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An Investigation into Conditions and Support for Innovation and Entrepreneurship in a Deep Crisis Context

Διερεύνηση συνθηκών και πρωτοβουλιών υποστήριξης για την καινοτομία και την επιχειρηματικότητα σε συνθήκες βαθιάς κρίσης

Thesis

submitted for the Degree of Doctor of Philosophy (PhD)

by

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ABSTRACT

This doctoral research unfolds in the intersection of innovation, entrepreneurship and policy studies, and is conducted in the Greek crisis context. The Greek crisis is systemic as it simultaneously concerns all sectors of the economy, the political system, institutions and the social conditions of the country's citizens. The research problem focuses on the conditions for innovation and entrepreneurial activity in a deep crisis context and how companies, support initiatives and policy-makers can adapt and act in order to create and sustain innovation in such a context.

The main theoretical underpinning of the research is the coevolution approach to studying emergence and evolution of organizations, in interaction with their environment. Coevolution is a theoretical lens in organization studies that spans levels of analyses and involves adaptation over time, thus it is particularly well fit to the research challenge undertaken. Complementary theories used are institutional, innovation systems and innovation policy theories.

A qualitative research methodology was adopted, driven by the need to collect contextual data and explore a topic where very little research was published when this research was initiated, in early 2014. Data analysis followed well-established templates for qualitative research with a theory-building underpinning. The main source of data was interviews with innovators in established firms, startups and young firms, with successful innovation outcomes during the crisis. A case study of Cosmote was also conducted. Further, interviews were conducted with innovation and entrepreneurship support organizations, and a large volume of secondary data was also triangulated into the empirical base of the research.

The main result is the development of an integrated conceptual model for innovation and entrepreneurial activity in a deep crisis context. It was generated from the codes, categories and aggregate theoretical dimensions emerging from the analysis. The model highlights crisis-induced conditions, crisis context conditions, and intervening conditions in the innovation process in the crisis context. Further, three distinctive paths of how companies have affronted the crisis were developed; the ‘resource control’, the ‘compensatory institutions’, and the ‘innovation network’ integrated path. Each path is also underpinned by one of the framing theories on which the research was based, giving further theoretical strength to the paths identified.

The model offers a promising framework for further study of innovation and entrepreneurial activity in a deep crisis context, bridging the innovation and entrepreneurship fields, and integrating four theoretical lenses; coevolution, institutions, innovation systems and innovation / entrepreneurship policy. It provides guidance innovators, policy-makers and researchers of how to develop coherent strategies and actions along three distinctive paths, and how alternative paths can be more or less relevant to follow, and theorize around, in order to affront specific problems and circumstances.

ΣΥΝΟΨΗ

Η διδακτορική αυτή έρευνα αναπτύσσεται μεταξύ των επιστημονικών κλάδων της καινοτομίας, της επιχειρηματικότητας και των δημοσίων πολιτικών και διεξάγεται στο πλαίσιο της ελληνικής κρίσης. Η ελληνική κρίση είναι συστημική, καθώς αφορά ταυτόχρονα όλους τους τομείς της οικονομίας, το πολιτικό σύστημα, τους θεσμούς και τις κοινωνικές συνθήκες των πολιτών της χώρας. Το ερευνητικό πρόβλημα επικεντρώνεται στις συνθήκες καινοτομίας και επιχειρηματικής δραστηριότητας, σε ένα πλαίσιο βαθιάς κρίσης, και στον τρόπο με τον οποίο οι επιχειρήσεις, οι πρωτοβουλίες υποστήριξης και οι υπεύθυνοι για τη χάραξη πολιτικής μπορούν να προσαρμοστούν και να ενεργήσουν κατάλληλα, προκειμένου να αναπτυχθεί και να ενθαρρυνθεί η καινοτομία.

Το κύριο θεωρητικό υπόβαθρο της έρευνας είναι η προσέγγιση της συνεξέλιξης (coevolution), ώστε να μελετηθεί η εμφάνιση και η εξέλιξη των οργανισμών σε αλληλεπίδραση με το περιβάλλον τους. Η συνεξέλιξη είναι μια θεωρητική οπτική στις οργανωσιακές μελέτες, που καλύπτει τα επίπεδα των αναλύσεων, και συνεπάγεται προσαρμογή με την πάροδο του χρόνου. Επομένως, είναι ιδιαίτερα κατάλληλη για την ερευνητική πρόκληση που έχει αναληφθεί. Συμπληρωματικές θεωρίες που χρησιμοποιούνται είναι οι θεωρίες θεσμών, συστημάτων καινοτομίας και πολιτικών καινοτομίας. `

Η μεθοδολογία της ποιοτικής έρευνας υιοθετήθηκε από την ανάγκη συλλογής συναφών δεδομένων και διερεύνησης ενός θέματος, πάνω στο οποίο είχαν γίνει πολύ λίγες δημοσιεύσεις, όταν ξεκίνησε η παρούσα διατριβή στις αρχές του 2014. Η ανάλυση των δεδομένων ακολούθησε τα καλά καθιερωμένα πρότυπα της ποιοτικής έρευνας και θεμελιώθηκε σε ένα θεωρητικό υπόβαθρο. Η κύρια πηγή δεδομένων ήταν οι συνεντεύξεις με καινοτόμους σε εδραιωμένες, νεοσύστατες και νέες επιχειρήσεις με επιτυχημένα αποτελέσματα καινοτομίας κατά τη διάρκεια της κρίσης. Επίσης, διεξήχθη μια μελέτη περίπτωσης της Cosmote. Επιπρόσθετα, διενεργήθηκαν συνεντεύξεις με οργανισμούς υποστήριξης της καινοτομίας και της επιχειρηματικότητας και ένας μεγάλος όγκος δευτερευόντων δεδομένων επεξεργάστηκαν (μέσω της μεθόδου triangulation) στην εμπειρική βάση της έρευνας.

Το κύριο αποτέλεσμα είναι η ανάπτυξη ενός ολοκληρωμένου εννοιολογικού μοντέλου για την καινοτομία και την επιχειρηματική δραστηριότητα σε ένα πλαίσιο βαθιάς κρίσης. Δημιουργήθηκε από τους κώδικες, τις κατηγορίες και τις συσσωρευμένες θεωρητικές διαστάσεις που προέκυψαν από την ανάλυση. Το μοντέλο υπογραμμίζει τις συνθήκες που προκαλούνται από την κρίση, τις συνθήκες που πλαισιώνουν την κρίση, και τις συνθήκες που παρεμβαίνουν στην διαδικασία καινοτομίας, μέσα στο πλαίσιο της κρίσης. Επιπλέον, αναπτύχθηκαν τρεις διακριτές διαδρομές για τον τρόπο με τον οποίο οι επιχειρήσεις αντιμετώπισαν την κρίση: τον ‘έλεγχο πόρων’, τους ‘αντισταθμιστικούς θεσμούς’ και την ολοκληρωμένη πορεία του ‘δικτύου

καινοτομίας'. Εκτός αυτού, κάθε διαδρομή θεμελιώνεται από μία από τις θεωρίες που πλαισιώνουν την έρευνα, δίνοντάς της μεγαλύτερη θεωρητική ισχύ.

Το μοντέλο προσφέρει μια υποδομή με δυνατότητες για περαιτέρω μελέτη της καινοτομίας και της επιχειρηματικής δραστηριότητας σε ένα πλαίσιο βαθιάς κρίσης, γεφυρώνοντας τους τομείς της καινοτομίας και της επιχειρηματικότητας και ενσωματώνοντας τέσσερις θεωρητικές οπτικές: συνεξέλιξη, θεσμούς, συστήματα καινοτομίας και πολιτικές για καινοτομία /επιχειρηματικότητα. Παρέχει καθοδήγηση για τους δημιουργούς καινοτομίας, τους υπεύθυνους χάραξης πολιτικής και τους ακαδημαϊκούς ερευνητές σχετικά με τον τρόπο ανάπτυξης συνεκτικών στρατηγικών και δράσεων κατά μήκος τριών διακριτών διαδρομών, όπως και τον τρόπο με τον οποίο οι εναλλακτικές διαδρομές μπορούν να είναι περισσότερο ή λιγότερο σχετικές για την αντιμετώπιση συγκεκριμένων προβλημάτων και περιστάσεων.

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1 INTRODUCTION AND CENTRAL RESEARCH QUESTION

This doctoral research unfolds in the intersection of the academic disciplines of *innovation*, *entrepreneurship* and *public policy* studies, and is conducted in the Greek crisis context.

The research problematic relates to *what public and private players do* and *how they act and interact* in the process of building and implementing an ecosystem for innovation and entrepreneurship as a reaction against and a way of getting out of a national deep crisis context. This deep crisis context has 'developed' since 2010 and hit its bottom in 2014 as far as economic indicators are concerned (Krugman, 2015). The characteristics of the Greek deep crisis context can be summarized as follows (Enterprise Greece, 2015. Gogos & Kosma, 2014; Pasiouras, 2012; Zavras et al, 2013):

1. Loss of national solvency,
2. Economic recession,
3. Scarcity of funding for investments,
4. Austerity measures,
5. Discontinuous changes in institutional frameworks,
6. Escalating unemployment,
7. Political instability, and
8. Deep uncertainty regarding the viability of the public debt, which has exploded during the period.

To these is added the capital controls that took effect on June 28-29th 2015, which, together with the accelerating political uncertainty during 2015, culminating with the August 20 announcement of premature elections in September, have put an unforeseen stress on the private economy especially, including a one year return of the Athens Stock Exchange Index of -46.40% (as of August 26th 2015).

In spite of this unforeseen economic turmoil in a Eurozone country, entrepreneurship has become a buzzword in Greece during the crisis years, and a lever in the efforts to restore growth and create jobs in the absence of the traditional career alternatives in the public or private sectors, which have retracted substantially. Although the numbers are impressive, with over 50 institutions having been set up to support entrepreneurship, 95% of them launched since 2010, and more than 80 million Euro of seed capital available in 2013, the

Greek entrepreneurial landscape still lacks many elements of an ecosystem (Endeavor Greece, 2013). As the Endeavor study emphasizes, the state has also "ridden the entrepreneurship trend" (p. 5) setting up or funding many of these institutions and initiatives, lacking, however, a clear strategy for where to focus and how to effectively support the emerging startups and the innovation efforts engaged by established companies. Moreover, the parallel destruction of many of the countries industrial "commons", i.e., collective capabilities such as R&D know-how, engineering skills and manufacturing competencies (Pisano & Shih, 2009), makes both the access to resources and the prospects of local off-set markets extremely uncertain for startups.

Departing from the above, the broad research question to be investigated in this doctoral research can be formulated as follows:

> ***What are the conditions for innovation and entrepreneurial activity in a deep crisis context and how should companies, support initiatives and policy-makers adapt and act to create and sustain innovation in such a context?***

This question will be addressed from the perspective of the practicing innovator / innovating entrepreneur. The focal point of the research and the unit of analysis in the empirical work is thus the *Innovator*, whether he or she is a first-time entrepreneur launching a scalable knowledge-based startup, an owner/leader of an innovation-driven SME, or an innovation manager / innovation mission-holder in a larger enterprise.

We define entrepreneurial activity as "opportunity evaluation and subsequent opportunity exploitation" (Kollmann, et al, 2017, p. 280), and innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations" (OECD, 2005, p. 46).

The theoretical underpinning of the research is the *coevolution* approach to studying the emergence and evolution of organizations in interaction with their environment. Coevolution is a theoretical lens in organization studies that spans levels of analyses and involves adaptation over time (Lewin et al, 1999), thus it seems particularly fit to the research challenge we are undertaking.

The main bodies of literature that inform the research and constitute its conceptual base pertain to the areas of innovation systems (e.g., Malerba, 2005), entrepreneurship ecosystems

(e.g., Feld, 2012), public-private partnerships (e.g., Hodge & Greve, 2012), and policies and support mechanisms for innovation and entrepreneurship (e.g., Edquist & Zabala-Iturriagagoitia, 2012).

An initial ambition is to strive for an integration of the fields of innovation and entrepreneurship from a support initiative perspective. This is because although much of entrepreneurial activity involves innovation and entrepreneurs are critical to the innovation process both scholars and policy-makers tend to pursue research and interventions in separate silos that rarely meet and converge (Brem, 2011; Lindholm Dahlstrand & Stevenson, 2010).

The thesis is organized as follows: Chapter 2 introduces the broad area of entrepreneurship and innovation support. Chapter 3 describes and analyses the Greek crisis context and provides an overview of the emerging support structures for entrepreneurship and innovation that have been launched during this period. Chapter 4 reviews the important literature streams that will underpin the research and proposes a model for connecting these and guiding the data collection. In chapter 5 the research methodology is presented, and data collection and analysis methods are discussed. Chapter 6 presents and analyses the data, collected through interviews and analysis of relevant secondary sources, along the main literature streams reviewed in chapter 4. Chapter 7 provides a complementary validation and adds conceptual richness to the results emerging in chapter 6 through the analysis of a single case, Cosmote, the leading Greek telecommunications provider. Chapter 8 presents the integrated model of innovation and entrepreneurial activity in the Greek deep crisis context, and answers the research questions. Chapter 9 presents the theoretical and managerial contributions. In chapter 10 finally, general conclusions, limitations and directions for further research are discussed.

2 INNOVATION AND ENTREPRENEURSHIP SUPPORT – AN INTRODUCTION

The literature stream with the most direct impact on the present research is studies that deal explicitly with the structure, organization, processes, conditions, outcomes and problems/difficulties of public interventions in favour of innovation and entrepreneurship. As Lerner (2010) emphasizes, the academic literature presents arguments both for and against such interventions. For our purposes we limit the scope to research that put forth the potentially positive impact, without ignoring of course the different inefficiencies, mismatches and even waste of resources that sometimes characterize public support initiatives. We structure our analysis around three fundamental questions: Why, What and How support should be provided?

2.1 Why Should Governments Support Innovation and Entrepreneurship?

Lerner (2010) identifies three fundamental rationales from a review of extant literature. First, it is widely recognized that *innovation favors economic growth* by getting more out of the same level of input. Countries or regions with consistently high level of innovation, which implies on the one hand effective R&D and new knowledge creation, and, on the other, an effective entrepreneurial tissue to bring new offerings to markets (Diniz & Sequeira, 2012) are also consistently leading both economic and social development (Furman et al, 2002; Sarasvathy & Venkataraman, 2011).

Second, entrepreneurship –entrepreneurs and their startup ventures- is needed in order to *bring new discoveries to the market*, and can also be a *source in itself for stimulating innovation* (Lerner, 2010). Microsoft, Apple, Amazon, Google, Facebook or Instagram are only the top of the iceberg of new entrants, starting as tiny ventures in garages, university labs or startup communities, that have fundamentally transformed industries, creatively destroyed other, or even created entirely new ones.

Third, there is the assumption that *public institutions actually effectively can promote entrepreneurship, innovation and the related essential ingredient of venture funding* (Lerner, 2010). The approach governments should adopt is crucially dependent on the industrial eco system in a particular geographical, technological and socio-economical space. It is widely recognized that innovations 'run in packs' (Van de Ven, 2005), are dependent on industry 'commons' (Pisano & Shih, 2009) and that entrepreneurship communities have to be driven by entrepreneurs themselves (Feld, 2012). Hence, public initiatives should support and

facilitate these eco systems, not 'impose' what they should or not should do, or artificially try to 'force' them in particular directions.

To sum up, public bodies should support innovation and entrepreneurship because both are directly linked to economic and social development, and the one needs and reinforces the other. Moreover, new entrepreneurial ventures both generate inventions and act as between-takers shuffling inventions through the laborious paths from labs (or garages) to markets. However, support must be canalized to favor and facilitate natural innovation and entrepreneurship processes which are grounded in eco systems of interrelated technological, economical, social and even cultural factors and conditions.

2.2 What Should be Supported?

Research on entrepreneurship and innovation dynamics, which aims at understanding these processes by exemplification and/or generalization, focus mainly on the conception, funding and execution of new ventures (Short, et al, 2010) or on the transformation of SMEs towards more innovation-driven business models and outputs (Knockaert et al, 2013). These areas, conception, funding, execution and transformation, are also reflected in most of the public interventions encountered.

Support for *conception* of new ventures will typically comprise some kind of semi-structured process ranging from idea generation and team formation, to definition of an initial business model and completion of a presentable to financers and other stakeholders business plan (Brinckman et al, 2010). Presentation and communications skills, pitching exercises and networking events are also important ingredients of support processes for conception.

The external equity *funding* support available for new ventures (we do not consider in this research debt financing) can be grouped in three categories: Venture Capital (VC), Angel Capital (AC) and Crowd Funding (CF). There is also Seed Capital (SC), which, however, is limited to symbolic amounts intended to support execution of a nascent business model, rather than actually funding a venture in exchange of some tangible gain.

Venture Capital is held in and canalized to entrepreneurs through some kind of structure or institution. Bertoni & Tykvová (2012) propose a typology of VC, distinguishing between:

- Two fundamentally different types of investors, i.e., governmental and private venture capitalists,

- Two transaction structures, i.e., syndicated and stand-alone deals,
- Syndicated structures either *led* by private investors or by governmental investors, and
- Syndicated structure either *composed* of investors of the same type (homogeneous structures) or of both private and governmental investors (heterogeneous structures).

Business angels differentiate from venture capitalists in that they act as individuals investing own money. Synthesizing the literature, Mason (2006, p. 261) define business angels as "high net worth individuals who invest their own money, along with their time and expertise, directly in unquoted companies in which they have no family connection, in the hope of financial gain".

Crowd funding, finally, is the process by which an entrepreneur raises external financing from a large group of individuals, generally by using on-line social networks, with each providing a very small amount (Belleflamme et al, 2013). Compared to VC and AC, CF is a relatively new phenomenon, enjoying an impressing growth in the funds collected (Hui et al, 2014). Combinations of the three basic forms of funding support can be found, which, however, requires particular attention to the underlying financer strategies, especially when venture capitalists and business angels coinvest (Bonnet & Wirtz, 2012), as well as to legal limitations, especially upper equity limits, or restrictions on number of possible owners of a registered firm (Griffin, 2012).

Support for *execution* intervenes after any process of conception and most often in parallel with searching and hopefully obtaining some kind of external funding. The aim is to provide a supportive environment to business plans and venture projects that have already taken some initial steps in terms of disposing of a completed business plan, prototypes and preliminary customer feedback from experiments conducted in test markets. Support for execution must take into account the heterogeneity of entrepreneurs, teams and ventures, thus providing flexible structures and processes (Lerner, 2010) ranging from technical assistance to accompanying immersion into entrepreneurship communities and networks (Scillitoe & Chakrabarti, 2010). Ideally, any structure for execution support should also be able to infuse some amount of seed capital throughout the process.

Support for *transformation towards innovation* concerns incumbent companies and is essentially focused on SMEs. There is a long tradition of regional, national and supranational innovation policy interventions and support efforts for the development of regional and/or sectoral innovation systems, paralleled in academic research which extensively analyzes

these phenomena (Martin, 2012; Radosevic & Yoruk, 2013). Innovation support initiatives for SMEs rest on the assumption that there are size-related characteristics determining the needs and nature of support, including limited financial, human and management resources, a smaller knowledge base, limited bargaining power in SMEs' relations with the environment, as well as cultural particularities (North et al, 2001).

2.3 How Should Support be Provided?

Business Plan- or Business Idea Competitions is what most frequently is found as support mechanisms for venture *conception*. Today, any competition worth the name initially provides some support that aims at funneling individuals, or teams most commonly, through a process that will transform a business idea into a business model design and full business plan, before short listing most promising plans, and ultimately awarding some 1-3 high-potential plans in some way, most often comprising a symbolic monetary award. The business plan will be the outcome of an iterative design and planning process where there is dynamic interaction between planning and learning in view of evaluating options and making decisions (Chwolka & Raith, 2012). Business schools play and important, but sometimes contested role in supporting venture conception (Aulet, 2013). Today, the conception process extensively leans on the game-changing 'lean startup' approach (Blank, 2013; Ries, 2011). Its core ingredients are rapid hypothesis-testing with customers, business model prototyping using, e.g., the business model canvas (Osterwalder & Pigneur, 2010) and pivoting, which means re-iterating the business model until enough fit with markets is achieved to permit experimental launch of the venture.

The main obstacle to attracting *funding* is lack of knowledge about how to get the attention from investors (Basu et al, 2011; Ebbers & Wijnberg, 2012), whether these are venture capitalists or business angels (crowd funding being a different game). The reasons for this are many. New venturers and investors speak different languages, entrepreneurs get carried away by their game-changing product or service seeing the financial aspects of their business as being of secondary importance, and, for many, there is simply lack of knowledge in financial matters and lack of know-how about how to present, communicate and bring forth those key aspects and key words that investors look for in their interactions with startups (Petkova et al, 2013). Hence, the financial and financing aspects of new ventures should be omnipresent in any support initiatives accompanying both conception and execution. In conception, focus

should be on financial knowledge and the language of investors; learning how to make financial calculations and predictions, and, above all, how to put forth the revenue models and streams and the aspects of growth and scalability in the language of investors. In execution support, financers should be integrated in networking activities and hands-on technical support as well. When it comes to crowd funding, the legal issues in local markets must be made clear and venturers informed about different forms of crowd funding, e.g., pre-ordering and profit-sharing (Belleflamme et al, 2013) and platforms tailored to crowd funding such as Kickstarter (Kickstarter, 2014).

When it comes to supporting the *execution* of new business plans and business models, this is what incubator initiatives are designed for. The incubation process normally includes both business and technical assistance through networking and counseling interactions between the entrepreneur, the incubator management and the incubator's wider recourse base (Scillitoe & Chakrabarti, 2010). The conclude that a common route to entering incubator is to have arrived at a high position in a business plan competition, hence, the business plan competitions is used as a selection process for incubation. In the era of lean startup, some incubators also organize a fast-track process in terms of or 'boot camps' of intensive training in business model design and business planning (Hochberg, 2015). The result of an incubation process, which normally lasts between 12 and 18 months, is a revenue-generating business with great growth potential and that can stand on its own before exiting the incubator.

Concerning *innovation support* for SMEs, the volume of policy interventions and public money spent unfortunately often remain unmatched in the actual innovation results in terms of innovations launched in the markets and their impact on economic growth or intellectual value added (Fischer et al, 2009). Programs tend to fail if they are over-engineered, add restrictions on several dimensions, present goals diverging from those of the businesses targeted or fail to address the pragmatic needs of companies (Lerner, 2010; Massa & Testa, 2008). Hence, initiatives must recognize and address these shortcomings.

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From the above it seems clear that the field of entrepreneurship and innovation support is in burgeoning development. Situated at the crossroads of economic development, academic research, and business/management practice, it involves tight connections and dynamic interactions among a wide range of different players. Hence, besides its dimension of

practical application –hands-on interventions by public and/or private players in conception, funding, execution and transformation of new ventures and innovation projects- it has strong systems and societal dimensions, and is also heavily rooted in and dependent on the context where entrepreneurs and innovators reside and act.

Before delving into the theories that underpin the field, we therefore review the Greek economic and business context, which, unfortunately, since 2010, has been marked by a persistent deep recession with an unprecedented within the EU negative impact on economy, employment, institutions and the moral of citizens in general. This deep crisis context, however, must be turned around, and one of the ways to head out of it could be a conscious and consistent approach to the support and development of new ventures and innovation projects.

3 THE GREEK CRISIS CONTEXT AND THE EMERGING ENTREPRENEURSHIP AND INNOVATION LANDSCAPE

The socio-economic crisis currently unfolding in Greece has led to a dramatic GDP drop and an equally dramatic explosion of unemployment. The Greek crisis is systemic (Fotopoulos, 2010) in that it simultaneously concerns all sectors of the economy, the political system, state governance, institutions (banks, education, healthcare...) and the social and even humanitarian conditions of the country's citizens.

As counter-forces to this problematic situation, a plethora of initiatives are being launched, aiming at promoting and supporting innovation and entrepreneurship as motors for growth and job creation. A common characteristic of most initiatives is that they involve both public and private players, in some cases also NGOs, or other institutional organizations.

3.1 The Greek Crisis Context

Triggered by the global credit crisis that bust out with the Lehman Brothers bankruptcy in September 2008, Greece faces a large and stringent economic crisis with huge challenges, such as the low rate of growth, escalating debt and large unemployment (26.4% in July 2014). In terms of unemployment, the youth has been hit the strongest with around 50% of those under 28 being unemployed (50.60 % in October of 2014). There was a delay before the crisis hit Greece full front as GDP in 2009 was still higher than in 2008, and the first drop occurred in 2010. Since then drop has continued and the 2014 GDP is approximately at the same level as that of 2006. After five years of economic collapse accompanied by political instability, no less than three parliamentary elections, one referendum, and capital controls since June 28-29 2015 midnight, Greece is still in the longest-lasting economic turmoil of any EU member state since the foundation of the Union and social tensions are high.

Several studies conclude that the austerity measures undertaken by the Greek government had small redistributive effect in relative terms while they led to important effects in absolute poverty, i.e., stable over time in real terms (e.g., Matsaganis & Leventi, 2012). The austerity measures have thus contributed to the crisis, although they have also highlighted the significant role of more fundamental problems of the Greek economy such as the weak production structure, low competitiveness, public service bureaucracy and malfunctioning, slow adoption of technology and innovations, etc. (Mitrakos, 2014).

From 2009, Greek public debt exploded as the country entered into one of the most serious economic downturns in its modern history (Eurostat, 2013), Figure 1. The total estimated debt end 2014, is as much as 320 billion as illustrated in Figure 2.

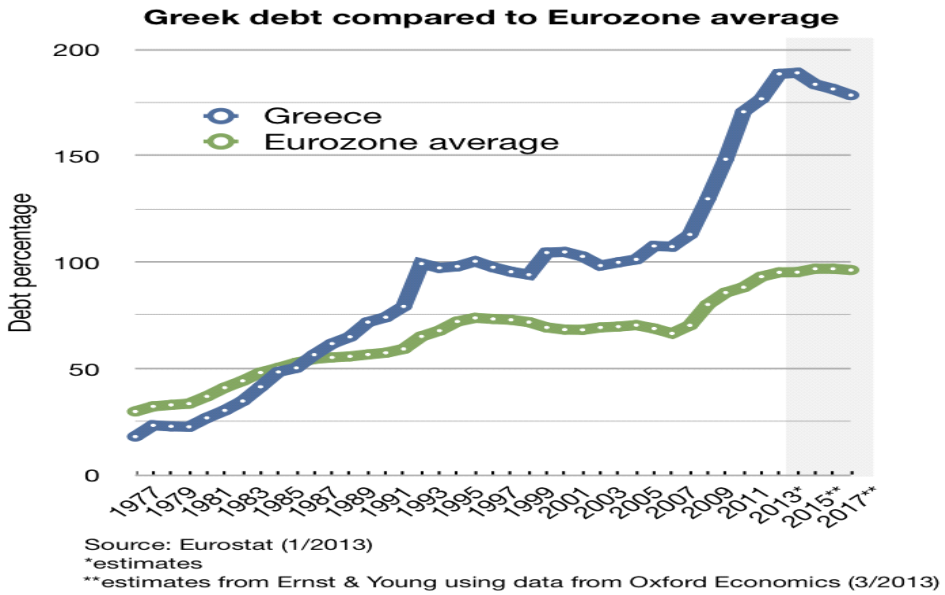

Figure 1. Greek Debt Compared to Eurozone Average (Eurostat, 2013).

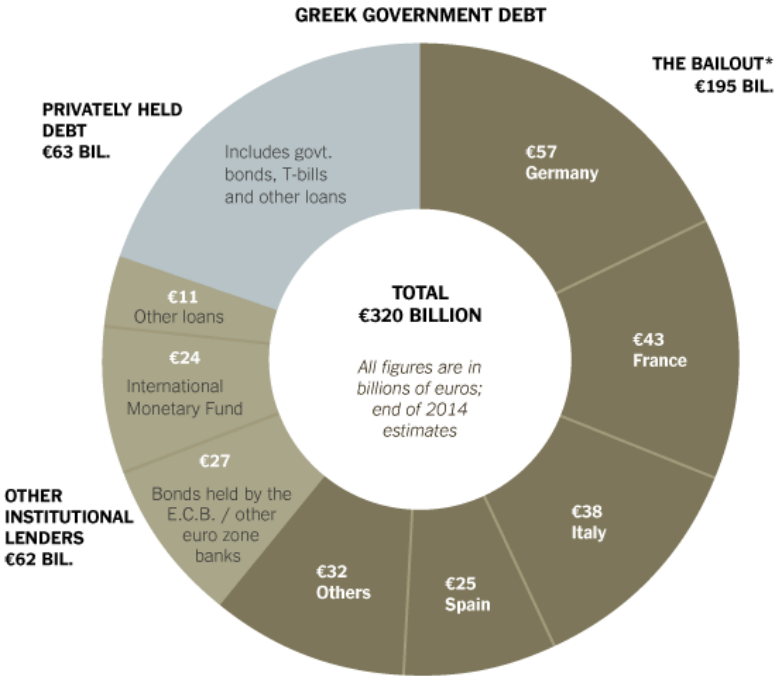

Figure 2. Greek Government Debt (New York Times, 20/8/2015).

