has evolved from an organic R and D lab into a stable and functional operating company characterized by bureaucratic principles” (1989, p.1492).

Block & MacMillan, 1985

Block and MacMillan suggest a milestone path, for manager to develop viable business plans for new ventures. The principle is that managers should ask themselves a series of questions and, as events occur, they should replace assumptions with facts, review the previous assumptions and set forth new questions to answer in the future. The first milestone regards the “*completion of concept and product testing*”. This step is relevant in order to avoid bigger failures later and sometimes it helps manager to identify in advance alternative solutions. Indeed, the tests during this phase should investigate on which are the desired product characteristics, the target market and the customer needs; this helps manager to recognize the existence of an effectively real opportunity. The second milestone is the “*completion of prototype*”. During this phase, managers receive important feedbacks on what has caused roadblock in the prototype development and how is possible to overcome them. Sometimes creative solutions to those problems can create important inventions during this phase. The third milestone is “*first financing*” which can happen for many reasons such as testing the concept’s potential, developing the prototype or financing manufacturing and sales. The financing process is useful for entrepreneurs to help them to understand if investors perceive the financial structure of the company as acceptable. The fourth milestone is “*completion of initial plant test or pilot operation*”. Managers would gather information regarding material costs, required processing skills and training, timing etc.; every information gathered here would be worthwhile when the operations will run full scale. The next milestone is “*market testing*”. Here managers should truly understand the reasons for customers to buy the products, their pricing expectancies and service requirements. The sixth milestone is “*production start-up*”. This is the time to test assumptions done during pilot operations regarding timing, quality, inventory accumulation etc. The seventh milestone is “*bellwether sales*” which refers to the first relevant sale to an important account or distributor. Managers here have the possibility to gather information on the competition, additional data on the product’s quality and service requirements. The next milestone is “*first competitive action*” to which, however, the firm should be prepared thanks to previous milestone’s questions. The ninth milestone is “*first redesign or redirection*” of the product to a different target market. During this phase, the initial offer can differ from what it is learned as desirable from the

market. The last milestone is “*first price change*” and refers to the necessary pricing revision due to changes in technology, competition, and costs. This revision induces to reconsider the validity of initial assumptions on target markets and competition.

1.2.3 Critics to lifecycle theories: an evolutionary approach

Critics

At the basis of all lifecycle theories, there is the so-called *organismic analogy*. Firms are compared to “developing organisms” (Tsoukas, 1991) such as plants (Lippitt & Schmidt, 1968) or humans that evolve psychologically and physiologically toward adulthood (Bhidé, 2000). The tangible parallel with organisms’ growth is intuitive and seems to explain the complex and uncertain phenomenon of firm’s evolution by providing justification for their pattern of growth. The “face validity” of lifecycle theories has been distinctly recognized by authors (Levie & Lichtenstein, 2010; Greiner, 1972; Stubbart & Smalley, 1999). Indeed, Eggers, et al. (1994) provide a study in which all the founding entrepreneurs interviewed had to collocate their company into one of five given stages. However, in order for the lifecycle construct to be more than a simple management tool and to have the attribute of a theory, three propositions are driven from the organismic analogy. The propositions were first suggested by Quinn and Cameron (1983) and later rearranged by Phelps et al. (2007) and by Levie and Lichtenstein (2010):

“The first proposition is that just as in a growing organism, distinctively different stages of development can be identified in a growing organization. The second is that as in a growing organism, the sequence and order in which a growing organization undergoes these recognizable stages is predetermined and thus predictable. The third is that just as all organisms of the same species develop according to the same (genetic) program, so all organizations develop according to prefigured rules.” (p.319)

Whetten (1989) drew on Dublin’s (1978) methodology arguing that a theory should present three elements: *what* –i.e. the factors that would explain a given phenomenon, *how* –i.e. the interrelation of these factors and the relationship of causality behind, and *why* –i.e. the underlying assumptions that validate the suggested interrelation of factors. Levie and

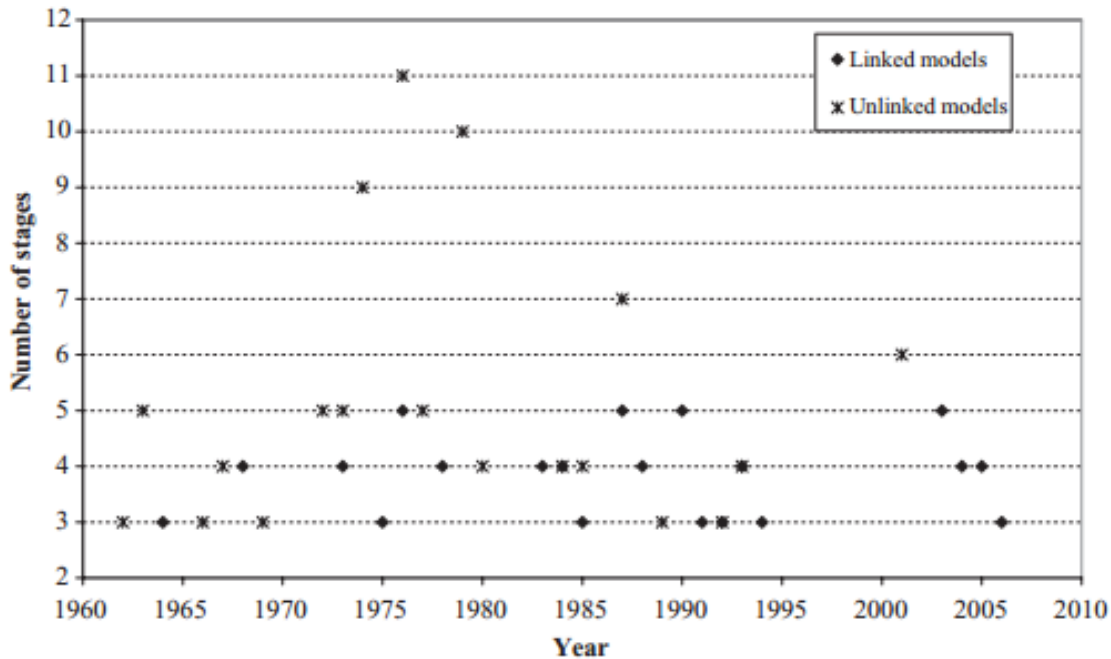
Lichtenstein (2010) distinctly applied this theory-building framework, particularly suitable for applied science (Ardichvili, Cardozo & Ray, 2003) to lifecycle theory in general and, in order to validate the propositions above, investigated on “whether and to what degree there is any agreement as to *what* a stage represents, *how* many there are, and *why* these stage transitions take place” (p.319).

Hence, after more than 100 studies on organizational lifecycle have been published across more than 40 years, it seems that no consensus has been reached on the first two propositions: the identification and number of stages. This is clearly demonstrated by the cumulative number of published lifecycle stage models which increased by 53% only between 1990 and 2006 (Levie and Lichtenstein, 2010). Hanks et al. (1993) in their literature review investigated on the question “what constitutes a life-cycle stage?” and suggested a definition that compared a stage to a “unique configuration of variables related to organizational context and structure” (p.7). However, there has been no consensus on the central element of this definition: the identification of the stages’ patterns of configuration (Phelps et al., 2007). Hanks et al. (1993) themselves found difficult to demonstrate empirically that aggregate theories could be grouped into six categories: their study found two clusters of older and smaller firms that were not recognizable into any previously suggested stage. The main shortcoming of stage models is that many authors advanced different visions of what actually are the characteristics of a particular stage, depending on what is conceived to change during the evolution through stages due to the “operation of latent mechanisms that governs the formation, growth transformation, and maturity of stages” (Stubbart & Smalley, 1999, p.279), without finally generating cumulative knowledge. This is connected to the third proposition - *why* firms grow through stages. If some cumulative knowledge can be found, this has been criticized from a theoretical point of view. Indeed, Levie and Lichtenstein (2010) identified four main theoretical sources of the literature that are complementary in the sense that do not rely on common citations. The first is the model firstly investigated by Greiner (1972) that is based on “evolutions and revolutions”. Phelps et al. (2007) called it the “problems perspective” referring to the multidimensional approach through which the organization is believed to evolve throughout crisis. The undergoing of organizational transformation presents a management challenge and enables the passage to the subsequent stage. The second source is called the “stage of corporate development” and refers to the model of Christensen and Scott (1964) which suggests a progress of the firm from informal structure, to bureaucracies, and then to diversification. The third source “morphogenesis” refers to the

work of Normann (1977) that has been lately the inspiration of the model developed by Kazanjian (1988). This set of theories suggest that organizations evolve depending on environmental circumstances through a learning process. The fourth source: “organizational life cycle”, is based on Lippitt and Schmidt (1968) model of evolution grounded on the organismic construct. Levie and Lichtenstein challenged each of these four sources by providing theoretical inconsistencies in the underlying citation of other authors as support for the models. Indeed, Christensen and Scott credited Chandler (1962) provided only a limited historical view of American enterprises; Lippitt and Schmidt based the validity of the organismic analogy on the work of Gardner (1965), which provided the analogy only as an example and clarified that the cycle of organization is, differently from plants, not at all predictable; and Normann cited Rhenman (1973) that in his book did not actually suggest any stage, instead argued against them.

Concerning the second proposition, neither some general attributes of the theories such as the number of stages or the duration of each stage have been fixed by convergent theories. In fact, the number of stages of the different models ranges from 2 to 11. Levie and Lichtenstein (2010) analyzed the common features of the lifecycle models proposed in the literature that has been published between 1962 and 2006 and they assessed that since there is not agreement on the number of stages “the stages approach [cannot] accurately reflect a pattern in the social environment” (p.322). As depicted in Figure 1, along the years there is no unanimity in saying that organization evolves through a precise number of stages and theorists continue to propose new models sometimes totally unlinked to existing theories. Therefore, this accumulation of knowledge is not fruitful and does not seem to give any contribution in term of dominant theories. Theorists have also found difficulty in demonstrating the empirical validity of multiple-stages models; Dodge, Fullerton and Robbins (1994) found that even a two-stages model was not predictable of the problems encountered by a sample of 645 small firms.

Figure 1. Number of stages prescribed by the literature



Source: Levie & Lichtenstein, 2010, p.323.

Regarding the duration of each stage, some authors suggest that this lasts around three years (Abetti, 2000) while others suggest that it ranges 10 years or more (Miller & Friesen, 1984), or from 3 to 15 years (Greiner, 1997). However, the majority of studies do not indicate a precise number of years for each stage and some say that “age alone does not confer greater environmental or administrative complexity and, so, would not cause major evolutionary trends in structure and strategy” (Miller & Friesen, 1984, p.1177). As a conclusion, the sequentiality of stages has not been strongly demonstrated: both Rutherford (2003) and Bailey & Grochau (1993) found no correlation between the age of the organization and the lifecycle stages. Galbraith (1982) has appointed size as a dimension that indicates the passage between stages, however this parameter lacks of specificity (Hanks et al., 1993).

Another central critic against lifecycle theories is the limited empirical evidence. As Hanks et al. said: “most models of the organization life cycle are conceptually rather than empirically based” (1993, p.11). Evidence draw from case studies is not appropriate to define the validity of a lifecycle model since it would not provide enough generalization about firms’ growth (Westhead & Storey, 1997). Moreover, the general tendency of researchers to focus on in-depth knowledge of a limited number of *case studies* brings them to cite some well-known general pattern that apply to the specific case but if these general patterns are suspect once empirically tested, the argument of the case turns out to be suspect (Ragin, 2000). Even if

limited, some empirical evidence is present but also contested. Phelps et al. (2007) argue against the two existent lines of empirical studies that are suggested to bring validation to stages models. On the one hand, longitudinal studies that refer to empirical analysis done over a period of time or cross-sectionally, are believed to take a range of time that is too limited – normally 3 to 5 years, with the exception of Miller and Friesen (1984) which analyzed historical data of 36 firms old 20 years or more but in any case found no evidence of the “common life-cycle progression [through] lengthy periods of time” (p.1176). On the other hand, the *hypothetico-deductive* studies search to allocate sample firms into a priori stages but the result is a diversity of models that provide some specific structures and management practices in response to different stages. Every model seems to find a non-contestable turning point to address lifecycles even without a strong coherence between the pattern of change and the a priori stages. This congruence has been found to lay on priorities of management (Shim et al., 2000), the dynamism of the environment (Gupta and Chin, 1993), structural patterns (Kazanjian & Drazin, 1990), types of problems and functional specialization (Hanks and Chandler, 1994). Since every authors points something different and not complementary to the others, it is clear that the absence of consensus on which are the stage’s drivers of change does not make the lifecycle models part of a strong theory. If we take a different perspective on empirical validation of stages models, going back to the four theoretical sources identified by Levie and Lichtenstein (2010), they similarly appear not to be empirically tested. The Greiner’s model *-evolution and revolution-* has been tested by Tushman, Newman and Romanelli (1986) which found no evidence of firms following Greiner’s sequence or any sequence. The Scott model was recognized not to be reliable in describing non-American and multinational firms, indeed confirming the validity of the model only as an historical picture of American firms. The Kazanjian’s model, which is based on Normann’s one, has been criticized because it takes only a restricted sample (new high-technology ventures). Kazanjian and Drazin (1990) in their empirical study seem to provide “moderate to strong support for the expected relationship of certain dominant problems to the particular stages as contained in the preceding stage descriptions [...] although there were some deviations from the expected pattern of problems across and within stages, the model in general was supported” (p. 1492). However, as Scott & Meyer (1992) observed, many sample firms used in the empirical assessment of the Kazanjian model were not predicable of the model since they fell into the “error cells” including those that moved back across stages. The fourth source, which Levie and Lichtenstein call the *organizational life cycle*, has been part of the model built and tested by Miller and Friesen (1984) which found no sequential correlation between stages and

indeed did not provide support for the theoretical literature of Scott (1971) but also Greiner (1972) and Adizes (1979). Birch, Haggerty and Parsons (1995) examined a longitudinal data from 10 millions of US firms and discarded the anthropomorphic similarities in the pattern of evolution of companies. They concluded that: “the relatively few firms that survive and evolve exhibit their own distinctive pattern (p.5). Lifecycle models have similarly been tested on samples of new high-technology ventures and did not confirm their utility to describe the evolution pattern of these particular types of firms. McCann (1991) analyzed the progression of 100 new independent high-technologies ventures and concluded that the complexities faced by these firms were not well described by a deterministic model of growth. Garnsey, Stam and Heffernan (2006) analyzed a sample of 93 high-technology new ventures over 10 years and they found that less than one third of the sample followed a growth path.

The evolutionary approach

Some authors provided frameworks to describe the firms’ development alternative to lifecycle models. Aldrich (1999) refers to lifecycle theory as a “developmental” perspective, when an organization evolves it is thought to develop its inherent potential. The “evolutionary” perspective challenges the existence of predictable lifecycle stages and argues that patterns of organizational change are the result of the interaction between internal and external factors. The evolutionary approach views the organization’s development as a consequence of some variations that are generated internally, for example when an organization seeks to innovate, or blindly, change occurs by chance. Subsequently, there is a selection of some of the variations occurred, this selection process can be internal through incentive systems and imitation or external through market forces for example. Some selected variations are then retained and duplicated through mechanisms internal to the organization (specialization, standardization etc.) or thanks to organizational linkages, such as workers movements and inter-organizational learning. This happens in a climate of struggle for scarce resources, which can be the time of employees or customers, and also opportunities on which organizations compete.

Thereafter I present the frameworks alternative to life cycle models suggested by the two papers most cited in the paragraph: Phelps, Adams & Bessant (2007) and Levie & Lichtenstein (2010). The two paper provided complementary critics on the lifecycle theories

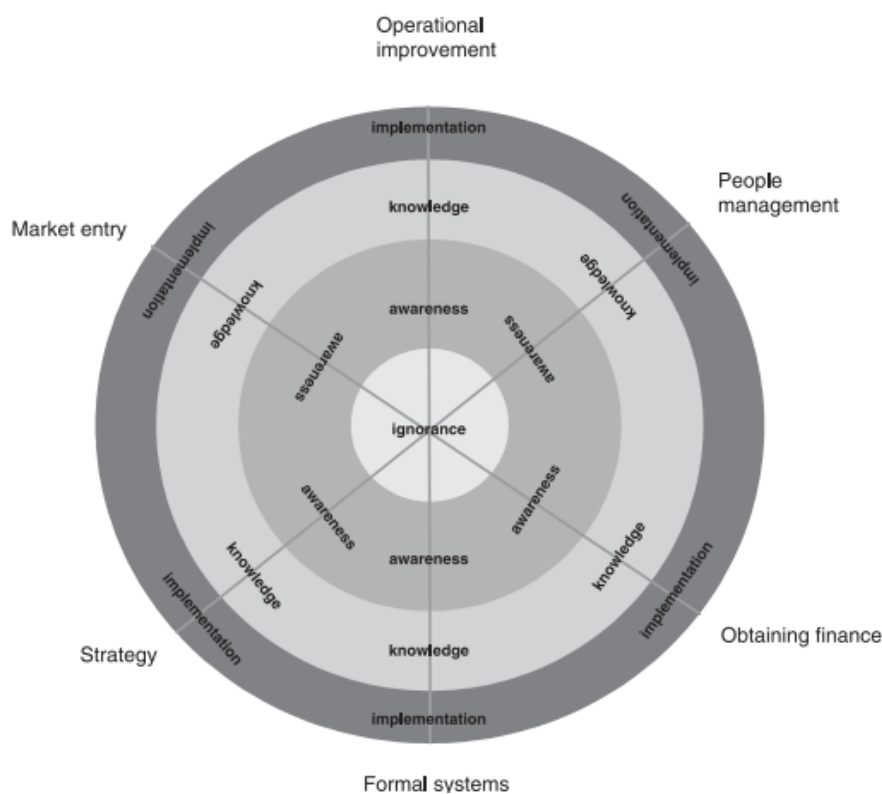
presented above and suggested two different baselines to approach the complexities of organizational growth.

Phelps, Adams & Bessant, 2007

The pattern of growth suggested by the authors identifies six “states” which are not predictable, linear, or developmental but path-dependent and unique to the firm’s situation. The model is based on previous studies of the problems perspective on lifecycles (Kazanjian, 1988; Greiner, 1972) which has been integrated with notions of critical “tipping points” faced by the firms (Gladwell, 2000) and notions of “absorptive capacity” (Cohen & Levinthal, 1990) which refers to the firm’s ability to recognize the need for new knowledge, acquire, and exploit it. Following the evolutionary perspective, the firms can encounter six tipping points that can derive by issues of internal growth or changes in the environment. Firms have different capabilities and sometimes decide to acquire them externally (through consultants for example), this suggests “that firms are differentially able to acquire, assimilate, transform and apply knowledge to navigate tipping points” (Phelps et al., 2007, p.13). The model, exemplified in Figure 2, is composed by four “learning states” that refer to the commitment of the firm to the search and use of new knowledge; they are: *ignorance*, *awareness*, *obtaining of knowledge* and *implementation*. In this way, management is able to transversally address “Tipping points”, which represent six problems that the firm can face: *people management*, *strategic orientation*, *formalized systems*, *new market entry*, *obtaining finance*, and *operational improvement*. Regarding the first problem, authors suggest that if management is able to develop skills such as communication, teamwork and empowerment; the firm is able to move toward delegation and professionals’ recruitment and, accordingly, the growth of the firm would not inhibits HR management. However, little research is present on people integration and HR practices for start-ups. The second “tipping point” refers to the progression from sporadic and opportunity-based considerations to a more articulated and planned strategy. The third problematic concerns the process of formalization that implies coordination and control. On one hand, formalization can be beneficial to the firm because it permits to concentrate efforts and limited resources on innovation and effectiveness but on the other hand can discourage this innovation when structures and systems become too “ossified” and the firm is unable to expand its environment. The firms should be able to balance these opposing effects. Fourth, the firm that enters new markets should develop awareness of customer needs and therefore develop marketing and sales skills, which normally lack in the

first periods. Moreover, the firm should be able to attract funding through a good commercial strategy and risk management. This represents the fifth “tipping point”. The funding can derive from founders, loans, venture capitalists, government sponsor etc.; the firm should understand well the implications of its funding strategy. Lastly, firms should develop the capabilities that would enable the firm to implement best practices in order to improve quality, operations and efficiency. This need can be recognized internally through the observation of productivity gaps for example, or derive from external pressures. New firms find difficulties in implementing those practices because of costs, information asymmetries, indecision or lack of motivation. This “capability model” is considered to be more pertinent to small and young firms. Differently from the lifecycle perspective, this model does not assume linearity or predictability of states; it points instead the need to develop the right knowledge to address specific challenges of the firm.