The economic policies pursued during the last decades, which have been unmatched by the country's real economy, productive power and fiscal system – especially tax collection (Arghyrou & Tsoukalas, 2011), have led Greece to factual bankruptcy, only avoided by the implementation of a series of rescue packages, or Economic Adjustment Programs, provided by the European Commission, the European Central Bank and the IMF. The economic crisis revealed problems that have existed and in many cases worsened for many years. Greece entered the euro area in 2001 and it was believed that the new strong currency would protect for future economic problems, however, "Greek governments of 2001-2009 did not implement sound economic policies, thus allowing further deterioration of fundamentals" (Arghyrou & Tsoukalas, 2011, p. 13).

From the 1960s until the early 1970s, Greece's macroeconomic performance was impressive. During the 1980's started a period of stagflation and the explosion of public debt begun. In the 1990s Greece launched several structural reforms and efforts of fiscal stabilization, in order to secure its participation in the future Eurozone. Important reforms were indeed implemented, although flawed statistics were reported at least since 1997 (European Commission 2010a). The years between 2001 and 2007 *looked* good for the Greek economy; it was one of the fastest growing in the Eurozone with an annual growth rate of 4.2%, foreign capital flooded the country, the unemployment declined, and the public debt to GDP ratio was consolidated up until 2006 (European Commission 2010b). Despite that, the country continued to record high budget deficits each year, debt was not used for investment and growth-sustaining reforms but for consumption, all while fiscal control remained highly inefficient (European Commission 2010b). Simultaneously, the purchasing power of the employee middle class started to decline due to the uncontrolled euro-inflation phenomenon (Dziuda & Mastrobuoni, 2009) that became known in Greece as *ακρίβεια* - *akrivia*, i.e., 'expensiveness' of common goods compared to the before-euro era in particular and to other Eurozone and European economies in general. Hence, when the global economic crisis busted in 2008, Greece was already in a weak position. Macroeconomic policy could not avert a deep recession, which embraced almost the entire world. It was against this background that the Greek sovereign debt crisis took place (Alogoskoufis, 2012).

In May 2010, the country was put under the supervision of the European Commission, the European Central Bank and the International Monetary Fund, and signed the Economic Adjustment Program and its revision in autumn 2010. From 2010 and onwards the recession intensified considerably due to country's fiscal imbalances (Enterprise Greece, 2015). Since

then, the financial crisis has affected all the major sectors of the Greek economy with all principal economic indicators showing a significant deterioration (Zavras et al, 2013):

- GDP per capita has fallen by close to 23% between 2009 and 2014 (Figure 3). It corresponds to a fall from 94% of the EU average in 2009 to 73% in 2013. Things turned out to be worse in Greece in 2010, with real GDP growth falling by 4.5 per cent (EU-15: +1.8 per cent). This was mainly due to the highly restrictive fiscal policy, which had an adverse effect on domestic demand (Pasiouras, 2012).

Figure 3. GDP per Capita in Greece 2006-2014. Source: www.traidingeconomics.com and World Bank.

- The unemployment rate in Greece remains stuck at close to its highest level since the onset of the economic crisis (25.8% as of November 2014), see figure 4.

Figure 4. Unemployment Rate in Greece 2014. Source: www.traidingeconomics.com and World Bank.

- The youth has been hit particularly hard. Youth unemployment has the tendency to be super- cyclical, i.e. more responsive to fluctuations of economic activity that unemployment of older persons. The problems with youth unemployment in Greece could have persistent negative implications for an individual's subsequent career, in the sense that it could hurt his productive potential and later job opportunities (Gogos & Kosma, 2014). At the end of 2014, youth unemployment remains over 50%, figure 5.

Figure 5. Youth Unemployment Rate in Greece 2014. Source: www.traidingeconomics.com and World Bank.

- Greece experienced one of the largest falls in real wages across OECD countries (more than 5% per year on average since the first quarter of 2009) (OECD, 2014).

Serious consequences of the crisis have emerged beyond these indicators, in the real economy: Inability for private businesses to borrow money for investments, escalating taxation hitting low and middle income classes, discontinuity in tax and lea gal frameworks, and austerity measures in terms of salary cuts and layoffs (Gogos & Kosma, 2014; Matsaganis & Leventi, 2012; Mitrakos, 2014). Businesses are relocating to other countries (like Bulgaria) where taxation is much lower for enterprises than in Greece. Many young educated people have also decided to leave the country, in order to find better opportunities in other EU-countries. According to Endeavor Greece (2015), more than 200.000 Greeks, most of them younger than 35 years old, have left the country since 2010 and are currently employed abroad. Typically highly educated and skilled, they pursue a career mainly in the EU (71% of total). Within EU, Germany and UK are the most popular career destinations, absorbing more than 50% of migrating Greeks. Seven out of ten people who are about to complete their studies would gladly leave Greece abroad for a better chance (Botsiou & Klapsis, 2011).

Greek youth not only suffered from job destruction that was due to economic slow-down. They suffered even further from the fact that they are outsiders in a labor market that favors experienced employees. As a result, even in sectors that managed to retain employment, there was still uncontrolled job loss for youth. More so, this is the case in professions that have been the traditional dream for the Greek family: lawyers, doctors, bank employees. Youth seem to seek a way out mainly in sectors that are either underdeveloped (e.g., the social sector), or require specific skills only they have, e.g., ICT, or employ flexible and seasonal labor, e.g., tourism and commerce (Endeavor Greece, 2015).

Greece, in order to ensure sustainable growth and a positive budget balance, needs to focus on specific sectors with export value that simultaneously create high-quality jobs. It is of equally crucial importance to *improve* traditional industrial and service sectors, and to *create* new industries in high value-adding technologies and knowledge-based services. This requires the creation of a proper business eco system which nurtures, supports and connects high-impact businesses and new ventures (Endeavor Greece, 2013). An economy needs an

upstream innovation system, where public spending and public research is critical (Mazucatto, 2011), in order to be able to initiate entrepreneurial activities on a broader basis and connect them with innovative and productive incumbents (Nelson, 1993).

Although Greece's innovation system achieved a significant catch-up in key indicators such as R&D gross expenditure and R&D employees during the 20 years preceding the crisis (European Commission, 2003), R&D activity has remained comparatively low in relation to the EU 15 core group and the R&D and innovation landscape shows significant weaknesses. There has indeed been a wide range of public policies and programs implemented through European and national funds to stimulate innovation, but they lack focus on a clear national innovation strategy, which makes the Greek innovation problem systemic (Lioukas, 2009).

Integration of the crisis context is a central pillar of the present research. The crisis constitutes the background influencing all decisions and actions at the levels of individual entrepreneurs, firms, organizations, institutions, policy makers, government and even the European Union.

3.2 The Emerging Entrepreneurship and Innovation Landscape in Greece

In view of the above, Greece obviously fights from a very unfavorable position when it comes to developing innovation and launching entrepreneurial ventures. In their study on job creation in Greece for youth, Endeavor Greece (2015) emphasize that the current boom in startups is a good beginning though: "As their number doubles every year and as they attract local and international investment, they [startups] rapidly change the perception of entrepreneurship, establish inspiring role models and create solid success stories. We do need more and higher quality startups, better balanced among sectors and appropriately supported from idea to maturity in order to create more scale-ups and spin a multiplier effect" (Endeavor Greece, 2015, p 41).

Hence, priority should be given to addressing the systemic problems of fragmentation of structures and initiatives, weak collaboration among players and bureaucracy, while simultaneously focus support on Greece's comparative strengths in tourism, food, infrastructure and ICT, the latter emerging as a sector of potential growth with higher knowledge intensity compared to the other.

The Greek efforts could also potentially benefit from riding on the global wave of entrepreneurial activity. "Countries around the world have embraced the idea that programs to foster entrepreneurship are a worthwhile strategy for economic development. Now it’s time to start thinking about which programs are working". This quote (Business Week, 2013:1) from J. Ortmans of the Kauffman Foundation, a US think tank focusing on education and entrepreneurship, both highlights the current global entrepreneurship 'hype' and provides the rational for the present doctoral research. Startup communities, new venture incubators, business plan competitions and various support programs for innovation are mushrooming around the globe. According to the Endeavor Greece (2013) survey, the characteristics and needs of Greek entrepreneurs can be summarized as follows:

- The age of the majority of the entrepreneurs is between 25-34 (44%) and 35-44 (41%). The gender of the larger part of them (81%) is male, hence women are in minority.
- 42% have studied abroad, 30% in Greece, and 28% have their diplomas from both Greece and other countries. Hence 70% have at least partially studied abroad.
- The previous business activity for the most of them (37%) was in the private sector in Greece, 20% of them in the private sector abroad. Some of these entrepreneurs (18%) owned other business and 15% of them their family business.

- They are extroverted businesspeople who have experience, willing to supplement their knowledge with advice from the business community.
- They want to invest in high-quality resources, are ready to join networks and aim at alliances, and a majority want to compete internationally.

In conclusion, the Endeavor 2013 study emphasizes the following strengths and weaknesses in Greek entrepreneurial efforts:

1) Issue with quality rather than quantity of ventures - Generally the number of the incoming requests for funding and other support gives the impression of being adequate, but the quality is not the expected.
2) Entrepreneurs are praised for their commitment, aspiration, openness to feedback and strong academic background. Weaknesses are their limited business experience and their difficulties to execute.
3) Business ideas and ventures are praised for their innovation, but there are questions about clarity/focus of the underlying business plan, the monetization model and the future competiveness of the intended ventures.

Hence, support should primarily focus on business plan fine-tuning, networking at an international rather than on a local level, and under way support and instruction to drive to strategic ambitions.

Moreover, a large number of institutions supporting innovation and entrepreneurship have been set up over the last years. Endeavor has identified as many as of 55 in 2013, out of which 95% were non-existing in 2010. They group these along two dimensions, as illustrated in figure 6:

- Four categories of *support activities*, namely Finance, Network, Knowledge and Inspiration, and
- Five *phases of startup / firm development*, namely Idea, Product, Early Revenue, Scale-up and Mature.

These dimensions correspond closely to the intervention areas of conception, funding, execution and transformation (Knockaert et al, 2013; Short, et al, 2010) identified in chapter 2.

Figure 6. Support activities and venture phases of Greek entrepreneurship-related organizations. Source: Endeavor 2013, p. 39.

These institutions, which have been established over the last years, demonstrate the growing power of entrepreneurship in Greece. Even with their weaknesses and gaps, these actors can be seen as constituting the version '1.0' of a wider Greek entrepreneurship and innovation landscape, which must be created in order to confront the primary needs of entrepreneurs-knowledge/skills, networking, and funding-across sectors and stages, and also inspire the new generation of entrepreneurs. In synthesis, it comprises:

Despite the lack of many elements, in order to be a proper ecosystem, this entrepreneurial landscape is a substantial start. This landscape comprises more specifically:

1. Multiple one-off awards and competitions. However, almost sole focus on ICT, and many fail to follow up suitably after these events.
2. Big number of events, which inspire the Greek youth, and serve as a provider of a different Greece, based on creativity, innovation and extroversion. However, weak or fragmented follow up.
3. Incubators / accelerators are developing, but show high fragmentation and over-focus on ICT ventures.
4. VC vehicles are developing, with available capital in excess of 80 million essentially backed by EU funds (EIF/Jeremie). One seed capital scheme in progress. The number of international funds augments, exploring the opportunities across sectors.
5. Some examples of brilliant academics in public education system, which strive to promote and support entrepreneurship. However, initiatives are typically based on individual drive, rather than institutional support.

These characteristics are common for a new entrepreneurial landscape in shaping and becoming (Feld, 2012). Bottlenecks can be observed in specific areas, like incubators/accelerators, and venture/seed capital. Also, excessive focus on early stage ICT and lack of continuity between events and among players are apparent weaknesses. Mainly, there is a clear ‘supply and demand’ imbalance, meaning that the supporting organizations tend to have more or other kinds of capacity or resources than what startup ventures seek and demand.

Simultaneously, there are gaps in sectors like tourism, energy, food, and in growth stages, e.g., support for more mature companies. Addressing these gaps will bring the entrepreneurial

landscape closer to a more effective and complete version '2.0', which is where the present research aims to contribute.

The Endeavor 2013 report lays out various directions for the development towards a 2.0 entrepreneurial ecosystem in Greece, with direct implications for the research:

1. Consolidation or scale-up of existing players in certain areas (accelerators, co-working spaces) would be necessary, permitting them to reach bigger size and perfection their services. This would facilitate integration in these schemes by the highest possible quality candidate startups, reinforcement of the interactions and exchanges with international networks, and access to high level mentor and investor pools.
2. Emergence of new players or expanded focus of existing ones to cover gaps in business sectors, in venture growth stages and in niche areas such as social entrepreneurship.
3. Cooperation and partnerships between players to ensure full spectrum and continuity of support. This should also include interaction with public bodies to establish public policy groups.
4. Channelling of both corporate and state-driven initiatives and underlying budgets through a selected set of existing players rather than pursuing own facilities and infrastructure. This would limit the problem of fragmentation of small initiatives with final little impact.
5. Channelling selected investments by international funds and angel investments to later stage companies that have proven their viability through local players and VCs.
6. Expand and strengthen ties in the community of existing and aspiring entrepreneurs.
7. More effective role of educational institutions.
8. More effective participation of Greek diaspora.

These guidelines will be used when generating questions and critically assessing the current state of support initiatives in Greece. In particular the problem of fragmentation will be addressed trying to understand why it happens, what drives the establishment of new players/initiatives and why new are created rather than existing ones growing and consolidating?

Summing up, Greece has always presented strong tendency towards entrepreneurship. However, there has never been a consistent public policy and consistent public support to strengthen and support this. Moreover, entrepreneurs and the state have often perceived themselves, and been perceived in general, as pursuing antagonistic interest. During the persistent crisis of the recent years, companies have met unprecedented difficulties and unemployment has exploded. Entrepreneurship of a new to the Greek context kind has indeed emerged as the counterbalance for business opportunities and also as an enabler for growth restoration and job creation. Nonetheless, it is clear that a large scale entrepreneurial increase has not yet fulfilled. Nor a sufficient 'ecosystem' has been created, in order to support entrepreneurship.

3.3 Developing the Research Questions Guiding the Exploratory Research

Based on this overview of the Greek crisis context and the emerging entrepreneurship and innovation landscape in the country, the central research question is broken down into five sub-questions in order to structure the findings around (1) *drivers* for innovation in the crisis context, (2) conditions specific to the crisis *context* that act for, or against, innovation, (3) conditions that *intervene* in the innovation process, both *from* the crisis context and as *a reaction to* the crisis context, (4) *mechanisms* developed in order to *affront the crisis-driven difficulties*, and (5) the development of an *integrated model* for managing and developing innovation and entrepreneurship in a deep crisis context. In consequence, the five sub-questions that will guide the exploratory research are formulated as follows:

1. What are the crisis-induced conditions that drive innovation and how do companies respond to these to use innovation as a way to affront the crisis?
2. What are the crisis context-specific conditions that act for, or against, innovation?
3. What are the conditions that intervene in the innovation process, both *from* the crisis context and as *a reaction to* the crisis context?
4. What are the most appropriate mechanisms that can affront specific crisis-driven problems?
5. What could an integrated model of innovation and entrepreneurial activity in a deep crisis context look like, and how could it be used to design company actions, support

initiatives and policies to moderate the effects of the crisis by creating and sustaining innovation?

Moreover, the results of the research will be related to the specific objective of entrepreneurship and innovation support and policy as a way to mitigate the crisis effects, and to the specific weaknesses identified hitherto, i.e., fragmentation and lack of a clear nation-wide innovation strategy for Greece.

***

The next chapter reviews the literature primarily relevant for understanding conditions for innovation and entrepreneurial development, and how these processes can be enhanced by the innovating organizations, support initiatives and policy-makers. Hence, we review, in order of appearance, coevolution theory, innovation systems theory, innovation and entrepreneurship policy, and institutional theory.

4 RELEVANT LITERATURE

Innovation's contribution to economic growth, social development, and firms' competitive advantage and performance has been well established in the extant innovation literature (Keupp et al, 2012). Since the early works of Schumpeter (1934, 1943), who defined innovation as new combinations driving economic change through industrial mutation (Sledzik, 2013), the field of innovation research has come to embrace a wide range of topics including types, dimensions, determinants, conditions and impact of innovation, studied at the macro-, organization- and micro levels, applying various theoretical lenses including institutional and evolutionary economics, networks, resource-based view, learning and change theories (Crossan & Apaydin, 2010).

Based on a systematic review of literature published since the early 1980s, consolidating the state of academic research on innovation, Crossan & Apaydin, (2010) define innovation as follows: "Innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome." (Crossan & Apaydin, 2010, p. 1155).

This definition confirms the tight connections and dynamic interactions among a wide range of factors and players that characterize innovation as a phenomenon, and that gives it strong systems and societal dimensions, as suggested in our introduction. A particularly significant observation in the above definition is that innovation "is both a process and an outcome". The present study is primarily concerned by innovation as a process.

Innovation and Entrepreneurship are closely linked, because, on the one hand, much of entrepreneurial activity involves innovation, and, on the other, entrepreneurs are critical to the innovation process (Lindholm Dahlstrand & Stevenson, 2010), acting as 'between-takers' in the laborious process of transforming opportunities into marketable offerings. Moreover, the turbulence produced by a high rate of business entry and exit activity, i.e., entrepreneurial activity, is in itself associated with higher levels of innovation in an economy. Hence, it makes sense to aim at convergence between innovation and entrepreneurship support activities, particularly when their goal is to foster new high-growth innovative firms (Atkeson & Burstein, 2011). In spite of this, and although the relationship between innovation and entrepreneurship is theoretically uncontestable and strikingly evident to any practitioner, both

scholars and policy-makers tend to pursue research and interventions in separate silos that rarely meet and converge. As Brem (2011) argues, in spite of the obvious strong relationship between the two, this is barely articulated among researchers in the respective fields.

The present research and the literature review that follows aim at pursuing along this still quite narrow integration path as "[both] innovation and entrepreneurship are inherently about management practice and creating change" (Bessant & Tidd, 2007, p.11).

4.1 Coevolution

The term coevolution first made its appearance in biology, in Ehrlich and Raven's (1964) study of butterflies and plants. It refers to the *simultaneous evolution of entities and their environments*, whether these entities are organisms or organizations (Baum & Singh, 1994). Coevolution is an established research framework in the biological and evolutionary sciences, and a newer entrant to organization studies, where, however, its proponents emphasize its potential to transform the field (Lewin et al., 2003).

In organizational terms, coevolution involves *identifiable elements* of a *self-organizing system* that *change permanently* through *interaction among its entities* and *recombining of its resources* (Langton, 1992). Langton stresses that this dynamic system interaction takes place at the 'edge of chaos', between structure and disorder, between fixed rules and inspiration, see also Brown & Eisenhardt (1998). Many researchers have been drawn to the idea of coevolution because of the realization that different levels of social organization—groups, subunits, organizations, industries, institutions, and economies—often change together (McKelvey, 1997; Murmann, 2003).

A part of evolutionary theory, coevolution has been developed to provide insight into how and why two or more populations can causally influence each other's evolution (Murmann, 2003, Norgaard, 1994). Importantly, co-evolution only occurs between populations and these must be separable (Murmann, 2003). in more recent work, Murmann (2012) includes changes to variation processes. He explains that in order to prove coevolution, one must be able to demonstrate that reciprocal (bidirectional) causal mechanisms between the populations influence change in at least one of the three evolutionary processes (i.e. variation, selection and retention).

Lewin et al (2006) state that firm strategic and organization adaptations coevolve with changes in the environment (competitive dynamics, technological, and institutional) and

organization population and forms, and that new organizational forms can mutate and emerge from the existing population of organization.

Figure 7 (Lewin et al, 1999) adds to the traditional focus of strategic management research (on the performance and conduct of the firm and the competitive dynamics of industries) the *institutional environment* as a source of constraints and opportunities of firm and industry adaptation, and the *mutual adaptation* of firm, industry, and institutional environments. The institutional environment is further differentiated to acknowledge, on the one hand, potential differences and outcomes related to country-specific variations, and, on the other, potential influences of extra-institutional effects (macroeconomic, technological, social, and political). Hence, the model of Lewin et al attempts to integrate the interplay between the adaptation of individual organizations, their competitive dynamics, and the dynamics of the institutional systems within which firms and industries are embedded.

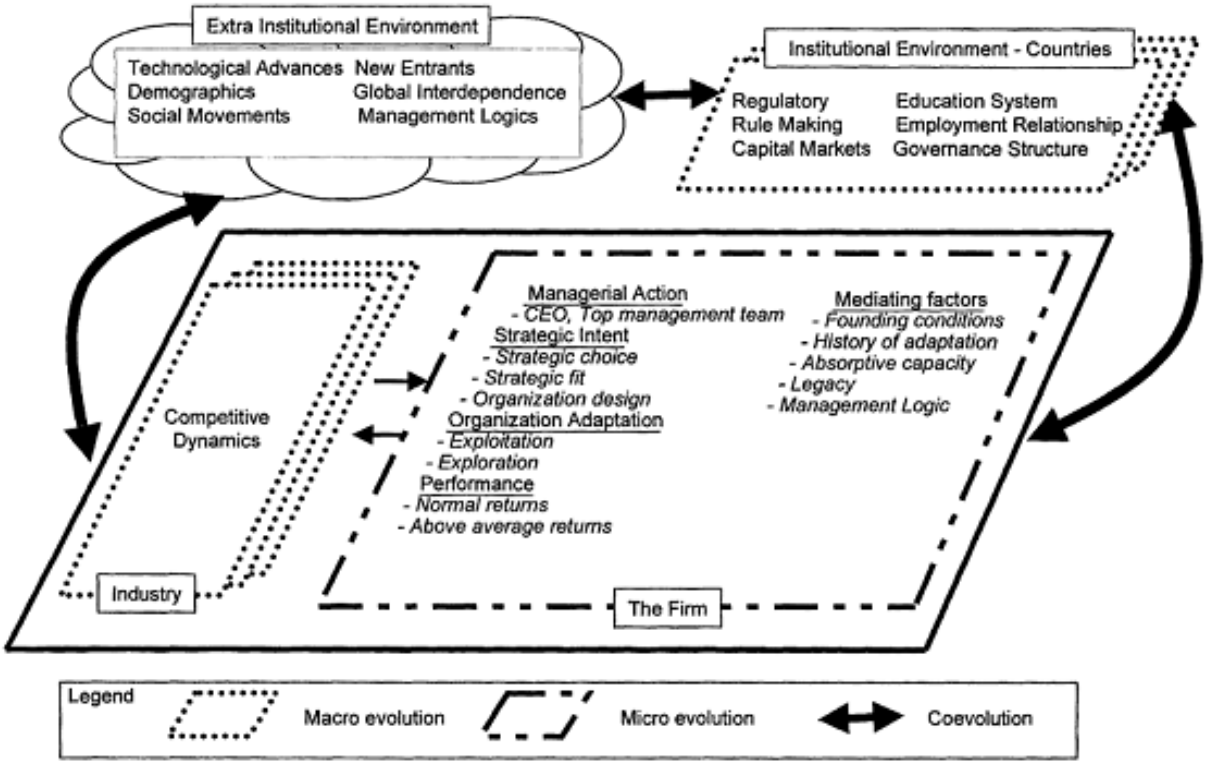

Figure 7. Coevolution of Firm, Its Industry, and Environment (Lewin et al, 1999, p. 537)

Developing further their reasoning, Lewin et al (1999) conclude on the following five institutional factors, slightly different from what they initially present in the figure: Role of government; Rule of law; Structure of capital markets; Culture (Individualism/Collectivism); Educational system.

Coevolution spans all levels of analysis and has been applied in the evolution of industries (Malerba, 2006), new organizations (Inkpen & Currall, 2004), new organizational forms (Lewin, Long, & Carroll, 1999), and new forms of adaptation (Lewin & Volberda, 2003). The fundamental criteria of coevolution (Futuyama & Slatkin, 1983) are:

a) *Specificity*, that the evolution of one entity is due to the evolution of other entities, and that evolution occurs between entities belonging to different populations,

b) *Reciprocity*, that different identified entities coevolve through interdependence, and

c) *Simultaneity*, that different identified entities coevolve concurrently.

All changes in all interacting organizations result from direct and indirect feedback. An organization that stimulates the evolution of another organization is, in turn, itself responsive to that evolution (Baum and Singh, 1994). Porter (2006) further emphasizes that what distinguishes coevolution from intended or induced strategy is that it is adaptive and emergent, unplanned and unpredictable, and unfolds at the edge of chaos.

Coevolutionary theory is a bridge between the prescient adaptationist and ex post selectionist perspectives of organizational change, countering the misperception that evolutionary arguments in management require human agents to act randomly, without intentions, when striving to develop new variations (Murmann,2012).

As an underpinning theoretical model for the present research, coevolution emphasizes the dynamic interactions between a wide range of *factors*, where evolutionary reciprocity should be identified, and *players* where maximum inclusion should be favored. Specificity, reciprocity and simultaneity are characteristics that provide a framework for analysing the coevolutionary dynamics of crisis-induced factors on the one hand, innovation conditions on the other, and the interconnections between these two sets of factors as well. Moreover, the model depicted in figure 7 provides a basic framework for classifying and analysing players in ecosystems.

4.1.1 Operationalizing the Coevolution Model

Using coevolution as a basis for empirical research presents many challenges because of its complexity and broad inclusion of a very large number of factors (Blankenberg & Buenstorf, 2016; Marks & Gerrits, 2017).

As data will be collected at the micro level of firms and support organizations, and as institutional factors will be analyzed through a focused literature review of institutions in the subsequent section 4.5, it seems most relevant to structure the data analysis from the coevolutionary perspective around the extra-institutional factors of Technological Advances, Social Movements, Global Interdependencies, and Management Logics (c.f., Figure 7).

4.2 Innovation Systems

The concept of innovation system has been dominating innovation studies over the last 20 years, since its introduction by Lundvall in 1985 and its widespread through the 1997 OECD report entitled 'National Innovation Systems'. The basic idea behind this concept goes back to Friedrich List (1841) and his concept 'national systems of production' that considers a wide set of national institutions including those engaged in education and training as well as infrastructures such as networks for transportation of people and commodities (Freeman, 1995). List's main concern, expressed in his book entitled *The National System of Political Economy,* was the problem of how Germany could overtake England in terms of economic power. For 'underdeveloped' countries (as Germany then appeared relative to England) he advocated not only protection of infant industries but a broad range of policies designed to accelerate or to make possible industrialization and economic growth. Most of these policies were concerned with learning about new technology and applying it. In this sense List argued in accordance with and anticipated contemporary theories of 'national systems of innovation' (Soete et al., 2009).

The Systems of innovation concept has been accepted and embraced by academics, researchers and policy-makers in a relative short period time. In spite of that, there is no unanimity on the definition of an innovation system, because the concept is yet evolving. A system may be defined as ''a set or arrangement of things so related or connected as to form a

unity or organic whole'' (Webster's). In technical terms, it can be seen as a set of interrelated components working toward a common objective. More specifically, systems are made up of:

- *Components* – the operating parts of the system (purposefully created *organizations* and emerging *institutions* - sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between organizations),
- *Relationships* – the links between the components, and
- *Attributes* - the properties of the components and the relationships between them.

Lundvall (1992, p. 34) gives both a narrow and a broader definition of a system of innovation. The narrow definition includes "Organizations and institutions involved in searching and exploring such as R&D departments, technological institutes and universities". The broader definition include "all parts and aspects of the economic structure and the institutional set-up affecting learning as well as searching and exploring - the production system, the marketing system and the system of finance present themselves as subsystems in which learning takes place".

Freeman (1987, p.1) defines a system of innovation as "the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies".

Edquist (1997, p. 14) defines a system of innovation as "all important economic, social, political, organizational, and other factors that influence the development, diffusion, and use of innovations".

Beije (1998, p. 256) finally, defines a system of innovation as "a group of private firms, public research institutes, and several of the facilitators of innovation, who in interaction promote the creation of one or a number of technological innovations [within a framework of] institutions… which promote or facilitate the diffusion or application of these technological innovations"

Synthesizing these early innovation system definitions, they all refer to the components and somewhat to the attributes of the system, leaving quite imprecise any specification of the relationships. Moreover, the function and purpose of an IS remain somewhat blurred. The definition of OECD (1997) narrows these voids by emphasizing that the interactions among the units in an innovation system can be technical, commercial, legal, social, and/or financial with the goal of the interactions being the development, financing, protection or regulation of

new science and technology. Carlsson et al (2002) also emphasize the function of an innovation system, beyond a policy buzzword, namely to generate, diffuse, and utilize knowledge and technology for innovation purposes, i.e., in order to create viable new offerings (Keely et al, 2013), which is a recent broad definition of innovation.