Figure 2. "The absorptive capacity/tipping point framework for growth firm states"



Source: Phelps et al., 2007, p. 14

Levie & Lichtenstein, 2010

As pointed above, Levie and Lichtenstein challenged the lifecycle framework from a theoretical point of view; their analysis then resulted in a framework – *the dynamic states of*

entrepreneurship. The authors revised the assumptions behind the organismic metaphor and developed a model, which do not hold that organizations evolve through a precise number of stages and that the evolution of firms is not a consequence of an intrinsic “genetic” program of growth. Instead, the framework is based on notions of complexity science and the concept of opportunity tension. The authors define “a dynamic state [as] a network of beliefs, relationships, systems, and structures that convert opportunity tension into tangible value for an organization’s customers/clients, generating new resources that maintain that dynamic state” (p.333). Indeed, the entrepreneur’s desire and aspiration make him willing to endorse an opportunity for creating value in the future by establishing a firm and capturing resources. The commitment of the entrepreneur derives both from his personal passion and perceived ability to exploit a business opportunity. Thereafter, this “opportunity tension” is transformed into “value creation” by means of a business model, which exemplifies the multiple relations that sustain this creation of value for the customer which include revenues and structures of costs, indeed the reason of existence of the firm. Normally the dynamic state will tend to maintain its structure over time but at some point, organizations can undertake change by generating “a new cycle of opportunity tension that extends the potential capability of [...] organizations by reformulating dynamic states” (p.334). In the same way as before, the transition can depend on environmental dynamics such as external demand and on internal capability to change such as bigger productive capacity. Two particular situations can occur: when the interdependence between the firm and the environment increases. On one hand dynamic state changes can become continuous in a situation of “self-organizing renewal” (p.336); on the other hand organizations can regress back through states when the market, for example, is shrinking and the entrepreneur can decide to re-size the firm by re-establishing the link between demand and the internal capability to satisfy this demand.

CHAPTER 2. ORGANIZATIONAL DIMENSIONS' EVOLUTION THROUGH THE LIFECYCLE

2.1 Introduction: a configurational approach

As described at the end of the previous chapter, lifecycle theories have been strongly criticized mainly for their inability to provide empirical verification of theoretical stages and because of the lack of a single and unifying theory regarding the organizational lifecycle. In this chapter, the level of analysis is the organization of new ventures suggested by lifecycle theories. In their prescription of characteristics of the organizations at each stage, lifecycle theories provide taxonomies in terms of “dimensions of environments, industries, technologies, strategies, structures, cultures, ideologies, groups, members, processes, practices, beliefs, and outcomes” (Meyer, Tsui & Hinings, p.1175, 1993) which can be empirically or theoretically derived (McKelvey, 1975). The early models of Mintzberg (1979) and Miles & Snow (1978) suggest that the most effective organizations resemble ideal types because organizations tend to define their domain and develop necessary mechanisms that would enable the organization to pursue the chosen strategy. Miles and Snow’s taxonomy - composed by: “the prospector, the analyzer, the defender, and the reactor”- has been empirically tested multiple times and seems to provide moderate results (Smith, Guthrie & Chen, 1989; Hambrick, 1983; Doty & Glick, 1994). What lifecycle theorists do is to provide an ideal type to which organizations are prescribed to consistently adhere. However, the great variety of lifecycle studies and the impossible unification of theory suggests that a different approach to the provision of prescribed characteristics of ventures during time is necessary in order to integrate theories. What we suggest is to use a configurational view and the concept of “equifinality” in order to both test lifecycle theories and to conduct an empirical study with regard to new ventures. Configurations are offered by theories that organize and describe causal relationships between strategic, contextual, and structural factors into coherent typologies in connection with an outcome of interest (Doty & Glick, 1994). The value of typologies is mainly found in the possible integration of theories and the provision of an appealing way to analyze multiple causal relations at the same time. In general, configurational theories seem promising but are said not to have been tested enough to be totally validated. Fiss (2007) argued that the method used to test these theories stresses too much the finding of an ideal configuration and a “holistic approach” while it should use

instead the concept of *equifinality* (Katz & Kahn, 1978; Van De Ven & Drazin, 1985) to recognize that more than one configuration could equally achieve high levels of firm performance. In the empirical part of this thesis, the concept of *equifinality* will be applied through the use of a fuzzy set approach (Ragin, 2010) in order to find which configurations are exhibited in our dataset in terms of organizational dimensions.

This chapter is dedicated to the evolution of organizational attributes as indicated by lifecycle theories. First, Section 2.2 defines the five “organizational dimensions” of formalization, specialization, centralization, vertical differentiation and integration. Sections 2.3 and 2.4 provide a synthesis of the previous similar literature and describe the methods normally used for a longitudinal analysis. Section 2.5 pertains the description of each dimension’s evolution and the similarities and differences between theories. The final Section 2.6 seeks to provide a general view of each theory’s provision of the five dimensions contemporarily – “organizational configurations” as defined by Miller (1996)- and how in some theories dimensions are described to influence each other. In this last part, I will particularly focus on the first stages of growth since the purpose of this thesis is to analyze new ventures.

2.2 Organizational dimensions

In order to define what is intended as “organizational dimensions”, I used as main reference the comprehensive description that Jones (2010) provides in his textbook of well-known concepts, already vastly investigated in the literature.

Formalization. This component refers to the presence of rules and procedures that would improve standardization-i.e. the conformity of behaviors to definite models. By balancing standardization and *mutual adjustment* managers set the condition for employees to behave in conformity to certain norms or to behave in an innovative way by using their best judgement (Mintzberg, 1979).

Centralization and Decentralization. The level of decentralization of authority refers to the the allocation of decision-making authority to lower level managers.

Vertical Differentiation. It is defined by how many levels in management and supervision there are in an organization. The reporting relations between levels connect subunits and organizational roles.

Structure. It refers to the “formal system of tasks and authority relationships that control how people coordinate their actions and use resources to achieve organizational goals” (Jones, 2010, p.30). The simplest structure is based on a linear hierarchy of authority, a functional structure refers to the organizational design that “groups people into separate functions or departments because they share common skills and expertise” (p.170) while in a divisional structure the functions are grouped again based on specific customers, markets or products.

Horizontal differentiation or specialization. It refers to the division of labour and roles into subunits and to the possibility of people inside an organization to become more specialized and skilled, indeed “the collective nature of organizations allows individuals to focus on a narrow area of expertise” (Jones, 2010, p.27). After vertical differentiation, this is the other principal way through which organizations retain control over employees.

Integration. In order to avoid a “subunit orientation”, however, managers should facilitate coordination and communication among subunits through the process of integration. Jones proposes different integration mechanisms such as “hierarchy of authority”, “direct contact”, “liaison roles”, “task forces”, “teams and integrating roles”. They range from the simple technique of allocation of authority to the more complex role of a managerial position dedicated to improve the communication between divisions.

The research provided by Levie and Lichtenstein (2010) consists in the most comprehensive coding of stages models that has been published. It comprehends 104 stages theories and investigates which are the most cited attributes through methods of coding. The attributes relating the structure range in the first positions as ones of the most common attributes in lifecycle models. In particular: “extent of formal systems” is in the 1st position, “organizational structure” in 3rd position, “complexity” in 5th position, and “formality of communication systems” in 7th position. It is important to point that the conclusion of the authors regarding their research is that “there is in fact no uniform ‘stages theory’ of business growth nor a “general connection between what one researcher defines as a stage and the measures used by subsequent researchers” (p.321). In any case, here we provide a more descriptive approach on organizational themes faced by the lifecycle theories illustrated in the previous chapter. The number of studies analyzed is, for obvious reasons, inferior to the literature considered by Levie and Lichtenstein. The intent is to provide a description of how authors suggest that the organizational dimensions of *formalization*, *specialization*, *centralization*, *vertical differentiation* and *integration* change during the development of an organization across lifecycle stages. The literature review proposed in this work is based on

the summary model of Hanks et al. (1993) that stated in their work that, in the dominant literature, “dimensions such as formalization, specialization, and centralization are addressed only in broad categorical terms (i.e. informal vs. formal, centralized vs. decentralized)” (p.13). This validates the findings on the lack of specificity in the description of organizational dimensions of the stages models that do not provide specific indication of what managers should actively do in order to “getting organized” (Adizes, 1979, p.6). Hanks et al. tried to build an empirically based taxonomy and provide a definition of lifecycle stage. However, the number of the sample (n=27) was very little to provide generalization and the variables have been derived from the existent literature, which, as the authors suggested, address very poorly the so-called “structural dimensions”. The authors built their study on 5 variables relative to structural dimensions, other 3 relative to structural dimension, plus 3 descriptive variables.

2.3 Method of analysis

The sample is composed by 10 lifecycle theories (i.e. Adizes, 1989; Churchill & Lewis, 1983; Galbraith, 1982; Greiner, 1972; Hanks et al., 1993; Kazanjian, 1988; Miller & Friesen, 1984; Quinn & Cameron, 1983; Scott & Bruce, 1987), three of which are summary models (Hanks et al., 1993; Miller & Friesen, 1984; Quinn & Cameron, 1983). I excluded from the sample some theories described in the first chapter because they were not informative on the explored dimensions, in particular the theories of Block & MacMillan (1985), Flamholtz (1995) and Smith et al. (1985). Burgelman (1984) has been excluded because it refers explicitly to internal corporate ventures, which differ from independent ventures.

For each considered theory an excel table was built in order to identify the level of each organizational dimension across different stages. Information on organizational dimensions has been gathered through an accurate review of each author’s work. When there was not enough information regarding a dimension, that dimension for that particular author was not considered. While, when the author addressed the dimension for the majority of stages, we did assumptions for the empty cells. Assumptions are based: first, on the general sense of the paper and second, on the trend of the variable and its values on the previous and subsequent stage. A range of number between 0 and 3 was assigned at each cell, following this guideline:

Formalization

0 = no formalization of rules

1 = beginning of formalization

2 = increase of formalization

3 = apex

Specialization

0 = no need for specialization

1 = beginning of specialization

2 = increase of specialization

3 = apex

Decentralization

0 = centralized organization

1 = fairly centralized

2 = increasingly decentralized

3 = decentralized organization

Vertical Differentiation

0 = flat organization

1 = hierarchy increase

2 = taller organization

3 = maximum number of hierarchical levels

The numeration is arbitrary, in the sense that the scope is to give an idea of the evolution of each dimension more than to assess its absolute value at a particular stage level. The goal is to display the organizational dimension's values through different stages in a curve form. In order to be able to compare considerations of all the authors contemporarily, 10 curves should be superimposed through four graphs, one for each dimension. However, theories differ in the number of stages proposed; so, in order to compare different theories, we should be able to unify the stages. This was possible by using the summary model of Hanks et al. (re-elaborated in Table 1) since they provide information on the position of each theory's stage within a five-stage model. This summary model is particularly useful since the authors constructed it with particular consideration for the "structure dimensions" which partially coincide with our organizational dimensions. The summary model itself was considered in the final graphs, as a curve representing a sort of trend line.

In order to see graphically each dimension's path through stages, two considerations have been necessary. First, since excel does not allow displaying superimposed graphs with different abscissa's values, it was necessary to find a number of abscissas which is a common multiplier of the number of abscissas for all curves and to build a new set of abscissas including all the values from every graph. Since this set is larger than any other abscissa set, it is necessary to derive the values of the value graphs also for those new abscissas. I have used linear interpolation to this purpose. Since excel does not provide an interpolation function, I have used the XonGrid excel add-on. The added function has the form: `"=Interpld(-1;[x];[f(x)];[f])"`

Where [x] are the abscissas derived by the position of the stages in the summary model of Hanks et al.; [f(x)] are the values of that variable and the last point [f] is the new abscissa's value where interpolation has to be carried out. The function returns the interpolated value in the new abscissa. When every curve has been interpolated using the new abscissa set it has been possible to construct the graphs. Some curves end before the last stage, this is because the summary model prescribes that the theory does not provide information on the last stages. In order to make the curves end at the level corresponding to their last value I manually changed the values at the end of the function series in order to interrupt the interpolation that would make the curves grow exponentially sometimes. In fact, the interpolation was a useful tool to connect the points internal to the curve, to give a description of the evolution of dimensions' values between one stage and the other; the models do not give information on how the dimensions eventually evolve after the last stage.

3.2 Organizational dimensions evolution

These graphs should be intended as a display of the collection of information on organizational dimensions throughout the literature. Since the model is based on the Hanks' distribution of single theories' stages on a five-stage scale, it is connected to the validity of that finding. However, we recognize that the author attempt to distribute discrete stages has more than all a descriptive relevance -i.e. different authors' stages cannot be perfectly superimposed because each theory focus on some aspects more than others and there is no general prescription of which age or size of the organization enables it to pass to the subsequent stage. Since "all theory necessarily simplifies and so distorts reality" (Mintzberg, 1984, p.214); the curves should be thought as different sides of the same coin. Indeed, more than the absolute values, it is important to see the general pattern of a dimension and understand nearly when a theory recognizes the presence of the dimension and how this evolves through the prescribed lifecycle in general, remembering that stages are "fluid" more than tight configurations and problems faced by the firm overlap in adjacent stages (Normann, 1977). The stages to which I refer thereafter are the five main stages identified by Hanks et al. Some curves in the graphs end before the final stage, this is because the corresponding theory does not cover all the five summary stages. The dotted curves refer to the summary models of Hanks et al., that as cited before should describe the general trend; the model of Quinn & Cameron, which comprehends some earliest theories not included in the study such as Katz and Kahn (1966); and the one of Miller and Friesen (1984) that is relevant for its empirical validity.

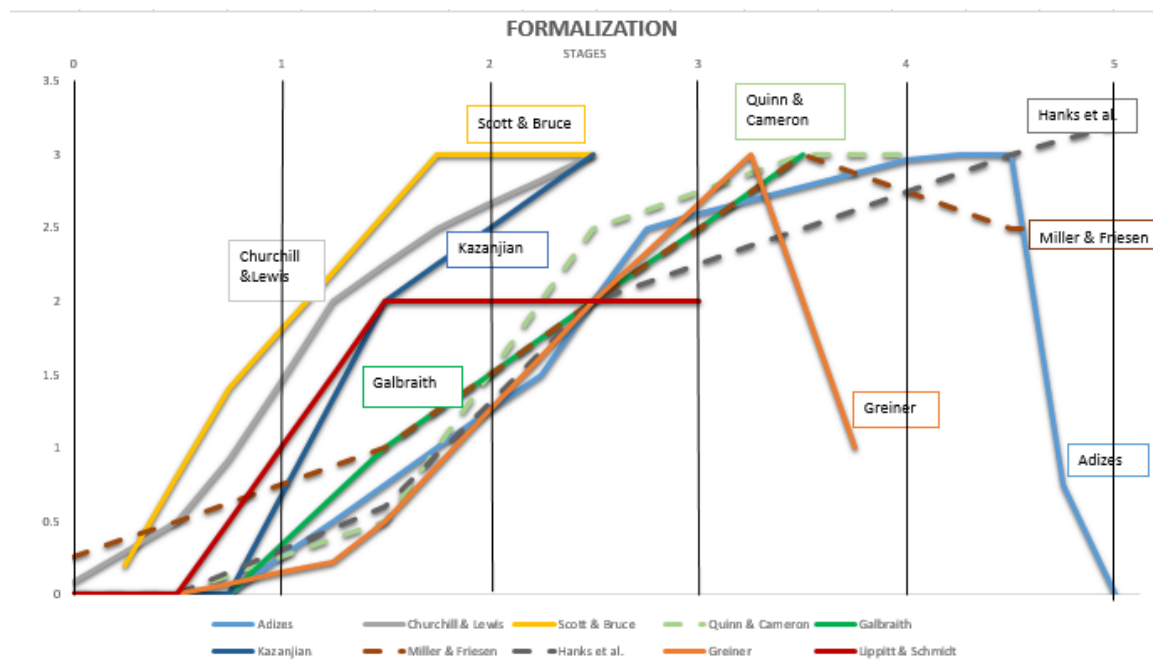
Regarding the structure in general, it is valid the assessment of Hanks et al. which suggest that "structure changes from primarily simple to functional to partially divisional" (1993, p.13). Almost all the theories suggest that during the first phase there is "no organization as such" (Galbraith, 1982). Only Galbraith and Greiner suggest the evolution of the structure into a matrix in the last stage. Since this thesis seeks to explore organizational attributes among new ventures, it is interesting to focus on the first stages. In particular, some authors precise that at the very beginning of lifecycle "there is no organization as such" (Galbraith, 1982, p.72) and "structure and formality are nonexistent" (Kazanjian, 1988, p.), therefore they do not provide consideration on organizational dimensions (Adizes, 1989; Greiner, 1972; Quinn & Cameron, 1983). Indeed, in the corresponding single Excel tables dedicated to these authors the first row contains the values: (0;0;0;0;0). All theories in the first stage share the same emphasis on the

conception of a business idea (Galbraith, 1982), product or technology development (Kazanjian, 1988), creation of a market (Greiner, 1972) and tension towards achievement of profitability (Scott & Bruce, 1987). The figure of the entrepreneur is also largely cited during the first stages, both as who takes the first important choices of the organization and supervises the beginning of growth (Churchill & Lewis, 1983) and as who takes the risks and expenses connected to the newborn organization (Adizes, 1979). However, Galbraith suggests that there is a need to focus on the organizational design of the new venture by “thinking stagewise” because “the business idea is not realized [until] the appropriate organizational structure, decision process or incentive system is not adopted” (1982, p.71). Indeed, what is inherent to the very first stage (i.e. the absence of structure) becomes an obstacle subsequently because managers “resent the change to their eventual detriment” since they believe that “success was in part due to the lack of structure and constraint” (p.75). Sometimes the lack of structure and the friendly climate is what made attractive the organization for managers in the first stage, but later on they acknowledge the need for a reconfiguration of structure by thinking “stagewise”.

Hereafter is described the longitudinal analysis on the four organizational attributes in order of importance that was given by the cumulative literature.

3.2.1 Formalization

Figure 3. Evolution of Formalization in Lifecycle Theories



Source: personal elaboration

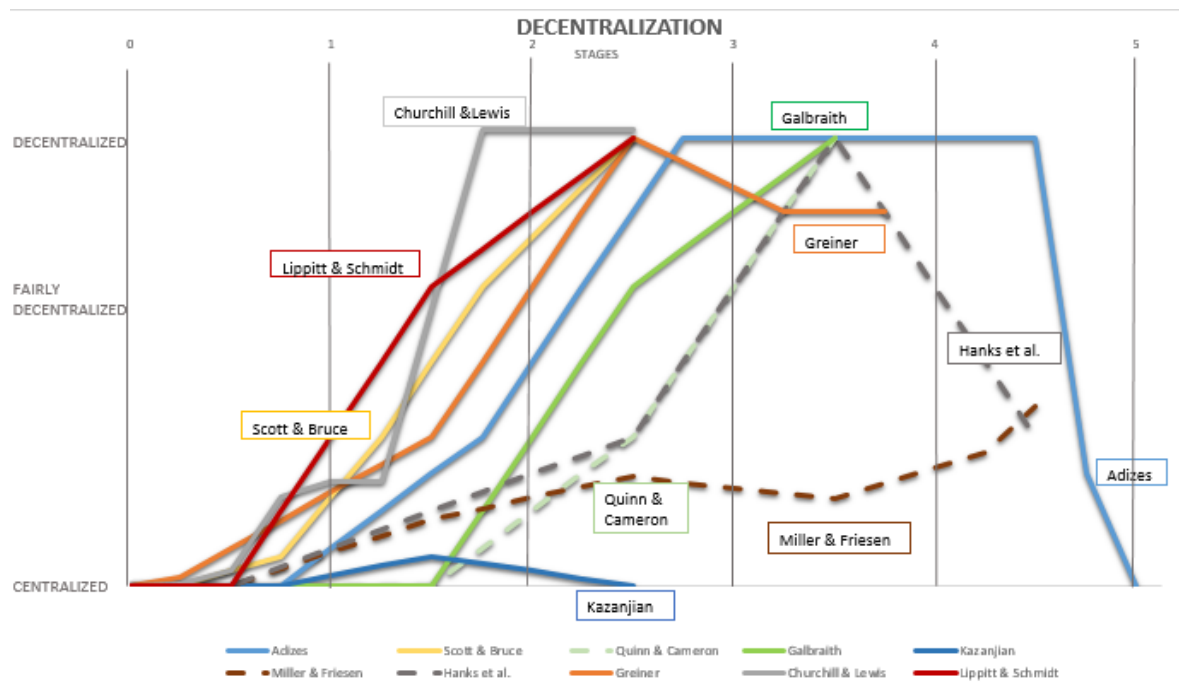
Almost all lifecycle theories analyzed provide little or zero formalization at the beginning, which corresponds to little planning and explicit informality of practices (Quinn & Cameron, 1983). Some authors recognize the necessity for the organization to formalize some practices only in the second stage (Greiner, Galbraith); while others suggest a minimal need for systems' formalization already at the beginning of the lifecycle, which consists mainly in accounting-related activities such as record-keeping and cash forecast (Miller & Friesen; Churchill & Lewis; Scott & Bruce). For the most part, formalization starts to be relevant in the second stage and reaches the apex correspondingly to the third and fourth stage. This pattern is coherent with the evolution of formalization suggested by Hanks et al. There is also a group of three theories –Scott & Bruce, Churchill & Lewis and Kazanjian- which anticipates this trend in respect to the others. This is mainly due to the underlying grouping of the number of stages that follows the Hanks et al. model which are a hypothesis of this model. Taking a closer look, only Scott & Bruce clearly recognize an early need for formalization since the beginning. Indeed, the yellow curve representing their theory is consistently shifted to the left in respect of the others. There are also three exceptions to the general increasing trend; the theories of Adizes, Greiner and Miller & Friesen provide an apex and a subsequent decreasing

trend. The reasons behind different trends vary according to authors. The decreasing trend of the Adizes' curve in the fifth stage is connected to the author's considerations on the "death" of the organization, where no "organizational role" is active anymore. Greiner, instead, clearly express a positive decrease of formalization at the end of the lifecycle, corresponding to the fourth stage: "social control and self-discipline replace formal control which is simplified [in favor of mutual adjustment]" (1972, p.62). The third decreasing curve is that of Miller & Friesen, however the authors do not provide clear specifications on the late evolution of this dimension even though they report a slightly decreased value of the corresponding variable in their empirical study (Table II, p. 1169).

Two theories provide for a steady state of formalization at the end of the lifecycle. In particular, they do not provide an increasing trend of the variable but still recognize its need, whose value has therefore been kept stable. These are: Scott & Bruce and Lippitt & Schmidt. The first couple of authors considers formalization as a positive attribute of the organization. Similarly to Greiner and differently from Adizes, they prescribe that the organization in the last stage can continue to grow while it maintains its systems of formal control. On the other hand, Lippitt & Schmidt do not clearly provide for an increase in formalization. Even if in the last stage they suggest an update of policies, it seems that the role of formalization is overall significant during the middle stage where the organization seeks to reach stability.

3.2.2 Decentralization

Figure 4. Evolution of Decentralization in Lifecycle Theories



Source: personal elaboration

Two theories out of 10 do not clearly include the need for organizations to decentralize in their description of organizational lifecycle stages, although they mention centralization. In particular, Kazanjian stresses the role of the founder in the definition and direction of the business. Corresponding to the second stage, he seems to consider the possibility that the entrepreneur would not be the only one who drives decisions but he does not develop the concept, while in the third stage he recognizes a need for increased control by the founder due to the larger size of the organization. Likewise, Miller & Friesen never clearly mention decentralization. Their assessment of centralization is connected to the level at which top executives make decisions without consultation with middle managers and in their study, they report that power is highly centralized at the beginning and subsequently goes from less to moderately centralized. In their empirical study the variable ‘V37: Centralization of Strategy Making Power’ fluctuates between values of 6.25 and 5.25 out of 7. These numbers have been translated in this study as corresponding to a range that goes from centralization to moderate centralization. The authors make one reference to decentralization in the introductory literature review by saying that usually with time organizations face an increase in

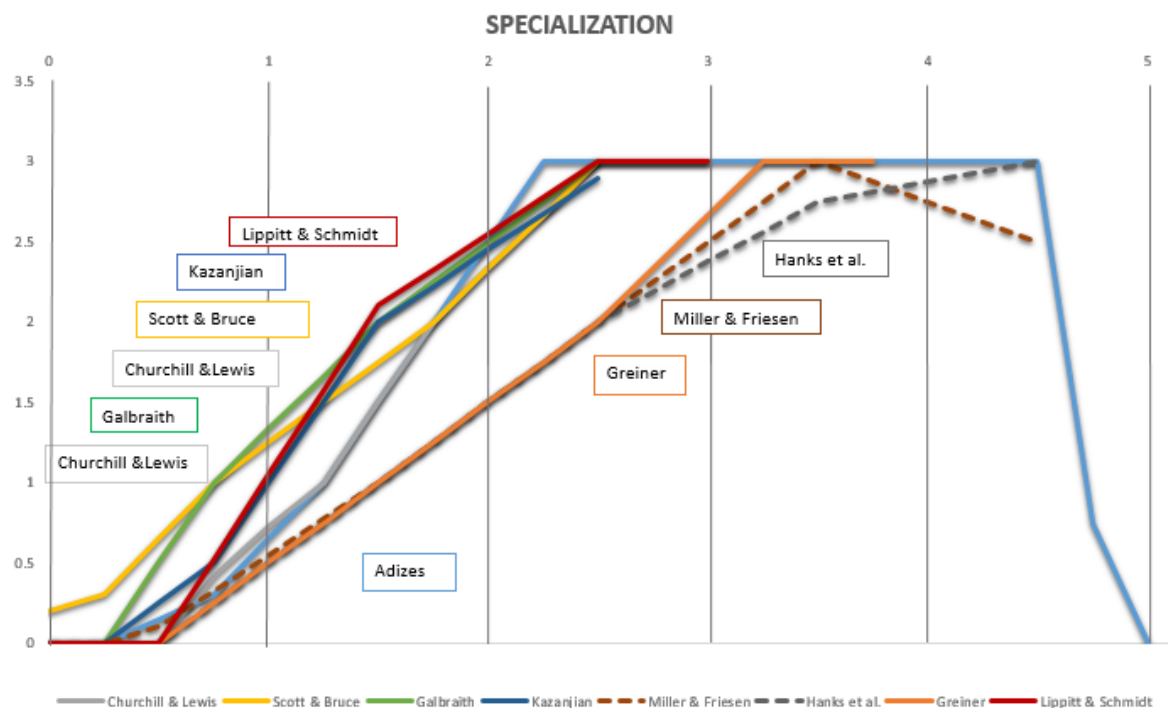
decentralization of decision-making authority, however, they do not clearly observe this phenomenon empirically. On the contrary, the rest of the theories provide a general increase in decentralization that reaches its apex corresponding to the third or fourth stage. The trend is increasing with the exception of Hanks et al, Greiner and Adizes that provide for a final decrease in decentralization, which corresponds to a more centralized organization. As with formalization, it is necessary to specify the reasons behind this decline in the variable since every theory has its own. Adizes suggests a falling in decentralization connected to organizational death. Hanks et al. say that centralization generally follows a decreasing pattern; however, in their empirical study and in Table 3 (1993, p.12) descriptive of the lifecycle literature they put forward the idea of a slight increase in centralization corresponding to the last stage but they do not provide an explanation for that. Lastly, Greiner is the author who better justifies a return of the organization to a certain level of centralization. In his view, the organization achieves a matrix structure in the third stage and decentralization reaches its apex, after that, though, the organization scales down some of its decentralization to the point at which certain functions are centralized at a headquarter lever while daily-to-day operative decisions continue to be decentralized. It seems reasonable since over time “decentralization of all functional responsibilities became increasingly difficult to support” (Bartlett, 2014, p.398). The grey line corresponding to Churchill & Lewis seems to slow down at the second stage because it reflects the non-perfect subsequentity of the Success-Disengagement and the Success-Growth stages, which show the same organizational structure. In any case, this theory is the one that achieves earlier a complete decentralization of power (at the second stage). They clarify that a “pivotal period” is when the owner is already reasonably separated from the business because he will face some chances to make his organization become a larger business. In this way, it seems that decentralization is already achieved when the business is small and is actually a condition for the business to grow and appeal to outside investors.

There are some considerations regarding decentralization that are not clearly visible from the graph. Hanks et al., Miller & Friesen, Scott & Bruce and Churchill & Lewis suggest that during the very first stages the organization is centralized in the figure of the entrepreneur, and that an employee does not make “major decisions independently, but instead carries out the rather well-defined orders of the owner” (Churchill & Lewis, 1983, p.34). On the other hand, other theorists (i.e. Adizes; Galbraith; Kazanjian; Quinn & Cameron) suggest that, even if the founder is formally the person that retains the power, this situation differs from some

other subsequent stages in which centralization is explicitly mentioned as an achievement of the organization. During the first stage, indeed, the organization has “no managerial depth” meaning that there is no possible substitute for the founder after his death (Adizes, 1979); this situation differs in some sense from later stages in which “a centralized functional organization emerges” (Galbraith, 1982, p.77). To highlight this absence of specification regarding the centralization/decentralization dimension Quinn & Cameron described the situation in which “organizational structure was a reflection of the philosophy of [the] director. [...] While the director reserved a veto power over group decisions, he seldom used it and most major decisions were arrived at through participative decision-making techniques” (Quinn & Cameron, 1982, p. 45).

3.2.3 Horizontal differentiation/Specialization

Figure 5. Evolution of Specialization in Lifecycle Theories



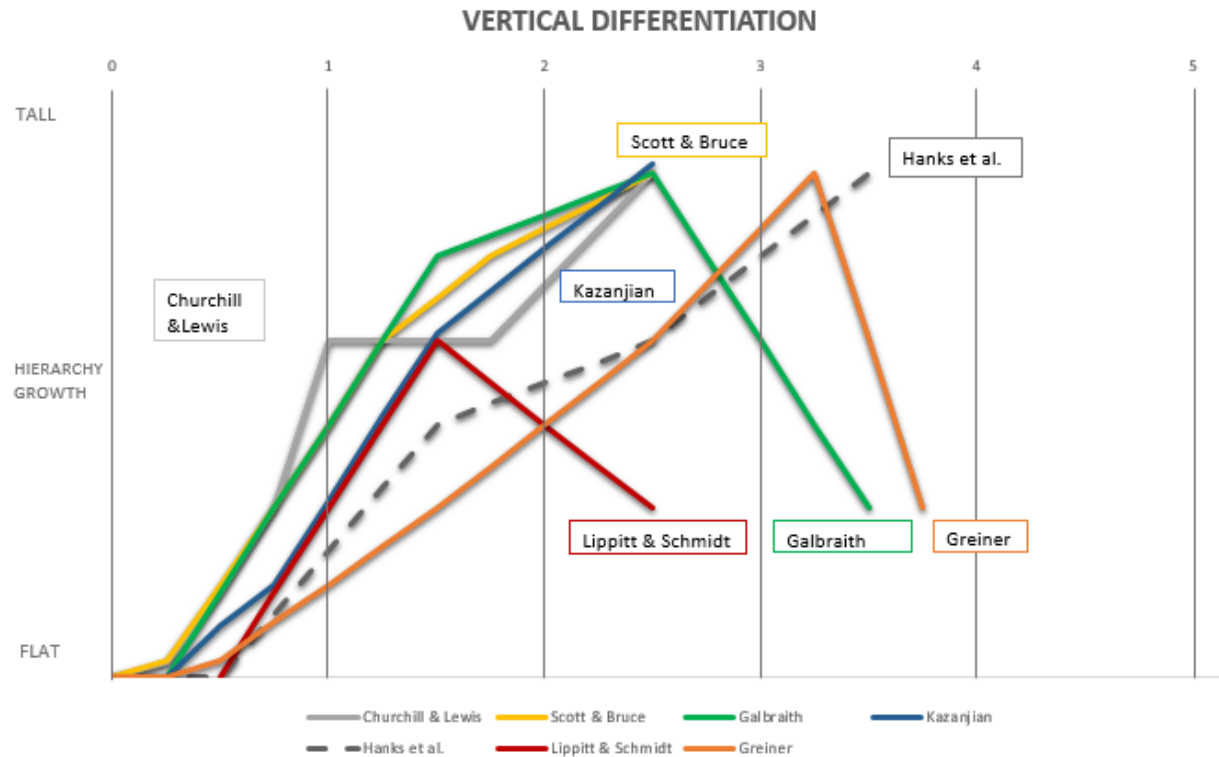
Source: personal elaboration

The pattern of this variable is quite consistent in all theories: a gradual increase in specialization of tasks through stages. For the most part, the authors prescribe that in the first phase “the owner does everything [...] the owner is the business [and he] performs all the

important tasks” (Churchill & Lewis, 1983,p.32). Only Miller & Friesen, Scott & Bruce and Kazanjian do some considerations on the minimal presence of technocrats and staff experts already at the first stage. Scott & Bruce, in particular suggest that the owner will soon face the necessity to delegate some of the supervisory responsibilities that he used to retain. The fact that some authors pay attention to horizontal differentiation earlier than others means that they highlight the increasing concern of organizations to build ‘an organizational task system’ (Kazanjian, 1988, p.263). Adizes recognizes, at the beginning of the second stage, the presence of some division of labor and, at the same stage-level, Greiner points out that “jobs assignments become increasingly specialized” (1972, p.60). During the second and fourth stage, normally horizontal differentiation is prescribed to increase; in this sense, the grey dotted curve relating to Hanks et al. well describes the linear increase trend of the variable. The only author that suggests a negative connotation of the evolution of this variable is Greiner, who mentions the risk for managers to lose control over increasingly diversified operations; eventually leading to disagreements between staff and line managers since everyone believes to have a deeper knowledge of their own field. Indeed, correspondingly to the last stage only Adizes and Miller & Friesen provide a decrease in specialization. For both authors this is connected to a decline in the organization’s proactive approach toward the expansion of the core areas of the business. In general, specialization is the way through which employees broaden their expertise in some functional areas. At the beginning, limited operations hardly sustain a great degree of specialization, but with the venture growth new roles emerge and this is believed to increase the level to which individuals are able to scan the environment and identify opportunities for growth connected to their field (Box, White & Barr, 1993).

3.2.4 Vertical differentiation

Figure 6. Evolution of Vertical Differentiation in Lifecycle Theories



Source: personal elaboration

Only 7 theories out of 10 tackle the issue of vertical differentiation. This variable is prescribed to increase in its value through time in general. During the last stages some authors prescribe that the organization would return to be flat in some sense (i.e. Lippitt & Schmidt, Greiner and Galbraith). The authors that give a more precise meaning to the variable are Hanks et al. In order to quantify vertical differentiation, they measure the number of organizational levels as the higher number of levels that connect operational workers and the CEO, as proposed by Pugh & Hickson (1976). They found out, through respondents answers that the number of levels in their study ranged between 2.2 and 5.7. On the other hand, Churchill & Lewis provide a quite simplified organizational chart with an equal number of levels for three consequent middle sub-stages. Therefore, the grey line seems to be stable for a while but this is probably due to the simplification made by the authors in their visual description of vertical differentiation. All authors start to acknowledge the growth of hierarchy around the second stage. At the very beginning it seems that the owner is in charge for everything that has being done in the organization and he is the one directly supervising others (Churchill & Lewis,

1983). Kazanjian points out that, at one point, some critical functions start to be given away to key managers or contracted out, suggesting that the organization grows by recognizing the need to increase its structure as Greiner suggest. Corresponding to the third stage, all author agree that a hierarchy is in place and that span of control will be first stretched and eventually reduced (Kazanjian, 1988; Greiner, 1972; Scott & Bruce, 1987). Indeed, the organization has become too complex to be managed only with the pre-existing structure and, following Galbraith's estimation the addition of new functions induces the span of control to increase over a number of 12 and eventually leads to the addition of new organizational levels. Sometimes this process leads to an excessive "distance of top management from the action" (Scott & Bruce, 1987, p.51) and three authors ultimately prescribe that vertical differentiation decreases at the end of the lifecycle and that the organization becomes more flat (Lippitt & Schmidt, 1967; Greiner, 1972; Galbraith, 1982). Both Greiner and Galbraith suggest that at the end the organization grows into a flat matrix structure where "previously bureaucratic control oriented staff and systems are replaced by a smaller number of consulting staff experts who facilitate rather than control decisions" (Greiner, 1972, p.65).

3.2.5 Integration

This dimension is characterized by a multiplicity of different interpretative alternatives proposed by authors. In general there is no agreement on what Integration really means. Some authors talk about integration mechanisms that organizations put in place such as task forces, meetings or project management activities (i.e. Churchill & Lewis, Kazanjian, Galbraith, Greiner, Miller & Friesen, Scott & Bruce). Others recommend that Integration has to do with communication in a general sense (Lippitt & Schmidt) and that this is quantifiable by the easiness through which information can reach decision-makers in an undistorted way (Miller & Friesen). In the case of Adizes, Integration carries out a negative meaning. The author provides that one of the four roles that an organization needs to achieve in order to be effective is the so-called Integrative Role. It concerns the management endeavor towards teamwork and eventually results into the creation of a friendly environment. For Adizes, the Integration role drops when in the last stage there is a general "climate of friendship" but a lack of excitement or criticism about new ideas. Since authors do not agree on the ultimate meaning of integration, it is difficult to provide a clear cross-comparison and to weight one trend against the others. Another issue is that sometimes integration mechanisms can be in

place but still ineffective. As an example, Miller & Friesen in their last stage speak about “poor communication” but do not clarify if integration mechanisms from the preceding stage are still in place or not. In general, we do not have enough elements to compare all the curves as we did with the previous variables, since the means of comparison (i.e. integration mechanisms cited) are heterogeneous and not perfectly matching for the all theories; therefore, clear trends cannot be identified. In order to track the level of integration described by different theories, efforts have been made to find in the literature references to integration mechanisms which have been ordered in a scale of increasing cost and effectiveness (Jones, 2010). The approach used to report authors’ perspective on integration is different from the one used for the other variables. As already said, a graph would not provide a clear view on a dimension on which there is not agreement at all and that cannot be clearly ordered on a scale. I therefore opted for a table (Table 2) in which, for each phase, points indicate one or more particular integration mechanisms that the corresponding author has mentioned. The various mechanisms have been ordered following Jones (2010) scale and grouped into two categories: feedback and standardization (Costa & Gubitta, 2004). Feedback refers to the direct exchange of information between related actors in both vertical and horizontal directions (Mintzberg, 1983). An example of feedback is the direct supervision in which an actor which is part of a rigid hierarchy, exerts formal authority and possesses the information necessary in order to take decisions. The second case exemplified by mutual adjustment mechanisms when relations develop between actors at the same hierarchical level, and autonomy is considered the base of the reciprocal interactions between actors (Costa & Gubitta, 2004). Standardization, instead, refers to procedures and routines that guide actors in terms of which decision to take in a particular situation (Mintzberg, 1983). Standardization reduces coordination costs because actions are centrally planned and formalized through the definition of a set of rules and methods. It is possible to standardize processes in every phase of their progression, while an alternative to reduce costs is to standardize the expected outputs and give more autonomy to actors, a third way is to standardize and code the knowledge that actors need to possess in order to achieve the required actions.

During the first phase authors provide both coordination through feedback and standardization. Kazanjian strongly suggests the use of feedback such as “product development teams”; the author suggests the idea that even if the organization is recently born, coordination is achieved implicitly following principles similar to those of project management activities. Also, Galbraith and Lippitt & Schmidt provide the use of meetings

and frequent face-to-face contacts between employees and the entrepreneur. Contrarily, Adizes –even if he recognizes the excitement of entrepreneurs who “behave like missionaries” (1979, p.4)- says that during the first phase normally there are very few meetings because there are not enough financial resources to dedicate to complementary teams to which delegate some decision making authority. Greiner shares the idea of dedication to the enterprise but stresses more the use of informal communication and behavioral norms. On the other hand, Churchill & Lewis and Scott & Bruce mention standardization and the use of budgets; in particular, Scott & Bruce say that standardization is a consequence of the confusion caused by the previous delegation of tasks.

During the second phase, authors focus mainly on the use of hierarchy and standardization. Some authors mention the presence of intergroup problems and disagreements (Adizes, Kazanjian, and Lippitt & Schmidt) while only Quinn & Cameron talk about a sense of collectivity, however without citing any specific coordination mechanism. On the other hand, Galbraith, Miller & Friesen, and Scott & Bruce acknowledge the need for coordination among functions and the first two authors mention some sort of linkages across departments (integration roles) while Scott & Bruce provide for formalized systems which can solve this forthcoming need.

During the third phase, standardization is frequently mentioned by authors. A standardization mechanism in particular is cited twice in Scott & Bruce and Churchill & Lewis: Management By Objectives; which emphasizes a management style defined by Scott & Bruce as the “watchdog”. Some authors, instead, start to emphasize here non-hierarchical coordination mechanisms such as the use of project managers (Galbraith, Kazanjian), while others highlight a situation of paralysis, lack of motivation and losing of control (Adizes and Greiner). Conversely, Lippitt & Schmidt and Miller & Friesen enhance communication across departments and mention a situation of internal control.

During the fourth phase, Miller and Friesen continue to emphasize cross-functional coordination through the use of “coordinative committees” for example, while Galbraith suggests a matrix which indicates a very high level of integration effort. In addition to the use of the matrix, Greiner submits a higher level of control by mentioning standardization and both Greiner and Galbraith advocate the use of behavioral norms and the instauration of a management culture.

The last phase does not give much information, and in general coordination is said to be poor, teamwork is not present and the organization reaches a sort of paralysis (Adizes and Miller & Friesen).