The relations between organizations and institutions, as Edquist (2001) states, are important for innovations and for the operation of systems of innovation, but also very complex and often characterized by reciprocity. This emphasis on the complex relations between components constitutes a major advantage of the Innovation Systems approach. However, it also constitutes a challenge since our knowledge about these relations is very limited. The relations between two phenomena cannot be satisfactorily investigated if they are not conceptually distinguished from each other. It is therefore important to specify the concepts and to make a clear distinction between organizations and institutions in order to be able to address the relations between them (Edquist, 2001).

In view of the complexity of innovation systems, their many components, intertwined relationships and variety of attributes, several indicators must be used when performance is analyzed. Further, the level of analysis applied and the degree of maturity of the technological components of the system must be taken into account (Carlsson et al, 2002). Coenen & Díaz López (2010) suggest a basic framework for studying innovation systems, by identifying and describing the following six dimensions:

1. System boundaries,
2. Actors and networks,
3. Institutions,
4. Knowledge,
5. Dynamics,
6. Policy implications.

To these dimensions is also added issues of training and employment incentives, to match the development of actors, networks and knowledge (Rodríguez-Soler &Brunet Icart, 2018). Relating the innovation system concept to coevolution, there are obvious parallels, although the IS literature emphasizes less the core phenomena of coevolution, which is evolution, i.e., development through variation, selection and retention. Lundvall (2005) attributes this to the fact that knowledge and learning have mostly been treated as black box concepts in the

innovation systems literature, while they are the core processes that tie the system together and nurture its dynamics. He argues that IS research must develop into "an analysis of how knowledge evolves through processes of learning and innovation" (p.11). This will strengthen the approach to innovation systems as coevolutionary creating diversity, selecting and retaining players, relationships and attributes in the interplay between production structure, technology and institutions.

Summing up, the innovation systems literature adds important components to the agenda of the present research:

- Basic systems thinking must be considered; What are the components, what are the relationships and what are the attributes of these components and relationships in the spatial and/or functional area where the initiatives are implemented? This corresponds to identifying and describing system boundaries, actors, networks and institutions in Coenen & Díaz López's (2010) framework.
- The black box of components and relationships should be opened up; What are the most important issues in terms of knowledge, technology, actors, networks and training / employment incentives that potentially will enhance or risk hampering innovation in the spatial and/or functional area in question? This corresponds to identifying and describing system actors, networks, institutions and knowledge in Coenen & Díaz López's (2010) framework.
- Components and relationships are interdependent as they coevolve. Knowledge and reciprocal learning processes are the drivers in this process of coevolution. Coevolution focuses on *agency* because it "considers organizations, their populations, and their environments as the interdependent outcome of managerial actions, institutional influences, and extra-institutional changes" (Lewin et al, 1999, p. 535). Hence, the actions and behaviors of some players will have effects on the actions and behaviors of other. This corresponds to identifying and describing the dynamics and policy implications in Coenen & Díaz López's (2010) framework.

Innovations systems can be approached in a variety of ways; they can be national, regional, sectoral, or technological. Hence, there can be both a spatial and a functional dimension to innovation systems. In the next sections we briefly review these subcategories of innovation systems.

4.2.1 National Systems of Innovation

The term “National Systems of Innovation” (NIS) was developed in the 1980s and connected with the names of Freeman (1987), Lundvall (1985) and Nelson (1993). According to Freeman (1995) Lundvall was the first who used the term “National System of Innovation”, but in published form, the expression was first used by Freeman himself in his book on technology policy and economic performance in Japan. Grounded in a tradition of country studies the NIS approach provided a new look at innovation and its governance and stimulation as compared to the more neoclassical, market failure approaches (Soete, Verspagen, and Ter Weel, 2010). Nowadays NSI is considered "one of the most important concepts to emerge in the field of innovation studies" (Martin and Bell, 2011: 896).

The focus on the nation state as unit of analysis for innovation studies provides some control of both organizations (e.g., educational, public support, specific firms…) and institutional variables such as practices, rules and laws, even some cultural traits. As such it lays a direct ground for policy-making that can influence and to some extent even control these factors. In an increasingly globalized economy, however, innovation rarely contains within national boundaries (e.g., Herstad, et al, 2014). In this reality the driving force of the NIS approach, national policy-making (Lundvall, 2005), is complemented or replaced by policies concerning regions, sectors or technologies (e.g., European Commission, 2010).

Due to its focus on the Greek crisis context, the present research first and foremost look into the innovation systems variables from an NIS perspective.

4.2.2 Regional Innovation Systems

Regional innovation systems (RIS) have gained the interest of academics, practitioners and policy makers over the last two decades. The RSI approach was developed mainly by scholars of geographic economy who were trying to understand the special role of institutions and organisations in the regional concentration of innovative activities (Asheim et al., 2003; Asheim and Gertler, 2005). The literature on the regional system of innovation highlighted the importance of tacit knowledge and hence geographical proximity, and borrowed learning by interacting from the NSI literature. Also, increasing returns benefit regions: if for any reason a region starts early in a new industry, it may attract entrepreneurs, scientists, engineers, and other relevant factors from other regions; new companies will emerge as spin-

offs of existing ones. Feedback processes will attract more skilled labour and training and employment initiatives will allow for competency development. This will bring in new companies and lead to new supporting industries and institutions. Such path-dependent processes explain the strong resilience of RSIs and the difficulties that new regions have in challenging incumbent agglomerations (Niosi, 2010).

The Regional Innovation System is a normative and descriptive approach that aims to capture how technological development takes place within a territory. It is generally conceded that the innovative performance of regions is improved when firms are encouraged to become better innovators by interacting both with various support organizations and firms within their region (Doloreux, Parto, 2004).

Breschi and Malerba (1997) defined "Regional Innovation System" as being a system (group) of firms active in developing and making a sector's products and in generating and utilising a sector's technologies; such a system of firms is related in two different ways: through processes of interaction and cooperation in artifact-technology development and through processes of competition and selection in innovative and market activities.

Malerba (2002) gave a different definition for RIS as being a set of new and established products for specific uses and the set of agents carrying out market and non-market inter-actions for the creation, production and sale of those products (p. 250).

Regional innovation system has an influence on innovation at regional level and thus it can also be assumed to have an influence on the competitiveness and success of a region (Seppänen, 2008). The external influences to a regional system of innovation come from other regional systems of innovations, from the national innovation system, and from international sources (Autio 1998, p.135)

Every industrial country, as well as the European Union (through, among other initiatives, the Regional Program for Innovative Actions of European Fund for Regional Development), has put in place some kind of regional-innovation policy. Observers have emphasized that effective regional policy requires a clear understanding of the initial conditions, the regions size, and the sectors they hope to expand (Niosi, 2010).

The present research is carried out only in the Attica (wider Athens) region in Greece. Hence, the observations made relate to organizations pertaining to the Attica regional innovation system.

4.2.3 Technological Innovation Systems

A Technological innovation system (TIS), by definition, is a network of actors, institutions, technologies, and the interrelations between them (Carlsson et al., 2002). TISs do not only contain components exclusively dedicated to the technology in focus, but all components that influence the innovation process for that technology (Bergek et al, 2008). The technological (innovation) systems framework has been developed to study the emergence and development of new technologies over time and to identify general patterns responsible for the course of such processes, including success and failure (Carlsson et al., 2002).

Technological systems involve market and non-market interaction in three types of network: buyer–supplier (input/output) relationships, problem-solving networks, and informal network (Carlsson,1997).

The structural components of a technological system are actors, institutions and networks.

- The actors may include not only firms along the whole value chain, universities and research institutes, but also public bodies, influential interest organizations (e.g. industry associations and non-commercial organizations), venture capitalists, organizations deciding on standards, etc (Bergek et al, 2008).
- Institutions are the core of the systems approach and can be defined as "sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals, groups and organizations" (Edquist and Johnson, 1997). Institutions may come in a variety of forms and may influence the TIS in different ways (Bergek et al, 2008).
- Networks can be perceived as modes for the transfer of tacit (Metcalfe, 1992) and explicit knowledge. A number of different types of networks are relevant. Some are orchestrated to solve a specific task (such as standardization networks, public-private partnerships etc), other networks evolve in a less orchestrated fashion and include buyer-seller relationships and university-industry links. Social communities, such as professional networks and associations or customer interest groups, may also be important to map (Bergek et al, 2008).

There is a practical Scheme of analysis (Bergek et al., 2008) that can be used to identify the key policy issues and set goals in any given TIS, see figure 8.The analyst needs to go through six steps (Bergek et al., 2008) :

- Setting the starting point for the analysis, i.e. defining the technological innovation system (TIS) in focus.
- Identifying the structural components of the TIS (actors, networks and institutions).
- Mapping the functional pattern of the TIS.
- Assessing the functionality of the TIS and setting process goals.
- Identify inducement and blocking mechanisms.
- Specify key policy issues.

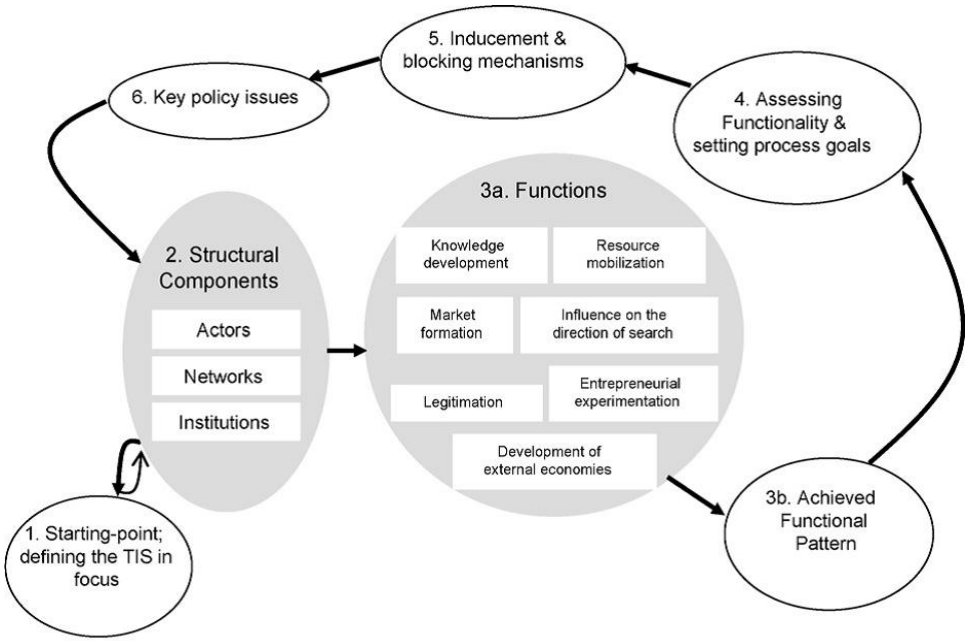

Figure 8. The scheme of analysis of Technological Innovation Systems implemented by Bergek et al 2008 (adapted from Oltander and Perez Vico, 2005).

To support technological innovation systems, policy measures should be more specific and directed to specific technology platforms (Godoe and Nygaard, 2006). In the present research there will not be any particular focus on specific technologies or technological domains. However, we retain from the above that similarly to the previous perspectives, actors, networks and institutions are the fundamental building blocks, to which are added knowledge development resources and competency development (training and employment incentives).

4.2.4 Sectoral Systems of Innovation

Innovation and technological change are highly affected by the sector in which they take place. The agents, the relationships among actors and the institutions of a sector all exert a major and profound influence on the differences in innovation across sectors (Malerba, 2005).

A sector is a set of activities that are unified by some related product group for a given or emerging demand and that share some basic knowledge. Firms in sectors have commonalities and at the same time are heterogeneous. Innovation in sectors has relevant systemic features. Sectoral system of innovation (and production) is composed of a set of agents carrying out market and non-market interactions for the creation, production and sale of sectoral products (Malerba, 2005).

A workable definition of a sectoral system of innovation and production is the following "A sectoral system of innovation and production is a set of new and established products for specific uses and the set of agents carrying out market and non-market interactions for the creation, production and sale of those products" (Malerba, 2002).

Sectoral systems have three broad dimensions that affect the generation and adoption of new technologies and the organization of innovation and production at the sectoral level (Malerba, 2002):

a) knowledge (and the related boundaries)

b) actors and networks

c) institutions.

Again, these are similar components to the other innovation system types reviewed. The agents comprising the sectoral system are organizations and individuals (consumers, entrepreneurs or scientists). Organizations may be firms and non-firm organizations (universities, financial institutions, government agencies, trade unions, or technical associations), including subunits of larger organizations and groups of organizations (Malerba, 2005).

Within the same sectoral system the profile of technological diversification among large firms is quite similar (Patel & Pavitt, 1997). Sectoral systems may take different features in different countries, and in different times. And in continuously changing environments, with historical processes going on and embedded in different countries, there is no way to identify an "optimal" sectoral system (Malerba, 2005).

4.2.5 Innovation Clusters

The notion of innovation clusters has emerged as an integrative notion of the spatial and functional dimensions of innovation dynamics. Cluster, is alternately used as synonymous with *industry-sector-technology* (Furman et al., 2002), and as synonymous with *region* (Oerlemans, et al, 2001). The result in the broader innovation dynamics literature has become its implicit use as an encompassing notion of space *and* sector (Ter Wal & Boschma, 2009). Clusters can also be at least partly national, thus NIS ideas are also relevant.

Calls for more integrative approaches of co-existing innovation systems continue to develop, questioning the existing conceptual boundaries of innovation systems as reviewed above (Meuer et al, 2015). They empirically show that different innovation systems co-exist and most often, but not always, integrate. Further, they propose two different layers of innovation systems: "a 'central' layer that hosts generic innovation systems and that constitutes the foundation for a second 'surface' layer that hosts regional and sectoral innovation systems" (p 888). The latter follow a technological imperative.

The present research will take these new developments into consideration, focusing both on the characteristics of existing components on innovation systems in the Greek reality and on their interactions.

Having reviewed theories and approaches that aim at describing and explaining how organizational entities act and interact to materialize innovation and new economic development, it is time to turn to the subject of innovation and entrepreneurship policies per se.

4.3 Innovation and Entrepreneurship Policy

The public policy field in innovation studies is vast, coincides with the innovation systems approach, and has a history that goes back to research policy and technology policy, notions coined in the 1960s and 1970s respectively (Fagerberg, 2015). It is coupled to the constant evolution of innovation dynamics, as shows the rapid discussion of policy implications and concrete policy guidelines proposed related to, for example, Open Innovation, one of the most recent developments in the innovation field (Chesbrough and Vanhaverbreke, 2011). Public investment in science and basic research plays an important role in developing new

technologies that become seedlings for innovation and entrepreneurship, as illustrated by the many high-tech commercial successes and fundamental innovations with deep and positive social impacts which had their roots in public research and would have been impossible to foresee from a strictly commercial point of view (OECD, 2007).

Fagerberg (2015) argues that a broad definition of what is meant by innovation policy; "all policies that have an impact on innovation" (p. 3), is the most appropriate. This reflects an understanding of innovation as "the entire process from the emergence of new ideas to their economic exploitation" (p. 3) because what interests policy-makers is how innovation becomes catalyst for economic growth and development of regions, nations and the society as a whole (Van Stel, 2009). It also reflects the broader aim of supporting innovation with public money; that besides being a vehicle of economic prosperity innovation also contributes to socially inclusive progress by reducing unemployment, poverty and social exclusion, particularly among disadvantaged and vulnerable groups (de Geus, 2011).

A review of literature and explicit policy white papers that provide recommendations for supporting innovation by entrepreneurial firms lead to the identification of five main categories of policies (table 1):

1. Funding,
2. Education and Human Capital,
3. Cooperation and Networking,
4. Institutional Conditions, and
5. Government Action.

References / Policy Categories	World Bank Group, 2013	OECD, 2010	Atkeson & Burstein, 2011; Fayolle, 2007; Laredo & Mustard, 2001; Sloan, 2001
Funding		Mobilise private funding for innovation.	Government funding for R&D. Direct and indirect subsidies. Tax credits and other tax benefits, such as deductibility of research expenses.
Education & Human Capital		Empowering people to innovate. Creating and applying knowledge, with an effective public research system.	Access to qualified workforce. Support development of entrepreneurship in the education system, with educators more responsive to the changing conditions of the marketplace in order to develop future entrepreneurs having the necessary skills that are critical for the survival of their business.
Cooperation & Networking	Strengthen linkages between public R&D and private sector users of technology and knowledge.	Encourage consumers to contribute to innovation Strengthening the framework for innovation Foster efficient knowledge flows, networks and markets	
Institutional Conditions including climate and culture for innovation	Build domestic science, technology, and innovation capabilities to make effective use of global knowledge.	Foster open markets. Foster markets for innovative outputs through appropriate regulation and institutional integration. Motivate enterprises to access new and/or foreign markets	Labor relations.
Government Action	Support public investment in R&D that focuses on improving efficiency and relevance to end users as well as on strengthening the use of research results in public policy decisions. Stimulate and support enterprises with high potential of jobs creation, export and high growth.	Invest in a knowledge-supporting infrastructure.	Encouraging managerial and administrative decentralization. Shortening distance between science and technology policymakers & the beneficiaries of their policies. Improving the governance and measurement of policies for innovation. Establish a strong linkage with policy and results. Smart regulations, standards, pricing, consumer education, taxation and public procurement

Table 1. Policy recommendations that encourage innovation by entrepreneurial firms.

Innovation policy, like entrepreneurship policy, has different meanings to different governments, thus, the policy instruments and measures encompassed in their policy implementation also vary widely from one government to another (Lindholm Dahlstrand and Stevenson, 2010). Upper-middle-income countries, such as Brazil, Chile and China give high priority to innovation to reinforce existing industry in their development plans, while lower-middle-income countries prioritize innovation and entrepreneurship to diversify from resource-based to knowledge-or innovation-driven development (World Bank Group, 2013).

Developing countries, and those nations seeking to rejuvenate their industrial base by seeking to pursue development strategies that foster growth, must build the capacity to acquire, disseminate, and use technologies to promote innovation and encourage new and existing firms to invest in business opportunities (World Bank Group, 2013). Innovation thus can become the means for diversification and exploitation of unique advantages that will reinstall national competitiveness. In this context some have requested support from OECD and UNCTAD for in-depth review of innovation policy in order to diagnose their innovation systems and identify policy priorities to enhance their innovation performance (World Bank Group, 2013).

There is a consensus it the literature that Governments need to go beyond the provision of narrow push measures that target the first occurrence of a new product (Fagerberg, 2015) to address policy and market failures that dampen entrepreneurial activity and limit the scope for innovative small firms to grow (Chetty, 2014). Many of these programmes and policies are designed and implemented at the local level and thus must be largely context sensitive. Moreover, they should be evaluated regularly to identify ways to improve the effectiveness, both in terms of impact and participation of target beneficiaries. For example, Singapore's excellent investment climate and supportive regulatory environment have played a key role in the country's successful innovation-driven growth, creating striking levels on innovation outputs and one of the most competitive economies in the world. High levels of investment in human resources or R&D are not sufficient if they are not allocated to activities that improve competitiveness.

To sum up, although innovation is context-dependent (Kelley et al. 2011), being perceived differently in different economies and influenced heavily by educational process and cultural norms, it can be enhanced by deliberate supporting policies (Dodescu, 2012). The main challenges when developing and implementing such policies are (Atkeson & Burstein, 2011; UNECE, 2012):

1. To channel innovation support effectively; policymakers need to know which policies are most successful in spurring what type of innovation in what kind of companies (Large, SMEs. Startups...),
2. To apprehend to what extent specific firm-level innovation induced by these policies truly generate broader economic growth and positive social impact given policy measures' fiscal cost to taxpayers,
3. To comprehend when and to what extent 'technology push' vs. 'demand based' policy instruments are most appropriate. Government grants, loans and other financial incentives are of the 'technology push' kind, while 'demand-based' instruments are expected to encourage innovation through public procurement policies, development of transparent rules, norms and standards, and implementation of market development measures.

Having identified main policy dimensions and actions, and having synthesized main policy challenges, a major problem remains in that entrepreneurship policy and innovation policy areas are rarely integrated (Lindholm Dahlstrand & Stevenson, 2010), and this is reflected also among academics where much of the research work related to entrepreneurship and innovation is pursued by different scholars. As a result, policies are, more often than not, designed and implemented by different actors including different ministries within national governments (Atkeson & Burstein, 2011). Hence, there is little guidance on how to develop effective interventions that can help policy makers select, design and implement policies and integrated programs to support innovation and entrepreneurship in a holistic manner (World Bank Group, 2013).

The comparative framework of innovation and entrepreneurship policy measures proposed by Lindholm Dahlstrand & Stevenson (2010) is an exception and promising tentative to integration. Identifying a context of three phases –initiation, anchoring and development- for innovation and entrepreneurship activities respectively, they propose seven policy actions that with some adaptation are common to both innovation and entrepreneurship policy, see figure 9.

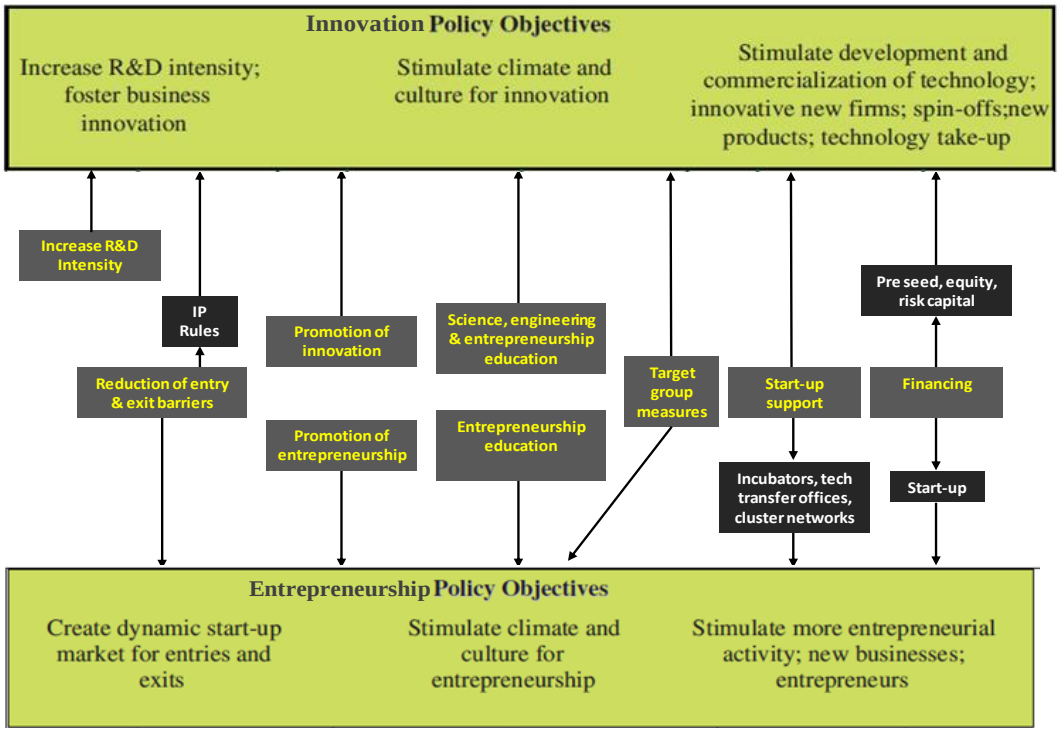

Figure 9. Innovation and Entrepreneurship Policy Objectives. Adapted from (Lindholm-Dahlstrand & Stevenson (2010)

Policy studies should recognize the relationship between innovation, underlying research, and entrepreneurial effort aimed at commercializing the results of R&D. Innovation and Entrepreneurship are closely linked, because, on the one hand, much of entrepreneurial activity involves innovation, and, on the other, entrepreneurs are critical to the innovation process (Lindholm Dahlstrand & Stevenson, 2010). In addition, they argue that the turbulence produced by a high rate of business entry and exit activity, i.e., entrepreneurial activity, is in itself associated with higher levels of innovation in an economy. Hence, it makes sense to aim at convergence between innovation and entrepreneurship policy, particularly when the policy goal is to foster new high-growth innovative firms (Atkeson & Burstein, 2011). Entrepreneurship policy, geared towards startups and academic spin-offs, which bring a large portion of R&D results to the market, must be flexible in order to support innovation successfully (UNECE, 2012).

In comparison with other countries, Greece does not lack innovation policies and programs. Actually, in many cases (e.g., innovation programs participation) Greece is at the forefront. However, the plethora of policies and programs has not been followed by results. This raises

questions about the suitability and effectiveness of the national plans, even though the results of any plan will become evident only in the long-run (Lioukas, 2009).

Based on the above, we use the integrated model of Lindholm Dahlstrand & Stevenson (2010) to conceptualize the following four dimensions of policy factors as areas guiding the empirical research into the role of innovation and entrepreneurship policy during the Greek crisis:

1. Create Dynamic Startup Markets,
2. Stimulate Entrepreneurial Activity, Development and Commercialization,
3. Increase R&D Intensity, and
4. Stimulate Innovation and Entrepreneurship Culture.

***

The review of the central to our study innovation and entrepreneurship policy literature, emphasizes the role of government and public actors in the conception, funding, execution and transformation of new ventures and innovation projects. A major approach to public support at the crossroads of public and private actor interaction is Public-Private Partnerships (PPPs). The next and final section of the literature review investigates how the PPP literature can contribute to the present research.

4.4 Public-Private Partnerships

A large and rapidly growing academic literature on the subject matter of Public-Private Partnerships (PPPs) has been developed since the late 1990s due to their increasing popularity in many both developed and developing countries. PPPs for development have come to be described as the "collaboration paradigm of the 21st century" (Austin, 2000b) and "a new and innovative type of governance" (Witte & Streck, 2003). Despite of their dynamic and population, a review of the academic literature illustrates that the concept of 'PPPs' is an ambiguous term with a number of differing meanings and usages in various contexts (cf. McQuaid, 2000; Wettenhall, 2003; Hodge & Greve, 2012; Weihe, 2005).

An increasing number of countries are enshrining a definition of PPPs in their laws, each tailoring the definition to their institutional and legal particularities (World Bank, 2009). For

example, in the Canadian context a PPP is defined as a: “cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards” (Canadian Council for Public-Private Partnerships, 2012)[1]. The European Commission in ‘Guidelines for successful PPPs’ gives the following definition: “Public – Private Partnerships is a form of collaboration between public and private sectors in order to services’ realization which delivered only by the public sector in a traditional way’ (European Commission, 2003). In that form of cooperation there is a separation between the public and the private sector. The public sector plays a framing and guiding role and the private is an executive body. For the public sector the most important issues are the social satisfaction, the increase of the social trust etc. For the private sector the main interest is the financial profit.

Broadly defined, a PPP is an arrangement that brings public and private sectors together in long-term partnership for mutual benefit. A useful synthesis definition is provided by (Van Ham & Koppenjan, 2001, p. 598): "[PPPs are a] cooperation of some sort of durability between public and private actors in which they jointly develop products and services and share risks, costs, and resources which are connected with these". These "cooperative institutional arrangements between public and private sector actors" (Hodge & Greve, 2007, p. 545) can be implemented in a wide range of constellations and areas (Hodge & Greve, 2012), ranging from public utility services by private operators (e.g., roads, harbours or airports) to local efforts of enhancing knowledge development and growth (e.g., an incubator run by a public university, or a technology park providing publicly sponsored incentives for innovative SMEs). PPPs have emerged as possible 'third way' solutions to market failures associated with, respectively, vertical public integration, contracting-out of public services, or full privatization (Hodge & Greve, 2007; Rui Silva & Rodriguez, 2005). Figure 10 illustrates the typical structure of a PPP project.