Table 2. Coordination mechanisms (Jones, 2010; Costa & Gubitta, 2004) mentioned in lifecycle models of authors (Adizes, 1989; Churchill & Lewis, 1983; Galbraith, 1982; Greiner, 1972; Hanks et al., 1993; Kazanjian, 1988; Miller & Friesen, 1984; Quinn & Cameron,1983)

| AUTHORS | PHASES | | | | | | | | | | | | | |
|--------------------------|-----------------|--|--|----------|--|--|---|--|--|---|--|--|---|--|
| | 1 | | | 2 | | | 3 | | | 4 | | | 5 | |
| integrative organs | | | | | | | | | | | | | | |
| matrix | | | | | | | | | | | | | | |
| project manager | | | | | | | | | | | | | | |
| integration roles | | | | | | | | | | | | | | |
| product manager | | | | | | | | | | | | | | |
| teams | | | | | | | | | | | | | | |
| task force | | | | | | | | | | | | | | |
| meetings | | | | | | | | | | | | | | |
| direct contact | | | | | | | | | | | | | | |
| management by objectives | | | | | | | | | | | | | | |
| communication systems | | | | | | | | | | | | | | |
| standardization | | | | | | | | | | | | | | |
| information systems | | | | | | | | | | | | | | |
| hierarchy | | | | | | | | | | | | | | |
| behavioral norms | | | | | | | | | | | | | | |
| | STANDARDIZATION | | | FEEDBACK | | | | | | | | | | |
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Source: personal elaboration

3.3 Conclusions: overview of new ventures' configurations and interrelations between dimensions.

There are some limitations in the comparison of life-cycle theories provided in this chapter. A first limit derives from the linear interpolation of values, we assume that variables increase linearly from one stage to the other and we do not take into account any possibly different increasing rate. A second limit derives from the extrapolation of numerical values to assign to each variable for every author's stage. The cross-comparison of papers assumes that they are superimposable, but we know that this is not necessarily the case. Some authors could have emphasized different aspects or have used different scales for instance. The guideline that was used to assign numerical values is that when authors describe the correspondent variable – let's say Formalization- as reaching its apex, the number assigned was 3 and for the remaining stages the values were assigned based on the importance that Formalization had in comparison to its apex. This is, inevitably, an effort to quantify and put in a scale the authors' qualitative assessment regarding the Formalization level for each stage. Notwithstanding these difficulties, some valid consideration can be derived not only from the comparison of authors' proposed evolution of each variable as we did in the previous paragraph, but also from a cross analysis of variables. Effectively, many authors state in their works that some variables are related. A way to observe these correlations is to create a graph for every author that places in juxtaposition the four organizational variables studied in the previous paragraphs (i.e. Formalization, Decentralization, Specialization, Vertical Differentiation and Integration). In any case, since we are interested in studying new ventures configurations, it is possible to restrict this analysis to the first two or three life-cycle stages. Figures 7 to 15 exhibits nine graphs representing each author's suggested configuration of new ventures –i.e. variables' interrelations during the first three macro-stages. From these interrelations and the theories behind we can draw some useful considerations. Adizes, for example, connects Decentralization, Integration and Specialization in an interesting way. On one hand, the author provides that there are some “programmed decisions” which can be delegated since they concern production and administration issues, ultimately increasing Specialization. On the other hand, the delegation of “non-programmed decisions” implies Decentralization. These decisions normally involve adaptive and entrepreneurial initiatives and the integration of people efforts into the commitment toward organizational changes. Therefore, delegating

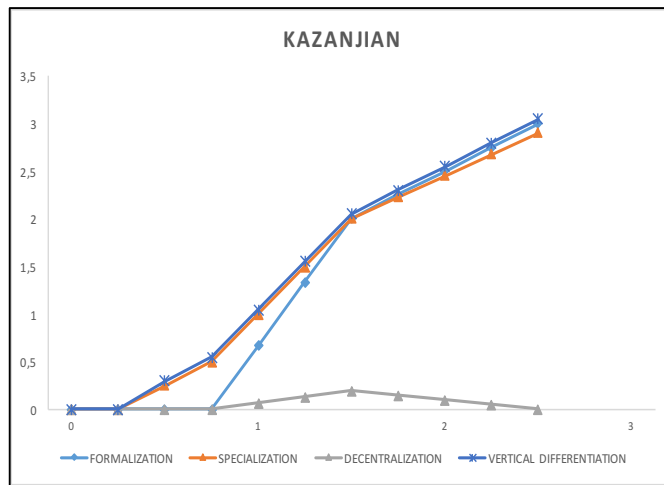
such significant decisions entails a greater decentralization and as an ultimate consequence, management is increasingly involved in developing Integration mechanisms such as teams. In Adizes' graph (Figure 14) we can observe that when Decentralization reaches 1 and starts to increase, the Integration variable rises at a faster path. Looking at Greiner's graph, the first thing one notices is that Integration retains a lower level compared to other variables, this is because in the beginning managers seem not to keep up with the increased diversification of operations and rely on hierarchy and budgets (i.e. Vertical Differentiation and Formalization) instead of increasing top-down communication. Churchill & Lewis provide that at the end of the first macro-stage the organization assumes a functional structure; Specialization and Decentralization contemporarily rise at significant levels. In fact, the owner starts to move apart and functional managers acquire some of his former duties. Also, the company increases in size with the hiring of professional staff. Scott & Bruce suggest that Integration is connected to Formalization since the mechanisms cited in the second stage –when Integration becomes necessary- are “budgetary control, reports and formalized account systems”. As an evidence, the Formalization line is the one that shows greater values in almost every point; this is because the authors put more emphasis on this variable since the beginning. Galbraith prescribes that organization in its young stages remains centralized while hierarchical levels increase until Decentralization eventually begins, corresponding to the end of the second stage. Kazanjian, who claims that the new ventures remain centralized and Integration starts from significant levels, appoints a configuration similar to Galbraith. In conclusion, the summary models of Miller & Friesen, Hanks et al. and Quinn & Cameron do not present enough information to suggest a cross effect of variables; they tend to keep them quite separate and sometimes they fail to mention a variable entirely.

The analysis we performed by isolating five variables and extrapolating their variation in importance throughout the lifecycle for the most relevant literature has enabled a deeper investigation of how authors provide evidence for slightly different patterns of growth in organizational structure, providing a deeper level of analysis when assessing new ventures configurations and when testing configurations in our dataset later. Some general sentences that one can find in the literature on new ventures may assume different nuances when compared to the graphs above since authors provided sometimes concurrent and sometimes different path of growth of variables. Let's take as an example Chrisman, Bauerschmidt & Hofer's (1998) sentence regarding new ventures' organization: “The absence of fixed structure and functional specialization may be unavoidable since decision-making power is

largely vested in the hands of the entrepreneur(s)”. This suggests that an elevated degree of centralization translates to a low level of specialization and in general of all the other variables. But from Figure 5 we are able to see that even if in general all authors may agree on that at the very beginning of the lifecycle, there are different paces at which these two variables are prescribed to increase later. For example, Galbraith provides that the new venture first will increase its level of specialization while decentralization will rise later and Greiner on the other hand prescribes a simultaneous increase of the two. This is evidence of a different analysis by the two authors. Greiner believes that a consequence of the fact that the entrepreneur moves apart is that new functions emerge while Galbraith believes that a “centralized functional organization” can exist (1982, p.74).

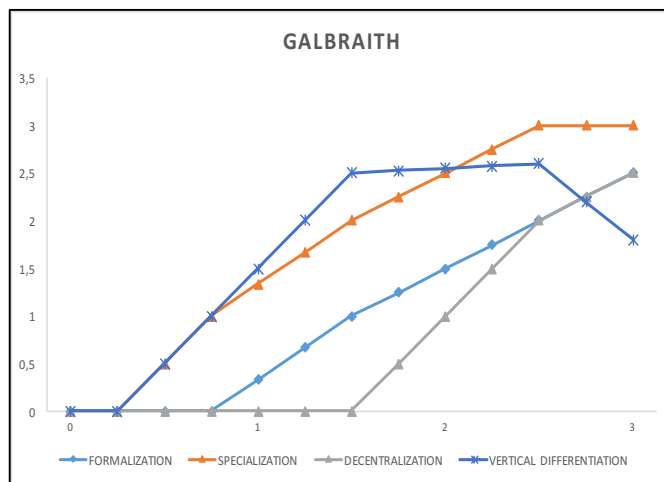
In the lifecycle literature, there is no doubt that organizational dimensions have been addressed (Levie & Lichtenstein, 2010); however, these attributes normally become relevant after the first stages and sometimes they gain a negative meaning during last stages. Conversely, very little is known on the role of organizational factors from a more positive perspective such as their role as facilitators for change (Jensen, 2005) or innovation (Koberg, Uhlenbruck & Sarason, 1996) for example. In conclusion, the existing lifecycle literature even if vast, is highly fragmented and many authors have brought different views on the same factors affecting new ventures’ growth. In conclusion, this second chapter represents an attempt to increase the ease of access to information provided by authors regarding configurations of new ventures and to set the basis for the assessment of configurations that can be empirically found in our dataset of high-technology companies.

Figure 7. Kazanjian's view of first three lifecycle stages



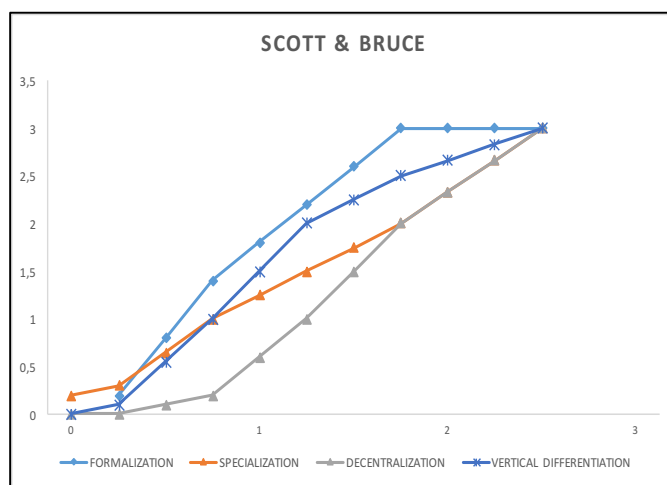
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Figure 8. Galbraith's view of first three lifecycle stages



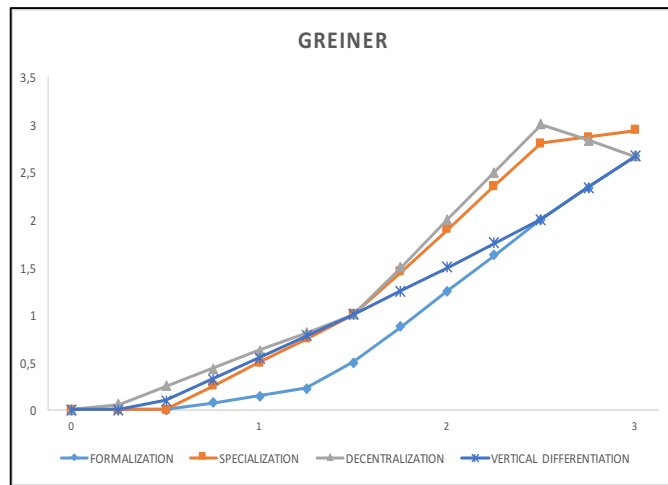
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Figure 9. Scott & Bruce's view of first three lifecycle stages



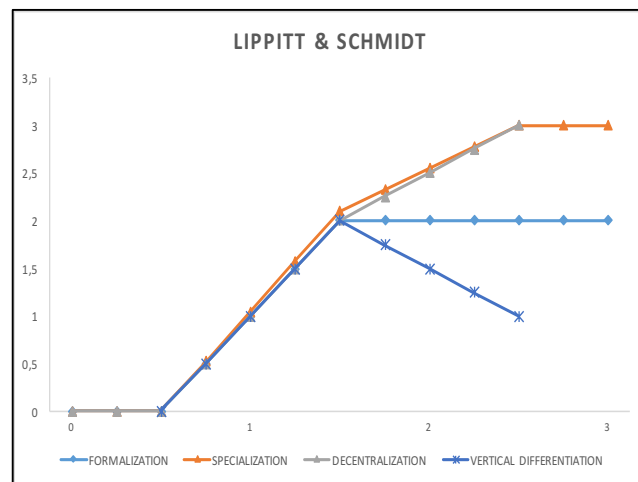
Source: personal elaboration

Figure 10. Greiner's view of first three lifecycle stages



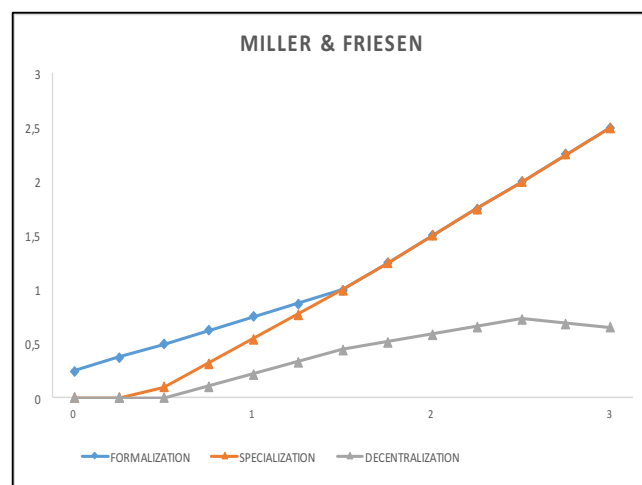
Source: personal elaboration

Figure 11. Lippitt & Schmidt's view of first three lifecycle stages



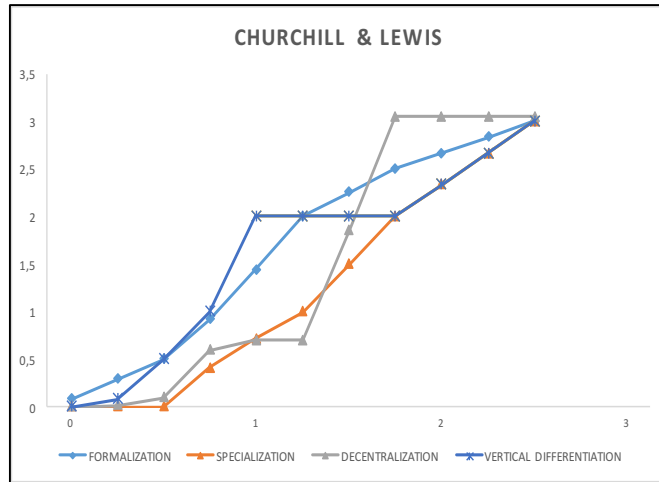
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Figure 12. Miller & Friesen's view of first three lifecycle stages



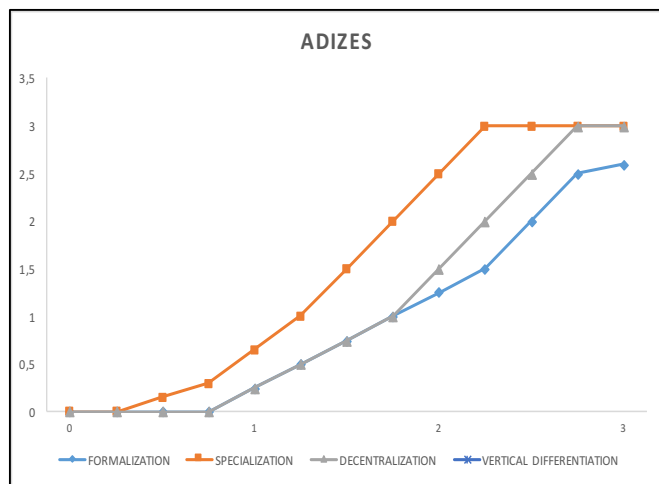
Source: personal elaboration

Figure 13. Churchill & Lewis' view of first three lifecycle stages



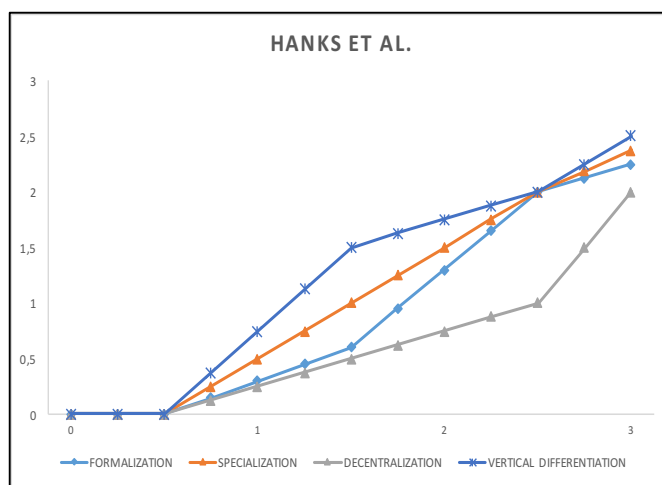
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Figure 14. Adizes' view of first three lifecycle stages



Source: personal elaboration

Figure 15. Hanks et al.'s view of first three lifecycle stages



Source: personal elaboration

CHAPTER 3. EMPIRICAL ANALYSIS

In this chapter I will describe in detail the dataset employed (3.1.1), the questionnaire provided for the empirical study of new ventures' configurations (3.1.2) and I will give a general view on data through descriptive statistic measures (3.1.3). In Section 3.2, I will describe the Fuzzy approach that has been used in order to analyze these configurations and in Section 3.3 the process of calibration of causal variables used in this study, which is an important step in deriving configurations from our dataset.

3.1 Data description

Data are provided by the joint-project PRIN (Progetto d'Interesse Nazionale) funded by the Italian governmental department of education (Ministero dell'istruzione, dell'università e della ricerca scientifica) which involves the Universities of Padova, Udine, Siena, Brescia, Molise, Napoli, INSUBRIA Varese-Como, Trieste, Bergamo, Venezia Ca' Foscari and Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna. Each university has built a part of the questionnaire and the study has been conducted on 280 new ventures (3-7 years) in the high-tech sector, during the month of December 2015.

3.1.1 The sample

A number of 280 companies responded to the questionnaire, they were chosen from a database containing high-tech new ventures built through the website AIDA (Analisi Informatizzata delle Aziende Italiane), which provides key figures regarding Italian companies. This initial database was built by including companies born from 3 to 7 years and pertaining three sectors: Manufacturing High Tech, Manufacturing Medium-High Tech and Service High Tech. Sectors have been identified through SIC codes which correspond to the European ATECO codes. For the scope of this study, the sample of 280 companies was therefore reduced to 96 by considering only the manufacturing sectors and companies of 4 to 7 years old. The literature studies on new ventures usually analyze companies that are seven years old or less (Littunen & Virtanen, 2009; Boeker and Wiltbank, 2005; Zahra & Larraneta & Gonzalez, 2014). For the scope of this study we took a range of companies that age between 4 and 7 years in order to increase the comparability of the sample which enable us to find common configurations that lead to high performance. The final sample is composed of

96 companies, of which 17 born in 2007, 31 in 2008, 22 in 2009 and 26 in 2010. The final sample contains companies of the Manufacturing High and Medium Tech sectors. More specifically, Table 3 shows the partitioning of the sample into sectors represented by the European denomination ATECO 2007.

Table 3. ATECO sectors represented in the sample

| ATECO | Denomination | Freq. | Percent |
|-------|--|-------|---------|
| 20 | FABBRICAZIONE DI PRODOTTI CHIMICI | 4 | 4.17% |
| 26 | FABBRICAZIONE DI COMPUTER E PRODOTTI DI ELETTRONICA E OTTICA; APPARECCHI ELETTROMEDICALI, APPARECCHI DI MISURAZIONE E DI OROLOGI | 13 | 13.54% |
| 27 | FABBRICAZIONE DI APPARECCHIATURE ELETTRICHE ED APPARECCHIATURE PER USO DOMESTICO NON ELETTRICHE | 20 | 20.83% |
| 28 | FABBRICAZIONE DI MACCHINARI ED APPARECCHIATURE NCA | 44 | 45.83% |
| 29 | FABBRICAZIONE DI AUTOVEICOLI, RIMORCHI E SEMIRIMORCHI | 5 | 5.21% |
| 30 | FABBRICAZIONE DI ALTRI MEZZI DI TRASPORTO | 4 | 4.17% |
| 32 | ALTRE INDUSTRIE MANIFATTURIERE | 2 | 2.08% |
| 33 | RIPARAZIONE, MANUTENZIONE ED INSTALLAZIONE DI MACCHINE ED APPARECCHIATURE | 4 | 4.17% |
| | Total | 96 | 100.00 |

Source: personal elaboration

3.1.2 The questionnaire and investigated aspects

Only a part of the complete questionnaire is used in this study (Appendix 1). The questions tackle two big areas concerning company configuration: on one hand, organizational dimensions such as vertical differentiation, centralization, specialization, and formalization; on the other hand the strategy orientation of the company. In particular, the questions taken into consideration and their pertaining areas of investigation are the followings:

- Vertical differentiation:
 - PD2 investigates how many intermediate positions there are besides the CEO.
- Horizontal differentiation:

- PD8 investigates how many of 8 given functions are formalized in the company. Respondents had to choose among:
 - Administration, Finance and Control
 - Information Systems
 - Organization and Human Resources
 - Research and Development
 - Production
 - Marketing and after-sale services
 - Sales
 - Quality Control
- Formalization:
 - PD9_1 investigates, on a 7-points scale, if organizational roles are progressively formalized in the company (for example through job descriptions).
 - PD9_2 investigates, on a 7-points scale, whether each worker is assigned to an exclusive role and uses his time to complete activities related to a single area.
 - PD9_3 investigates, on a 7-points scale, whether people use formalized procedures in completing their jobs
 - PD9_10 investigates, on a 7-points scale, whether the use of communication and information systems has been progressively formalized.
- Centralization:
 - PD9_8 investigates, on a 7-points scale, whether the decision making power is centralized in the hands of the CEO/director/founder.
 - PD9_9 investigates, on a 7-points scale, whether collaborators play an active role in taking important decisions for the company. This is more specifically a measure of Decentralization.
- Strategy dimensions (Porter, 1979):
 - NA1 investigates, on a 7-points scale, whether the company is highly innovative in the sector in which competes (i.e. patents, radically innovative products)
 - NA3 investigates, on a 7-points scale, whether the company focuses and competes in a niche market.