[1] http://www.pppcouncil.ca/resources/about-ppp/definitions.html

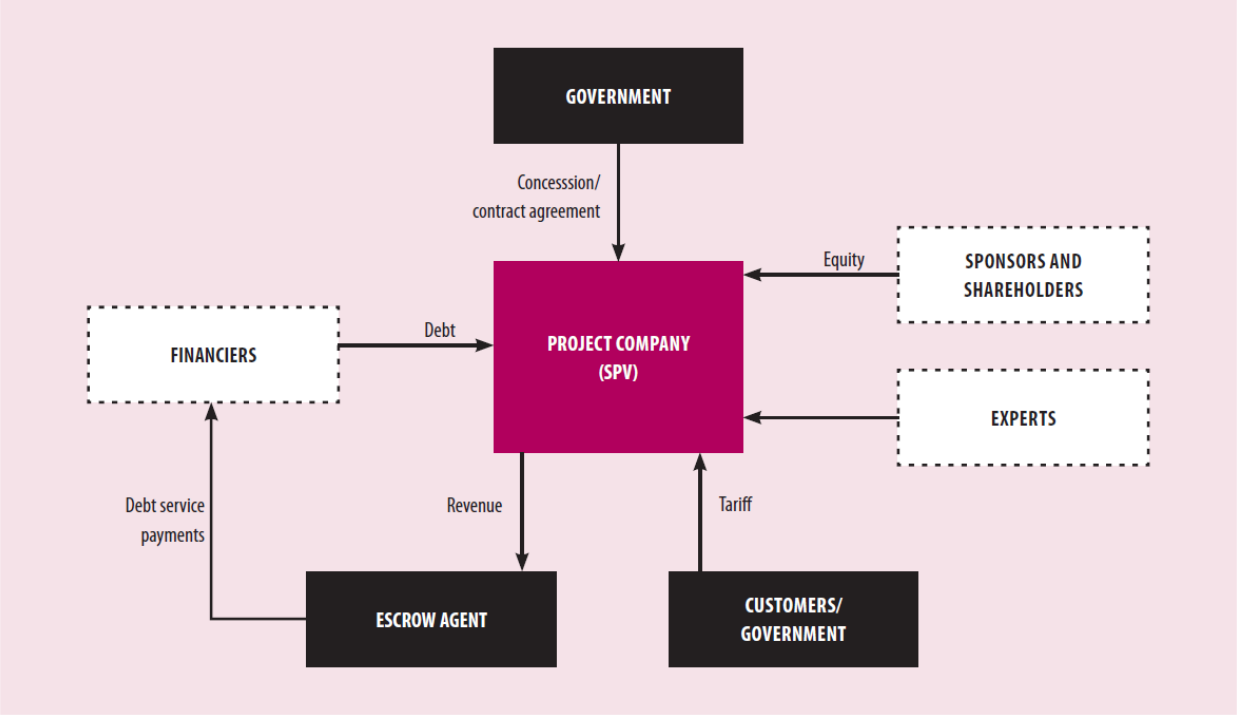

Figure 10. Typical Structure of a PPP project. Source: UN ESCAP (2011), retrieved from Witters et al (2012, p. 82).

In synthesis, PPPs are an arrangement that brings public and private sectors together in long-term partnership for mutual benefit (SO, 2000). PPPs are contractual agreements between a public agency or authority and a private sector entity that allow for greater private participation in the delivery of public services, or in developing an environment that improves the quality of life for the general public, and where the partners share risk, reward, and responsibility for a shared investment (Akkawi, 2010).

4.4.1 PPP and Innovation

Public-private partnerships are broadly known to be forceful tools in accomplishing major projects at first in the area of infrastructure, but are also of important use in activities such as energy exploration and generation, public transportation and roads, education, health, community-development sectors or even large-scale research or scientific projects in order to improve efficiency in the generation and performance of public services (Witters et al, 2012). In particular, they argue, PPPs are extremely important in the area of innovation as they can be tailored to enhance competitiveness and economic growth; countries thus are making

moves to identify the best use of them in this way. PPPs are decisive instruments for innovation, help governments become more inventive by creating a space outside their structure that allows innovation to flourish. PPPs for innovation can be considered a learning process among various public and private agents (Douthwaite, 2002) that can be catalyzed through the building of specific partnerships—for example, by assembling innovative talents across research and private-sector organizations. In partnerships, agents benefit from developing solutions they could not have developed on their own. Participation by the productive sector makes the developed solutions more relevant and practical, and, as a result, the probability of the innovation's being adopted increases (Hartwich et al, 2007). PPPs can promote coordination between public and private partners, support and sustain networks for innovation, and integrate policy with the real needs of private actors on local markets (Rui Silva & Rodriguez, 2005).

Public-private partnerships for innovation can fill important gaps in the science and innovation systems and increase the leverage of public support to business R&D through cost and risk sharing (OECD, 2007). In particular, they can help valorizing research and canalizing innovation efforts to key challenges in the public sphere, e.g., delivery of health care, social services for ageing populations, environmental protection, sustainable transport, on-line security and privacy by harnessing the creative capabilities of the private sector via public-private partnerships to achieve productivity gains and service improvements that can benefit society (OECD, 2007). Programs of this kind should be directed to enhancing focus and mass in excellent research and, be it in innovation/technology or in knowledge that is useful for solving societal issues (OECD, 2007).

All OECD countries (Greece being one of them) provide public support to promote innovative activity in the private sector. The effectiveness of such support can often be improved, by identifying an appropriate mix of direct and indirect instruments and rigorous evaluation to ensure that public support achieves its goals in an efficient manner. A careful evaluation of policies to support business innovation is needed to ensure that the policies are effective and achieve their goals (OECD, 2007).

But, it is not only countries that promote PPPs. The President of the European Commission, José Manuel Barroso, in a high-level launch event hosted by the European Commission's Directorate-General for Research and Innovation(at 9-7-2014), stated that *"Only if the best brains from academia, industry, SMEs, research institutes and other organizations come together can we successfully tackle the huge challenges that we are facing. This is what*

public-private partnerships are about, the joining of forces to make the lives of Europeans better, create jobs and boost our competitiveness". Moreover, the United Nations Development Program is actively advocating the value of PPPs and encouraging their use, while the World Bank runs courses and workshops on implementing PPPs and the OECD (Organization for Economic Cooperation and Development) has a unit focusing on supporting PPP development within its member states (Hawkesworth, 2010). Similarly, private sector companies also proclaim their involvement in PPPs as a way of expressing that they are important players involved in big projects and big business.

To sum up, a number of characteristics and approaches found in PPP arrangements are of interest to our problematic, as they can inform and inspire both governance structures and execution processes of entrepreneurship and innovation support initiatives:

- Provision of a context for *risk sharing* (Hodge & Greve, 2007) for the startup or innovative SME where the public partner would provide either funding for some kind of indirect support of both conception and execution of new ventures, or direct financial support for transformation of established firms. The risk sharing factor reflects a policy support motivated by the growth-enhancing effects of entrepreneurship and innovation.
- Provision of *robust public markets* for young firms (Lerner, 2010) where they can find initial or partial set-off for their emerging offering. This can materialize easier if there are explicit public sector goals of introducing innovative products, services or business models in the public sector (Hodge & Greve, 2007). This factor represents a market mechanism where the public organization will have a direct commercial involvement as part of the support and potentially ripe direct gains.
- PPPs involve *long-term commitment* (Van Ham & Koppenjan, 2001), which is a crucial ingredient for scalable startups and transforming SMEs in order for the support initiative to bear fruits in the shape of viable new or renewed businesses. This factor refers to the behavior adopted by the public organization towards the beneficiaries of support.

4.4.2 PPPs in Greece

Greece has long been searching for new instruments, in order to sufficiently respond to the country's needs for public infrastructure and services. Public works in Greece have been traditionally accomplished through public procurement. The public sector selects a private

contractor through competitive tendering procedures. The public authorities financed the project while the private sector was responsible only for the constructing procedures Nonetheless, lack of public funds, Greece was in the need to use the private capital. Thus, Greece had begun making use of the potentials of implementing partnerships.

In Greece PPPs has been introduced through the form of "concession agreements", which, at the time, have been said to form a kind of "legal paradox" (Trova & Koutras, 2001). Following the dominant perception about PPPs in the international market, these alternative cooperative models were presented in Greece as a partial application of ambitious privatization programs, which all the Greek governments —regardless of their political ideology— have constantly applied, to reduce the enormous public debt (Kitsos, 2014). Public private partnerships (PPPs) have been developing, in their contemporary forms, since the 1980's, as an answer to poor public sector performance, state budgetary constraints as well as increased international competition, demanding for means to promote new opportunities for private capital (Boix, 1997).

Greece has started a new, dynamic period of PPP development, when the Greek Law (3389/2005) introduces the first regulation on PPPs in the country and opens the market to this new type of public procurement. This Law was voted in September 2005 by the Greek Parliament and created a national legal framework for PPPs in Greece, under which projects will be implemented directly once approved by a task force, without the need for individual approval by the parliament. The Law also adopts the recent EU Directives on Public Procurement in all occasions, therefore ensuring the set EU standards are implementing PPP models as a fundamental pillar for economical development (Kitsos, 2014).

Therefore, this Law has significantly simplified and clarified the rules and procedures applicable to PPPs and thereby laid the foundation for the robust development of the Greek PPP market. It brings some risk allocation issues that have typically caused major concerns in Greek project finance deals in line with international market standards. It has defined a minimum content for a partnership contract and resolved a number of special legal issues that in the past required special regulation (protection of the environment, granting of permits, archaeological findings, expropriation etc). The PPP Law also regulates financial and legal issues such as listing on the stock exchange, sureties, risk taking or dispute resolution by arbitration. It has speeded up the procedures and enhanced legal security for private investors.(Schaefer, .Voland, 2009).

Along with the ratification of Law 3389/2005 a Special Secretariat for PPPs was set up in the Greek Ministry of Economy and Finance. This Unit follows the structure and role of equivalent units in other Member States of the European Union for the promotion and implementation of PPPs. The mission of the Special Secretariat is the provision of support and assistance to the Inter-Ministerial PPP Committee and to public entities[2], although with the remark that Public Private Partnerships have proven to be beneficial not only for the public and the private sector, but mainly for the citizens (Tomadaki, 2008).

Hence, there is a basic platform for PPPs in Greece, although their application in projects related to innovation and entrepreneurship activities has not yet been formalized let alone analyzed and studied. As the PPP approach can provide a complementary perspective on entrepreneurship and innovation support studies, particularly useful for conceiving risk sharing, comprehending the appropriate conditions of public markets, and emphasizing the need for long-term commitment to venture and innovation development, the PPP perspective seems highly relevant to include in the research being proposed.

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Having reviewed the theories and literature streams of primary importance to the present research, the following chapter consists of the specific research proposal stemming from the questions generated and the different frameworks reviewed.

4.5 Institutional Theory

In recent years, the institutional perspective has received increasing attention in social sciences, including innovation and entrepreneurship studies (e.g., Alvarez et al, 2015; Crescenzi et al, 2013, Hinings et al, 2018). Institutional theory is seen as foundational and a necessary perspective of any study involving entrepreneurship (Williams & Vorley, 2015a). As Tonyan et al (2010) state "Economic activities cannot be analyzed without consideration of the formal and informal institutional context in which they occur" (p. 804).

Based on an extensive literature review of the new institutional economics and more precisely institutions' role in and interconnection with entrepreneurship (e.g., Ahlstrom &

[2] http://www.sdit.mnec.gr/en/

Bruton, 2002; Bruton, et al, 2005; Denzau & North, 1994; North, 1990, 1994; Powell & DiMaggio, 1991; Scott, 1995), Tonoyan et al (2010), summarize the following five claims regarding institutions' importance and relevance for entrepreneurial activity:

1. Institutional frameworks interact with both individuals and organizations,
2. Institutions influence individuals' decision-making by signalling which choices, actions and behaviours are acceptable in a given society,
3. Institutions have an impact on the cognitive and ethical considerations that shape human judgment and behaviour,
4. Institutions affect organizational behaviour by constraining and defining which actions are acceptable and supportable both within and between organizations,
5. Institutions are a means of reducing uncertainty and transaction costs for economic transactions.

We adopt these claims as a theoretical platform for the integration of institutions in the present research. In order to bridge institutional theory to coevolution and the other literature streams reviewed so far, we first systematically link the above points to these literatures, before reviewing in more detail the relevant institutional literatures.

Table 2 provides an analytical account of how the characteristics of institutional theory connect to innovation and entrepreneurship, based on the Tonoyan et al (2010) framework.

Literature Streams / Theoretical Claims Concerning Institutions	**Coevolution** Emphasizes the dynamic interactions between players and entities, where maximum inclusion should be favoured. Specificity, reciprocity and simultaneity are analysed in innovation and entrepreneurial ecosystems.	**Innovation Systems** Emphasizes that basic systems-thinking should be adopted by identifying the components –players and actors, the relationships between the components, and the attributes of the components and relationships.	**Innovation & Entr. Policy** Policy should contribute to the creation of dynamic startup and innovation markets and contexts. Major fields for support are Funding, Education and Human Capital, Cooperation, Networking, tax and legal conditions.	**PPPs** PPPs can enable governments to innovate by creating a space outside their structure that allows innovation to flourish. PPPs can also provide a context for risk sharing, provision of robust public markets, and long-term commitment.
1. Institutional frameworks interact with both individuals and organizations.	This adds the importance of the micro-perspective of individual innovators' dependence on institutions for their acts and decisions as one form of coevolution.	Institutions define what an innovation system is: formal institutions are a central component, and informal institutions shape how IS are structured, evolve and perform. The individuals or groups that make up any organization have common purposes to achieve certain objectives, which are shaped by formal and informal institutions.	Central to policy-making is to create favourable formal and informal institutional conditions for innovation and entrepreneurship. 'Institutional engineering' is the essence of policy-making. Individuals respond actively to the institutional environment they face, which creates reciprocity between institutions and entrepreneurial actors.	PPPs, as formal institutional arrangements, respond innovatively to changing economic and market circumstances. Formal institutions can determine the success of PPPs and if successful, informal institutions regarding the role of private vs. public actors in solving common problems will evolve in favour of them.
2. Institutions influence individuals' decision-making by signalling which choices, actions and behaviours are acceptable in a given society.	Coevolving factors will be reinforced when they rhyme with similar institutional signals. Coevolution will weaken or lead to divergence when institutions are unfavourable to the interplay of certain factors.	Institutions set IS boundaries that will influence the innovation processes regarding actor involvement, breadth and depth of relations, direction of knowledge development, reciprocal trust and collective learning.	Institutions frame acceptable policy decisions, but also evolve and take shape as a function of policy development. Innovation policy can institutionalize how innovation's promise of increased growth can be optimally distributed.	PPPs, as a politically and socially accepted model for innovation, development and growth, depend on informal institutions embracing them. Successful instances of PPPs need to be formalized to set role model examples.
3. Institutions have an impact on the cognitive and ethical considerations that shape human judgment and behaviour.	Institutions can regulate and frame the balance in terms of power and impact of various co-evolving entities, and cater to fairness between them.	Institutions can enhance or hamper the conditions conductive to innovation within productive systems. Innovation systems need institutions that foster and support equal and transparent conditions for collaboration and interaction.	Policy cannot ignore the institutionally shaped public opinion. Also, policy will be politically in line with the ideology of each government in office. Hence, conflicts can emerge between technocratic vs. opinion-based vs. political policy agendas.	PPPs can become the middle way between the two extremes of inefficient public bureaucracy and profit-only focused private enterprising. Institutions regulate this middle way for maximum societal benefit.
4. Institutions affect organizational behaviour by constraining and defining which actions are acceptable both within and between organizations.	Institutions need to ensure a level-playing field for coevolving entities.	The behaviour of organizations is shaped by institutions that constitute constraints or incentives for innovation that stems from inter-entity relations in an IS.	Policy must institutionalize factors that favour innovation and dismantle those that don't. Sometimes constraints, e.g., environmental regulation, can be engines for innovation, if policy backs up the innovations addressing them.	Formal institutions regulate PPPs and need to provide a balance between control and flexibility. Informal institutions influence the extent of operations where PPPs that are admitted as a solution.
5. Institutions are a means of reducing uncertainty and transaction costs for economic transactions.	Institutions need to ensure a level-playing field for coevolving entities.	Innovation systems need to contain institutional arrangements, such as financial, legal and tax arrangements that reduce uncertainties and costs for innovators and entrepreneurs.	Policy can affect institutions in order to reduce uncertainty and transaction costs by creating institutions that minimize these factors and become part of the Innovation System.	Formal institutions regulate PPPs and need to provide a balance between control and flexibility. Informal institutions influence the domains where PPPs that are admitted as a solution.

Table 2. Institutions' importance and relevance for innovation and entrepreneurial activity and their relation to literature streams in innovation and entrepreneurship support.

To sum up on this analysis:

- From a **coevolutionary perspective**, innovators' dependence on institutions, institutions' fit with other coevolution dynamics, institutions' regulatory power vs. co-evolving entities, and the power of institutions to regulate evenly for coevolving entities are essential factors to include in the study.
- From an **innovation systems perspective**, institutions define the entities and shape the workings and purposes of IS. Institutions define IS boundaries and conditions of interactions within IS. They interplay with IS so that favourable, transparent, cost- and risk-minimizing conditions emerge. All these factors should be studied in the research.
- From a **policy perspective**, the proactive role of policy in shaping the institutions that shape the conditions for innovation and entrepreneurship, the reciprocal influence between institutions framing policy and policy as institutional engineering, as well as the driving force, or hampering force, of policy are essential factors to include in the study.
- From a perspective of **public-private partnerships**, this is in itself a formal institutional arrangement whose acceptance depends to a large extent on what informal institutions form around this arrangement and its successes or failures. If proven successful, informal institutions will embrace PPPs and, if correctly and flexibly regulated, they can become a middle way between public bureaucracy and for-profit-only arrangements. The research will investigate cases of PPP and analyse how they become an innovative solution to crisis-engendered problems.

Having established the importance and relevance of institutions for the present research, we proceed by defining institutions and conducting a focused literature review on their role and impact in innovation and entrepreneurship research.

4.5.1 Defining Institutions

The most basic and general definition is that institutions are the formal and informal rules governing human behavior (North, 1990). Some further precision is given by Hoffman (1999, p. 351) who define institutions as "rules, norms, and beliefs that describe *reality* for the organization, explaining what *is* and *is not*, what *can be acted upon* and what *cannot*" (emphasis added).

Introducing three institutional pillars; cognitive, normative and regulative, and discussing how institutions are being represented and diffused in society, Scott (1995, p. 33) define institutions as "social structures that have attained a high degree of resilience. [They] are composed of cultural-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life. Institutions are transmitted by various types of carriers, including symbolic systems, relational systems, routines, and artefacts".

Institutions are further analyzed in terms of, respectively, informal and formal institutions:

- "Formal institutions are those written or formally accepted rules and regulations which have been implemented to make up the economic and legal set-up of a given country" (Tonoyan et.al, 2010, p. 805).
- "Informal institutions are traditions, customs, societal norms, 'shared mental models,' unwritten codes of conduct, ideologies, and templates (Tonoyan et.al, 2010, p. 805). Informal institutions "have never been consciously designed" (Sugden, 1986, p. 54) and can be viewed as "the old ethos, the hand of the past or the carriers of history" (Pejovich, 1999, p. 166) that are passed on from one generation to another through various transmission mechanisms such as imitation, oral tradition, and teaching (Tonoyan et.al, 2010).

Formal institutions can be identified with 'design' and 'intention', informal institutions with 'spontaneity' and 'emergence'. The formal/informal difference can also be likened to the distinction between explicit versus tacit rules (Hodgson, 2015). Formal institutions guide action through coercion and threat of formal sanction (regulative institutional pillar), while informal institutions guide action through norms of acceptability, morality and ethics (normative institutional pillar), as well as through the very categories and frames by which actors know and interpret their world (cognitive institutional pillar) (Scott, 1995).

Although formal institutions traditionally receive most attention in management research (Tonoyan et.al, 2010), and are backed by formal laws and rules, informal institutions will influence how formal institutions operate in practice (North, 1990). Moreover, there might be formalization of informal institutions if informal practices are codified to become formal law (Boettke & Coyne, 2009). Thus, formal and informal institutions are interdependent and tend to interact (Boettke & Coyne, 2009).

Williamson (2000) explains institutions by proposing a hierarchy of four levels of institutions (Figure 11), each level placing constraints on the ones below.

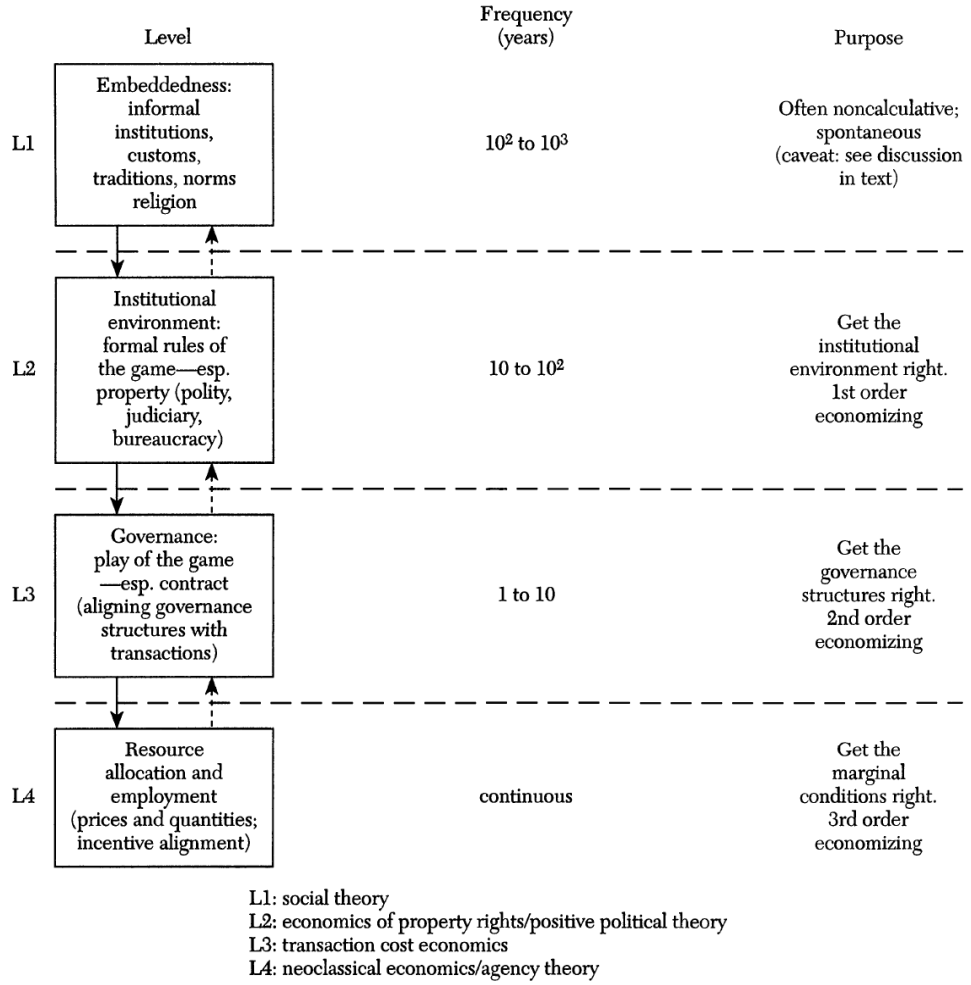

Figure 11. Economics of Institutions analyzed at four levels of social analysis. Source: Williamson (2000, p. 597).

Estrin et al (2013) depart from this model in their research on how institutions encourage or not entrepreneurial growth, making a more detailed distinction between constitutional formal institutions and regulatory formal institutions at Williamson's second level. They further argue that Williamson's third and fourth levels –*governance*, underpinned by transaction cost theory, and *resource allocation*, underpinned by agency theory- concern the organizational, e.g., the firm perspective, and therefore pertain to the micro level of analysis where, as Williamson himself argues, the bulk of management research is situated. Synthesizing Estrin's et al (2013) approach to informal and informal institutions and their relation to entrepreneurship, three kinds of institutions are identified:

- **Informal institutions**, e.g., customs, traditions, religion, which are socially embedded, deeply rooted and take very long -up to a century or even more- to change. Anthropology, sociology and organizational behavior are the theoretical foundations for explaining informal institutions. The *level of corruption* in an economy is an example of an informal institution influencing entrepreneurial conditions and entrepreneurs' behavior.
- **Formal constitutional institutions**, which are the key rules of the game including, e.g., rule of law and property rights, and with theoretical pillars in positive political theory. The *strength of property rights* is particularly important for entrepreneurs who need to secure returns and sustainability of what they have created. The formal constitutional institutions create transactional trust (or mistrust) for entrepreneurs.
- **Formal regulatory institutions**, e.g., detailed regulatory frameworks, fundamentally government apparatus, activity and bureaucracy, but also capital markets, tax system and educational system. With theoretical underpinnings in positive political theory and organizational relations theory, basically any institution that is subject to formal rules and regulations where government intervene pertain to the formal regulatory type. The *level of government activity* influences the sphere of entrepreneurs' aspirations and actions. Both formal constitutional and regulatory institutions change at the pace of decades, the former at a slower pace than the latter.

Formal and informal institutions are mutually dependent and normally co-evolve (Smallbone & Welter, 2012). Further, institutions co-evolve with individuals, firms, industries and extra-institutional factors (Lewin et al, 1999), as identified in the review of coevolution theory above.

Linking the above categories to the institutions listed in Lewin's et al (1999) coevolution model, the present research will analyse:

- Formal Institutions: Role of Government, Rule of Law, and Capital Markets,
- Informal Institutions: Organizational Culture, Culture in the Society,

Having defined institutions and established their importance for the present research, the next sections will review institutional characteristics and institutional explanations to the crisis unfolding in Greece since 2010.

4.5.2 Institutional Quality and the Case of Greece

There is a consensus among researchers that institutional development is a strong indicator for structural development and long term prosperity creation for a country (Bruinshoofd, 2016). Referencing Zhu et al (2015) and Meyer et al (2009), Barasa et al (2017) argue that poor regional institutional quality, i.e., presence of weak institutions in a country, undermine the functioning of factor markets, increase transaction costs and magnify information asymmetries. As a result, firms operating in a context characterized by poor institutional quality have great difficulties in successfully use and extract value from their resources in order to innovate (Barasa et al, 2017).

High quality institutions might not be able to prevent an economic crisis, but they increase the chances for a society to affront it in a more organized way, to learn from a crisis and to continue on its long term trajectory of progress (Bruinshoofd, 2016). Synthesizing the literature (e.g., Loayza et al, 2005; Aisen & Veiga, 2013; Jong A Pin, 2009; Acemoglou et al, 2005), Sala-I-Martín et al (2015) identify three main characteristics of institutions that determine their quality:

1. *Absence of corruption* and *undue influence* (corruption being understood as the misuse of public power for private gain, and undue influence as favouritism and flaws in judicial independence),
2. *Efficiency in the public sector*, which involves efficient administrative services –absence of unnecessary red tape- and stable policy environment –minimal uncertainty concerning rules and regulations affecting business and other economic activity.
3. *Endogenous institutions*, which means that the rules governing human interactions are the result of choices made by those in power, and that the latter are selected (e.g., through general elections) on the basis of the rules they commit to set and actually set once in power. Separation of powers and independence of the judiciary are the central pillars of endogenous institutions.

Based on these and additional parameters, including voice & accountability, political stability and rule of law, the World Bank[3] monitors institutional quality regularly across the globe.

[3] https://info.worldbank.org/governance/wgi/#home

Institutional quality is also one of the parameters making up the Global Competitiveness Index[4].

Longitudinal data from these studies show that the level of institutional quality varies significantly across countries and that European institutional quality outperforms the global average. Concerning Europe (Figure 12), the Nordic countries present the highest level of overall institutional quality both in Europe and globally. Western Europe has the second-highest level of institutional quality, while Italy, and particularly Greece, suffer from a combination of weak scores on corruption, rule of law, and government effectiveness, combined with low scores on political stability.

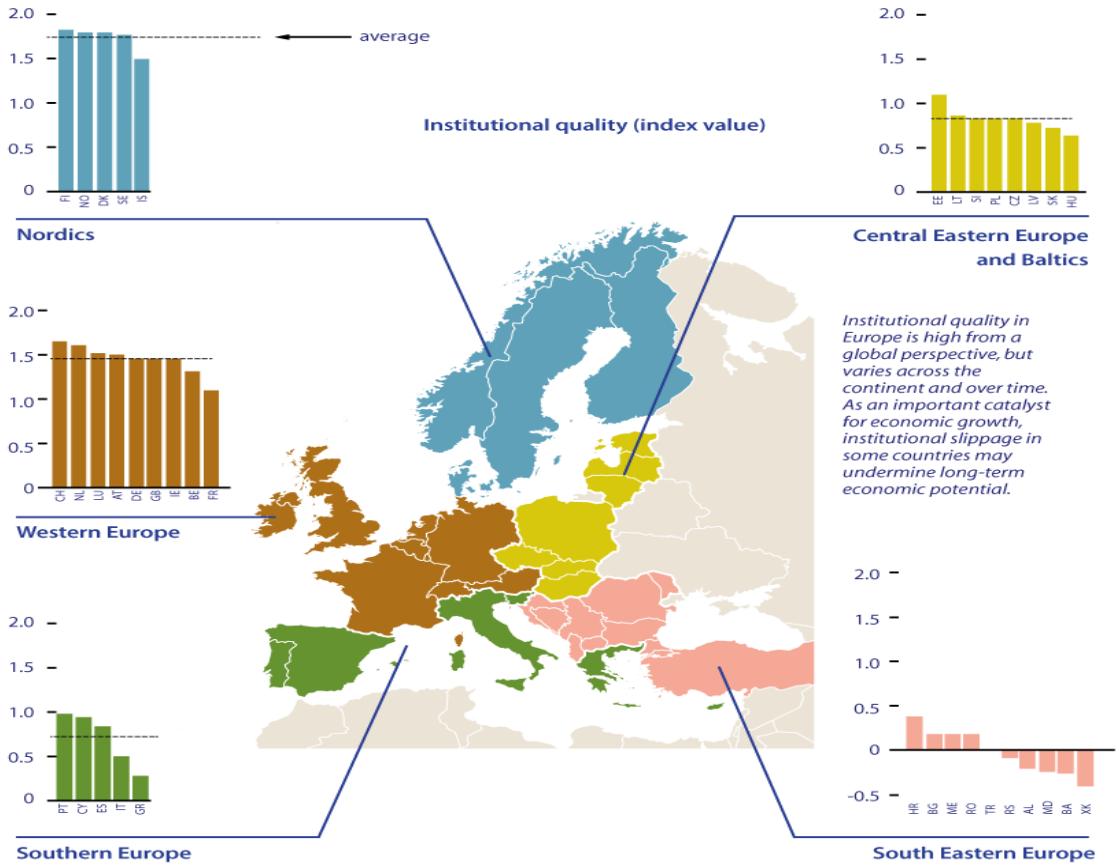

Figure 12 Institutional Quality in European Countries. Source: World Bank, Rabobank. Retrieved from Bruinshoofd (2016).