3.1.3 Performance indicator

Two important indicators to measure new ventures’ performance are sales growth and employees’ growth (Gilbert, McDougall & Audretsch, 2006). In order to get data regarding sales, we used the database AIDA and exported information regarding sales of the year subsequent to the founding ($year_{t+1}$) and of the last available year (2014). We took the year subsequent to the founding in order to increase comparability of results since many companies have been founded at the end of the year, consequently reporting very few sales in the first year. Then we applied the CAGR (Compound Annual Growth Rate) formula:

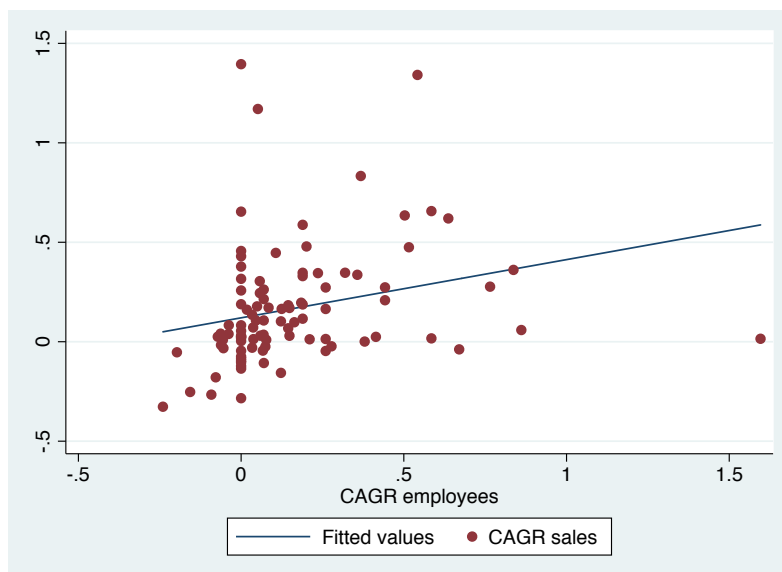
$$CAGR = \left(\frac{Sales\ 2014}{Sales\ year_{t+1}} \right)^{\left(\frac{1}{\#\ of\ years} \right)} - 1$$

For what concerns employees’ growth, data were extracted directly from the questionnaire which reported more reliable data. Respondents were asked how many employees the company had at the founding and how many employees it has currently. Then we applied the CAGR formula:

$$CAGR = \left(\frac{Employees_{current}}{Employees_{founding}} \right)^{\left(\frac{1}{\#\ of\ years} \right)} - 1$$

These performance indicators, even if measure different venture’s areas of growth, go on the same direction; indeed, they are correlated by a coefficient of 0.26 (see Table 4 & Figure 16).

Figure 16. Stata scatterplot between performance measures.



Source: personal elaboration

3.1.4 Descriptive statistics and correlations

Table 4 summarizes the main descriptive statistics while Table 6 represents an analysis of correlation coefficients between configuration variables and performance measures. Furthermore, there is evidence of some bivariate correlations between indicators. PD8 and PD9 are negatively correlated, and this supports the fact that the first is a measure of centralization while the second is a measure of decentralization. Regarding measures of Formalization, they report some correlations which are better expressed by a measure of Cronbach's Alpha which is normally used between indicators that seek to investigate the same construct. The Cronbach's Alpha of the formalization measures (PD9_1, PD9_2, PD9_3, PD9_10) is 0.612. At this level, the Alpha indicates some internal consistency even though to show good internal consistency it should be greater than 0.70. Some other positive correlations are present between specialization (PD8) and vertical differentiation (PD2) and between the measure of strategy differentiation (NA1) and vertical differentiation (PD2), formalization of information systems (PD9_10), and decentralization (PD9_9). However, in general correlation coefficients are not high and therefore do not present some substantial net effect. For the type of analysis that will be performed, fsQCA, the data were appropriate in the sense that inputs and outputs measures present characteristics of non-linearity and are asymmetric (Ricciardi, Zardini & Rossignoli, 2016). The reader is referred to Section 3.2 for a more comprehensive explanation of the fuzzy-set approach.

Table 4. Descriptive statistics

| Statistics | Measure of Performance | | Vertical Differentiation | Horizontal Differentiation | Formalization | | | | | | | | | | Centralization | | Strategy | |
|---------------|------------------------|----------------|--------------------------|----------------------------|---------------|------|-------|-------|-------|--------|-------|-------|-----|-----|----------------|--|----------|--|
| | CAGR Sales | CAGR employees | | | PD2 | PD8 | PD9_1 | PD9_2 | PD9_3 | PD9_10 | PD9_8 | PD9_9 | NA1 | NA2 | | | | |
| Average | 16,63% | 15,76% | 1,04 | 5,44 | 4,32 | 3,69 | 5,01 | 5,16 | 6,22 | 4,28 | 5,16 | 5,57 | | | | | | |
| 25 percentile | 0,20% | 0,00% | 0 | 4 | 2 | 2 | 4 | 4 | 6 | 2 | 4 | 5 | | | | | | |
| 50 percentile | 8,26% | 6,94% | 0 | 6 | 4 | 4 | 6 | 6 | 7 | 5 | 6 | 6 | | | | | | |
| 75 percentile | 27,50% | 22,34% | 2 | 8 | 7 | 5 | 7 | 7 | 7 | 6 | 7 | 7 | | | | | | |
| St. deviation | 30,17% | 26,58% | 1,65 | 2,38 | 2,27 | 2,07 | 2,15 | 2,00 | 1,42 | 2,10 | 1,69 | 1,75 | | | | | | |
| Max | 139,53% | 159,62% | 10 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Min | -32,69% | -24,02% | 0 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | |

Source: personal elaboration

Table 5. Pearson bivariate correlation matrix

| | CAGRsales | CAGRemployees | PD2 | PD8 | PD9_S1 | PD9_S2 | PD9_S3 | PD9_S10 | PD9_S8 | PD9_S9 | NA_S1 | NA_S3 |
|---------------|-----------|---------------|---------|---------|---------|---------|---------|---------|----------|---------|--------|-------|
| CAGRsales | 1.000 | | | | | | | | | | | |
| CAGRemployees | 0.2579* | 1.000 | | | | | | | | | | |
| PD2 | 0.2308* | 0.2704* | 1.000 | | | | | | | | | |
| PD8 | 0.0914 | 0.1280 | 0.2548* | 1.000 | | | | | | | | |
| PD9_S1 | -0.0721 | 0.1040 | 0.2316* | 0.2266* | 1.000 | | | | | | | |
| PD9_S2 | -0.0161 | 0.1333 | 0.1761 | 0.1136 | 0.2835* | 1.000 | | | | | | |
| PD9_S3 | -0.0534 | -0.0095 | 0.2131* | 0.1823 | 0.3978* | 0.2232* | 1.000 | | | | | |
| PD9_S10 | 0.0605 | 0.0341 | 0.1793 | 0.1579 | 0.3057* | 0.1848 | 0.2883* | 1.000 | | | | |
| PD9_S8 | -0.0088 | -0.1544 | -0.0263 | -0.0472 | -0.0579 | -0.0516 | 0.1678 | 0.0137 | 1.000 | | | |
| PD9_S9 | 0.0142 | 0.1347 | 0.0844 | 0.1162 | 0.1813 | -0.0304 | 0.0926 | 0.1897 | -0.2144* | 1.000 | | |
| NA_S1 | 0.0871 | 0.1133 | 0.2993* | 0.1899 | 0.1705 | -0.0763 | 0.1620 | 0.2419* | 0.0207 | 0.3911* | 1.000 | |
| NA_S3 | -0.1271 | -0.1174 | -0.0410 | 0.1135 | -0.0813 | -0.1331 | 0.0767 | 0.0252 | 0.1561 | 0.1502 | 0.1973 | 1.000 |

Source: personal elaboration. *significance levels equal or greater than 5% (p-value<0.05)

3.2 Fuzzy-Set approach

In this section I describe the methodology used, fsQCA, both in descriptive terms, reporting the literature that supports the use of fuzzy set analysis to identify configurations (Paragraph 3.2.1), and in more practical and numerical terms, by describing the logic behind the approach (Paragraph 3.2.2). In conclusion, I explain the reasons why this methodology is particularly suitable for this study (Paragraph 3.2.3) and how the identification of new ventures' configurations can be a useful tool in order to evaluate how similar configurations are today in respect to what prescribed by the literature "yesterday", for example lifecycle theories.

3.2.1 Ragin's theory

In his book "Fuzzy-Set Social Science" (2000), Charles C. Ragin provides a method for the study of social phenomena. He first describes the two main methodological styles used by researchers in order to connect evidence. *Case-oriented studies* generally focus on the qualitative study of social phenomena by finding many complex interconnections among cases, but they show limited possibility for generalization. With case studies, researchers seek to identify commonalities between cases, trying to explain *how* they are related by the same outcome. On the other hand, *variable-oriented studies* provide documentation for general patterns but limit the possibility to study many variables since the number of cases (n) should be elevated to provide enough information. In particular, researchers "seek to explain *why* outcome changes across observations" (Ragin, 2000, p.71). Classical multivariate methods isolate the effect of variables on the outcome of interest but does not enable an exploration of all the possible interactions between variables. Also, when comparing these two methodologies, they appear to be mutually dependent because the general patterns found in variable-oriented research can be better described at a case level by exploring multiple causal connections. Moreover, the findings derived from case studies need at least to be supported by a variable-oriented research to have a general validity. Ragin challenges variable-oriented and case-oriented approaches and suggests a *diversity-oriented* approach that permits the integration of the interpretation of cases as members of a homogeneous population and as parts of a very limited but more informative sample. This refers to an empirical technique, fsQCA, that treats cases as different combinations of more attributes which should be quantified in a preliminary step. Cases will be expressed as sub-populations of the sample,

treated as types/configuration derived from a bigger population. Classical multivariate analysis assumes that a dependent variable X has the same effect on all the cases that are part of a representative sample (homogeneity of cases). Therefore, when the effects are different this is considered a normal deviation caused by the stochastic nature of the variable X . Differently, fsQCA treats those cases as representing different configurations (or sub-population). Indeed, the effect of a single component depends on the presence or absence of other variables (causal heterogeneity). In this way, the study of diversity generalizes the combinations causally associated to a certain outcome of interest, distinguishing cases depending on defined combinations of attributes pre-selected for the explanation of the studied phenomenon. The belonging of a case in a configuration is defined by the membership levels of the single causal variables into the set of causal variables present in a configuration. While crisp sets are limited to a dichotomy presence (1) or absence (0) of causal variables for the achievement of a certain outcome, fuzzy sets permit a broader range of values for the measure of membership into a set. Indeed, this membership is bounded by critical thresholds:

$X_i = 1$: full membership in the set;

$X_i = 0.5$: maximum point of ambiguity between fully in and fully out;

$X_i = 0$: fully out.

Where X_i is the membership score of the i -case in the set referred to the causal variable X .

The calibration procedure performed by the researcher defines these three thresholds that influence the calibration procedure for every attribute or causal variable. In conclusion, a combination is created by recombining the membership scores for each set. For an explanation of the Boolean logic and the steps of fsQCA the reader is referred to the next paragraph.

The fuzzy set approach has been extensively applied to political science and has recently been extended to management research. Fiss (2011) pointed out that since organizations' success usually depends on interdependencies between multiple factors, theories such as fsQCA are particularly suitable for these studies, because they take into account multiple causal relations that link structure, strategy and environment following a configurational approach. Fiss has initially tested the Miles and Snow typology on a sample of 205 high-technology companies through fsQCA, and has further extended the theoretical knowledge by providing a visual framework which shows results and distinguishes between core and peripheral conditions.

Starting from the concept of “causal asymmetry” (Ragin, 2008), the causes that lead to the presence of the outcome can be different from those triggering the absence of the same outcome. In this sense, there are three possible attributes of the causal conditions for each configuration: “present”, “absent” and “don’t care” conditions, the first requires the presence of the condition in order to reach the outcome, the second requires its absence and the third indicates that the condition is indifferent for the outcome. The final patterns of “present”, “absent” and “don’t care” conditions are considered equal ways to reach the outcome in question. Present and absent conditions can be classified as core or peripheral: core causal conditions are those conditions that show a strong causal dependence with the outcome while peripheral causal conditions show weaker evidence for a causal relationship. The logic of “equifinality” gives the idea that “a system can reach the same final state [starting from] different initial conditions and by a variety of different paths” (Katz & Khan, 1978, p.30). Therefore, Fiss classifies “first-order equifinality” as types that show different core elements while “second-order equifinality” as “neutral permutation within a first-order equifinal type” (Fiss, 2010, p.398).

3.2.2 In numerical terms

The objective of Ragin’s methodology is to estimate which input factors -called causal conditions- are determinant for a desired outcome (O , binary) to show how those are connected through Boolean logic¹.

The Boolean logic defines three logic operators: two binary operators (AND, OR) and one unary (NOT). The operators can be composed to form more complex expressions. In general, a Boolean function is described by its Truth Table, which is the definition of the output for any possible combination of the inputs.

The methodology fsQCA is carried out in several steps:

Given k possible causal conditions and a n cases, the preparatory step is to create table $n*k$ and for every entry is assigned a score ($m_{n,k}$), which is a number between 0 and M_k . In our

¹ The Boolean logic is used in digital electronics. If the letter is lowercase it refers to the negation of the corresponding condition while if it is uppercase it refers to the case itself.

study k is the number of organizational, strategic and environmental dimensions investigated (7), n is the number of respondents (96), and $m_{n,k}$ is the score assigned to the k^{th} dimension in the n^{th} questionnaire. We then transform, for each casual condition (k) and for each case (n), the score $m_{n,k}$ into a real number μ between 0 and 1, called “membership function” which is an indicator of the probability that a casual condition holds considering that specific case. The software fsQCA transforms the value $m_{n,k}$ into a real number $\mu_{n,k}$ between 0 and 1 (process of calibration) using an algorithm that transforms variable scores into a log odds value and a fuzzy membership degree is derived through the formula (Garcia-Castro & Casasola, 2011):

$$\mu = \text{Degree of membership} = \frac{\exp(\log \text{ odds})}{1 + \exp(\log \text{ odds})}$$

Actually, the effective number of causal conditions considered in the computation can be lowered from the initial number by condensing a set of causal conditions into another condition representing a Boolean function of the previous ones. The corresponding score is derived from the original normalized scores by the fuzzy representation of the logical expression. In this study an initial number of 12 causal conditions has been reduced to 7. The reader is referred to Section 3.3 for a more comprehensive description of the process of calibration.

In fuzzy logic the AND operation becomes the minimum operator. Informally, the minimum will be closer to 1 when both terms are close to 1, reflecting the facts that in the Boolean AND operator the result is 1 if and only if both inputs are 1. Conversely, the fuzzy OR operator is implemented by the maximum, reflecting the fact that the output of the binary OR operator is 1 if at least one of the inputs is 1.

The next step is to consider for every n and for every combination of k (2^k binary combinations that can be seen as a sequence of k bits which can be either 1 if the condition is present or 0 if the condition is not present) a number calculated from $m_{n,k}$ which represents the membership function of the particular sequence of presence or absence of that conditions. The membership function of the sequence is calculated considering the minimum² of a

² If the membership function were exactly the probability of having such a causal condition in the considered case and if the causal conditions were all statistically independent, then the probability of a given combination of causal conditions would be given by the product of the probabilities of each casual condition (1 – probability if the causal condition is negated in the combination). Since this condition normally does not hold, a different heuristic is taken in the computation of the membership function of the combination by considering the

sequence of k numbers where the i th number is equal to $\mu_{n,i}$ if the condition is present (i^{th} bit = 1) or $(1-\mu_{n,i})$ if the condition is not present (i^{th} bit = 0) in the considered sequence. Therefore, in total we obtain $2^k \cdot n$ membership scores. We will then select the combinations which yield a combined membership function greater than 0.5 which are called the surviving causal combinations. For every n at most one causal combination will be surviving. To prove this, suppose that there exists a surviving combination, with membership function greater than 0.5; this implies that the membership function μ of every causal condition (or $1-\mu$ if the causal condition is negated in this combination) is greater than 0.5. If we consider any combination of casual conditions which differs from the considered one of at least a single bit (meaning that at least one causal condition would be inverted), then necessarily its membership function μ will be less than 0.5 because the component which has been inverted will participate to the minimum operator with a number which is less than 0.5 –because it is the ones component of the original value. The resulting table will summarize the surviving combinations and associated cases. Table 6 is an example of a reduced truth table taken from Mendel & Korjani (2012). Observe that the outcome of the selection of the surviving combinations yields a disjunction of several terms each composed by the conjunction of every causal condition or its negation.

Table 6. Example of a truth table

Table 3
Distribution of cases across causal combinations and set-theoretic consistency of causal combinations.^a

| Best instances | Causal combinations | | | | | Corresponding vector space corner | Number of cases with >0.5 membership | Set-theoretic consistency |
|----------------|---------------------|---|---|---|---|-----------------------------------|--------------------------------------|---------------------------|
| | A | B | C | D | E | | | |
| 8, 14, 16 | 0 | 0 | 0 | 0 | 0 | abcde | 3 | 1 |
| 11, 15 | 0 | 0 | 0 | 0 | 1 | abcdE | 2 | 0.982 |
| 1 | 1 | 0 | 1 | 1 | 0 | AbCDe | 1 | 0.974 |
| 7 | 1 | 1 | 1 | 1 | 0 | ABCDe | 1 | 0.971 |
| 4 | 0 | 0 | 1 | 0 | 1 | abCdE | 1 | 0.861 |
| 9, 13 | 0 | 0 | 1 | 0 | 0 | abCde | 2 | 0.855 |
| 5, 10 | 1 | 0 | 1 | 0 | 1 | AbCdE | 2 | 0.498 |
| 6,17 | 1 | 0 | 1 | 1 | 1 | AbCDE | 2 | 0.495 |
| 2, 3, 12, 18 | 1 | 1 | 1 | 1 | 1 | ABCDE | 4 | 0.250 |

^a Bold-faced entries are for consistencies >0.80.

Source: Table 3, Mendel & Korjani (2012)

Next, we consider the membership function of the outcome μ_o obtained in the same way as the other μ in order to take into account the relationship between causal conditions and outcome

minimum of the membership functions (or $1 - \mu$ if the causal condition is negated in the combination). The rationale behind is to consider the combinations which are likely to hold in the considered case.

and we calculate a number (consistency) which would give us an indication of the validity of the considered causal combination -i.e. leading to the desired outcome.

$$\text{Set theoretic consistency} = \frac{\sum \min(\mu_i, \mu_o)}{\sum \mu_i},$$

We take into account only the surviving causal combinations that yield a set-theoretic consistency greater than 0.8³. Stated informally we are now considering only those cases with a clear cause (surviving causal combinations) and a clear outcome (set-theoretic consistency > 0.8).

Since we found a Boolean relationship between the input causal conditions and the desired outcome, this can be expressed by a Truth Table. Using a methodology borrowed from digital technologies it is possible to derive another Boolean expression, normally much simpler than the original one, yielding the same Truth Table. In other words, we can express the same relationship between causal conditions and desired outcome (obtained following the above steps) possibly dropping causal conditions that are not essential for the desired outcome.

In order to get an idea of the procedure, consider the following simplification in a Boolean expression:

$$O = A * B * C \sim D + A * B * C * D \rightarrow O = A * B * C$$

Using a similar reasoning, the original terms of the overall disjunction of the OR function (called implicants) can be reduced until not more reductions can be performed (prime implicants). This corresponds to the intermediate solution. The Quine-McCluskey methodology⁴ may perform a further reduction yielding even simpler representation of the same logical expression. The adding of some known conditions leads to further simplifications.

³ Ragin (2008) found that the number 0.8 is a good indicator of output consistency

⁴ Quine-McCluskey algorithm permits the expression of the same Truth Table with a simpler Boolean expression

3.2.3 Implications for this study

The fsQCA methodology is particularly suitable for this study since the identification of new ventures' configurations can be a useful tool in order to evaluate what type of configurations are observed in well-performing new ventures today in respect to what prescribed by the literature "yesterday".

The value of typologies is found in the possible integration of theories and the provision of a way to analyze multiple causal relations at the same time (McPhee & Scott Poole, 2001). What this thesis investigates is indeed the interrelation among organizational, strategic and environmental dimensions in new ventures and the provisions for configurations leading to an elevated performance derived both from the literature (Chapters 1 and 2) and from an empirical study on a sample of 96 firms (Chapter 3 and 4). In general, configurational theories (elucidated in Section 2.1) seem promising but are said not to have been tested enough to be totally validated. Fiss (2007) argued that the method used to test these theories stresses too much the finding of an ideal configuration and a "holistic approach" while it should use instead the concept of *equifinality* (Katz & Kahn, 1978; Van De Ven & Drazin, 1985) to recognize that more than one configuration could equally achieve high levels of firm performance. In the empirical part of this thesis, therefore, the concept of *equifinality* is applied through the use of a fuzzy set approach (Ragin, 2010) in order to find which configurations are exhibited in our dataset in terms of organizational dimensions. This is purposely a second step after the identification of organizational configurations prescribed by the classical lifecycle theories and the new ventures works, since these are thus confronted with empirical results in order to validate or challenge some of the literature.

3.3 Calibration

The process of calibration of causal variables is necessary in order to indicate to the software fsQCA the threshold points for the attribution of membership values between 0 and 1 into the fuzzy sets. The software enables calibration through the command "calibrate":

```
Calibrate (x, n1, n2, n3)
```

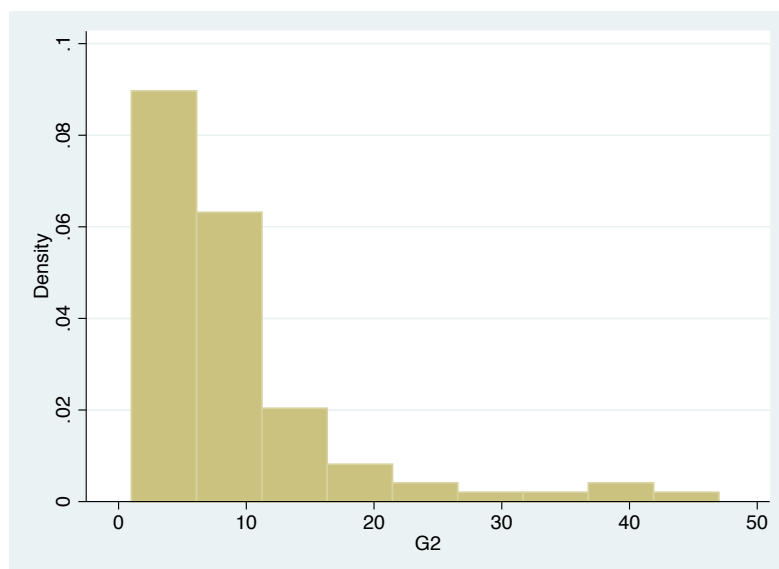
Where x is the variable to be calibrated, n1 is the value of the variable x considered as a threshold for full membership in the target set (to which is assigned a membership score of

0.95), n_2 is the crossover point (0.5) and n_3 is the value of the variable x corresponding to the point of full non-membership in the set.