In Greece, the reforms implemented in line with the country's EU/IMF bail-out packages have so far failed to bring about an improvement of overall institutional quality. While

[4] http://reports.weforum.org/global-competitiveness-report-2018/

according to the data rules and procedures for doing business have been improved (although the public perception, reflective of informal institutions in becoming would not agree), the scores on rule of law and legal protection have deteriorated markedly (Bruinshoofd, 2016**)**.

This is corroborated by the latest World Economic Forum Country Report for Greece (World Economic Forum, 2018)[5] where the country scores low in many criteria. Out of 140 countries, Greece is ranked:

- 87 for Institutions, and next to last, before Bosnia & Herzegovina, in Europe,
- 83 for Macroeconomic Stability, and 33 of 37 in Europe,
- 63 for Product Market, and 30 of 37 in Europe,\
- 114 for Financial System, and *last* in Europe, and
- 44 for Innovation Capability, and 26 of 37 in Europe.

The Competitive Index for Europe is 30 out of 37 and globally 57 out of 140.

Interestingly, at least on the global scale, the innovation capability is significantly better than the overall score.

4.5.3 Institutional Explanations of the Greek Failure

In view of the above, it seems reasonable to look for explanations to the Greek failure from the angle of institutional theories. Several explanations to the main pillars of the Greek failure, including moral and cultural introspection, non-civic familism, irresponsible government systematically violating budget deficit limits, politicized public sector bureaucracy, tax evasion, and corruption mutually nurtured by civil servants and private interests are proposed in the extant literature (e.g., Gkintidis, 2018; Katsimi & Moutow, 2010; Liagouras, 2019; Williams & Vorley, 2015). The most common reason for the failure of nations today is the presence of **extractive institutions**, as these "keep poor countries poor and prevent them from embarking on a path to economic growth" (Acemoglou and Robinson, 2012, p. 398). Extractive institutions are generally referred to as institutions through which a small group of individuals do their best to exploit the rest of the population (Boldrin & Levine, 2012).

[5] http://reports.weforum.org/global-competitiveness-report-2018/competitiveness-rankings/

Krugman (2012) assumes that the roots of economic crisis are the effect of the demand reduction and austerity measures on the evolution of the crisis. However, the recent collapse of Greece was not provoked by the absence of inclusive political and economic institutions but rather happened in spite of them. Greece is the country in Europe that consistently **resists the most to reforms**, thus the country is a **constant laggard** in virtually all domains of economy, technology and societal development (Komninos & Tsamis, 2008).

A decisive factor and explanation for this enduring problematic situation is that Greece suffers from **institutional deficit**, -lack of efficient institutions that are necessary for economic growth- and this very much so already before the crisis (Rapanos, 2008). These characteristics, in combination with the regulatory complexity and stifling bureaucracy of the public administration, create barriers to entry for innovators and entrepreneurs, and obstruct fair competition. Moreover, the existing regularity framework fails to control truly unlawful behaviours, while they create unnecessary red tape for normal business and administrative practices (Williams & Vorley, 2015).

To sum up, there are three institutional factors that contribute to the Greek crisis and also hamper a fast and solid revival of the Greek economy, namely extractive institutions, resistance to reforms, and institutional deficit.

Moreover, and as discussed above, the role of informal institutions is crucial to the development of formal institutions (North, 1990). Unfortunately, Greece also suffers from low quality of informal institutions. This spans from day-to-day phenomena such as uncivil behaviour on the roads and disrespect for public order and cleanness, observable by anyone, through laissez-faire attitude and unreliability of information and services in the public administration, to sever misconduct such as corruption and misuse of public goods (Gkintidis, 2018; Liagouras, 2019). These flaws in informal institutions are an indication of **institutional immaturity**; something that mathematically leads to a reduction in both social and individual well-being (Böwer et al, 2014).

The **attitude of the public towards formal institutions** is a significant informal institution where Greece shows below EU average confidence in formal institutions including labour unions, parliament, public services, education system and justice (Rapanos, 2008). Only confidence in the church and the armed forces is higher than the EU average.

The weak quality of both formal and informal institutions is also a reason for Greece remaining a largely closed economy. Trade between countries depends not just on differences in production technology but also on compatibility of institutions (Costinot, 2009). If compatibility is low, it is more difficult to develop both procedures (depending on formal institutions) and trust (depending on informal institutions) for entering and developing sustained trade agreements. In this vein, and using an augmented gravity model, Böwer et al (2014) uncover that weak institutions can explain much of Greece's disappointing export performance. Greece has for long been, and still remains, the most closed economy in the EU. Greece's lack of openness stands out even more when controlling for the size of the economy. Small economies are typically more open and the smaller economies among the EU/OECD countries are characterized by much larger export-to-GDP ratios compared to Greece. Böwer et al (2014) suggest that an improvement in the quality of Greek institutions up to the EU/OECD average (c.f., figure 12) would narrow the Greek competitiveness gap significantly. Through their mathematical modelling they estimate a potential to narrow the gap of 50 up till 78%.

Having established the longstanding relative low quality of institutions in Greece, which in most parts has been aggravated seriously during the crisis, and the resulting negative impact in innovation and entrepreneurship in Greece, what does the literature have to propose in order for innovators and entrepreneurs operating in such a context to still be able to develop and even thrive? The answer could lie in the development of compensatory institutions that will fill holes and compensate for the weaknesses that the situation present.

4.5.4 The Quest for Compensatory Institutions

In view of the important impact of institutions on innovation activity and entrepreneurship, the institutional context in which entrepreneurs are embedded will have a substantial impact on the contribution that entrepreneurs make to economic growth and societal development (Bowen & De Clercq, 2008). In this vein, Estrin et al (2013) advance that the strategies of entrepreneurs and innovators reflect the opportunities and limitations defined by institutions. If, for example, corruption has become an informal institution, i.e., a custom and pattern of behaviour so widely shared that it has become a norm, then it can be viewed like a formal tax that discourage economic activities. Weak property rights (formal constitutional institution)

generate profound uncertainty in the business environment, while extensive government intervention (formal regulatory institution) will generate additional cost to entrepreneurs.

Experiences with the transformation process in Eastern Europe for example indicate that the interaction between formal and informal institutions is crucial for the functioning of institutions in their entirety (Efendic et al, 2011; Grzymala-Busse, 2004). If modifications in formal rules cooperate with the prevailing informal rules, this will tend to limit transaction costs and boost the production of wealth. Conversely, if new formal rules collide with the prevailing informal rules, the transaction costs tend to rise and the production of wealth reduces (Heritier, 2017).

Consequently, the *same formal* institutions may have different impact on economic performance, due to *local differences* in *informal* institutions (Marošević & Jurković, 2013). Williamson (2009) advances that countries will present a specific mix of weak or strong informal and formal institutions. Figure 13 shows examples of countries representative for strong vs. weak formal or informal institutions.

The dichotomy 'strong vs. weak' represents institutional constraints and control. For example, in Sweden (Figure 13), informal control is high due to widely shared and highly respected social norms. Conversely, formal institutions impose few constraints on economic activities; they support rather than creating frictions. On the opposite side, in a country like Pakistan for example (Figure 13), informal control is low – there is little impact of norms and common codes of conduct on doing business- while formal institutions impose constraints on economic activities. Concerning Greece, the country has stronger than average formal institutions and weaker than average informal institutions (Williamson 2009), meaning it is a country with lower social control on economic activity through informal institutions and higher friction created by formal institutions.

Informal Institutions		
Strong	Weak Formal Strong Informal *The Netherlands, Sweden*	Strong Formal Strong Informal *Canada, New Zealand*
Weak	Weak Formal Weak Informal *South Africa, Turkey*	Strong Formal Weak Informal *Pakistan, Uganda*
	Weak **Formal Institutions** ***Strong***	

Figure 13. Strength Adapted from Williamson (2009).

In the approach of Williamson (2009) it is important to understand that strong institutions do not mean well-functioning (high quality institutions), and weak does not mean ill-functioning (low quality institutions) by definition. The notion 'strong vs. weak' refers to the level of constraints and control. In practice, however, it means that strong *informal* institutions, i.e., widely shared and highly respected social norms, are necessary (but not sufficient) for sustained high innovation performance and entrepreneurial activity . *Formal* institutions, conversely, do not have such a clear-cut impact on innovation and entrepreneurship in terms of weak vs. strong. Weak formal institutions can be of high quality, e.g., case of Sweden and the Netherlands, where formal institutions do not create constraints or frictions on the one hand, but offer, on the other, a high level of protection of property rights, crack down hard and consistently on corruption, set a stable and transparent legislator framework, and offer relatively flexible job markets and openness to international trade with scarce intervention in the financial system (Simón-Moya et al., 2014). This corroborates the claims that the impact of macro level institutional order is moderated by local social structures as advanced in the foundational literature on institutional economics (e.g., DiMaggio and Powell, 1991).

The Greek historically problematic and by the crisis aggravated institutional context seems to be a type case of how failing institutions can damage innovation and entrepreneurial activity in a downward co-evolutionary spiral where exogenous and endogenous reforms of formal institutions have a negative effect on informal institutions such as a culture for innovation and entrepreneurship (Williams & Vorley, 2015).

Such contexts incite innovators to turn to, or even build, compensatory institutions including social networks, entrepreneurial communities, and other local social structures to counterbalance institutional deficiencies (Estrin et al, 2013). The phenomenon of compensatory institutions is scarcely researched in innovation and entrepreneurship research (Golovchanskaya, 2017), and even more generally in management (Khanna and Palepu, 2010).

In particular, it seems important to investigate the positive dimension of compensatory institutions (Estrin et al, 2013; James, 2017) in opposition to their 'dark side' when compensatory institutions are associated with kinship among entrepreneurs and officials breeding the ground for rule-bending and corruption to compensate for failed formal institutions (e.g., Tonoyan et al, 2010).

4.6 Synthesis of the Literature Review and Research Model

This doctoral research unfolds in the intersection of the academic disciplines of *innovation*, *entrepreneurship* and *public policy* studies, and is conducted in the Greek crisis context.

The research problematic relates to *what public and private players do* and *how they act and interact* in the process of building and implementing an ecosystem for innovation and entrepreneurial activity as a reaction against and a way of getting out of a national deep crisis context.

The broad research question to be investigated is formulated as follows:

> ***What are the conditions for innovation and entrepreneurial activity in a deep crisis context and how should companies, support initiatives and policy-makers adapt and act to create and sustain innovation in such a context?***

A fundamental ambition of the research is to arrive at integrating the innovation and entrepreneurship support research streams as both are directly linked to economic and social development, and the one needs and reinforces the other. Such an inclusive approach is unanimously called upon from practitioners, academics, and policy-makers alike (Brem, 2011; Curley & Salmelin, 2013; Feld, 2012), but little integration work has still been presented, one notable exception being Radosevic & Yoruk (2013) who take stock of the entrepreneurial

propensity of innovation systems. Especially, academic research is lagging behind when it comes to forging links between innovation and entrepreneurship, both at the micro and macro levels of studies (Radosevic & Yoruk, 2013). Illustratively, in spite of the abundant research about innovation policy, grounded in the innovation systems literature, researches setting out from an entrepreneurship scholarship stream claim that research in and around *entrepreneurial* eco systems is still in its infancy, especially when it comes to investigating their quality as a societal force "put to work in the design and achievement of socioeconomic ends" (Sarasvathy & Venkataraman, 2011, p. 113).

In view of the above, and leaning on the review of the most related and relevant literature streams, we propose that in order to build new and relevant knowledge about the context, processes, dynamics and outcomes of emerging innovation and entrepreneurial ecosystems, three issues need to be addressed and embodied in the present research:

- First, if the *objective* and *underlying rational* of programs and initiatives that intend to foster, canalize and support innovation and entrepreneurship is to *achieve economic development*, no context could be more relevant than that of a '*deep crisis*', which unfortunately has characterized Greece since 2010. This deep crisis context has set the tone in the socio-economic reality and public debate in Greece and more broadly in Europe since 2010. Only since mid 2018 there is discrete reference made to Greece gradually exiting the crisis. Responding to the Academy of Management call for "selecting a topic [that] confronts or contributes to a grand challenge" (Colquitt & George, 2011: 432), research on entrepreneurship and innovation should concentrate on those countries, regions and sectors where the need for growth is most urgent (Eisenberg, 2010).
- Second, research should integrate received wisdom from the innovation management and innovation systems fields with underlying potentially explanatory theories of coevolution and institutions. Explicitly or implicitly standing on the theoretical ground of coevolution and institutions, the concepts of *Innovation Systems* (national, regional, sectoral, clusters…), *Innovation and Entrepreneurship Policy*, and *Public-Private Partnerships* can all contribute to a solid underpinning of research investigating entrepreneurship and innovation activities in a crisis context. Research must not fall into the trap of favoring single concepts to the exclusion of others, which to some extent seems to have happened during the current entrepreneurship hype (Aulet, 2013).

- Third, studies should adopt the perspective of the practicing innovator or innovative entrepreneur. After all, the entrepreneurs must be the leaders of any startup community (Feld, 2012). Such a perspective 'from the inside' will combat the unsubstantial counting approach where research is more preoccupied by identifying the 'best' place for starting a business, instead of focusing what these 'good places' actually do to attract and support entrepreneur (Business Week, 2013:1).

The literature review identified four major literature streams relevant for understanding the field of innovation and entrepreneurship support, which are all underpinned, explicitly or implicitly, by the theory of coevolution.

Coevolution theory emphasizes the dynamic interactions between a wide range of players and entities, where maximum inclusion should be favored. Specificity, reciprocity and simultaneity are characteristics that provide a framework for analyzing the functioning and development of an entrepreneurship ecosystem. The research will identify basic factors in the external environment, both of extra-institutional and institutional nature. In the Greek crisis context, extra-institutional factors such as technological advances, demographics and global interdependence meet institutional factor characterized by uncertainty and even pathogenesis, such as regulatory frameworks, rule making processes, capital markets and culture – all factors identified in the coevolutionary model and that need to be described. In the dimension internal to a firm engaging in innovation and/or entrepreneurial activity, the coevolution model focus the attention to a range of factors essential to the stance adopted vis-à-vis support initiatives, including managerial action, strategic intent, organization adaptation, and mediating factors such as founding conditions and management logic. Finally, the coevolution model includes the characteristics –competitive dynamics- of the industry in which the focal organization competes. When innovators are interviewed, these factors that refer partly to the outside-in conditions and partly to the inside-out individual apprehensions will be researched.

The **innovation systems** literature emphasizes that basic systems thinking should be adopted. This implies that:

1. The research should identify the components, i.e., who are the players and actors, in the spatial and/or subject/topic area engaged by initiatives being implemented.

2. The relationships between the components should be identified. What are the most important issues in terms of network structures and inter-relational ties that potentially will enhance or, conversely, might hamper innovation in the spatial and/or functional area in question?
3. The attributes of the components and relationships should be identified. What are the underlying rationales and objectives that drive and motivate the players and the structures that are built up? *Alignment* of support initiatives with the components and relationships of the system is crucial in order to potentially enhance innovation in the spatial and/or functional area in question. Here incentives for training and employment play an important role.

The **innovation and entrepreneurship policy** literature has identified the major fields where activities can be supported in order for innovation and entrepreneurship to become catalyst for economic prosperity and socially inclusive progress. These are

1. Funding,
2. Education and Human Capital,
3. Cooperation and Networking,
4. Institutional Conditions, and
5. Government Action.

Policy studies should recognize the relationship between innovation, underlying research, and entrepreneurial effort aimed at commercializing the results of R&D. In doing so, policy should contribute to the creation of dynamic startup markets and stimulate entrepreneurial activity in the external environment of startups and innovating firms. It should encourage increased R&D intensity and stimulate development and commercialization of new technologies in the internal strategy and organization of firms, and it should leverage the components and functions of innovation systems to stimulate an innovation and entrepreneurship culture in the spatial context of the focal firms.

The **public-private partnership** literature, finally, emphasizes that PPPs can be decisive instruments for innovation as they can help governments become more inventive by creating

a space outside their structure that allows innovation to flourish. They have the potential of assembling innovative talents across research and private-sector organizations, and support the development of solutions that the partners could not have realized on their own. The imperatives for innovation and support initiatives that can be drawn from the PPP literature are provision of a context for *risk sharing,* provision of *robust public markets* , and *long-term commitment.* All of these factors are essential ingredients for scalable startups and transforming SMEs and will be assessed when initiatives are analyzed in the research.

The **institutions** literature focuses on the institutional part of the coevolution model, opening up the back box left by coevolution, concerning formal and informal institutions. The research will seek to understand how formal institution, including Role of Government, Rule of Law, and Capital Markets, and informal institutions including Organizational Culture and Culture in the Society, affect innovation in the crisis context. Moreover, institutional explanations to the Greek failure will be searched for and possible compensatory institutions identified.

Figure 14 integrates these theories and concepts in a research model that will act as a roadmap to the research. The central component is the process of innovation in the crisis context, which is influenced by coevolutionary, institutional, innovation systems, policy and PPP elements.

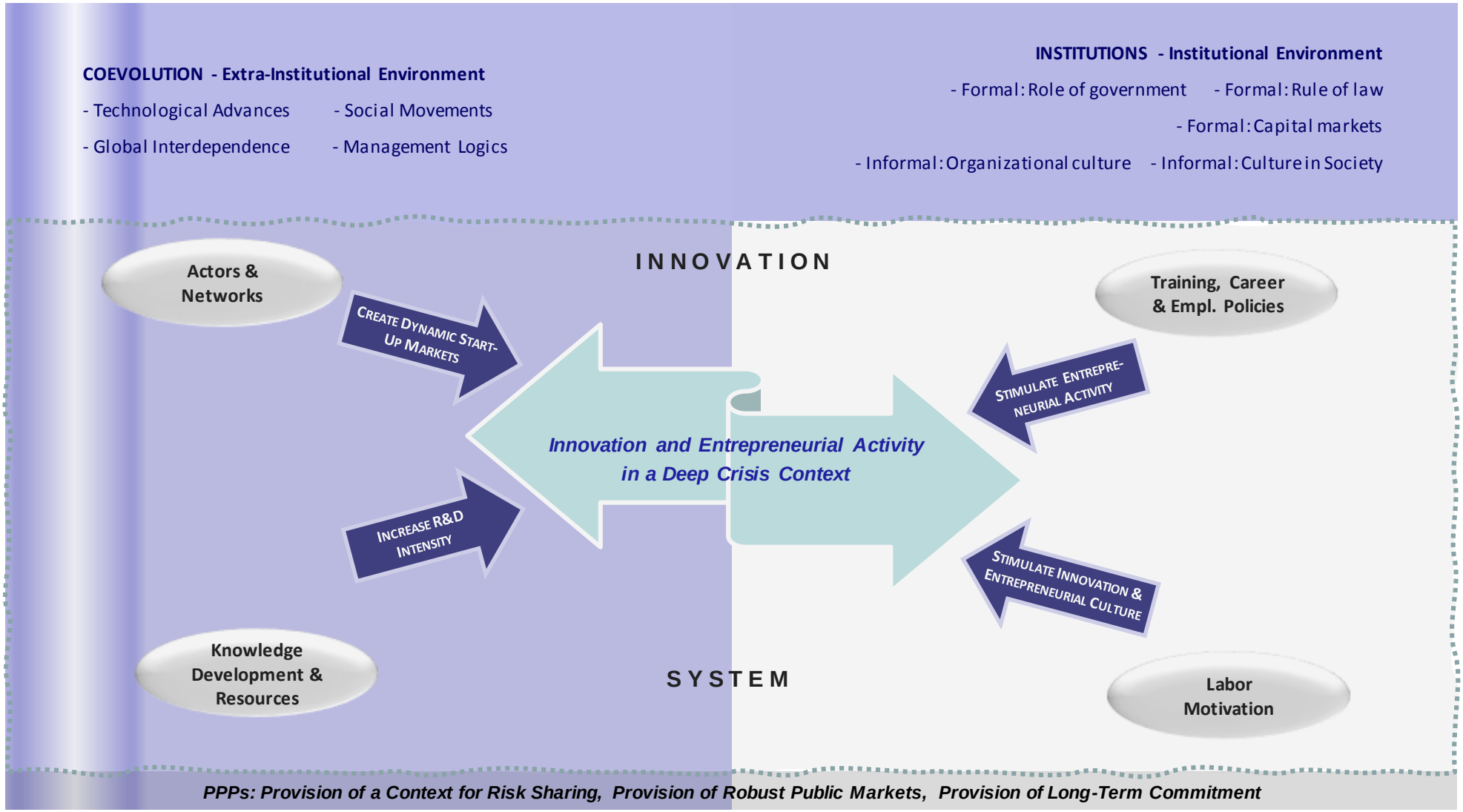

Figure 14. Integrated Conceptual Research Model.

5 RESEARCH METHODOLOGY

This chapter presents the methodological approach of the research process. It gives information about the method adopted in this research and explains why and how it was used. The different stages of the research as the choice of participants, the data collection and the process of data analysis, as also the role of the researcher are described. A discussion of validity and reliability in qualitative research concludes the chapter.

5.1 Epistemology

The word has its root in the ancient Greek verb ἐπίσταμαι (epistame). From this word comes the term Science (Επιστήμη, in Greek), which means that the one who deals with Science, the scientist, is the one who has full control and supervision of a subject. As Hofer and Pintrich (1997) refer: "*Epistemology is a branch of philosophy concerned with the nature and justification of knowledge"*. According to Crotty (1998), epistemology is "how we know what we know". An epistemological point of view is significant as it helps to shed light on issues of research design (Easterby-Smith et al., 2012). Crotty (1998) proposed that there incurs a relationship amid the theoretical attitude and the methods used by the researcher, as also his view of the epistemology, which give a philosophical background for deciding what sorts of knowledge are licit and sufficient (Figure 15).

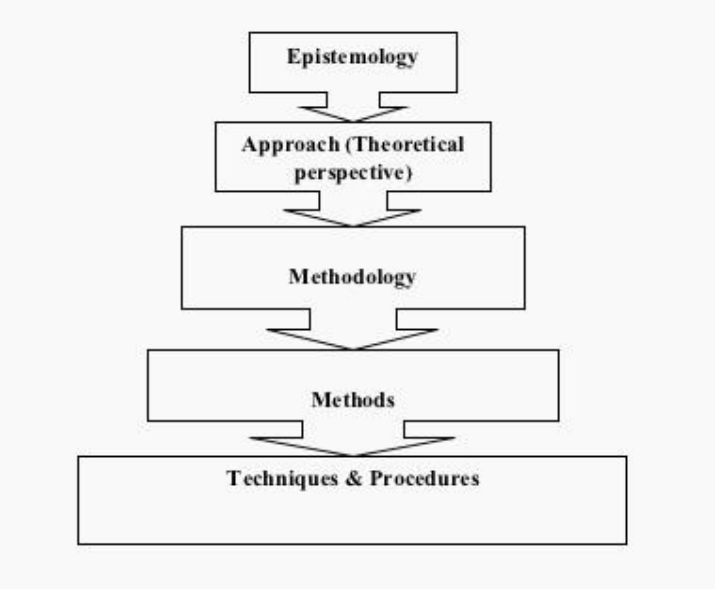

Figure 15. Crotty's Theoretical Grounding. Source: Crotty (1998).

5.2 Research Design

Research design is a critical part of any research as it determines the research strategy (e.g., quantitative vs. qualitative), the relation to theory, the identification of whom and what to study, and the tools and processes to be employed in order to gather and examine data. As Punch (1998) states, research design denotes a construction to plan and perform a specific research. For research planning, many factors need to be considered, such as:

- The research field or subject of the research,
- The purpose of the investigation,
- The theoretical and epistemological background,
- The research questions,
- The methods of producing research material,
- The sampling,
- The analysis of research material,
- The researcher's reflectivity and
- Principles and ethical issues in the research process.

The character of the research question and the topic being explored define the research methodology (Denzin & Lincoln, 2005). Ordinarily, research plan expresses a structure to organize and perform a specific subject. Research design is a pivotal component of the research and should be understood as a tool that can give an answer to the research question.

5.3 Research Methods

Research is an academic activity, which contributes to grow existing knowledge, through objective and systematic observation. Research comprises "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications (OECD 2002, p.30). The aim of research is to find answers to questions or at least to achieve new insights into it, through scientific procedures. The combination of experience with deductive and inductive reasoning is the keystone of scientific research (Easterby-Smith et al, 2012).

Kothari (2004), argues that Research Methodology is a process to a systematically arrive at a solution of the research problem. It may be understood as a science of studying how research is done scientifically. The various steps that are generally adopted by a researcher are being

studied. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Research methodology is not only the research methods but also the logic behind the methods used in the context of the research study which explains the use of a particular method or technique so that research results are capable of being evaluated either by the researcher himself or by others (Kothari, 2004).

Each research method has its distinctive characteristics. Each is a different way of collecting and analysing empirical evidence, following its own logic. Each one of them has its own advantages and disadvantages. It is particularly important for a researcher who would conduct innovative research to select a suitable research method. To achieve the best results you need to appreciate these differences. The selection of the proper research method depends on the following three conditions (Yin, 2009):

a. The type of research question posed. A basic categorization scheme for the types of questions is the familiar series: “who”, “what”, “where”, “how”, and “why” questions,
b. The extent of control an investigator has over actual behavioural events, and
c. The degree of focus on contemporary as opposed to historical events.

The nature of the research problem and the type of research questions being asked are the main drivers behind the choice of the initial methodology (Creswell, 2004; Simon & Francis, 2004; Yin, 2009). Therefore, the definitions of qualitative and quantitative research will be analysed.

Qualitative research is a type of scientific research, inductive, with the aim of describing multiple realities, developing deep understanding and capturing everyday life and human perspectives (Taylor G., 2005). Qualitative methods have become important tools and have gained in popularity outside the traditional social sciences to reach management research and become a central approach to understanding organizations and their interactions (Easterby-Smith et al, 2012).

Denzin & Lincoln (2005) define Qualitative research as a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that makes the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them.

On the other hand, Quantitative research is a formal, objective, systematic process in which numerical data are used to obtain information about the world. This research method is used: "a) to describe variables; b) to examine relationships among variables; c) to determine cause-and-effect interactions between variables" (Burns & Grove 2005, p. 23). This kind of research gives a measure of what people think based on statistical analyses of various degrees of sophistication. Quantitative research is essentially for the collection of numerical data, in order to explain a particular phenomenon using quantitative methods and is required in order to test deductively hypotheses generated from extant literature (Easterby-Smith et al, 2012). After the results have been analysed statistically, an inclusive answer came, and the results can be lawfully discussed and published.

Table 3 provides a comprehensive comparative summary of the major characteristics that distinguish qualitative vs. quantitative research.

Criteria	Qualitative Research	Quantitative Research
Purpose	To understand & interpret social interactions.	To test hypotheses, look at cause & effect, & make predictions.
Group Studied	Smaller & not randomly selected.	Larger & randomly selected.
Variables	Study of the whole, not variables.	Specific variables studied
Type of Data Collected	Words, images, or objects.	Numbers and statistics.
Form of Data Collected	Qualitative data such as open- ended responses, interviews, participant observations, field notes, & reflections.	Quantitative data based on precise measurements using structured & validated data-collection instruments.
Type of Data Analysis	Identify patterns, features, themes.	Identify statistical relationships.
Objectivity and Subjectivity	Subjectivity is expected.	Objectivity is critical.
Role of Researcher	Researcher & their biases may be known to participants in the study, & participant characteristics may be known to the researcher.	Researcher & their biases are not known to participants in the study, & participant characteristics are deliberately hidden from the researcher (double blind studies).
Results	Particular or specialized findings that is less generalizable.	Generalizable findings that can be applied to other populations.
Scientific Method	Exploratory or bottom–up: the researcher generates a new hypothesis and theory from the data collected.	Confirmatory or top-down: the researcher tests the hypothesis and theory with the data.
View of Human Behavior	Dynamic, situational, social, & personal.	Regular & predictable.
Most Common Research Objectives	Explore, discover, & construct.	Describe, explain, & predict.
Focus	Wide-angle lens; examines the breadth & depth of phenomena.	Narrow-angle lens; tests a specific hypotheses.
Nature of Observation	Study behavior in a natural environment.	Study behavior under controlled conditions; isolate causal effects.
Nature of Reality	Multiple realities; subjective.	Single reality; objective.
Final Report	Narrative report with contextual description & direct quotations from research participants.	Statistical report with correlations, comparisons of means, & statistical significance of findings.