Whenever possible, the sample has been anchored to external data, suggested by Ragin (2000) as the best approach to fuzzy sets since the researcher should indicate common knowledge and avoid anchoring the sample to values of mean or percentiles taken from the sample itself disregarding other already known circumstances. This is connected to the ultimate logic of fsQCA, which is a hybrid method between case studies and multivariate analysis and therefore tries to connect and test external evidence by looking at configurations of observable cases that, of course, cannot be taken per se as a sub-population of the external reality but can be successfully tested as observations of a phenomenon pre-defined in its components. Specifically, in this study we assigned values for High Turbulence and High Performance based on data gained through two big databases (AIDA and ISTAT) that include statistics of Italian firms and not based on data collected from respondents through the questionnaire. Variables as Centralization, Formalization, Strategy etc. have instead been anchored to a 7-point Likert scale of agreement and disagreement, letting the founder/manager express the level of Formalization, for example, based on his accordance to sentences that describe the techniques normally used in formalized organizations (i.e. the use of budgets, formalized information systems etc.).

3.3.1 Outcome calibration

In order to measure organizations' performance, we used the variable "CAGR_sales". The formula for its derivation is explained in paragraph 3.1.3. It has been decided not to use measures of employment growth since we lacked data necessary for the anchoring of "CAGR employees"; in effect, AIDA does not provide reliable information regarding employees. In any case the number of employees of firms in our sample are below 50, which means that all firms can be defined as small firms following the definition provided by the OECD (Organisation for Economic Co-operation and Development). In particular, as one can see from Figure 17, a great number of firms from the sample (73%) are also considered micro-firms (definition provided by OECD) since they have 10 employees or less.

Figure 17. Histogram of the current number of employees of firms in the final sample

Source: personal elaboration through Stata

We used the Italian database AIDA to find information regarding the performance of firms that are part of the same sectors that our sample covers, in order to define the anchoring points for the calibration of the outcome variable. In particular, we calculated the CAGR_sales of all firms present in the database AIDA founded before 2010 for each of the 8 ATECO sectors (which is the Italian version of the SIC code), and we calibrated the outcome variable depending on the performance of the sector. In this way, we are able to assess a firm's performance also based on the performance of the sector of which it is part. Hence, for each sector, the 75th percentile of the sales CAGR of firms between 2008 and 2014 has been taken as a measure of full membership into the set of high performance firms (for firms born after 2008, we took the year after their founding as starting point for the calculation of CAGR), the mean has been taken as a measure of full non-membership into the set of high performance firms, and the halfway between the mean and the 75th percentile has been taken as the crossover point. In this way, all firms of the sample that perform below the average of their sector are excluded from the set of high performance firms. The choice of these crossover points is similar to the one used by Fiss (2011) to define the set of high-performance firms. Table 7 summarizes the process of calibration of the outcome variable, including the size of the firms' samples taken from AIDA for each ATECO sector, and the respective crossover points. In general, our sample of 96 firms shows a high level of performance compared to the broader data regarding performance of firms of the same sectors, this means that more

companies will be included by the software fsQCA when looking for common configurations of causal variables.

Table 7. Outcome calibration (CAGR_sales)

| ATECO Sector | n | fully in (75th percentile) | fully out (mean) | crossover point (halfway) |
|---------------------|----------|-----------------------------------|-------------------------|----------------------------------|
| 20 | 2775 | 6,72% | -1,69% | 2,51% |
| 26 | 3652 | 6,40% | -3,58% | 1,41% |
| 27 | 4124 | 4,52% | -4,97% | -0,22% |
| 28 | 11615 | 5,19% | -3,34% | 0,93% |
| 29 | 1266 | 4,01% | -6,93% | -1,46% |
| 30 | 1360 | 4,64% | -7,93% | -1,64% |
| 32 | 3528 | 5,56% | -4,72% | 0,42% |
| 33 | 3766 | 7,79% | -1,31% | 3,24% |

Source: personal elaboration

3.3.2 Causal variables calibration

Big part of the questionnaire has been purposely built through a 7-point Likert scale. In this way the respondents clearly express their grade of agreement or disagreement regarding the considered organization's attribute. To translate answers in the language of fuzzy sets, we took as crossover point the middle of the scale (4); firms that expressed the maximum point of agreement to the question (7) were considered fully in, and those that expressed the maximum point of disagreement and were considered as fully out (1). The peculiarity of fsQCA calibration is that if the crossover point overlaps some variable scores (meaning that some scores have fuzzy membership score of exactly 0.5), those cases result difficult to analyze (Ragin, 2008). In line with the methodology applied by Fiss (2011), a constant of 0.001 has been added to causal conditions' scores below 1 in order to overcome this limitation and consider answers of 4 as more in than out.

Conversely, the causal variable "high turbulence" regarding the environment has been built by using external data derived from ISTAT (Italian National Institute of Statistics).

3.3.2.1 Organization

Vertical Differentiation

Hanks et al. (1994) reported the number of 3.18 as the medium level of organizational levels between three cluster of firms ranging from 4.29 to 7.36 years. They counted the number of hierarchical levels including direct workers and the CEO, following Pugh and Hickson’s (1976) measure. In particular, when levels equal to 3.18 (Cluster B) the structure is described as starting to add organizational levels to its hierarchy while the apex of vertical differentiation that a new venture can reach is prescribed in Cluster C, when levels are 4.00. This study has been used here as a reference to indicate when a new venture has reached a quite significant number of levels to be defined as more vertically differentiated in respect to others. Since in our questionnaire (question PD2) respondents were asked to number the current intermediate positions besides the CEO, the chosen crossover point of the variable renamed VER_DIFF is 2 which corresponds to the maximum number of levels (4) that Hanks et al. observed in a sample of 86 new ventures. The point of full non-membership corresponds to VER_DIFF=0, meaning that there is no other intermediate position between the CEO and the employee at the lowest level. The point of full membership has been set at 4 to indicate an organization that has significantly grow in number of levels.



| | | | |
|------------------------|---|-----|---|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| PD2/VER_DIFF | 4 | 2 | 0 |

Horizontal Differentiation


To measure the Specialization of the firm we used a scale derived from Pugh, Hickson, Hinings & Turner (1968) which is commonly used in the organizational literature. The respondent had to report the number of functional areas formalized in the company among 8 areas provided. The maximum number of functions has been set as the point of maximum membership in the set (HOR_DIFF=8), companies that mentioned only one function have been considered out of the set (HOR_DIFF=1) and the average number of functions possibly present in the firm has been set as the crossover point (HOR_DIFF=4).




| | | | |
|------------------------|---|-----|---|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| PD8/HOR_DIFF | 8 | 4 | 1 |

Centralization

Centralization has been measured through two separate questions indicating the level of agreement/disagreement on a 7-point Likert scale. The first (PD9_8) investigates whether the decision-making power is centralized in the hands of the CEO/director/founder while the second (PD9_9) investigates whether collaborators play an active role in taking important decisions for the company. The second question measures, at some extent, the level of decentralization and therefore has to be reversed in order to measure centralization. This operation is done through the set negation (symbol ~) of variable PD9_9. The same values can be derived by subtracting to 8 the value associated to each answer, which is a number between 1 and 7. The two variables have been calibrated and consequently combined through the use of the Boolean operator AND. In this way, respondents who indicated a high level of centralization in question PD9_8 and a low level of decentralization in question PD9_9 have been categorized as centralized through the assignation of a membership score higher than 0.5. As described in Paragraph 3.2.2, in this case the operator is a binary logical operator AND which returns true if and only if the two inputs are true. This logic operator is reflected in fuzzy logic by an operator which returns the minimum of the two inputs' values. Hence, in this case the final fuzzy membership score assigned to variable CENTR is the minimum fuzzy membership score between the scores obtained in question PD9_8 and in ~PD9_9 after calibration. The ratio behind the inclusion of two questions is to build a causal variable (CENTR) that isolates those firms consistently centralized. In fact, new ventures usually report a high level of centralization, but have also founding teams to which decisions on new products' development, for example, are delegated. Therefore, a more exclusive measure of centralization has been built (CENTR) by restricting the fuzzy membership to both centralized and not decentralized firms.



| | | | |
|------------------------|---|-----|---|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| PD9_8 | 7 | 4 | 1 |



| | | | |
|------------------------|---|-----|---|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| ~PD9_9 | 7 | 4 | 1 |

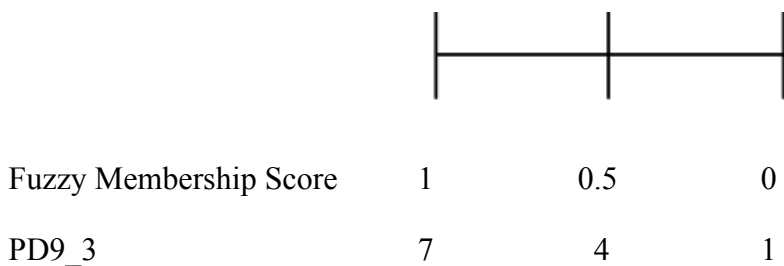
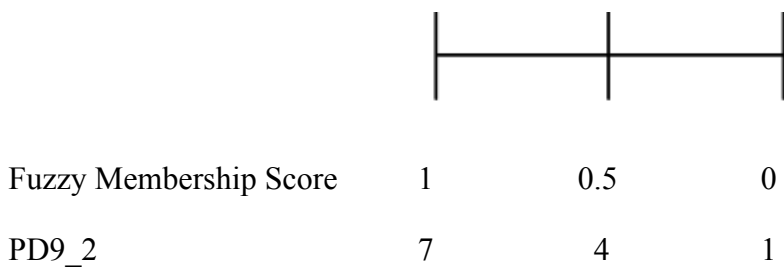
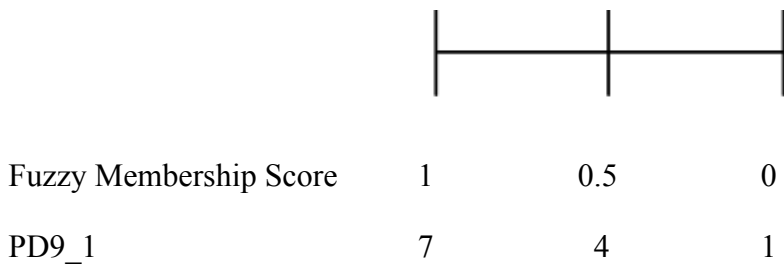
| |
|---|
| $CENTR = PD9_8 * \sim PD9_9, \text{ where } * \text{ stands for the logical operator AND.}$ |
|---|

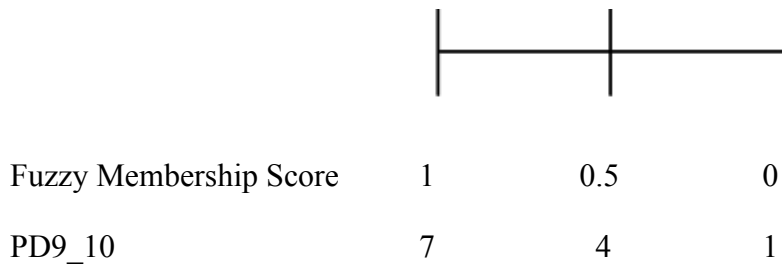
Formalization

The measure of formalization is similar to the one used by Miller & Friesen (1984) and by Hanks et al. (1994). They both used a 7-point Likert scale and measured formalization of roles, the extent of defined formal procedures, the use of budgets, job description etc. In our questionnaire, 4 questions were dedicated to measure the level of formalization of the firm. PD9_1 and PD9_2 investigated formalization of roles, PD9_3 explored the use of formalized procedures, and PD9_10 studied the formalization of communication and information systems. We used as a reference Martinez & Jarillo (1989) who consider the definition of the formal structure of the firm, standardization and planning as part of the so-called “formal coordination mechanisms”, to be distinguished from “informal coordination mechanisms” such as task forces, committees, teams, MBO etc. We focused here only on formal mechanisms because they are easier to identify and because it was necessary to reduce causal variables to an acceptable number. Together PD9_1, PD9_2, PD9_3, and PD9_10 exhibit a Cronbach’s Alpha of 61%, similar to the Alpha found by Meuer, Rupietta & Gellner (2015) among five items investigating the level of decentralization. Cronbach Alpha is used to test the internal consistency among items that test the same aspect; normally it should exceed 70%

to show good reliability. Notice that in our case two pair of questions test two slightly different elements: formalization of roles on one hand and procedures on the other.

For what concerns calibration, some literature is useful to delineate when an organization start to be defined as formalized. Miller and Friesen empirically tested the levels of formalization on 36 companies and considered as in a stage of “early formalization” firms that reported an average score of 3.68/7. More recently Fiss (2011) measured formalization and used as crossover point the middle of a 5-points scale. Coherently, we defined as crossover point the middle of the scale (4) and thus 1 and 7 respectively as point of full non-membership and full membership in the fuzzy set corresponding to each of the four questions.

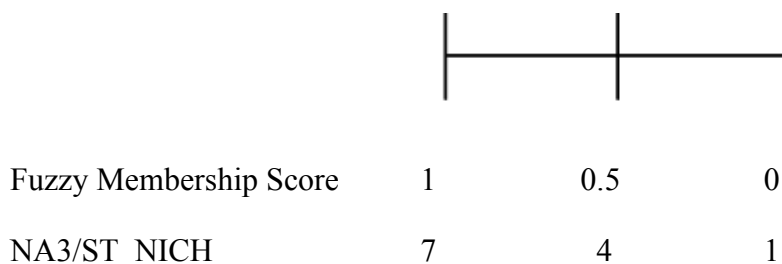
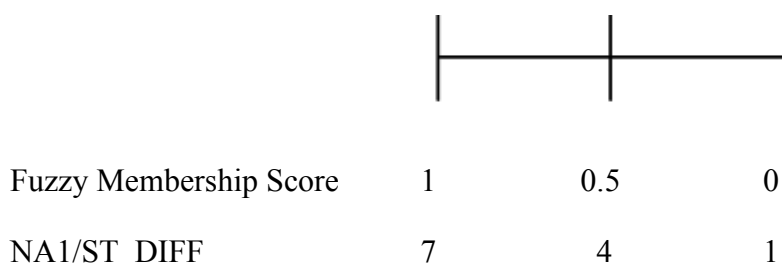




$$FORM = (PD9_1 + \sim PD9_2) * (PD9_3 + PD9_10), \text{ where } + \text{ stands for the logical operator OR and } * \text{ stands for the logical operator AND.}$$

3.3.2.2 Strategy

For what concerns causal variables measuring strategy, this thesis conforms to all the recent studies on organizational configuration through the application of fsQCA which use the structure provided by Fiss (2011) who applied the well-known framework for general strategies of Michael Porter (1980). Indeed, the strategy of a firm can be identified through two different continuum of elements: differentiation vs cost leadership and focus on a niche market vs mass market. In order to test differentiation vs cost leadership, question NA1 (renamed ST_DIFF) from our questionnaire seek to identify –on a 7-points Likert scale– whether the organization launches radically new products and patents on a regular basis. NA3 (renamed ST_NICH) assesses, instead, whether the organization focuses on restricted segments of the market therefore pursuing a niche strategy. Both variables have been calibrated as all other 7-points Likert scales, by using as crossover point the middle of the scale and the extremes as points of full membership and full non-membership.



3.3.2.3 *Environment*

There is a vast literature dedicated to the conceptualization and measurement of the environment, Sharfman & Dean (1991) synthesized three big areas: Complexity, Dynamism and Stability, and Resource Availability, that correspond to Mintzberg's (1979) Complexity, Stability and Hostility. Aldrich (1979) provides 6 elements which fall in pairs into the categories identified by Sharfman & Dean: Concentration and Heterogeneity, Stability and Turbulence, Capacity and Consensus. In this thesis, we tried to include elements from each of the three main categories of literature works on the environment. Therefore, environment has been measured based on two indicators derived from ISTAT for each ATECO sector. The first index that gives an indication of the Dynamism and Stability of the environment is "mortality rate" which is used as an alternative to the more commonly employed "concentration ratio" which isolates the instability of the market and the results of the competitive threats among firms. "Concentration ratio" was not available for all ATECO sectors and "mortality rate" resulted to be a more precise information because available at the third ATECO digit; therefore, we opted for the second, which denotes environmental turbulence (Aldrich, 1979) and in some sense gives an idea of new ventures' possibility to survive in each sector and their ability to overcome the liability of newness (Freeman, Carroll & Hannan, 1983) since it sums up the overall mortality risk that the organization faces (Shepherd Douglas & Shanley, 2000). The second indicator we adopted is the ISCO (Indice Sintetico di Competitività ISTAT) which synthesizes through a geometric average: cost competitiveness, profitability of the sector, variation of export, share of turnover exported and share of innovative companies –i.e. firms that conducted activities dedicated to product or process innovations through a three-year period. This synthetic indicator provides information regarding the Complexity of the environment, because it includes a measure of "technical intricacy" (Mintzberg, 1979). The same indicator (ISCO) is employed as a measure of Resource Availability in the sector or "munificence" (Aldrich, 1979) which is seen as the extent to which the environment provides resources for the firm. In conclusion we can say that the indicator provides also information regarding the first category, Dynamism and Stability, since it includes cost competitiveness.

First we created two variables (ENV_MORT and ENV_ISCO) and assigned values corresponding to each firm of the sample, one for mortality rate and another for the indicator

ISCO, based on the ATECO sector of pertinence. Table 8 gives a general view of environmental attributes assigned to each ATECO sector inside the High Tech. However, data associated to each firm of the sample are more detailed and depend on the age of the firms, in order to report the level of turbulence of the environment that the company has faced since its birth. Indeed, to each firm of the sample it has been assigned a mortality rate value associated to the third ATECO digit averaged from the year of birth of the firm until 2013 (the last year available); the same was done for the indicator ISCO which was available only at the second ATECO digit. Afterwards, the two variables have been calibrated separately and lastly they have been aggregated through the logical operator AND. Variables EN_MORT and EN_ISCO have been calibrated by looking at the minimum and maximum levels reported in the sample (correspondent to points of full membership and full non-membership) and as crossover points we chose the mean values reported in the sample which are similar to the average values reported for the whole High-Tech sector in Table 8. The exact values used for calibration are reported in the schemes below. In conclusion, the aggregation of EN_MORT and EN_ISCO is carried out through the logical operator AND, in this way the variable ENV results to be more circumscribed and clearly identifies those firms that exhibit a very high level of turbulence compared to others.

Table 8. Environmental attributes of the High Tech sector

| ATECO sector | Mortality rate | ISCO |
|----------------------------------|-----------------------|-------------|
| 21 Pharma | 3,8 | 148 |
| 26 Computer/Electronic equipment | 6,2 | 101 |
| 30 Transport equipment | 6 | 113 |
| 20Chemicals | 4,1 | 121 |
| 25.4 Weapons | 1,7 | 89 |
| 27 Electric equipment | 5,6 | 115 |
| 28 Mechanical equipment | 4,2 | 119 |
| 29 Motor vehicles | 5,3 | 174 |

| | | |
|--|-----|-------|
| 32.5 Mechanical instruments | 5,5 | 102 |
| 33 Installation and fixing of mechanical equipment | 7,6 | 56 |
| Average | 5 | 113,8 |

Source: personal elaboration



| | | | |
|------------------------|------|-----|-----|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| EN_MORT | 13.2 | 5.7 | 2.8 |



| | | | |
|------------------------|-------|-----|----|
| Fuzzy Membership Score | 1 | 0.5 | 0 |
| EN_ISCO | 121,3 | 112 | 56 |

$ENV = EN_MORT * EN_ISCO$, where * stands for the logical operator AND.

In order to calibrate all variables, the software fsQCA have been used. This first step in the fuzzy-set analysis sets the basis for the subsequent derivation of the Truth Table and its simplification into the final solution. The reader is referred to the next Chapter for a more comprehensive explanation of the process of derivation of results and subsequent interpretation and discussion.

CHAPTER 4. DISCUSSION AND RESULTS

In this final chapter I provide some frameworks useful to understand the findings of the research. The final configurations leading to higher performance have been detected by applying the Fuzzy-Set Approach to the sample of 96 new ventures. In the first section (4.1) I describe the process that fsQCA applies, which leads to the solution –i.e. the derivation of the Truth Table and its transformation into parsimonious, complex and intermediate results. Therefore (in Section 4.2), I firstly describe final configurations as stand-alone results and secondly I connect Lifecycle Theories to the findings. I finally explain the limits of the research and possible future improvements (Section 4.3).

4.1 fsQCA Derivation of solutions

We performed a fuzzy-set fsQCA analysis using the 2.0 version of the fsQCA software (<http://www.u.arizona.edu/~cragin/fsQCA/software.shtml>). The software has been used also for the previous phase of calibration of causal variables, during that phase the researcher has the possibility to define the logical rules for the assignation of membership scores which, as mentioned, should be anchored to external data as much as possible. Thereafter, the researcher intervenes in order to specify which variables should be included in the analysis performed by the software. In this section, we focus on the software operation once all causal variables have been pre-defined and calibrated.