Table 3. Summary characteristics distinguishing qualitative vs. quantitative research.
Sources: Johnson, B. & Christensen, L. (2008, p.34); Lichtman, M. (2006, p-7-8). Retrieved from https://www.aabat.org.au/research/about-evaluation-methods.

Every empirical study has an implicit, if not explicit, research design. In the most elementary sense, the design is the logical sequence that connects the empirical data to a study's initial research question and, ultimately, to its conclusions. Five components of a research design are especially important for case studies (Yin, 2009):

1. A study's question. The case study method is most likely to be appropriate for "how" and "why" questions, and for "what" questions of exploratory kind. So the initial task is to clarify precisely the nature of your study questions in this regard.
2. Its propositions, if any. Each proposition directs attention to something that should be examined within the scope of study.
3. Its unit(s) of analysis. This component is related to the fundamental problem of defining what the "case" is, i.e., what is the major entity in a social context that will be interviewed, observed, etc.
4. The logic of linking the data to the questions and propositions.
5. The criteria for interpreting the findings. These components (the fourth and the fifth) will be determined by the data analysis approach adopted.

Case studies can be quantitative or qualitative (Doolin, 1996; Stake, 1994) or any mix of both (Yin, 2009). In the qualitative interpretive case study the researcher is directly involved in the process of data collection and analysis (Andrade, 2009). A case study is 'an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used (Yin, 2009). The case study method is flexible, producing diverse research outcomes (Darke et al, 1998), and supporting all types of philosophical paradigms. The case study relies on multiple sources of evidence and multiple data collection methods. Each source has advantages and disadvantages and all complement each other, so that it is recommended that multiple sources of evidence be used and triangulated (Yin, 2009).

To sum up, our research problem dictates to adopt a qualitative research methodology relying on documentary analysis, interviews and case studies, in order to examine in-depth 'purposive samples' to better understand the phenomenon (Racino, 1999). It represents the

following characteristics that make a qualitative approach most effective (Easterby-Smith et al, 2012; Miles & Huberman, 1994, Yin, 2009):

- It takes place in a complex context, which has to be part of the investigation itself, but over which the researcher will have little control,
- The research questions deal with relationship and links between phenomena.
- The central research questions are of 'exploratory what' and 'how' type, which also call for a qualitative investigation that searches to explain meaning and cause effect relations, rather than occurrences, frequencies and quantitative relationships between phenomena.

5.4 Deduction in relation to Theory

As Goddard & Melville (2004) state, inductive approach begins with the observations and theories that are proposed towards the end of the research process as a result of observations. From the other side, as Bernard (2011) argues, inductive research "involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses".

When a researcher follows the inductive approach, starts by gathering an essential amount of relevant to his subject data. In the meantime, he is looking for patterns and relationships in the data and he tries to explain them, in order to build a theory. That is meant, that the researcher observe and tries to move from data to theory, or in other words to go from the specific to the general. In the other side, in a deductive approach the researcher reads existing theories of the studying topic and tries the rising from them hypotheses. That means that he goes from the generality to the specificity. This process is illustrated in Figure 16.

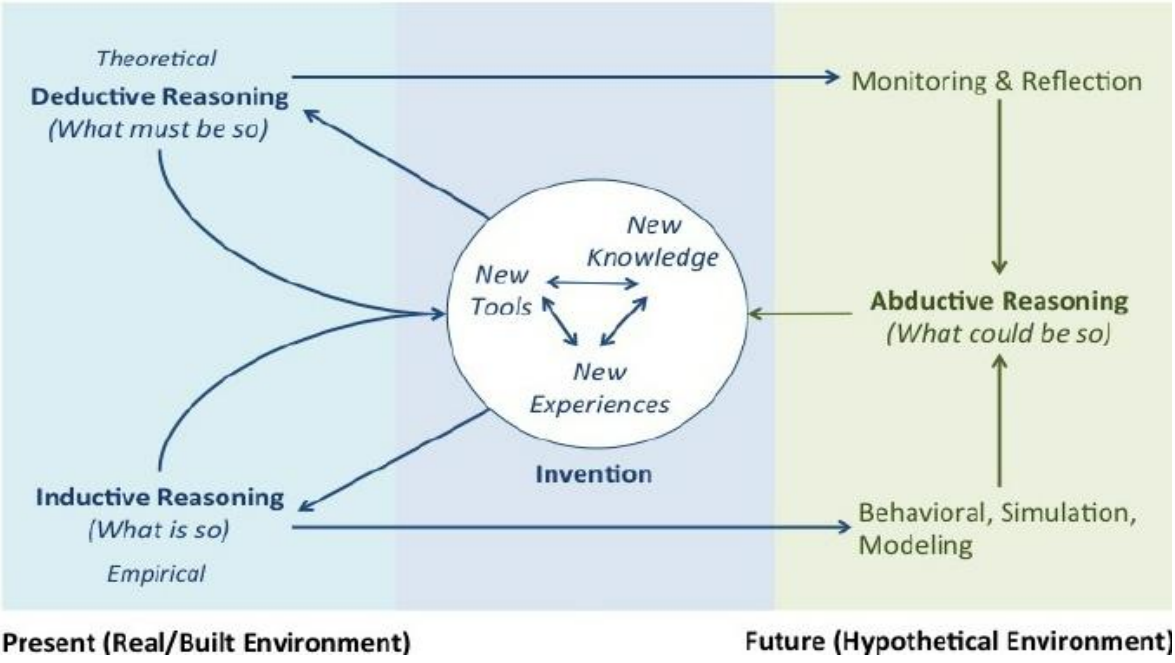

Figure 16. Deductive, Inductive and Abductive Reasoning. Source: Manoff et al (2013).

Creswell and Plano Clark (2007) state that an inductive researcher is someone who works from the "bottom-up, using the participants' views to build broader themes and generate a theory interconnecting the themes", while a deductive researcher "works from the 'top down', from a theory to hypotheses to data to add to or contradict the theory".

Although inductive and deductive approaches appear to be completely different, nevertheless they can be quite complementary indeed. As Creswell and Plano Clark (2007) state, the differences are not opposites but are rather differences on a continuum. According to Trochim (2006), arguments based on experience or observations are best enunciated inductively, while arguments based on laws, rules, or other broadly acceptable principles are best expressed deductively.

For the aims of this research the inductive approach was followed. The reason for this choice was that this approach takes into account the conditions under which this research is held and also is the most relevant for small samples, which a qualitative research requires.

The interview data were well suited to an inductive approach; we looked for patterns across the interviews and then tried to make sense of those patterns by theorizing about them.

5.5 Data Collection

Data collection is a critical step of research that involves a plan to collect the information within the research method selected. In many instances the researcher uses both secondary and primary data collection as part of the same research project. In the present research, the 'unit of analysis', i.e., the major entity in a social context from and around which data will be collected, is the *Innovator*, whether he or she is a first-time entrepreneur launching a scalable knowledge-based startup, an owner/leader of an innovation-driven SME, or an innovation manager / innovation mission-holder in a larger enterprise.

Data collection methods for qualitative research are time consuming, but the information is better and focus deeper on the phenomenon under study. There several methods for collecting qualitative data. As Eisenhardt (1989) suggests, the researcher can rely on different data sources as face-to-face interviews, phone conversations, follow-up emails, and archival data such as internal documents, press releases, websites, and news articles. Triangulation of data sources provides more accurate information and improves the robustness of the resulting theory (Anand et al, 2007; Jick, 1979).

According to Patton (2002) the qualitative findings grew out of three kinds of data collection:

a) In-depth, open-ended interviews. Open-ended questions and probes yield in-depth responses about people's experiences, perceptions, opinions, feelings, and knowledge. Data consist of verbatim quotations with sufficient context to be interpretable.

b) Direct observations. Fieldwork descriptions of activities, behaviours, actions, conversations, interpersonal interactions, organizational or community process, or any other aspect of observable human experience. Data consist of field notes: rich, detailed descriptions, including the context within which the observations were made.

c) Written documents. Written materials and other documents from organizational, clinical, or program records; memoranda and correspondence; official publications and reports; personal diaries, letters, artistic works, photographs and memorabilia; and written responses to open-ended surveys. Data consist of excerpts from documents captured in a way that records and preserves context.

In the present research, a combination of the above three approaches were used, so called triangulation of data, which besides providing richer information also improves reliability and validity (Easterby-Smith et al, 2012; Yin, 2009). Semi-structured interviews with both open-

and closed-ended questions helped to define the areas to be explored, but also allowed the interviewer or interviewee to diverge in order to pursue an idea or response in more detail (Britten, 1999).

Entrepreneurs, business owners and innovation managers were interviewed, complemented with representatives for major support initiatives and incubators in Greece. Before the interviews the participants were informed about the research and given assurance about ethical principles, such as confidentiality and anonymity (Britten, 1999).

The selection of companies and organizations for the interviews followed a criterion sampling strategy (Miles & Huberman, 1994; Silverman, 2016), meaning that all organizations selected for interviews meet some specific criteria to control for their relevance in relation to the research problem under investigation. In the present research the criteria were:

- Have a record for launching innovative products or services in the market during the crisis years (for established firms),
- Starting up and successfully exploiting an innovative business model during the crisis years (for startups and young firms),
- Have a record of at least three years (at the moment of making contact) of successive operation and support of startups and young firms through a systematic, repetitive and methodologically sound approach (for entrepreneurship and innovation support organizations),
- Be located in the Attica Region of Greece in order to control for local contextual conditions.

Based on these fundamental criteria, the selection of organizations relied on discussions with innovation and entrepreneurship experts from academia and other non-profit organizations during the early stages of the research. Each potential organization was scrutinized through collection of secondary data and validation with at least one expert, before making contact.

During the interviews a certain number of general guidelines developed in methodology literature were respected (Easterby-Smith et al, 2012; Silverman, 2016):

- Firstly, semi structured interviews with open-ended questions are the most appropriate when the opinions and meanings of the interviewees are looked for; the objective being to gather an 'authentic' understanding of people's experiences.

- Secondly, some specific techniques for animating the discussion were used. A too passive attitude from the interviewer, that might create a problem for the interviewee about what is relevant or force him/her to talk only to fill up a silence, was avoided. The topic guide served as a tool for conducting the interviews. Moreover, if the interviewee hesitated or gave imprecise answers questions like 'Could you tell me more about this?' 'Could you specify further'? or 'What are you thinking about in particular'? could be used. It is important in such cases not to give any suggestions to interviewees.
- Thirdly, the critical incident technique was useful to start out the interviews or enter into new subjects. It is efficient when managers have difficulties in articulating answers to specific questions. It consists of asking the interviewee to describe specific events that have had a critical impact on the way a specific question or domain has been managed.

In order to test the research approach and collect initial data, four pilot interviews were conducted during the spring of 2015. The pilot interview questions focused on the emergence of the idea, funding, support received and/or searched, and the major challenges encountered. The results of the pilot interviews are summarized in table 4.

Firm Characteristics	**What's the history of the basic idea and where did this idea for the startup come from?**	**How are you funded? Did you have any funds or are you self invested? How difficult was it to get funds?**	**What support have you received from public or other support structures, Are they sufficient?**	**What has been your biggest challenge so far as a startup owner? And, what has been your most precious experience so far since starting your business?**
An online service that aims to meet the need for blood	The grand-mother of one founder was gravely ill and was in need of constant blood transfusions.	When they begin, they were self invested, after they won at feast Athens and the first prize in Impact hub Athens. They think that you can find good support in this period of crisis	At the beginning you have the support of friends and relatives. In the next steps, they get support from University and they won in startup competitions.	It was the relevance and the common culture of their group. A valuable experience was the successful attempt of voluntary blood donation with the assistance of the hospital Evangelismos.
A digital photo frame with ads	It is the continuation of a previous idea of an automation company that he founded	He was self invested. The only funding he received was at the beginning from OAED .because of the large supply in startups it is difficult to choose what is really worth.	He has not received any support. It is difficult from someone alone in the open market to reach support program. Once in the MBA doors opened – ACEin.	Being able to pay your obligations as your Taxes and rent.

Table 4. Summary of pilot interview findings.

An online auction company for sale and rental properties	In the period of crisis, they made an online auction company for sale and rental properties. They saw that it works in U.S.A and they tried to incorporate it in Greek reality.	They were self invested, because they wanted to show that their model works. It's difficult in real estate to be funded in contrast of other kind of companies	They won the EGG contest and so they were given offices, mentoring, consulting and accounting services. They consider that this assistance was effective although it could be improved.	The most difficult was to create a proper team. The most valuable experience is the right management staff.
A Greek online platform which helps students and professionals find or change their career path.	The startup founders did not have the proper information and their choices were random about their studies or the selection of their mentors	At the beginning they were self invested because no one trusts a new venture. After that, they collaborated with 3 investors and they sold them a presentence of their firm. The most difficult was to develop relationships of trust with their investors.	They participated in many competitions, in order to see if their idea it's worth. They won in all of them either cash or assistance. The assistance they received was very effective, especially by people who shared the experience they had by other startups.	The biggest challenge is to accept your failure and to be able to change it. The most valuable experience is being able to select the best group and the best collaborators. To be able to listen to them, to learn and to work with more experienced people than you.

Table 4. Summary of pilot interview findings (Continued).

A common thread of these cases is that the initial path is characterized by a quite unstructured searching for developing the business idea, which can come from a personal preoccupation or passion, combined with a validation of the concept through benchmarking with similar ideas in other markets or contexts.

The beginning was also self-funding for all, which is a necessary ingredient, but a very insufficient resource for enabling fast growth. In general, the funding was problematic for all, small if any financial support, unless as for the career venture, a more sophisticated financial solution could be found.

Idea contests were a way to validate the concept as soon as a first prototype and/or complete business plan could be developed. Competitions that comprise assistance can also be very useful. However, jumping from one competition to another is not very meaningful as they are not designed for real development to take off. At the earliest stages competitions are useful to really trim the idea, but then it has to grow through the involvement in an incubator.

Biggest challenge was related to building the right team to run the venture. Also, a big challenge is to dare to question and change, 'pivot', the business idea and business model. For

a business that has taken off, maintaining and growing cash flow to pay expenses while developing the business is job 1.

The general input from the brief pilot interviews is that a more structured support and policy framework is absent from the horizon of the individual innovator / entrepreneur in the Greek context. This can be assumed to be different when established companies will be interviewed, who will have a more systematic approach to exploiting any available resources.

As to the crisis, it was not lifted forward with particular implications. Support exists, as noted in the literature review. Questions did not focus on the crisis context and as with the support structures it is probable that when established innovating firms will be researched the results will be quite different.

After the pilot interviews, the central data collection phase took off. It lasted from the spring of 2016 until the spring of 2019. The main data collection method was semi structured interviews with startups, established innovative companies, support organizations and innovation/entrepreneurship experts. A comprehensive list of the interviews is presented in table 5.

	Interviews	**Date**	**Position**
1.	IsMood	Feb-15	Co-Founder
2.	Blood-e	Mar-15	Co-Founder
3.	Psyllas	Mar-15	CEO
4.	Panos Mitsios	May-15	Co-Founder
5.	100 mentors	May-15	CEO
6.	Ace In	May-16 & July-16	TEAM
7.	Endeavor	Nov-16	CEO
8.	Blueground	Jun-17	Co-Founder
9.	Owiwi	Dec-17	Co-Founder
10.	Cyclefi	Dec-17	Chief Business Development Officer
11.	Elval	Feb-18	Technical Director
12.	Papadopoulou	Feb-18	Marketing Director & R&D Director
13.	Be Spot (ace)	Mar-18	Co-Founder
14.	Shopmind (ace)	Mar-18	Co-Founder
15.	Musicspot (ace)	Mar-18	Co-Founder

Table 5. Interviews with Entrepreneurs, Managers and Experts.

	Interviews	Date	Position
16.	Vieno (ace)	Mar-18	Co-Founder
17.	Angenta gamou	Mar-18	Co-Founder
18.	Gaming Brotherhood	Mar-18	Co-Founder
19.	Fably (ace)	Mar-18	Co-Founder
20.	Mellon	Jun-18	head of marketing
21.	Cosmote	May & July-18	Senior Manager, Strategy and Development Manager, Strategic Planning Manager
22.	Webeaucoup	Jul-18	Co-Founder
23.	Nimbata	Jul-18	Co-Founder
24.	StartupVentures	May-18	CEO
25.	Epignosis	Sep-18	Co-Founder

Table 5. Interviews with Entrepreneurs, Managers and Experts (Continued).

Based on the literature review and the research questions, a system of three different interview guides were developed; one for startups, one for established firms, one for incubators, and one for support organizations (Appendix 1, 2, 3 and 4 respectively).

We also conducted an in-depth case study of the Cosmote Group, Greece's major telecoms operator and a company that showcases a number of important examples related to the underpinning theories of the research, in particular coevolution and institutions. More importantly, however, was that the Cosmote case could inform many of the results emerging from the multi-organization interviews, and thus provides additional strength to the analysis and the emerging data categories, aggregate dimensions and conceptual model. Moreover, Cosmote illustrates a transformation process from a problematic publicly owned organization to a modern technology company, contributing to the digital development of Greece even during the deep financial crisis.

For these reasons, a special interview guide was developed with a series of structured questions, to which Group executives were invited to respond (Appendix 5). The interview guide was predetermined and the respondents were asked to answer a specific set of open-ended questions. This interview guide was formulated after a thorough study of the Group. The careful preparation and planning of the qualitative interview was based on the ontological and epistemological principles, which are related to the main research questions of the thesis and focused on the essence of the research topic.

The Cosmote Group Case Study interview guide aimed to collect data on the categories of co-evolution, institutions, innovation systems, as also of innovation and entrepreneurship policy. Finally, there were concluding questions to give participants the opportunity to make their final statements on the topics discussed and may have been omitted during the interview.

The interview guide was relatively long, because of the importance of the case in relation to all the research topics and the emerging results. However, company executives agreed to respond with great eagerness and thoroughly in the interviews, despite increased time requirements.

Interviewees were selected after contacting the Group's C-level executives. The participants were very knowledgeable on the topics and provided the conditions for a productive discussion on research topics. The high level of experience and background of the respondents provided important information for the ongoing research. The interviews were conducted in-person and gave the researcher the opportunity to develop relationships of trust, in order to deepen the subject under investigation.

The process was quite demanding not only during the conduct of the interview, but also during the design, recording and the analysis of the data. The need to re-examine some of the data that emerged across their processing was necessary, as to make fuller and better use of the findings.

The interviews were recorded with the consent of the respondents, but at the same time, the researcher recorded the main points and related observations in writing. Subsequently, procedures for transcribing and recording the research data were made, in an attempt to capture the answers of the interviews correctly. Depending on the research questions, the transcript was more extensive or more concise if some information was repeated.

Finally, an important volume of secondary data was analyzed, both regarding the crisis context, and related to the companies interviewed. In particular, the Comote case was supported by a large number of documents and studies, some provided by the company under confidentiality, and some identified on line. The most important secondary sources are referenced directly in the data analysis chapter, where their input was used a priori. All secondary sources are then listed in Appendix 6.

5.6 Data Analysis

Qualitative data is information gathered in a nonnumeric form and consists of words, texts and observations. As with all data analysis, qualitative analysis and interpretation aim to bring order and understanding in a somewhat messy mass of collected evidence for the research at hand (Easterby-Smith et al, 2012). Interviews and observations in the present research produced hundreds of pages of transcripts and field notes, to which were added documentary secondary sources. This information demand critical examination within a good qualitative analysis in order to better understand the phenomenon or the process. Qualitative data analysis is the process of turning written data such as interview and field notes into findings, using creativity, discipline and a systematic approach (Taylor & Gibbs, 2010). There are many different ways of doing QDA, there is no single or best way, and in fact there are several approaches. The particular approach the researcher will take depends on many factors, such as, the research question, the time and the resources etc. Whatever method of analysis is used, the researcher's aim should always be to produce the best quality findings.

The purpose of qualitative data analysis is to uncover emerging themes, patterns, concepts, insights and understandings (Patton, 2002). Sampling of research participants in qualitative research is described as purposive, meaning there is far less emphasis on generalizing from sample to population and greater attention to a sample "purposely selected for its potential to yield insight from its illuminative and rich information sources" (Patton, 2002, p. 40)

The most widely accepted phases for coding procedures are that of Strauss and Corbin (1990; 1998), namely *open coding, axial coding,* and *selective coding* (Jones & Noble, 2007; Siedel et al, 2013). There is a cyclical connection among the three phases, which introduces an important dynamic to the coding process (LaRossa, 2005). Data analysis begins with identification of the themes emerging from the raw data, a process called "open coding", during which the researcher must identify and name each separate incident, idea or event that represents a phenomenon. As Strauss and Corbin (1990, p. 62) describes "the data are broken down into discrete parts, closely examined, compared for similarities and differences, and questions are asked about the phenomena reflected in the data". The aim is to create different categories, in order to be in the same group similar words, phrases or events. Open coding relies heavily on a line-by-line coding of texts (Glaser, 1978; Strauss & Corbin, 1990), in other words a micro-analysis of the transcripts with the aim of identifying ideas, events, indicators, actions and processes that have a conceptual meaning and power to pave the way for the further analysis.

The open coding process in the present research resulted in 51 distinctive codes, grouped according to their nature into 23 conceptual categories reflecting the main themes emerging from the data.

As Strauss and Corbin (1990) refer, the next step of analysis requires re-examination of the categories identified to determine how they are linked, a process called "axial coding". According to Strauss (1987, p. 32), axial coding consists of “intense analysis done around one category at a time, in terms of paradigm items (conditions, consequences, and so forth)”. The function of the paradigm items is to serve “as reminder to code data for relevance to whatever phenomena are referenced by a given category, with special attention to conditions, interactions among actors, strategies and tactics, consequences” (Strauss, 1987, p. 32). In axial coding, the relationship between or among variables is explicitly examined, with the objective to develop a ‘new’ understanding of the data in terms of the interconnections among categories that can be conductive to developing a consistet conceptual model or theory of the phenomenon under study (LaRossa, 2005, Strauss & Corbin, 1990).

Axial coding relies of the “Paradigm Model” (figure 17) where all categories are structured around a **core category**, that represents the **central phenomenon** of the study, as identified from the research problem and the central research question (Strauss & Corbin, 1990; 1998). The other categories will be related to the core category as:

- **Causal conditions** that are of directive nature, influencing the central phenomenon (e.g., driving forces, objectives…). Causal conditions can be both *emerging* from environmental dynamics, and more directly *intentional* by managerial decisions),
- **Context** that represent organizational and environmental situation within which the phenomenon occurs and that compared to the causal and intervening conditions are of more static and stable nature (e.g., structures, organization, institutions),
- **Intervening Conditions** that are of shaping nature and that intervene, both from environmental dynamics and from intentional managerial decisions, in carrying out and managing the phenomenon (e.g., decision-making, reactions from stakeholders, changes in institutions and other contextual variables),
- **Consequences** that represent the outcomes, predictable or not, intended or not, that result from how the phenomenon unfolds and is managed through the other dimensions.

In addition to the above dimensions of categories, **action/interaction strategies** represent actions devised to manage, handle, carry out or respond to a phenomenon under the specific set of causal, contextual and intervening conditions. In an integrated research model derived from the paradigm structure, the action/interaction strategies represent essentially the managerial implication of a given research.

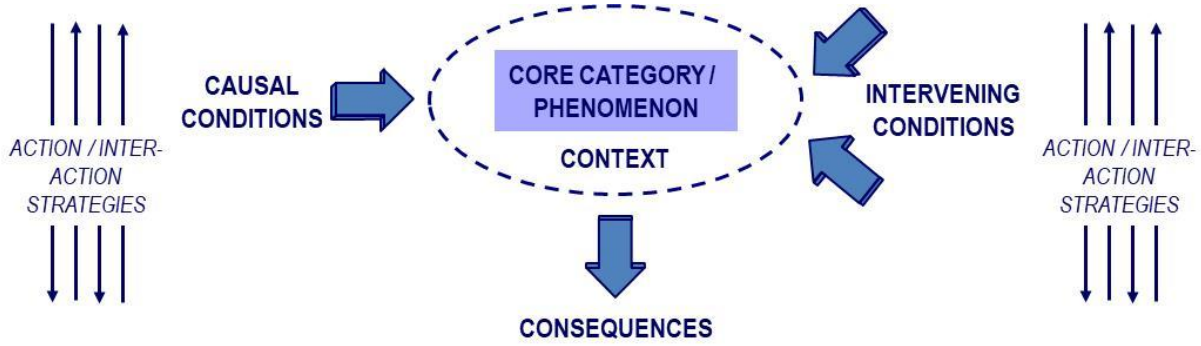

Figure 17. The paradigm model (adapted from Strauss & Corbin, 1990, p. 99).

Eventually, according to Strauss and Corbin (1990), the researcher must translate the conceptual model into the story line that will be read by others. Ideally, the research report will be a rich, tightly woven account that closely approximates the reality it represents. This final stage of the analysis process, which intertwines with the results and implications of the research is sometimes referred to as "selective coding" and ends up in "a larger theoretical scheme" (Strauss & Corbin, 1998, p. 143).

Easterby-Smith et al, (2012) consider that there are seven main stages of qualitative analysis that are intertwined with the three coding stages developed by Strauss & Corbin (1990):

1) Familiariazation. The researcher must apprehend what the data suggests relating to the studied phenomenon, and whose point of view is being expressed. Also, the relationship between the research and the people interviewed should be accounted for. This is the first step of open coding.
2) Reflection- There is so much rich data that trying to make sense of it seems an impossible task. Evaluation and critique become more evident as the data is evaluated

in view of previous research, academic texts and common sense explanations. Here data is sorted into the areas identified by the literature review and this identification is annotated as the open coding commences.

3) Conceptualization- At this phase there is a number of concepts that seem to be important for understanding what is going on. These concepts are now articulated as explanatory variables, and need to be coded. This is the outcome of the open coding phase.

4) Cataloguing concepts- Having established that these concepts do seem to occur in people's explanations, they can be transferred into a database. Focused codes are more directed, conceptual and analytical and axial codes specify categories and the dimensions of a category. This is the central activity of axial coding.

5) Re-coding- While the process is usually iterative there will need to be an element of going back in order to check against the original data and comparing incidents to identify particular properties. This is how axial coding proceeds and produces a first structured picture of the data.

6) Linking- This is the stage of developing theoretical codes by conceptualizing "how substantive codes may relate to each other as hypotheses to be integrated into a theory. This is the final stage and outcome of the axial coding.

7) Re-evaluation- In view of the comments of others, the researcher may feel that more work is needed in some areas. This is when the selective coding evolves into a narrative that addresses all the research questions and produces a conceptual model or even a novel theory.

Finally, during the data analysis, we applied a range of good practices, relying on recent qualitative studies that follow the Strauss & Corbin (1990; 1998) approach and that have been published in the Academy of Management Journal, one of the leading academic journals with a long-standing tradition of publishing high quality qualitative research in almost each issue (Gephart, 2004). These practices include:

- Research, interviewing and analyzing took place concurrently during all phases of data collection in order to enable continuous adaptation of the interview guide according to the critical themes emerging (Dattée et al, 2018). This iteration between

coding and data collection is essential for discovering patterns across interviews and other data sources and represents the process through which first codes and then categories emerge,

- Notions and sentences in the empirical data were named ‘in vivo’ (Wright & Nyberg, 2017), which means placing emphasis on the actual spoken words of the participants, used in response to the questions asked, and use these as inspiration or even verbatim for naming codes and categories (Locke, 2001). This ensures that the results of the analysis reflect the theories informing the research as well as the reality from which the data was collected, so that theoretical and managerial contributions speak the language of both the theoretical underpinning and the practical context of the research,
- The aggregate dimensions were named using action-oriented labels (Ramus et al, 2017) to reflect that the innovators, entrepreneurs and members of support structures that were interviewed and researched tried many different actions to drive and support innovation in the crisis context. This reinforces the link between theory and practice, essential in management research, and pave the way for identifying managerial and policy implications in parallel with the theoretical implications (Strauss & Corbin, 1990),

5.7 Validity and Reliability

To obtain the accuracy (reliability and validity) of key informant data, researchers collect supplementary data, such as information from archives or more respondents. The triangulation, as this tactic has been labelled (Webb et al., 1966), can be comprehended as “the combination of methodologies in the study of the same phenomenon” (Denzin 1978, p. 291). The ultimate goal of triangulation is to ensure the accuracy of key informant data. Triangulation results depend on specific characteristics of a study’s design, in particular the consistency of the questions being asked, and the degree of similarity of the phenomena measured across data sources (Borenstein et al. 2009).