4.1.1 The Truth Table

The software fsQCA derives a Truth Table that is an analytical device which displays all possible logical combinations of our 7 causal variables (i.e. $2^7=128$ combinations/rows), and reports the distribution of cases observed in the sample across these combinations. Table 9 shows the Truth Table once all rows that reported only one or no empirical instances have been removed. In this way, we have chosen a “frequency cutoff” of 2, meaning that 2 was the minimum number of cases that should pertain to a configuration in order to consider it in a possible solution. It is not conceptually true to say that the Truth Table maps cases, but case aspects instead. The 0s and 1s in the first seven columns of Table 9 are actually representing the instruction for considering location of cases. In fact, very few cases fall perfectly in all the conditions that denote the case, and any case has a partial membership in more than one row.

For example, a company that has 0.4 fuzzy membership score in the set of firms that are centralized has also a 0.6 membership score in its negation (non centralization or decentralization). The final scope of the Truth Table is to identify causal sufficiency –i.e. the ability of some configurations of organizational, strategic and environmental factors to consistently show high venture performance. Therefore, we are looking for the “consistency” which is a number that expresses the subset relation between a configuration of causal variables and the presence of the outcome. The formal calculation of consistency is presented in Paragraph 3.2.2. The minimum levels of consistency scores are normally higher than 0.75 (Ragin, 2004), and in this study we chose a consistency threshold of 0.80. Therefore, the column corresponding to the outcome (CAGR_sales) has been set at 1 if the consistency level is greater than 0.8 and 0 otherwise. A total number of 33 cases fell into a configuration that exceeds both the minimum frequency and the minimum consistency level set for the derivation of the solution.

4.2.1 Standard analysis option

The software then utilizes the set-theoretic logic in order to simplify data and find causal conditions which are “sufficient” for the verification of the outcome. In the derivation of the final configurations the program asks information regarding how to treat “remainders” –i.e. counterfactual configurations that do not show empirical cases associated to them. In this study we assume that all non-present configurations are possible and check “present or non-present” for every causal condition when the program asks whether conditions should be present or absent or both in order to contribute to the outcome. Indeed, we use the “Standard Analysis” function of the software, which returns the complex, parsimonious and intermediate solution. The parsimonious solution uses any type of remainder that help to generate logically simplified solutions. In our case the complex solution overlaps the intermediate solution since we did not provide “easy counterfactuals”. It is not possible to provide information regarding normal connections between causal conditions and the outcome because the literature (as seen in Chapters 1 and 2) is so vast that some authors provide that, for example, centralization sometimes is necessary for the good performance and sometimes they suggest the opposite, also depending on the lifecycle stage of the firm which is almost never defined in number of years of the firm. Therefore, firms of the sample which age from 4 to 7 years cannot be a priori considered as part of a particular stage suggested from a particular author and provide

information to the software regarding the usual presence of centralization for the performance; ultimately because our study seeks primarily to test lifecycle and configurational theories regarding new ventures' organization.

Table 9. Truth Table output from data elaboration through the software fsQCA

| VER_DIFF | HOR_DIFF | FORM | CENTR | ST_DIFF | ST_NICH | ENV | number | CAGR_sales | raw consist. |
|----------|----------|------|-------|---------|---------|-----|--------|------------|--------------|
| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 8 | 1 | 0.909 |
| 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 0.873 |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 0.871 |
| 1 | 1 | 1 | 0 | 1 | 1 | 0 | 9 | 1 | 0.860 |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 0.845 |
| 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0.825 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0.802 |
| 0 | 1 | 0 | 0 | 1 | 1 | 0 | 5 | 1 | 0.792 |
| 0 | 1 | 1 | 0 | 1 | 1 | 1 | 5 | 0 | 0.790 |
| 0 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0.785 |
| 0 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 0 | 0.785 |
| 0 | 0 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 0.767 |
| 0 | 1 | 1 | 0 | 1 | 1 | 0 | 15 | 0 | 0.749 |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 0.744 |
| 0 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 0.728 |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 6 | 0 | 0.717 |

Source: personal elaboration

4.2.2 Presentation of results

The solution reported in Table 10 have been displayed following the scheme provided by Fiss (2011) who has been the first author to display intermediate and parsimonious solutions in once through the use of “core” and “peripheral” conditions. Indeed, \otimes indicates that the conditions should be absent for the outcome, \bullet indicates that the condition should be present, bigger symbols indicate that the condition is “core” and part of the parsimonious solution while smaller symbols indicate that the condition is “peripheral” and part of the intermediate solution. The parsimonious solutions are 4 while the intermediate are 5, hence there are two intermediate solutions that exhibit the same “core” conditions (1a and 1b).

The solution also displays three tools for assessing the value of causal configuration in connection with the outcome: consistency, raw coverage, and unique coverage. Similarly to consistency scores in the Truth Table, consistency scores provided in the fsQCA solution for each configuration refer to the consistency of a causal combination as a subset of the outcome (Ragin,2008). All our solutions are above the threshold for acceptable consistency (0.8). The second tool useful to assess results is “coverage” which refers to the “proportion of the sum of the membership scores in an outcome that a particular configuration explains [...]”, “raw coverage” scores refer to the proportion of the outcome scores covered by an explanation by itself, while “unique coverage” refers to the proportion of outcome scores covered, net of that solution’s coverage overlap with the other solutions identified” (Ragin, 2008, p.79). The overall solution coverage and consistency are measure the same construct for all configuration and assess the validity of the bundle of configurations 1a, 1b, 2, 3, 4.

The configurations present in the solution have to be interpreted as a sequence of logical operations that highlight alternative combinations of Vertical Differentiation, Horizontal Differentiation, Formalization, Centralization, Niche Strategy, Differentiation Strategy, and High Turbulence. Therefore, the solution suggests that in order to achieve high performance, new ventures have to either:

1a- Be vertically differentiated, not horizontally differentiated, not centralized, formalized, focus on a niche market, and not be in a turbulent environment;

1b- or be vertically differentiated, be horizontally differentiated, formalized, focus on a niche market, have a differentiation strategy, and not be in a turbulent environment;

2- or not be vertically differentiated, not be horizontally differentiated, be centralized, not be formalized, exhibit a niche strategy, not exhibit a differentiation strategy therefore exhibit a strategy based on cost leadership, and not be in a turbulent environment;

3- or not be vertically differentiated, be horizontally differentiated, not be centralized, not be formalized, exhibit a niche strategy, exhibit a differentiation strategy and be in presence of a turbulent environment;

4- or not be vertically differentiated, be horizontally differentiated, be centralized, be formalized, exhibit a niche strategy, exhibit a differentiation strategy, and be in presence of a turbulent environment;

where the underlined items are “core” conditions therefore can be seen as stand-alone results and a highly simplified solution per se while the others are “peripheral” conditions. The solution can also be formally written as:

| | |
|----|---|
| 1a | $VER_DIFF*\sim HOR_DIFF*\sim CENTR*FORM*ST_NICH*\sim ENV +$ |
| 1b | $VER_DIFF*HOR_DIFF*FORM*ST_NICH*ST_DIFF*\sim ENV +$ |
| 2 | $\sim VER_DIFF*\sim HOR_DIFF*CENTR*\sim FORM*ST_NICH*\sim ST_DIFF*\sim ENV +$ |
| 3 | $\sim VER_DIFF*HOR_DIFF*\sim CENTR*\sim FORM*ST_NICH*ST_DIFF*ENV +$ |
| 4 | $\sim VER_DIFF*HOR_DIFF*CENTR*FORM*ST_NICH*ST_DIFF*ENV.$ |

Table 10. Final organizational configurations

| | Stable Environment | | Turbulent Environment | |
|-------------------------------------|----------------------|-------------------------|---------------------------|-----------------------|
| | Bureaucratic Control | Flexible Centralization | Informal Decentralization | Formal Centralization |
| | 1a | 2 | 3 | 4 |
| Structure | | | | |
| Vertical Differentiation | ● | ⊗ | ⊗ | ⊗ |
| Horizontal Differentiation | ⊗ | ⊗ | ● | ● |
| Centralization | ⊗ | ● | ⊗ | ● |
| Coordination Mechanisms | | | | |
| Formalization | ● | ⊗ | ⊗ | ● |
| Strategy | | | | |
| Niche Market | ● | ● | ● | ● |
| Differentiation | ● | ⊗ | ● | ● |
| Environment | | | | |
| High Turbulence | ⊗ | ⊗ | ● | ● |
| Consistency | 0.89 | 0.87 | 0.84 | 0.8 |
| Raw Coverage | 0.12 | 0.2 | 0.13 | 0.15 |
| Unique Coverage | 0.03 | 0.08 | 0.05 | 0.03 |
| Overall Solution Consistency | 0.86 | | | |
| Overall Solution Coverage | 0.40 | | | |

Source: personal elaboration

4.2 Description and interpretation of results

As mentioned in Paragraph 4.1.2, the results obtained (Table 10) have to be explained in their whole, as different patterns of causal conditions entailing high performance of a new venture. This is one of the differences in the interpretation of results from the classic regression analysis. Each configuration is analyzed in this section first from a descriptive point of view and second from a lifecycle perspective. On one hand, I provide a description of the configuration suggested by the solution and some possible explication of the particular interrelation of variables, and on the other hand I connect the longitudinal study carried out in Chapter 2 with the findings in order to find which lifecycle theories, more than others, have suggested a similar configuration. The findings have been divided in two groups: one that includes configurations of new ventures facing a stable environment (Paragraphs 4.2.1 and 4.2.2) and another that includes configurations of new ventures facing a turbulent environment (Paragraphs 4.2.3 and 4.2.4).

4.2.1 Configurations of new ventures facing a stable environment (1a, 1b and 2): a descriptive approach

Configurations 1a and 1b exhibit the same “core” conditions but have different “peripheral conditions”, meaning that given the “core” condition –i.e. vertical differentiation- the organization can reach high performance following two different paths described by two different patterns of the remaining causal conditions. Therefore, both paths identify vertically differentiated firms, these two typologies of firms compete in a non-turbulent environment and in a niche market, and they also share a high level of formalization but differ in terms of specialization of roles and centralization. Indeed, both typologies provide for a multi-level structure both in presence of low horizontal differentiation and decentralization and without any particular level of centralization specified and high specialization. Given the fact that in both solutions 1a and 1b the environment is not turbulent and firms compete in a niche market, they subsist in a quite stable situation.

Configurations 1a and 1b share the same “core” condition –i.e. a high level of vertical differentiation. Therefore, the organization has a vertically differentiated structure which is

normally not the case in young firms that are usually prescribed to have a simple and flat structure (Miller, 1986; Mintzberg, 1979). Siggelkow & Rivkin (2005) put forward the view that the “Hierarchical Archetype” is a way to lessen departments’ power since normally departments do not have a veto power but they keep generating alternatives for the top management level which exerts a final decision. Configurations 1a and 1b are in some sense similar to the “Hierarchical Archetype”, even though this construct was not specifically built for new ventures, because they share the “core” condition of having multiple hierarchical levels. Conversely, they differ in terms of centralization since this characteristic plays a greater role in the “Hierarchical Archetype” than in our findings. The same configurations (1a and 1b) can also be seen as an example of the “mechanistic structure”, similar to the Weberian bureaucracy, that Burns & Stalker (1961) defined suitable for stable environments since tasks are “distributed among specialist roles within a clearly defined hierarchy” (p.6).

Since both configurations 1a and 1b exhibit an elevated level of formalization, even though not a core condition, it seems that our findings confirm the “mechanistic structure” of Burns and Stalker (1961) mentioned above. However, these studies are said not to have been tested enough on new ventures instead of only with regards to more established organizations (Sine, Mitsuhashi and Kirsch, 2006). Only a restricted number of authors (Stinchombe, 1965; Walsh & Demar, 1987) focused on the particular role of formalization in new ventures. Stinchombe (1965) advocated that new firms need an increased level of formalization and in general a greater array of managerial resources if compared to established firms since they require a structural frame in order to face greater uncertainty. Walsh & Demar (1987) suggested that even though formalization in the long term could increase bureaucratization and slow down the firm’s activities, in young organizations it could promote performance and effectiveness since formalization can decrease communication time and enable a prediction of the performance in the short term.

The classical studies of Weber (1947), Pugh et al (1968), Hinings & Lee (1971), Child (1972) found positive correlations between formalization and vertical span of control and between functional specialization and formalization. Findings 1a and 1b seem to support the first type of correlation suggesting the need to formalize roles and procedures once hierarchical levels are added, while only 1b supports the second. The reasons behind the correlation between horizontal differentiation and formalization are that when there is a need for an increasingly specialized staff, the use of standards and procedures enable a successful coordination,

however configuration 1a seems to challenge this hypothesis because it exerts a lack of horizontal differentiation and a high level of formalization.

Configuration 1b is similar to what Harris and Raviv (2002) define as a “functional hierarchy”. Authors provide that optimal organizational designs are the results of a trade-off between the cost of employing an increased number of middle managers and the expected benefits from the coordination that they would achieve. The CEO opportunity cost -i.e. the time and efforts in the coordination and gain of information- can be reduced through the use of middle managers if these figures allow the CEO to reduce his time by enhancing company-wide interactions and provide information. Indeed, reductions in opportunity costs of the CEO lead to greater centralization. Following the view of Harris & Raviv, the configuration 1b is a situation in which middle managers probably have an intermediate cost and the opportunity cost of the CEO is not as high to justify the use of a decentralized structure.

Configuration 1a, instead, does not find an identical configuration in the organizational design literature. The only work that supports a slightly similar structure is the study conducted on 1955 high tech small firms by Cosh, Fu & Hughes (2010). Authors found that a decentralized and formalized structure support the ability of the firm to innovate since “decentralised decision-making, supported by a formal structure and written plans, supports the ability to innovate in most circumstances and is superior to other structures” (Cosh, Fu & Hughes, 2010, p.300).

Configuration 2 includes core conditions of absence of both horizontal differentiation and formalization. This is also the unique combination in the whole solution that presents a peripheral condition of absence of differentiation which is equivalent to the pursuing of a cost leadership strategy. The unique (“peripheral”) conditions of presence are centralization and niche strategy. A possible interpretation of configuration 2 is the situation of a firm which has a role similar to that of a subcontractor or of a corporate spin-off, intended to compete not based on innovation but based on productive capacity achieved by satisfying orders and needs provided by a restricted and stable niche of clients and responding to a unique boss (high centralization and low vertical differentiation). Therefore, the focus is both on flexibility and centralization.

This view is supported by the findings of Siggelkow and Levinthal (2003) who found that in the short-term, organizations that are decentralized are able to change the set of activities more quickly than in centralized firm, and in the long-term there is no effective coordination

benefit of having chosen a decentralized or centralized structure. Even if we lack information regarding configurations of firms competing in the mass market which is normally more challenging than a niche market, we can say that configuration 2 is situated in a very stable environment since low turbulence is associated with competition in a niche at a cost leadership strategy, therefore there are no pressures to innovate but a need to produce at a lower cost to satisfy the restricted set of clients. Therefore, centralized but not highly vertically and horizontally differentiated nor formalized organization is the optimal solution. This configuration is also similar to the classic “simple structure” (Miller, 1986; Mintzberg, 1979) which the literature normally assigns to new ventures since specialization, bureaucratic controls and management levels are not required and therefore kept at minimum. Moreover, the strong and imaginative CEO is the key figure of this structure, since his actions enable a quick response in case of environmental change.

4.2.2 Configurations of new ventures facing a stable environment (1a, 1b and 2): a lifecycle approach

We found evidence of similarities between the three configurations of new ventures facing a stable environment (1a, 1b and 2) and some authors’ provision for organizational configurations in the lifecycle literature. In particular, we found evidence that a big part of lifecycle theorists describe situations very similar to configuration 2 at the very beginning of the lifecycle and configuration 1b during the second macro-stage as identified in Chapter 2 of this thesis –i.e. following the summary model of Hanks et al. (1993).

All lifecycle authors analyzed in the first part of this thesis provide little or zero formalization at the beginning, which corresponds to little planning and explicit informality of practices (Quinn & Cameron, 1983), and recognize the necessity for the organization to formalize some practices only in the second stage (Greiner, 1972; Galbraith, 1982). Concerning specialization, authors prescribe that in the first phase “the owner does everything [...] the owner is the business [and he] performs all the important tasks” (Churchill & Lewis, 1983, p.32). Adizes recognizes, at the beginning of the second stage, the presence of some division of labor and, at the same stage-level, Greiner points out that “jobs assignments become increasingly specialized” (1972, p.60). Moreover, all authors start to acknowledge the growth of hierarchy around the second stage. At the very beginning it seems that the owner is in

charge for everything and he is the one directly supervising others (Churchill & Lewis, 1983). Kazanjian (1988) points out that, at one point, some critical functions start to be given away to key managers or contracted out, suggesting that the organization grows by recognizing the need to increase its structure as Greiner suggest. Theories provide a general increase in decentralization that reaches its apex corresponding to the third or fourth stage. Churchill & Lewis (1983) provide that at the end of the first macro-stage the organization assumes a functional structure; Specialization and Decentralization contemporarily rise at significant levels. In fact, the owner starts to move apart and functional managers acquire some of his former duties. In configuration 1b, the presence of the “don’t care” logical condition corresponding to the centralization dimension highlights that the situation of centralization and that of decentralization are almost equivalent for the performance. Ultimately, it seems that configuration 1b well summarizes lifecycle theories’ differences in providing a centralized (Greiner, 1972) or decentralized structure (Churchill & Lewis, 1983) corresponding to the second macro-stage.

In conclusion, lifecycle theories seem to support a progression from configuration 2 to configuration 1b and this progression is also supported by more recent studies:

“Organization structure will exhibit a sort of “life cycle” as the organization grows in complexity and size. In particular, we show that the structure will progress from a flat but highly centralized structure to a divisional hierarchy, to a functional hierarchy, and then either to a matrix structure or to a flat, highly decentralized structure” (Harris & Raviv, 2002, p.855).

Configuration 1a seems, instead, to describe a situation in which, given a stable environment, the organization is already formalized, decentralized, vertically differentiated but not already specialized. It could reflect a hybrid or temporary phase where formalization is already present and specialization is anticipated by decentralization of decision-making. Concerning this last point, Adizes provides some theory that connects Decentralization and Specialization: on one hand, the author asserts that the delegation of “non-programmed decisions” implies Decentralization; on the other hand, some “programmed decisions” can be delegated since they concern production and administration issues, ultimately increasing Specialization. Configuration 1a also supports the presence of formalization in new ventures which is almost never observed by lifecycle theorists and whenever present usually consists in accounting-related activities such as record-keeping and cash forecast (Scott & Bruce, 1987). Both configurations 1a and 1b seem to provide support to the observation that:

“Life cycle theorists then seem to ignore formalization's role in establishing early efficiency and effectiveness; instead, they focus on its relationship to deceleration and, by implication, possible ineffectiveness and decline. This is an interesting counterpoint to the organization empiricists who focus on formalization's relationship to efficiency and not on its role in deceleration” (Walsh & Deman, p.222, 1987).

Therefore, the role of formalization, seen as embedded in a bundle of other facilitating conditions for the new venture performance should probably be revised from what lifecycle theories prescribed and could, instead, assume a positive function in new ventures' organizations.

4.2.3 Configurations of new ventures facing a turbulent environment (3 and 4): a descriptive approach

Configuration 3 and 4 are best seen together since they both exhibit environmental turbulence as core condition, and show a niche focus, a differentiation strategy, horizontal differentiation and absence of vertical differentiation as peripheral conditions. They only differ in terms of centralization and formalization which in configuration 4 are prescribed as present and in configuration 3 are prescribed as absent. Moreover, configuration 3 exhibits the absence of formalization as a core condition while configuration 4 exhibits the presence of centralization as a core condition. From these findings, it seems there is a sort of substitution mechanism between formalization as “core” condition of absence and decentralization as “peripheral” condition (configuration 3, named Informal Decentralization) and; on the other hand, presence of centralization as “core” condition and presence of formalization as “peripheral” condition (configuration 4, named Formal Centralization).

Configuration 3 is similar to what Cohen, Ledford & Spreitzer (1996) define as self-managed teams. Indeed, this configuration resembles a group of individuals that are able to adjust their behavior regarding as entire set of activities. They maintain discretion over important decisions such as work scheduling and methods (Goodman, Devadas & Hughson, 1988). Usually the teams' members dispose of a great variety of skills in order to complete the set of activities they are assigned to, and they receive feedback based on performance and self-regulate the actions to undertake sometimes without a direct supervisor.

To some extent, the same configuration is similar to what Ward, Bickford & Leong (1996) defined as the category of “broad differentiators” which develops from the classical concept of “adhocracy” provided by Mintzberg (1979) and connects environmental, strategic and organizational design similarly to what we have done by applying fsQCA to our dataset. Indeed, “broad differentiators” face a complex environment because of the different markets they serve and the innovation they try to pursue. Regarding structure, they exhibit a decentralized and non-bureaucratic form, since they necessitate to be close to customer needs and competitors’ actions. They also exhibit specialization which supports a differentiation strategy. Configuration 3 seems to be coherent with this description except for the fact that, differently from “broad differentiators”, it follows a niche strategy instead of a broad market. Authors provide also examples of “broad differentiators” such as IBM and General Motors. Therefore, we can affirm that configuration 3 highlights the situation of firms much moderate in size and of younger age that pursue, on a smaller scale, similar configurations to what Ward, Bickford & Leong (1996) define as “broad differentiators”. Indeed, it equivalently faces a turbulent environment, probably because of the type of niche markets it focuses on and the level of competition. In this sense it seems that the category of “niche differentiators” overlaps the one of “broad differentiators” and the simple structure that authors provide for the first category does not fit some others firms that exhibit a similar strategy but face a more turbulent environment.

Configuration 4, instead, points out that in turbulent environment a successful configuration is primarily centralized (“core” condition) but also flat, horizontally differentiated, and formalized. The only work that supports this configuration is a study which revises the classical theories of Burns and Stalker (1961) which are said not applicable to new ventures (Sine, Mitsuhashi and Kirsch, 2006) drawing on Stinchcombe (1965) who had pointed out that a lack of structure formalization in the beginning could cause role ambiguity and therefore imply a disadvantage of new ventures vis-à-vis more established organizations. The study of Sine, Mitsuhashi and Kirsch (2006), conducted on 1,024 firms, suggests that new ventures performance is positively correlated to formalization, functional specialization and administrative intensity exhibited in founding teams. The unique dissimilarity with configuration 4 regards the last dimension which is “defined as the extent to which power is centralized in a few figures or diffused among several administrators, and organizations’ hierarchical configurations” (p. 123). Hence, configuration 4 suggests an organization contemporarily flat and centralized while the measure of “administrative intensity” provided

by Sine, Mitsuhashi and Kirsch (2006) does not distinguish between vertical levels and the measure of centralization.

In conclusion, configurations 3 and 4 find some support in the literature. Compared to the studies that support the first three configurations facing a stable environment, the works mentioned in this paragraph, mainly Sine, Mitsuhashi & Kirsch (2006) and Cohen, Ledford & Spreitzer (1996), take into account the young age of the organization and are particularly pertinent to the sample here used of new ventures.

4.2.4 Configurations of new ventures facing a turbulent environment (3 and 4): a lifecycle approach

Configurations 3 and 4 are diametrically different from every configuration that organizational lifecycle literature normally prescribe. In fact, authors usually prescribe a simple structure, similar to configuration 2, at the very beginning of the lifecycle and a functional structure, similar to configuration 1b, in a second stage. In lifecycle configurations there is nothing similar to what we defined an Informal Decentralization or a Centralized Formalization. Even in later stages, lifecycle theories never mention a decrease in formalization or an absence of hierarchical levels as prescribed in configurations 3 and 4.

This could indicate that lifecycle theories have been overcome by more recent studies regarding organizational design, or that the lifecycle approach is not well suited to describe the situation of new ventures facing a turbulent environment, or more simply that lifecycle theories which have been developed between the 60s and the 80s well describe a situation in which the environment is stable but poorly illustrate the actual situation of new ventures facing a turbulent environment. Ranson, Hinings and Greenwood (1980) provided a contingent view in which organizational design should be adapted in order to deal with environmental circumstances. In our study, by looking only at “core” conditions, it seems that new ventures facing a turbulent environment whether are not formalized or are strongly centralized. A clearer scheme emerges by looking also at “peripheral” conditions. Thus, in a situation in which firms face a turbulent environment and pursue a niche differentiation strategy, they are flat and specialized but differ in terms of formalization and centralization which are either both present or both absent.

4.2.3 Low performance assessment

I have also conducted a fuzzy-set analysis to find configurations leading to low performance (through the creation of a crisp set of firms showing below average performance) or not-high performance (through the set negation of the outcome “high performance”) as Fiss suggested (2011). However, no results have been found since consistency levels of each truth table row were all below the accepting threshold of 0.80. This makes sense since big part of the sample had performance levels above the point of maximum fuzziness (0.5) identified previously for each ATECO sector of reference. Therefore, while results clearly indicate configurations leading to high performance, no common configuration regarding structure, strategy and environment that leads to low or below average performance are found in the sample.

As a remainder, here it is provided some evidence from the literature for the above conclusion. Indeed, previous studies on “equifinality” which used multivariate regression analysis found that:

“In a suboptimal equifinality situation, the more an individual firm's configuration deviates from the preferred configuration type (i.e., the greater the misfit), the worse the firm's financial performance” (Payne, 2006).

However, the fuzzy set approach clearly overturns the hypothesis of symmetry and provides that:

“causal conditions leading to the presence of an outcome may be different from those conditions leading to the absence of the outcome” (Fiss, 2011, p.410)

Therefore, we cannot deduct that situations distant from the ones identified in solutions 1a, 1b, 2, 3 and 4 automatically lead to low performance, we can only describe the configurations associated with the outcome “high performance” since they are recognized multiple times in our sample as successful configurations.

4.4 Conclusions

In order to provide a final overview of our findings it is helpful to label configurations with significant appellations, summarized in Table 11 together with the main conditions of each configuration.

Table 11. Summary of configurations' conditions

| <i>Configuration</i> | | <i>Label</i> | <i>Conditions</i> | |
|--|-----------|--------------|--|--------------------|
| Structure Vertical Differentiation Horizontal Differentiation Centralization Coordination Mechanisms Formalization Strategy Niche Market Differentiation Environment High Turbulence | 1a | 1b | Bureaucratic Control - Multiple hierarchical levels - Managerial control - Minor focus on centralization | |
| | ● | ● | | |
| | ⊗ | ● | | |
| | ⊗ | | | |
| | ● | ● | | |
| | ● | ● | | |
| | ● | ● | | |
| | ⊗ | ⊗ | | |
| | ⊗ | | | |
| | ⊗ | | | |
| Structure Vertical Differentiation Horizontal Differentiation Centralization Coordination Mechanisms Formalization Strategy Niche Market Differentiation Environment High Turbulence | 2 | | Flexible Centralization - Cost strategy - Flat structure - Focus on centralization - Flexibility of actions | Stable environment |
| | ⊗ | | | |
| | ⊗ | | | |
| | ● | | | |
| | ⊗ | | | |
| | ● | | | |
| | ⊗ | | | |
| | ⊗ | | | |
| | ⊗ | | | |
| | ⊗ | | | |

| | | | | |
|---|--|---|--|------------------------------|
| <p>Structure</p> <p>Vertical Differentiation</p> <p>Horizontal Differentiation</p> <p>Centralization</p> <p>Coordination Mechanisms</p> <p>Formalization</p> <p>Strategy</p> <p>Niche Market</p> <p>Differentiation</p> <p>Environment</p> <p>High Turbulence</p> | <p style="text-align: center;"><u>3</u></p> <p style="text-align: center;">⊗</p> <p style="text-align: center;">●</p> <p style="text-align: center;">⊗</p> <p style="text-align: center;">⊗</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> | <p>Informal</p> <p>Decentralization</p> | <ul style="list-style-type: none"> - Multiple specializations - Self-managing teams - Informal interactions | <p>Turbulent environment</p> |
| <p>Structure</p> <p>Vertical Differentiation</p> <p>Horizontal Differentiation</p> <p>Centralization</p> <p>Coordination Mechanisms</p> <p>Formalization</p> <p>Strategy</p> <p>Niche Market</p> <p>Differentiation</p> <p>Environment</p> <p>High Turbulence</p> | <p style="text-align: center;"><u>4</u></p> <p style="text-align: center;">⊗</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> <p style="text-align: center;">●</p> | <p>Formal</p> <p>Centralization</p> | <ul style="list-style-type: none"> - Multiple specializations - Strategic center - Formal interactions | |

Source: personal elaboration

Hence, our findings are targeted on a sample of new ventures all competing in a niche market. Among these firms, two situations can be separated: configurations appropriate for firms facing a stable environment and configurations appropriate for firms facing a turbulent environment. Regarding the first set of configurations, we found that there are two configurations suitable for stable environments: Bureaucratic Control and Flexible Centralization types. Regarding structures suitable for turbulent environmental conditions, we found two possible configurations that we named Informal Decentralization and Formal Centralization.

When facing a stable environment, organizations focus either on hierarchical control and formalization or on centralization of decision-making processes together with flexible

specialization of roles and absence of formalization. In the Bureaucratic Control configuration, it seems that managers exert their influence through a well-defined structure, where formalization exacerbates the control of multiple hierarchical levels in the sense that each level's head should know what decisions he is prescribed to carry on and what he is not. In this way, centralization and the CEO opportunity cost (Harris and Raviv, 2002) are economized since formalization enforces the role that everybody in the hierarchy plays in order for a decision to take place. Therefore, the chain of command is clearly stated and some pre-defined type decisions can be delegated to lower levels (Siggelkow & Rivkin, 2005).

In a Flexible Centralization, instead, control is exerted by a specific manager or group of managers who do not need to formalize practices or to have multiple departments to count on in order to assign tasks inside the organization and are able to sustain the opportunity cost of processing information (Harris and Raviv, 2002). This configuration enhances flexibility, probably also due to the fact that the new venture competes in a niche and undifferentiated market. Indeed, there could be a variety of tasks to be assigned inside the organization that makes not convenient to formalize roles and practices since the firm responds to different needs of a restricted number of clients and does not properly compete in an open market. The example of a subcontractor provided in Paragraph 4.2.1 is useful to understand a situation in which, for the type of product provided by the organization, flexibility and centralized decision-making matter at the same time and, at least in those circumstances, make the organization performing.

In general, Bureaucratic Control and Centralized Flexible organizations are extensively described in the literature. The first is similar to the "mechanistic structure" (Burns & Stalker, 1961) suggested with regards to stable environments and the second is similar to the "simple structure" (Mintzberg, 1979) provided as the typical configuration assumed by new ventures in the first stages (Adizes, 1989; Churchill & Lewis, 1983; Galbraith, 1982; Greiner, 1972; Hanks et al., 1993; Kazanjian, 1988; Miller & Friesen, 1984; Quinn & Cameron, 1983; Scott & Bruce, 1987). Therefore, on one hand these findings confirm the "simple structure" as a common new venture configuration providing flexibility of action to the newborn organization and, on the other hand, draw the attention on the presence of multiple hierarchical levels and formalization in new ventures as sources of success instead of slowing attributes for decision-making as normally prescribed in more mature organizations. In conclusion, the Bureaucratic Control configuration confirms that the "mechanistic structure" provided by Burns and Stalker (1961) is not only suitable to established organizations but also

to new ventures facing a stable environment since they require a structural frame in order to face challenges typical of young firms, ultimately supporting the work of Walsh & Demar (1987).

When firms face turbulent environments, instead, our findings suggest that they commonly exhibit no vertical differentiation, high horizontal differentiation, and differ in terms of centralization and formalization. Therefore, either firms are both centralized and formal (Formal Centralization) or are both decentralized and informal (Informal Decentralization). One explanation of this substitution mechanism between presence of centralization and absence of formalization (mentioning only “core” conditions) could concern the role played by specialization in new ventures facing a turbulent environment.

On one hand, the Informal Decentralization structure, exemplified in Figure 18, suggests that different departments coordinate themselves in an informal way, without the need to formalize practices and, maybe, with the necessity to stay informal in order to stimulate exchanges of information and cross-building of new ideas. Similarly to what Cohen, Ledford & Spreitzer (1996) define as self-managed teams, this configuration resembles a group of individuals that are able to adjust their behavior regarding an entire set of activities. Usually the teams’ members dispose of a great variety of skills in order to complete the set of activities they are assigned to, and they self-regulate the actions to undertake sometimes without a direct supervisor. People in this type of organization speak the same language since their specializations have a common background. This can be the situation of a university spin-off directed at the research and implementation of a new drug therapy, where scientists should share their knowledge in order to build a new system and interchange information regarding different areas of expertise.

On the other hand, the situation of a Formal Centralization, exemplified in Figure 19, is a condition in which the organization needs a center in order to coordinate decisions and where some activities are required to be formalized. For example, this can be the configuration of a pharmaceutical consulting newborn firm, where differentiated expertise is present (scientists and R&D experts, market knowledgeable consultants, account managers etc.) and necessitates to be coordinated by a center, such as the team leader. This configuration exhibits a high level of specialization, but different specializations do not share the same background and a center is required in order to coordinate differentiated expertise.

It seems that there is some consequence between the two structures. In particular, Ndonzuau,

Pirnay & Surlmont (2002) studied academic spin-offs and suggested that during a second stage in the “global spin-off process” the organization requires some “liaison offices” in order to conciliate both technological and commercial development through the creation of a feasible business plan and a prototype. Therefore, in this example of academic spin-offs, the Informal Decentralization structure could be seen as the previous step to the Formal Centralization structure, where some coordinating roles start to be assigned to a strategic center and formalization supports interactions between different experts.

Figure 18. Informal Decentralization Structure

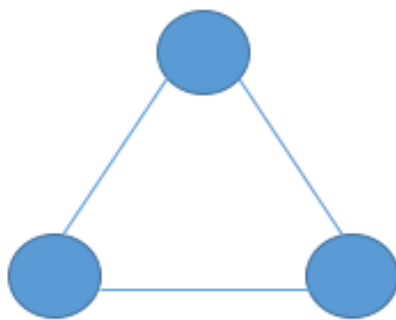
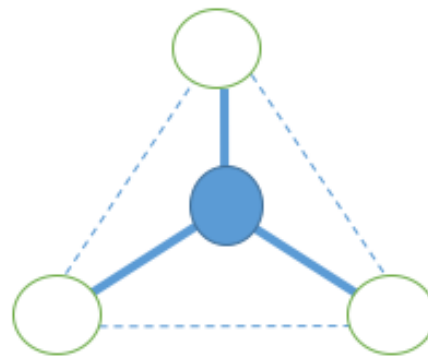


Figure 19. Formal Centralization Structure



Source: Personal elaboration

As already mentioned in Paragraph 4.2.4, the Informal Decentralization and the Formal Centralization configurations are diametrically different from configurations that the organizational lifecycle literature normally prescribe. In fact, authors usually prescribe a Flexible Centralization at the very beginning of the lifecycle, and a Bureaucratic Control structure in a second stage. This could indicate that the lifecycle approach is not well suited to describe the situation of new ventures facing a turbulent environment probably connected to the fact that the lifecycle literature dates back to the 60s, 70s and 80s. Following the contingent view of Ranson, Hinings and Greenwood (1980), organizational design needs to be adapted in order to deal with environmental circumstances. In our study, we assess that there are multiple configurations suitable for new ventures and, not only organizational design depends on different environmental conditions and strategies pursued, but also on the particular pattern of organizational design components themselves. The ultimate goal of “equifinality” is indeed the assessment of configurations and ultimately the display of the bundle of multiple components playing a role for the performance of the organization, seen as different ways to achieve the same outcome.

4.3 Limits of the research

Our findings seem to support studies that recently challenged the informal structure normally prescribed for new ventures (Walsh & Demar, 1987; Sine, Mitsuhashi & Kirsch, 2006). Some further research in this direction could support or disconfirm configurations hereby provided. It would be helpful to use a different sample of firms in order to test the present configurations in new ventures. Some limits of our research derive from the lack of a questionnaire perfectly suited for the use of the methodology fsQCA and the use of the Italian database ISTAT as source of information regarding the environment. ISTAT in fact did not provide detailed information regarding each ATECO sector after the second digit and some more reliable indexes to measure the environment (such as the concentration ratio) were present only for some sectors. Therefore, some assumptions have been done regarding the validity of the ISCO index and the Mortality Rate as measures of the turbulence of the environment.

One limit intrinsic to the methodology used (fsQCA) is that results depend on the process of calibration, therefore our findings depend on answers used from the questionnaire, choices made in the phase of calibration and identification of crossover points, and data gained from external databases –i.e. AIDA for the identification of the performance threshold and ISTAT for the environmental conditions. We tied the process of calibration to the existing literature regarding organizational design, however (as already pointed out in Chapter 1) the literature rarely explores organizational issues in new ventures. For example, we lacked information on what formalization really consists of in new ventures and how formalization differs in more established organizations, therefore we made assumptions regarding the fact that a new venture can be considered formalized if both roles and procedures show a positive membership score. Another constraint directly deriving from the use of fsQCA methodology is that our findings provide configurations leading to high performance in our sample, but do not provide information regarding what lies outside the identified configurations. Moreover, we were unable to find configurations leading to low performance, which could have given “a clear picture of asymmetric causality” (Fiss, 2011, p.410), since no cases exceeded the consistency threshold for the absence of high performance. Some further research in this direction could suggest configurations negatively impacting new venture performance and compare them to those suggesting positive performance, eventually identifying common management mistakes in new ventures.

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APPENDIX

Appendix 1. Questionnaire framework

ORGANIZZAZIONE

PD1. Al momento della fondazione, oltre all'Amministratore Delegato/Direttore Generale, quante altre posizioni intermedie erano presenti nella vostra azienda (es-: responsabile laboratorio, responsabile commerciale ecc.)? N° _____

PD2. Attualmente, oltre all'Amministratore Delegato/Direttore Generale, quante altre posizioni intermedie sono presenti nella vostra azienda (es-: responsabile laboratorio, responsabile commerciale ecc.)? N° _____

PD3. Al momento della nascita dell'azienda, in quanti eravate a prendere le decisioni chiave? N° _____

PD4. Oggi, in quanti siete a prendere le decisioni chiave in azienda? N° _____

PD5. Quale delle seguenti modalità di organizzazione del lavoro era adottata in modo prevalente nella sua azienda al momento della fondazione? (LEGGERE - RISPOSTA SINGOLA)

- Eravamo organizzati per aree, in base alle specializzazioni 1
- Eravamo organizzati per aree, in base al prodotto, servizio o cliente 2

PD6. Quale delle seguenti modalità di organizzazione del lavoro è attualmente adottata in modo prevalente nella sua azienda? (LEGGERE - RISPOSTA SINGOLA)

- Siamo organizzati per aree, in base alle specializzazioni 1
- Siamo organizzati per aree, in base al prodotto, servizio o cliente 2

PD7. Qual è l'attività prevalente svolta dall'imprenditore/gruppo imprenditoriale?

- Attività di coordinamento, controllo e orientamento strategico dell'impresa
1
- Attività quotidiane di supporto all'operatività dell'impresa
2
- L'imprenditore/gruppo imprenditoriale svolge entrambe le attività precedenti in maniera indistinguibile 3

PD8. Quali delle seguenti funzioni/aree sono formalmente costituite in azienda? (LEGGERE - POSSIBILE RISPOSTA MULTIPLA)

- Amministrazione, Finanza e Controllo 1
- Sistemi Informativi 2
- Organizzazione e Gestione Risorse Umane 3
- Ricerca e Sviluppo 4
- Produzione 5
- Marketing, Vendite e Servizi post-vendita 6
- Acquisti 7
- Controllo Qualità 8
- ALTRE FUNZIONI O AREE (SPECIFICARE NELLA SCHERMATA SUCCESSIVA)

PD9. Esprima il suo grado di accordo (in una scala da 1 in forte disaccordo a 7 in forte accordo), rispetto alle seguenti affermazioni. Rispetto al momento della fondazione...

1. oggi, i ruoli organizzativi sono progressivamente stati formalizzati (ad esempio sono state redatte delle job description oppure è stato creato un mansionario)
2. oggi, ciascun lavoratore è stato assegnato in modo esclusivo a un unico ruolo, cioè occupa il suo tempo per svolgere attività relative a un'unica area aziendale
3. oggi, le persone utilizzano nello svolgimento del lavoro procedure formalizzate a cui si devono attenere strettamente
4. oggi, all'interno dell'azienda sono formalizzati uno o più comitati stabili (es. comitato strategico, comitato prodotto)
5. oggi, per risolvere problemi temporanei, creiamo team ad hoc che durano per il tempo necessario a risolvere il problema
6. oggi, all'interno dell'azienda sono previsti uno o più ruoli di coordinamento trasversali rispetto a diverse aree di competenza aziendali (es. product manager)
7. oggi, l'attività quotidiana dei collaboratori è svolta prevalentemente in team
8. oggi il potere decisionale è accentrato nelle mani dell'imprenditore/Amministratore Delegato/Direttore Generale
9. oggi, i collaboratori dell'impresa sono coinvolti in misura attiva nella presa delle decisioni aziendali più importanti (es. allargamento della gamma prodotti, ingresso in un nuovo mercato, collaborazioni con altre imprese)
10. oggi, è aumentato il ricorso a sistemi di comunicazione e programmazione formalizzati (es. software gestionali, ERP)

PD10. Esprima il suo grado di accordo (in una scala da 1 in forte disaccordo a 7 in forte accordo), rispetto alla seguente affermazione.

- L'impresa verifica periodicamente l'adeguatezza delle procedure di lavoro e ne favorisce l'adattamento in funzione di cambiamenti tecnologici o di mercato

STRATEGIE DI COLLABORAZIONE, RETI E FATTORI CONTINGENTI

Parliamo delle strategie di collaborazione e delle reti di relazioni in cui è immersa la sua impresa. **Lo scopo è individuare il ruolo che hanno avuto nella crescita e i fattori che ne hanno influenzato l'efficacia".**

grado di accordo/disaccordo (1 = forte disaccordo, 4 = né disaccordo, né accordo, 7 = forte accordo).

Fattori contingenti

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------------|--|---|---|---|---|---|---|---|
| NA1 | nel settore in cui operiamo, la mia impresa è altamente innovativa (lancia prodotti/servizi radicalmente nuovi, brevetta) | | | | | | | |
| NA3 | nel settore in cui operiamo, la mia impresa adotta una strategia di nicchia, focalizzata su segmenti ristretti e particolari del mercato | | | | | | | |

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