To establish the quality of a research design, four tests have been commonly used to all research methods included case study (Yin, 2009).

1. Construct validity is about identifying correct operational measures for the concepts being studied. When doing case studies, three tactics can be used to expand construct validity: a) the use of multiple sources of evidence, b) establish a chain of evidence, and c) have the draft reports reviewed by key informants.
2. The concern over internal validity, for case study research, extends to the broader problem of making inferences. The results should be addressed and confronted with rigorous analytic techniques such as pattern matching, explanation building, addressing rival explanations and using logic models.
3. External validity. A test for defining the domain to which a study's findings can be generalized. In qualitative research this is done by linking the emerging findings to existing bodies of literature; how they can extend and complement them.
4. Reliability. A test which demonstrates that if a later investigator follows the same procedures as described by an earlier investigator and conducts the same case study all over again, the later investigator should arrive at the same findings and conclusions. In qualitative research this is done by keeping a clear record of:
    - Directly taken field notes - from interviews and observations,
    - Expanded typed notes made as soon as possible after the field work (this includes comments on problems and ideas that arise during each stage of the fieldwork and that will guide further research),
    - Analysis and interpretation steps (open, axial and selective coding).

Table 6 summarizes the validity and reliability criteria for interpretive case studies aiming at theory building.

Criteria for Interpretive Case Study Aiming at Theory Building

Criterion	Definition	Specific case study tactic	Grounded theory principles
Construct validity	Establishing correct operational measures for the concepts being studied	• Use multiple sources of evidence • Establish chain of evidence • Have key informants review draft case study report	• Corroboration • Theoretical sufficiency
Internal validity	Establishing causal relationship as distinguished from spurious relationships	• Do pattern-matching • Do explanation-building • Address rival explanations • Use logic models	• Theoretical coding
External validity	Establishing the domain to which a study's findings can be generalized	• Use theory in single-case studies • Use replication logic in multiple-case studies	• Theoretical generalisation
Reliability	Demonstrating that a study can be repeated with the same results	• Use case study protocol • Develop case study database	• Chain of evidence as afforded by grounded theory method

Table 6. Case Study Methodology Criteria (Yin, 2003, p. 34)

5.8 The Role of the Researcher

As Creswell (2007) states, the researcher's role in qualitative research is crucial, as he or she gathers data and performs analysis relying on perception, conceptual and theoretical sensitivity, and the obligation of keeping a neutral and objective stance towards the phenomena being investigated. The researcher tries to investigate the particularities of the phenomenon of interest, in order to undertake a thorough, detailed study, understand all the dimensions of the phenomenon of interest and approach it holistically. Enough time and resources must be set aside to enable an intensive contact with the field and the collection of rich data to grasp the complex nature of the subject matter.

In the qualitative research process, the main interest of the researcher focuses on the conception and understanding of the meanings of the answers given for the issue under investigation, and not so much in the study of the relevant literature. The researcher should continually assess actions and role during the research process and submit the results after thorough scrutiny.

The researcher following a qualitative method must observe, conduct interviews, note, describe and finally interpret the phenomena as they have been presented. After collecting the data, the researcher will try to interpret their meaning and relate it to the study context and the framing relevant literature (Eisner, 1991). The challenge is to combine in a reasonable way

data, elements and situations, to arrive at a conclusion from all the observation. The analysis technique described above are helpful in this process, but the development of an awareness of what is important and how it relates to context subject to the researcher's capabilities that develop over time from practice.

Undoubtedly, the researcher cannot be absolutely neutral, distant or emotionally disengaged (Rubin and Rubin, 1995). It is a challenge for the researcher to remain neutral, particularly as the relationship that develops with the respondent affects him/her (Mehra, 2002). The researcher should not wait for answers that are identical to what he has in his mind, but to see the respondent without being affected and not to overstate or underestimate the truth he is advocating (Rubin & Rubin, 1995).

During an interview the researcher must demonstrate important communication capabilities and try to generate a friendly tone. The researcher should offer a short, informal introduction for the research, emphasizing the significance of the subject’s contribution and affirming anonymity, or confidentiality leastwise, when it is possible (Connaway & Powell, 2010).

5.9 Summary of the Methodological Approach

The aim of this research is to develop an integrated approach to the study and understanding of the conditions for innovation and entrepreneurial activity in a deep crisis context. The unit of analysis is the innovator, whether he or she is a young start-upper, a more experienced entrepreneur, an innovation practitioner, innovation manager or business owner / CEO. In parallel to the focus on the innovation practitioner, data will be collected also from organizations and programs with their actors, that are designed and implemented to support innovation and entrepreneurial activity .

A basic assumption is that innovation and entrepreneurship are complementary because innovation is the source of entrepreneurship and entrepreneurship allows innovation to flourish and helps to realize its economic value.

The crisis context in Greece, characterized by among other, economic recession, scarcity of funding for investments, austerity measures, escalating unemployment and political and institutional instability, is assumed to have an impact on the research topic that is to be explored and described.

The exploratory nature of the research calls for a qualitative research methodology. The main source of data will be interviews and case studies, but emphasis is also placed on collecting data from secondary sources including company documents, reports, articles and websites.

A research model integrating theories of coevolution, institutions, innovation systems and innovation policy was developed from the literature review and will act as a roadmap to the research.

Data analysis follows well-established templates for qualitative research, integrating good practices from recent qualitative research published in top journals.

Validity was improved by using multiple sources of evidence, establishing a chain of evidence and having draft reports reviewed by key informants. Reliability was ensured by keeping a record of all field notes and interview transcripts, keeping a file with expanded field notes, and explicitly referring the analysis and interpretation steps (open, axial and selective coding) in the thesis itself.

6 DATA REPORTING AND ANALYSIS

This chapter will present the data analysis and the main findings in the different areas of the research, more precisely:

- Coevolution,
- Institutions,
- Innovation Systems, and
- Innovation and Entrepreneurship Policy.

As stated in the introduction, the aim of the research is to analyse innovation in the Greek deep crisis context and how companies, support initiatives and policy makers act and adapt to this situation. The central question of the study is:

> ***What are the conditions for innovation and entrepreneurial activity in a deep crisis context and how should companies, support initiatives and policy-makers adapt and act to create and sustain innovation in such a context?***

This central research question is broken down into five sub-questions in order to structure the findings around drivers for innovation in the crisis context, conditions specific to the crisis context, conditions that intervene in the innovation process in the crisis context, mechanisms developed in order to affront the crisis, and how an integrated model for innovation and entrepreneurship in a deep crisis context could look:

1. What are the crisis-induced conditions that drive innovation and how do companies respond to these to use innovation as a way to affront the crisis?
2. What are the crisis context-specific conditions that act for, or against, innovation?
3. What are the conditions that intervene in the innovation process, both from the crisis context and as a reaction to the crisis context?
4. What are the most appropriate mechanisms that can affront specific crisis-driven problems?
5. What would an integrated model of innovation and entrepreneurial activity in a deep crisis context look like, and how could it be used to design company actions, support

initiatives and policies to moderate the effects of the crisis by creating and sustaining innovation?

It should be noted that the perspective of Public-Private Partnerships is not represented in the data analysis for the simple reason that no such arrangements could be identified during the phase of searching for and approaching potential organizations to study. Hence, this perspective is left out of the further analysis.

6.1 Coevolution Mechanisms

As an underpinning theoretical model for the present research, coevolution emphasizes the dynamic interactions between a wide range of *factors*, where evolutionary reciprocity should be identified, and *players* where maximum inclusion should be favoured. Specificity, reciprocity and simultaneity are characteristics that provide a framework for analysing the coevolutionary dynamics of crisis-induced factors on the one hand, innovation conditions on the other, and the interconnections between these two sets of factors as well.

From the literature review, the following coevolutionary factors were used to analyse the data from the coevolutionary perspective:

- Technological advances,
- Social movements,
- Global interdependencies, and
- Management logics.

The analysis emphasizes how these factors interact with the micro-level of leading, managing and supporting innovation in the studied companies.

In the following, the data structure (Figure 18) and the analysis leading to it are presented for the coevolutionary perspective of the research into the conditions for innovation and entrepreneurial activity in a deep crisis context.

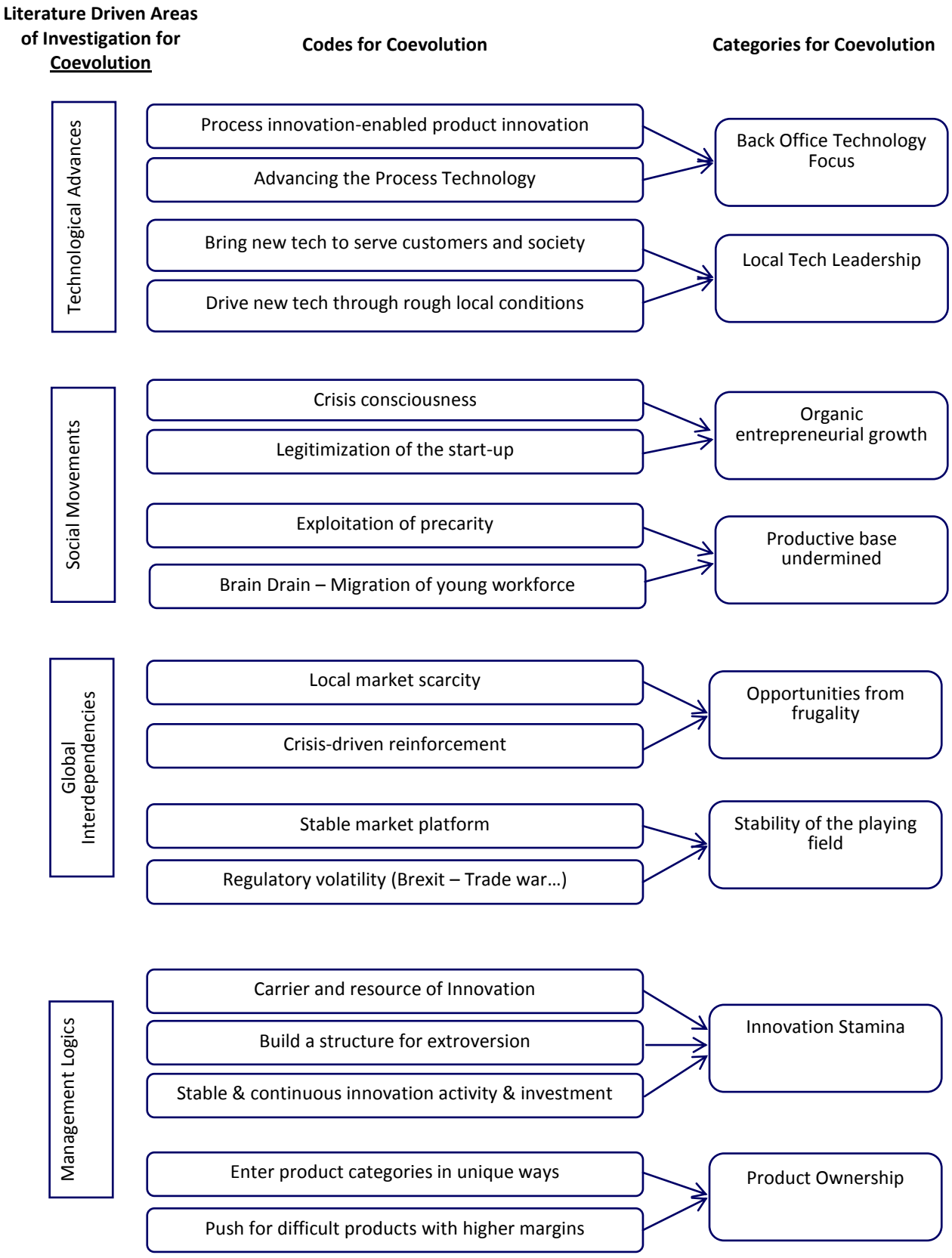

Figure 18: Data Structure for Coevolution.

6.1.1 Technological Advances

The central elements put forth by interviewees concerning technological advances were the important role of process and back-office technology, and the devotion to bring and implement new technologies in the Greek market. Both these processes have strong coevolutionary connotations as the first relies on a management logic of strong interconnection between the process and product dimensions of innovation, and the second on a management logic where technology's impact on the social structures of the country is also involved, as for example in the case of broadband implementation.

Process innovation-enabled product innovation

The central importance of process technology innovations as drivers and enablers for developing innovative products was strongly empathized by a cross section of companies, both small and large, and operating in all industry segments studied.

Two approaches were identified. The first was a reversed engineering approach, where most of the innovation focus was placed on process technology, and product innovation opportunities generated therefrom:

"*our latest […] process, which relies on several patents, enabled us to get such an extreme finish on the final product that we became the first choice of a very particular and demanding customer segment in* [a large export market]".

The second approach was more driven by a need to optimize process technology for efficiency and cost reduction reasons in the crisis context. Interestingly, however, this was not only applied traditionally, i.e., as a process development activity for materializing, in a more effective way, a product design, but also offered to the companies new product innovation opportunities. One example was explained by a product manager:

"*We wanted to enter a complementary market, but existing process technology was both too expensive and not producing the quality we wanted. Hence, we looked for alternative process technologies, and came across [particular technology]. We developed a new production line with this technology* [about two years of development]*, and then we realized that this technology could be used for a much greater variety of products and this boosted product innovation much more than we initially had thought*".

Advancing the Process Technology

Based on the positive product innovation outcomes of the process innovation focus, both industrial and software companies emphasized the strategic importance of the process technology needed to be mastered to actually make the products being developed. Giving a much higher weight to process technology means that companies balance the efforts and strategic importance of product and process technology, and shed away from any activity that can qualify as simple outsourcing. The CEO of one of Greece's fastest growing IT companies during the crisis years explained:

"You only make money from product, we develop products in Greece and sell them internationally. We refrain from anything that is service – in the service provision / outsourcing sense of the word. We focus on product, there is where the money is and thus the potential for growth. BUT, without process mastery, no products, so we start from the process – the knowledge and technologies we need to MAKE the products, that's where we are leaders."

These two codes, 'Process innovation-enabled product innovation' and 'Advancing the process technology' lead to the identification of the category **Back Office Technology Focus** that highlights a representative stance for a cross section of a large part of the studied companies. From a coevolutionary perspective this creates a technology-driven management logic that emphasizes the product-process technology interplay and strategically places process technology, which is 'back-office' in the customers' perspective, in the first room.

We assign this category to the Causal Conditions in the paradigm model, as it is one of the foundational aspects of the core category – Innovation in the Crisis Context.

Bring New Tech to Serve Customers and Society

This code emerged initially from the Cosmote case study of broadband and 4G implementation in Greece. The company has a broader agenda in terms of closing Greece's lagging behind in the focal technology areas within its realm; mobile and internet enabled communications. Heavy investments in communication infrastructure became more difficult to finance and more difficult to predict in terms of returns during the crisis. Partnerships and financial innovations were solutions developed to meet these difficulties:

"We closed a deal with [Major European Telecom Company] which involved both a financing model and privileged access to new technology. This effort enabled us to launch the

development program for broadband and 4G with latest technology adapted to the particular Greek crisis context."

Hence, a coevolutionary dynamic between technology development outside the country and institutional and societal conditions inside the country enabled to launch a major investment program that will support growth and development in all aspects where telecommunications play a role.

In fact, in all companies studied, the crisis had made them more socially conscious. In a smaller scale, many start-ups that were studied have business ideas that take as starting point to serve a need created by the crisis, or more generally, develop products or services with societal benefits:

"We develop and commercialize e-learning products for all types of organizations. The benefit is mostly for small-sized companies; they can affordably train personnel – may see it almost as a revolution. We also have a specific product that allows individuals to develop focused skill in a very fast and lean way. This benefits a lot both organizations and individuals as it increases their employability."

Drive New Tech through Rough Local Conditions

Instability of financial and offset markets, falling demand, extremely unfavourable tax system and fiscal context, and escalating bureaucracy was unanimously referred to by all interviewees as the sad but try characteristics of the Greek context. Very little, if anything, has improved in the institutional context during the crisis. The following quite from a new venture co-founder is illustrative of what most interviewees shared:

"As young entrepreneurs, I think many had hopes that through this true affliction many lessons will be learned. However, this seems more to remain a hope than a reality. Of course it is yet difficult to see what will come out later, we are still at the bottom of the crisis."

In order to thrive in this reality, companies shared their ways of focusing on the technologies they develop and/or commercialize, and drive them through these rough local conditions, including:

- Process technology investments driven by the need to cut direct costs of production,

- Focus on process technology expertise development, and then sell this knowledge within the group or even to other companies as a less expensive alternative to buy technology form abroad as traditionally always was the case in Greece,
- Take advantage of comparatively low costs to develop technology and then export this technology. Illustratively:

  "The difficulties that this country creates for companies have always been compensated by extroversion, bringing ideas into the market and exporting products. We are respected in our export markets and well networked in the industry internationally. This is a pull mechanism that take is through the internal difficulties and how they aggravated in the crisis".

- At the cultural level, crisis consciousness was an important factor. This means that companies that did the right thing grabbed the crisis by the horns; they did not try to hide from employees or business partners that the crisis was coming massively and with high speed, almost instantly. Illustratively:

  "When the crisis hit the country, there was an explicit strategic vision crafted, communicated and implemented by the top management to go against the crisis. So there was a great crisis consciousness. We would not retract and start limiting ourselves as a company. Conversely we made ourselves seeing it as an opportunity and a necessity to move on. Investments in technology was a major decision made, that turned out extremely well".

These two codes, '*Bring New Tech to Serve Customers and Society*' and '*Drive New Tech through Rough Local Conditions*', lead to the identification of the category **Local Tech Leadership** that emphasizes technology focus, both process and product, as an important strategic choice of both more established companies and start-ups. It is a local tech leadership both in terms of bringing / introducing new technology in Greece, and in terms of focusing on technology development for both local and export markets. From a coevolutionary perspective it links technology to social movements, in that a technology like 4G is being implemented with a strong motive of upgrading the technology infrastructure for social benefits through penetration of fast Internet access in the geographically challenging context of Greece. Start-ups also focus on social dimensions of the technology they develop, as an unavoidable factor in the crisis context. All put affordability on their development agenda,

many also think beyond economic terms to develop products or services with a social added value.

We assign this category to the Causal Conditions in the paradigm model, as it is one of the foundational aspects of the core category – Innovation in the Crisis Context.

6.1.2 Social Movements

The next set of codes and categories emerged from data collected about social movement related to innovation and taking place during the crisis.

Crisis Consciousness

The companies that made it through the crises, by adapting pro-actively to the challenges and even developing distinctive advantages through the austerity and affliction indulged by the crisis, were those that very early on, already after the U.S. crisis in the subprime mortgage market in 2007, and if not that early, soon after the Leman Brothers bankruptcy in September 2008, realized the depth and breadth of this crisis and the criticality it would bring for Greece and their own company operating in this context. Interviewees conveying this message illustratively stated:

"We anticipated very early that this was going to be severe, and took steps to safeguard our operations and review our supplier base, our processes and our customer base".

"The management team grasped the situation very quickly and deployed a crisis consciousness throughout the company, without creating panic. A sense of urgency coupled with coolness was the key to make the transformation necessary to navigate through these difficult years".

The key to success for startups was to build the crisis context and the unfolding difficulties into their emerging business model. The incubators we studied also made crisis consciousness a top priority of their support activities:

"It is where we start the first discussion with potential start-uppers, how to work around the crisis or how to grab it by the horns and turn it into opportunity. It is also where the process ends, with a viable business model that cuts across the crises conditions".

Legitimization of the Startup

Entrepreneurship and business activity has for long been seen in the Greek society as something slightly suspicious. A C-level bank manager characteristically stated concerning this kind of public opinion in Greece:

"Entrepreneurs are crooks, they don't pay salaries, they don't pay taxes, they cheat on quality, they only look at enriching themselves, they exploit society, they…, they…, they…".

This indeed widely diffused opinion, is one of the major reasons why Greek families to a large extent pushed their children to study and prepare for a public service job – to become appointed with life-long job security and a comfortable if not abundant salary increasing with the years of service. On the other hand, there was always a certain entrepreneurial spirit in the Greek culture, from that group of the population entertaining a family business of some basic kind, just enough for making a living for the narrow family. Needless to say that a huge chasm, with reciprocal mistrust, existed for generations between these groups.

The crisis came to turn this 'cold war' between the upside down. Public sector hires and appointments were stopped, although some backdoor entries have opened and closed during the successive governments, for obvious vote-fishing purposes. Public servants have seen many privileges being erased, and salaries and especially retirements cut with between 20 and 60%. On the other side of the fence, the traditional Greek low tech 'shop' is almost erased, and, overall, close to 30% of businesses closed during the crisis years and out of those that are active in 2018, some 40% are estimated as 'zombies' meaning that they are open but they don't pay taxes or their loans.

In this context created by the crisis, kicking off or joining a startup, or joining a very young enterprise has become not only accepted, but seen as way of respectfully and with hard work gaining one's own income. There is abundant secondary data about the development of youth entrepreneurship in Greece. Here, we quote a few data points that support the legitimation of the startup from one of the most respected; the Annual Entrepreneurship Report by the Foundation for Economic & Industrial Research – IOBE (2017)[6]:

- 44% of early stage entrepreneurs in 2016, were new entrepreneurs (3-42 months in business),

[6] Ioannidis, S., & Tsakanikas, A. Giotopoulos, I., Stavraki, S. & Valavanioti, E. (2017), "Annual Entrepreneurship Report 2016–2017", Global Entrepreneurship Monitor, *Foundation for Economic & Industrial Research–Entrepreneurship IOBE*.

- Approximately 20% of Greek the population between 18 and 64 years old are somehow related to entrepreneurship,
- 41% of early stage entrepreneurs (about 160 thousand people) are considered as necessity-driven entrepreneurs, while 36.1% of them (about 155 thousand people) are opportunity-driven entrepreneurs. The percentage of opportunity entrepreneurs was lower than the average level in the innovation-driven economies (55.8%). However, the percentage of entrepreneurs with opportunity driven motives increased in 2016, for the third consecutive year,
- Two out of five entrepreneurs – among the highest proportions in Europe - stated that they use new technologies in their venture.
- Among early stage entrepreneurs, where more than 70% believe they are capable of starting a business, indicating high level of self-esteem and confidence in Greece.
- Approximately 64% of population stated that entrepreneurship is a desirable career choice, whereas 65.9% stated that successful entrepreneurs have a high level of status and respect in Greece.

Primary data confirm a change of climate as well. Both startuppers and interviewees working in incubators and other support structures confirm a legitimation process in development:

"We see a new generation of entrepreneurs who take this very seriously. Luck-seekers are no longer among the startuppers. We see serious people, excellent teams and intention of making lasting change by building a sustainable business with sound structures and finances".

These two codes, '***Crisis Consciousness***' and '***Legitimization of the Startup***', lead to the identification of the category **Organic Entrepreneurial Growth** that emphasizes the development of entrepreneurship both operationally and culturally in the crisis context. Data indicate that entrepreneurship is growing and that a cultural shift in favour of self-employment also among higher educated individuals is in good way.

We assign this category to the Intervening Conditions in the paradigm model, as it is an aspect that is purposefully managed and shapes the innovation conditions in the crisis context.

Exploitation of Precarity

Unfortunately, the quote from the banker in the previous paragraph is not completely without substance.

"Ask any young final year student or any young graduate and they will tell you stories of exploitation on the part of different kinds of businesses", as one of the young entrepreneurs characteristically stated it.

The many examples quoted by interviewees across our sample include underpayment, demand for extreme over-qualification compared to job description, retarding payment till the employees quits, occupying personnel without insurance, working only with interns – serial internships, and a psychological warfare grounded in *"do you know how many would die to get this job"* as another entrepreneurs stated.

These problems, which are omnipresent across business sectors, are a major reason behind the necessity-driven entrepreneurship identified above. The public sector being a non-alternative due to recruitment freeze and hap-hazardous clientele-driven micro-recruitments, what many Greeks have done during the crisis years is to immigrate.

Brain-drain – Migration of Young Workforce

The Greek brain-drain phenomenon is widely documented and represents a kind of 'tradition' in times of hardship. The 2009- ongoing Greek crisis has been preceded by several waves of migration due to poverty, armed conflicts, civil war and suppression of free opinion.

There is abundant secondary data also about the recent brain-drain phenomenon:

- Close to 200.000 young Greek university graduates have migrated due to the crisis (Endeavor Greece, 2015).

- Migration of scientists due to lack of Greek suitable jobs and prospects and growth of such opportunities abroad affect primarily the better skilled and educated (Theodoropoulos et al, 2104),
- The mobility of Greek researchers is the highest in the EU – 73% against 56% EU average (Theodoropoulos et al, 2104),
- Even before the crisis, there was an increasing trend in educated youth migration because of the fact that Greece's "industries have not moved upwards in the value chain in order to produce more complex, knowledge- and technology-intensive goods and services, there is low demand for professionals, unemployment does not fall and the wages do not increase in relation to the level of education" (Lambrianidis, 2014: p 329.)

Primary data provided supporting evidence of brain drain being an important issue:

"It is exaggerated to say that all good people have left, but it is true that in some professions, like programmers, data analysts and people with cross-disciplinary studies there is a true lack of talent. Hence, we work with partners abroad to cover particular needs".

As the above quote representatively also illustrates, the short-term effects have been possible to manage for the companies in our research. There is a more deep concern, however, about the long-term effects of the brain drain phenomenon:

"Our main reason of being [as an incubator] during these crisis years, has been to create a microcosm of great conditions to keep young talent and canalize their energy to building a startup. The results are great, but the risk lies in the fact that so many young talents have left that this remains a drop in the ocean. The talent gap will be visible and possibly critical 5-10 years from now".

This emphasizes the strong coevolutionary effect of the social movement of brain drain. It drives new management logics of intensified international collaborations, and it also has effects on future competitiveness of Greece, which must be recognized and dealt with today in order to avoid serious difficulties tomorrow.

These two codes, '***Exploitation of precarity***' and '***Brain drain – migration of young workforce***', lead to the identification of the category **Productive Base Undermined** that

emphasizes the difficulties of social character affecting the innovation context. Hence we assign this category to the Contextual Conditions in the paradigm model.

6.1.3 Global Interdependencies

The next set of codes and categories emerged from data collected about global interdependencies related to innovation taking place during the crisis.

Local market scarcity

With the real GDP in 2018 being 25% below the 2007 level, the crisis obviously has brought a severe reduction of the local market base for virtually all Greek companies independent of sector. Established firms have had to counter-balance this by both proposing higher value products and service for the same price and lowering prices by innovation for process efficiency both technically and organizationally. This has given many firms and advantage in already existing or newly developed export markets:

"The Local crisis drove export opportunities, and made us more competitive than before on international markets".

Similarly, startups were almost forced, but often also helped by incubators, to focus on export markets from the very first click on the mouse in composing their business plans:

"We had the idea of a lean Greek operation and then focusing on foreign markets, and when we joined [an incubator] this was the first strong advise we got – to go abroad from day one with our very first product".

What played in favour of this strategy of a lean Greek base, reinforce by innovation, and an export focus was the comparatively quick take-up of growth in markets that the studied companies focus on, e.g., UK (back at 2007 level by 2013), Germany (back at 2007 level by 10/2010), France (back at 2007 level by 2011) and the U.S. (back at 2007 level by 10/2010 – all numbers from the World Bank), which is a characteristic example of how global interdependencies as a coevolutionary factor has been at play.

Lack of local resource factors and lack of competent customers in Greece are other factors brought up by interviewees as characterizing the Greek market scarcity. Additionally, the

Greek market has long been characterized by inefficiencies, that companies need to work around in order to grow and evolve:

"It [Greece] is a market that does not help you, it neither pushes you, nor pulls you. Even before the crisis competition was never very health du to cartels, corruption and bureaucracy with clumsy government interventions happening at any time. Now, in the 10th year of the crisis the market in weaker than ever, in terms of demand, resource factors and institutional conditions. If you have a very specific offer, outstanding quality and focus on exports you can thrive, but the local market will not take you far."

Crisis-driven reinforcement

The local market scarcity forces companies to *"identify weak spots and fix them"* and / or *"turn the table upside-down"*. A lot of focus has been made in established companies on maximizing efficiency, track down any form of waste and improve the quality of offerings.

In terms of turning the table, startups have looked for unserved niche markets, and in some cases built business models that go completely against the crisis:

"We got this counter-intuitive idea of focusing on luxurious offerings for the wealthiest segments – it was a risk, but it payed off and we have become a Greek example of going against the stream".

Hence, there are several examples in the data that confirms the saying that need is the mother of invention.

These two codes, '***Local market scarcity***' and '***Crisis-driven reinforcement***', lead to the identification of the category **Opportunities from Frugality** that emphasizes the opportunities, related to global interdependencies, that the frugal Greek crisis context have produced. We assign this category to the Intervening Conditions in the paradigm model, as it is an aspect that is purposefully managed and shapes the innovation conditions in the crisis context.

Stable market platform

Caring for and nurturing a stable market platform, both in Greece and internationally has provided many established firms with the baseline cashflow and structural stability needed in order to adopt to the crisis conditions.

For a company with some 70% of turnover in Greece and 30% in export markets, the approach could illustratively be:

"We first looked back at our faithful customers, at our base, which is the family and traditional Greek consumer, and asked ourselves: What do we need to do now for these people to satisfy their needs in these upcoming times of uncertainty and possible hardship? We identified factors and put in place a strategic plan that also comprised new products".

This approach allowed the particular company to maintain its market share, while introducing also new products targeted to the core markets to ensure fidelity. It payed off even over expectations:

"A stable segment platform has been established for the new product line, which opens up for small upwards adjustments in the pricing. In general, customer fidelity has increased, all our market data support this."

For a company with some 90% of turnover in export markets, the approach could illustratively be:

"We understood rough times were coming so we made an effort of pushing our capabilities to take one step further wherever possible in or product performance and quality so as to become even stronger in our differentiating characteristics. We worked extremely hard on this and it made us safeguard our customers and reach new ones as well."

This approach allowed the particular company to reinforce its niche markets abroad and even penetrate new. It also paid off over expectations:

"The bottom line is that we achieved double digit growth in almost all of the crisis years and our innovations in organization and processes have spread to all companies in the group."

Hence, safeguarding and reinforcing stable market platforms, by also building innovations from needs and necessities reinforced by the crisis, has been essential in order to achieve a balanced playing field for business.

Regulatory volatility

Acting against the above, has been the extreme volatility characterising the Greek market and not only:

"The tax system and multi-law context are our greatest enemies – there is no stability, no way to predict the legal and financial changes that might intervene. And on the horizon there is Brexit, US trade war…".

This quote, from a startup founder, is representative for all companies included in the study. Unfavourable, but above all unpredictable institutional conditions have made it very hard fo any company to just keep going. An illustrative call for help *"just let us do our job, don't change the rules every minute"*, points at the frustration created.

Regulatory volatility is the major driver of the creation of compensatory institutions to counter-balance the uncertainty. It is about achieving stability in the playing field for doing business, by working around the major difficulties engendered. Examples include establishing headquarters in countries with stable and favourable institutional conditions while operating and investing in Greece, exploiting opportunities through crypto currencies, and creating keiretsu-like cross ownerships to ensure cash flow and short- to mid-term investment capital.

These two codes, '***Stable market platform***' and '***Regulatory volatility***', lead to the identification of the category **Stability of the Playing Field** that emphasizes the need for balancing both markets and institutional conditions through pro-active interventions of strategic nature. We assign this category to the Intervening Conditions in the paradigm model, as it is an aspect that is purposefully managed and shapes the innovation conditions in the crisis context.

6.1.4 Management Logics

Protected public markets, weak competition, ineffective legislation, and lack of demanding customers and consumer organizations led Greek companies into a stagnation if not even decadence when it comes to effectiveness and innovation during the 1-2 decades preceding the crisis. Partly, the crisis has driven a change of attitude, at least within the private sector,

with management logics embracing more of entrepreneurial orientation (e.g., Covin & Lumpkin, 2011) and respect and recognition of people (e.g., Drucker, 2003).

The efficiency of managing a business will be through the right planning, organization, control and guidance of employees and the flexibility to respond to changes, practices and innovations that can improve its potency. This requires a management that can detect value opportunities and also form and build resources. Management must be proactive by taking action in the present, in order to ensure the future of the business. All shortcomings and market trends must be identified in time, as also the potential opportunities, even in doubt, creating innovative products or services, and a competitive advantage, enhancing thereby the company's position.

Innovation is the only weapon against the unprecedented and rapid change of our times and unexpected competition. Only companies that have the potentiality to adapt to the ever-changing competitive environment will be able to survive and grow, as in the immediate future any business that cannot be as flexible as the changes, will automatically become obsolete. At a time of turbulence, the only comparative advantage for an enterprise is its ability to redefine its business model before the situation demands it.

Carrier and Resource of Innovation

From our observations, we saw many examples of how management can create and secure conditions for innovation development, when the company is defined as both a carrier and resource of innovation.

"A big test for us, the management' professionals in today's more and more antagonistic environment, is that we must influence, and also innovate in our strategy to managing talent […] in order to motivate others to innovate".

As a resource for innovation, management investigates and proposes new practices, studies new trends and influences the company's culture and business activities. In addition, it creates the conditions under which innovation can be developed, encouraging and rewarding the new, achieving a more positive attitude of workers towards change. Because even the best managers often find difficulties to inspire the passion that will activate the imagination of the other members of the business and stimulate the spirit of change that all businesses need to survive.

As a carrier of innovation, effective managers have the capabilities needed to develop and drive innovation in their businesses:

"We have created a mechanism for the emergence of ideas from all levels of employees and functions, aiming at new innovative services and implementing what others have not thought about, covering thus some major gaps in the market".

By channelling innovations to different levels and functions of their business, and by acting as promoters of innovation both internally and across company boarders to the supply chain and collaborating companies, two of the firms studied had made significant contributions to the diffusion of innovations in their respective sector.

"We experiment a lot to drive innovation in our product field and much of our learnings are difussed across the group. Even if the technology issues are not useful, the organizational and process innovations can often be adopted by other units" as the R&D Manager in one of these firms put it.

An innovation-centred management logic implies that managers devote considerable time to develop, refine and strengthen the innovative strategy of their organization. The critical shift in mindset, which obviously is a lengthy process (Tomala, F. & Seneccal, 2004), is to see innovation as a means to improve the bottom line, to maximize effective use of resources, and to build a structure that can take a new idea all along its enhancement, testing and evaluation to its materialization as a product, service or process with commercial success and/or profit maximization and cost minimization.

Build a structure for extroversion

Despite the current deadlock, the economic crisis may also be the starting point for a new phase of extroversion in companies. Entering export markets, when the local market shrinks has been a solution for many companies. An export focus will also be a driver for focusing on high-quality products, capable to confront and even overcome international competition. It is what also finally also can contribute to the recovery of the Greek economy:

"One of the key components of the success of our business is extroversion. We live in a 'global village' and all the enterprises need a more extrovert attitude […] this is a crucial factor not only for the development of our company but also for the survival of our country's economy".

The way out is in foreign markets and consequently the strategy of business extroversion is an imperative for Greek businesses. As a manager of a fast-growing young businesses, that has already made significant strides abroad, stated:

"The extroversion has been the only route (one-way) since the beginning of my career, and it characterizes my entire career. The extrovert manager works as a businessman, takes risks and at the same time takes responsibility for his choices. But I do not mean extroversion in the strict sense of exports only, but outward-looking entrepreneurship in general".

The strategy of business extroversion is a catalyst for the reorganization of the Greek economy and its return to developmental trajectory. The majority of companies have now become more convinced that exports, which once were a small part of their activities, must now account for most of their production, in order to ensure long-term growth and profitability. Innovation, targeted marketing and quality diversification can leverage Greek products on international markets, lead to a surplus the current account balance and help businesses to disengage from fluctuations in domestic demand.

An organized strategy of business extroversion is not an activity of temporary benefits but an important prospect for the future development of the Greek economy and its survival in the context of international competition. For that purpose, a change in the country's productive tissue and an expansion of existing activities are needed to better align it with global demand for goods and services. Illustratively:

"Through the strategic plan we have drawn up, we have set as a bet to lead the digital transformation of Greece. So that, we become the leading provider of the country and take one of the best positions at European level. Extroversion is now an imperative need".

The creation of a national strategy of business extroversion on the basis of sound entrepreneurship, innovation, quality diversification and production of high added value products is a one-way street for the Greek economy as it is a credible choice that can provide long-term sustainable growth, business success and growth of the standard of living of Greek citizens.

Stable & continuous innovation activity & investment

A distinguishing feature of the larger-sized established companies that were studied was a strategy embracing innovation at its core. Although for some, the crises was the trigger

realizing that innovation is a prerequisite for staying competitive, success came from . supporting continuous innovation activity and trying to invest in innovation continuously. One of the managers of a large group of companies, active at international level, said:

"The innovation is in the DNA of our company and with it as a weapon we managed to compete with big overseas companies and overcome them in quality. We continually invest in innovation to offer our customers the most innovative products. This is a basic principle of our corporate philosophy".

Management logics should focus on adopting these functional and organizational strategies that will allow for the adoption of continuous innovation in company structures. The process of transformation towards stable and continuous innovation activity and investment require persistence and patience:

"For us, lasting innovation is not just a livelihood or an issue of greater development of our company; it is a way of life. From generation to generation, in addition to our love and passion for our products, we have inherited a different way of thinking, always operating in the light of evolution and continuous innovation. Every generation had something new to offer to the next".

This approach, explained by a manager of a company established almost 100 years ago, which not only managed to survive during the crisis, but also grow said, is unfortunately characteristic for few companies in Greece, as will be further discussed in the analysis of institutions

These three codes, '***Carrier and resource of innovation*'**, '***Build a structure for extroversion***' and '***Stable & continuous innovation activity & investment***' lead to the identification of the category **Innovation Stamina** that emphasizes the importance of innovation as one of the few dynamic strategies a company can take to generate growth and confront a recession. We assign this category to the Causal Conditions in the Paradigm Model. Continuous and stable innovation and extroversion must be reinforced in the current economic climate in Greece, in order to encounter the problems caused by the crisis, but also the requirements of a more and more competitive marketplace.

Enter product categories in unique ways

The back office technology focus identified above, and much driven by the crisis, has had important consequences for the product strategy implemented both by startups / young firms and larger established businesses.

"Our development of process technology has made it possible to enter product categories in unique ways",

explained the Operations Manager of a food processing company.

Mastery of a differentiating process technology in a specific business sector gave time, cost and quality advantages. As the founder of a service startup explained:

"Our uniqueness lies in the processing of data, information and claims, that enable us to deliver more complex analyses much faster than what is common in our sector."

Push for difficult products with higher margins

"Product ownership is a must to remain in business".

This quote from a serial entrepreneur summarizes elegantly the importance of mastering product technology for developing a successful startup. Similar approaches were found in the established companies as well:

"We push technology to the maximum to develop difficult products, [which means for us] products with specific characteristics and specs, where competitors lack the know-how or the patience and persistence to succeed".

A conscious focus on products with differentiating qualities, that for some specific reason or reasons are difficult to develop, manufacture and/or distribute provided a tangible advantage to many of the studied firms.

These two codes, '***Enter product categories in unique ways***' and '***Push for difficult products with higher margins***', lead to the identification of the category **Product Ownership**, which was assigned to the intervening conditions in the Paradigm Model.

6.2 Institutional Mechanisms

Following the literature review, the formal institutional mechanisms of Role of Government, Rule of Law and Capital Markets and the informal of Organizational Culture and Culture in the Greek Society were investigated in the research. The data structure for institutions is presented in Figure 19.

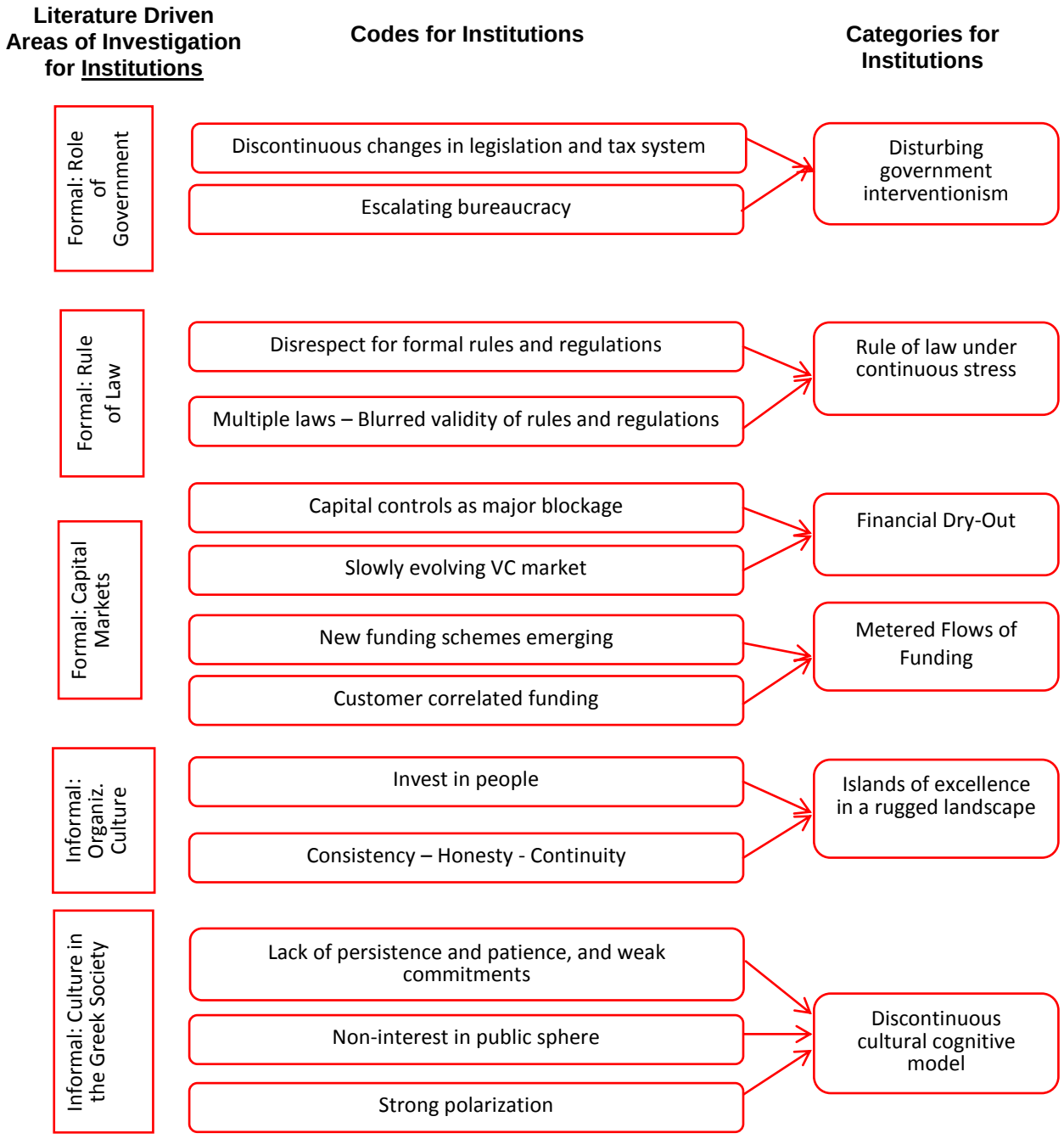

Figure 19. Data Structure for Institutions.

6.2.1 Formal Institutions: Role of Government

As emphasized in the Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth (European Commission, 2010), institutions are essential to the smooth functioning of a society. Based on these, companies are founded, practices and patents are adopted and the rights of natural and legal persons are protected. The relationship between entrepreneurship and institutions has been extensively studied in the literature and the strong link of the two concepts has been established.

In the literature, there is consensus that entrepreneurship will not be able to thrive in a country that neither has "weak" formal institutions nor has too many and detailed formal institutions. For this reason, it is very important that the government of each country develops the appropriate institutional framework, always in relation to its culture, in order to create the conditions for smart, sustainable and inclusive development (European Commission, 2010).

The data uncovered several interesting aspects of both formal and informal institutions in the Greek crisis context.

Discontinuous changes in legislation and tax system

The need to address Greece's unprecedented economic crisis and the demand to ensure a sustainable development path for the future call for a radical redeployment of the state at the operational and organizational level, as well as at the institutional level. Unanimously, many secondary sources converge to the facts that with the advent of the crisis in Greece (European Commission, 2017; Katsikas, et al, 2018):

1. The *institutional weaknesses of the past have emerged*, making the crisis much more difficult than in other countries with similar problems.
2. *Fiscal adjustment*, e.g., financial measures and efforts to ensure the stability of the banking system are *not enough* to change the negative climate.
3. Institutions *suffer from lack of prestige and respects* and do therefor no act as the powerful, acceptable, modern and efficient institutions that have a potential to act as a counterweight to the crisis and support smooth return to growth.

4. The *low effectiveness of Greek formal institutions* is much due to the maintenance of obsolete rules and to the public's doubts about them is the lack of consensus among the political forces, who rise to power every time.
5. As Greece is characterized by a deeply politicized state apparatus, any *governmental change brings significant changes to the institutions*, creating discontinuities in decision-making, delays in implementation of decisions (sometimes extreme delays that can exceed a decade) and multitude of often contradictory laws. All this leads to confusion for private and public actors, and citizens, of what is valid and due and thus paralyzes society for absolutely no relevant reason.

These frequent changes to legislation, retroactive alterations to laws, unclear, contradictory or inadequate tax directives, weak regulatory system create rigidities and difficulties in the development of innovation and entrepreneurship. As a start-upper stated:

"The constant change of laws on entrepreneurship creates uncertainty and confusion among young entrepreneurs. It adds fear and doubt beyond the product and business model, which should not be there".

A more stable environment is also instrumental for the ability to implement long-term investment plans and attract foreign investment. The latter is continuously on the top of the governmental agenda, but with very little progress and total lack of success as the fundamental criteria, simple and stable institutions and rules, including fair and competitive tax system, remain a pathogeny – an insolvable problem in the Greek state. The situation is well summarized by an interviewee in an entrepreneurship think tank:

"High taxation and constant changes in the tax framework do not allow a foreign company to invest in Greece. There must be stability in these areas so that interested investors know the data from the outset".

Escalating bureaucracy

Reducing bureaucracy is a crucial factor for the EU and one of the main objectives of the Lisbon Strategy, in order to enable European businesses to improve their competitiveness in the globalized economy. Thus, the objective is to ensure the efficient operation of the public administration of each member state, but without obstructing business activity.

Secondary sources are not flattering when it comes to the situation of bureaucracy in Greece. Indicatively:

- Greece ranks, together with Romania, lowest on overall assessment of public administration capacity and performance among the 28 member states of the EU (Thijs et al, 2017),
- Greece ranks 34 of 34 if the World Bank's Ease of Doing Business Index among High Income OECD countries, especially due to regulatory, tax and contract issues (World Bank, 2019).
- Greece is the only Western European country that ranks in the category "Mostly Unfree" in the 2019 Index of Economic Freedom Report (Heritage Foundation, 2019)The large majority of other EU countries rank two categories above as "Mostly Free".

Hence, throughout the public sector, complicated and time-consuming procedures are involved in dealing with state-business transactions that both don't serve the public interest and seriously burden business.

In our interviews, inefficient Public Administration and bureaucracy are consequently mentioned among the main factors that make the business environment in Greece difficult, preventing new investment and growth. In order to rebound the economic climate, a manager of a well-established company suggests:

"One of the strongest barriers that hinder business in Greece of the crisis is bureaucracy, which affects the growth of entrepreneurship. It is important to reduce as much as possible this major problem, which creates enormous investment difficulties".

The lost time and the cost in transactions, between businesses and the State, the fragmentation of public administration services, the incomprehensible legislative and other regulations, the lack of e-government of all public and municipal services and the absence of interconnections are just a few of the distortions of the Public Administration, which for years have hindered the rational development of entrepreneurship, costing time and money, creating huge problems in business. Illustratively, the manager of a young firm stated:

"The most important thing we expect from Government is to make away with the serious barriers to doing business that we struggle with day-by-day. Bureaucracy, is one of the main obstacles to the development of entrepreneurship in this country Unfortunately we see very little of this".

Although in recent years in Greece, Public Administration has promoted multiple changes and reforms in a number of fields related to the creation, operation and development of enterprises, the discontinuity discussed above, i.e., the fragmentary character of the interventions, the lack of integrated planning and the bureaucratic procedures accompanying many of the measures developed contribute to low efficiency and highlight the real need to solve business problems.

A specific case, with impact on innovation and entrepreneurship activity in Greece, is the hyper-regulation of universities, and especially the running and management of postgraduate and research programs that has intervened from 2017 and onwards. Gradually, the autonomy of universities has been dramatically reduced making it very difficult to support the entrepreneurial and industrial tissue of the country in an effective and efficient way.

These two codes, ***'Discontinuous changes in legislation and tax system'*** and '***Escalating bureaucracy'***, lead to the identification of the category **Disturbing Government Interventionism** that emphasizes the problems that the state creates when it does not make the drastic structural changes that are needed to reverse the negative climate in the economy, such as cutting bureaucracy and creating a modern institutional framework that will help the country's economic development. We assign this category to the Intervening Conditions in the Paradigm Model.

6.2.2 Formal Institutions: Rule of Law

There are many factors that cause serious problems in the operation and economic development of the state. The chaos of multiple laws is one of the most critical "invisible" enemies of development. Greece's, multifaceted legal system is an obstacle to any reform attempt, while simultaneously the Rule of Law Index is among the lowest in Europe (World Justice Project, 2019). This results in inefficiency in many areas of productive activity, a lack

of confidence in the country's institutional environment and considerable costs for individuals and businesses.

The plethora of laws, the overlapping of regulations, the occasional nature of some of them, the transposition of the European Directives into the national legal order without the necessary processing, the language mistakes and legal defects in the regulatory texts make it difficult for the public administration, which should support both the functioning of the state and, on the other hand, solve the big social problems in a fair and effective way.

The result of all this is the malfunction of the state and the great discomfort of the citizens. It is obvious that Greece needs urgently reforming the legal framework and, above all, simplifying it (Thijs et al, 2017). Moreover, the multiple laws and everything that it brings directly affects the competitiveness of the country and is one of the main negative institutional factors for a friendly environment for investment and the development of the economy.

Disrespect for formal rules and regulations

As a result of the above, the respect of laws and regulations is low in the Greek society. It concerns especially petty breaches for example concerning traffic regulations (society level) and workplace regulations (organizational level). This results in a wider climate of disrespect that easily can escalate into more severe breaches and corruption, but even if this does not happen, creates a disorderly daily reality of everything from school classrooms to parliamentary sessions.

A great deal of degradation of values, habits and institutions, and simultaneous raise of polarization and controversy are observed. When the rules, which society itself has established, are not respected, a state of liquidity of values and ideals occur.

Nearly no law would be necessary if proper behavior in economic and social relations were obvious and respected by all. As this is not the case, nor can it happen, new laws are introduced and added to existing legislation. In all countries there are phenomena of infringement of the legal order and institutions. What is remarkable, however, in the case of Greece is that contempt of law is a constituent element of Modern Greek culture and education at all levels, to the point that it is often considered self-evident and there is often extensive tolerance towards it. A C-level manager in the biggest telecommunication company in Greece states:

'The lack of respect for formal rules and regulations has created significant delays in alignment with the European regulatory framework for electronic communications and has created a recession in the Greek telecoms market. Greece's ability to enforce the regulatory decisions and measures required was limited and this made it more difficult to achieve the objectives of the Europe 2020 broadband strategy'.

Many times compulsion is being exerted on the government by pressure groups due to diverse interests and by individuals seeking exclusion from the general rules and the application of privileged arrangements. The Greek state often responds to this request, in violation of the principles of equality and the rule of law. Thus, this reaction of the state creates suspicion and disrespect towards the state itself and the laws, and as a result, laws lose their momentum and influence in society, so that everyone then can feel "vindication" breaking them at the first opportunity:

'Greece's tax system is problematic, unfair and ineffective. It is a major barrier to entrepreneurship because it fails to tackle economic inequalities; it is too complicated and causes the feeling of injustice, especially to us, the young entrepreneurs, leading many to evade paying taxes'.

This is the answer of one of the co-founders of a newly established company, who said he has experienced such problems from the very first moment he entered the market.

Another key negative consequence of the lack of stability and the duration of the regulations is undoubtedly the consolidation in society and the market that everything is temporary and therefore there is no need for compliance in regulations, which will probably be changed in the short term. But even if the body of the relevant rules is not changed, the citizen of this country is well aware that, even if he does not comply with them in good time, he will surely be won, as soon as some other "arrangements" come to reward all of persons, which have not been consistent with their obligations. And it is well known that it extends to all branches of law and, of course, to the field of Tax Law, which requires a major and substantial reformation. Some companies do not even clearly violate the law, but avoid it, using tricks to not pay taxes or to exploit workers, without "breaking" any law visibly, but exploiting the opportunities offered by legislation. In this context, the manager of a newly-founded company, trying to survive in these adverse conditions, expressed his concern about the issue:

'The uncertainty that the new entrepreneurs face with the tax storm, creates an unpredictable and totally useless administrative burden for our businesses. Policy measures are needed to simplify the tax system if the state wants to fight tax evasion'.

Multiple laws – Blurred validity of rules and regulations

The effect of multiple laws and misapplication of laws has for many years been visible and aggravate the everyday life of the Greek citizen. The existence of conflicting and contradictory laws characterizes important areas of public administration and raises serious problems in their implementation. Among other things, tax, urban planning and social security legislation are areas of legislative activity where the identification of existing provisions is a difficult legal challenge.

The phenomena of multiple and indiscernible laws, although closely related to the legal culture of a country, are not limited to the regulatory sphere, nor do they concern only the legislative and judicial functions of a State. They also have a negative impact on the efficiency of government services and hence on citizens' everyday lives and business activity.

However, the basic prerequisite for developing healthy entrepreneurship and attracting investment is the existence of a stable, understandable and predictable legal framework. The complexity and ambiguity of Greek law significantly discourage investors from placing their funds because the issue that concerns them is not just tax rates, but legal certainty, clarity of legislation and the way it is implemented, and also the predictability of the institutional framework. These are determining factors in the investment options.

'Multitudinous and blurry telecommunications laws have created serious problems in the field and this was particularly visible to our company. The stability, the codification of legislation and its implementation procedures are necessary for the development of eGovernment, in order to avoid bureaucracy'.

That referred an executive of a major telecom company, highlighting the problems caused by the ambiguity and complexity of the laws, provoking problems even to large companies trying to invest in the crisis.

The continuous change in the legislative framework makes the landscape for long-term business initiatives "blurry", with the consequence that the modernization of the economy is uncertain, which in turn generates the investment hesitation. But there can be no

modernization of the economy and serious business planning when the tax regime is based on a real labyrinth of legislation whose average life expectancy is only a few years or even a few months. As reported by a senior of a big and successful food company, which despite the problems it faced in the past, has strengthened and increased its capacity in the time of crisis:

'If there is no proper provision and management of the tax charges on an enterprise, then it is very reasonable to fail financially and lead to a stalemate. This is a common occurrence in a country, such as Greece, where the change in tax legislation is now every day'.

For business, every change means time and money, as the multiple laws in Greece denote an increasing bureaucracy, discourage investment, decelerate public administration, deploy customer relations between citizens and the state, delay law imposition and legal uncertainty. The existence of conflicting and contradictory laws seriously hits the validity and credibility of the law and creates enormous problems in the recovery of the economy.

These two codes, ***'Disrespect for formal rules and regulations'*** and '***Multiple laws – Blurred validity of rules and regulations',*** lead to the category **Rule of Law under Continuous Stress** that emphasizes the problems caused by the failure to keep the laws and the misty landscape of the rule of law created by the complexity and plethora of regulatory settings, resulting in economic recession and many other adverse effects. We assign this category to the Causal Conditions dimension of the paradigm model.

6.2.3 Formal Institutions: Capital Markets

The exclusion of Greece from the financial markets in 2010 was systemic economic blockage and led to financial deadlock at all levels of entrepreneurial and business activity, as well as in political and institutional governance. Also, capital costs sky-rocketed with the exclusion of Greece from the capital markets and the blocking of banks' access to European liquidity. This has created enormous difficulties and barriers to investment and financing of virtually all economic activity, leading Greece into a vicious cycle of recession and credit scarcity, undermining competitiveness (Thomadakis, 2014).

Capital controls as major blockage

Losses from the imposition of capital controls on the Greek economy include the closure of thousands of companies, SMEs mainly, a drop in competitiveness, a drop in exports, and a

flight of billions of deposits from the banking system. Capital controls have affected the entire economy, creating serious problems for imports and generally in e-commerce payments for purchases from abroad. As expressed by the CEO of a fast-growing young company, who has already made significant strides abroad:

'Freezing remittances from and to the outside affects businesses. Capital controls put everything at risk and can irreparably damage the credibility of businesses abroad'.

Developments during capital controls will not come into the market, nor there be a return to deposits or new money for Greek banks. Banking constraints may have relaxed gradually since their primary implementation, but they are still a major barrier to doing business, while they are holding back the return of deposits to banks. Restrictions on business transactions with foreign customers and suppliers have also not been fully removed and bureaucracy at the level of approvals by the Special Committee set up remains, causing significant import and export implications. However, their relaxation procedures are proceeding slowly despite the sacrifices to which businesses and individuals are subjected. As pointed out by the management of the Association of Entrepreneurs of Thessaloniki - "Young Horizons" in a special report:

'[...] the business world counts its wounds and thousands of padlocks, staff redundancies and the launch of obligations to banks, the public, the insurance funds, and not just these [...]'

The capital controls fuelled the recession further and has become a barrier to developing new businesses that could help boost GDP and create new jobs. As long as the capital controls remain, in any form, the poor image of Greece as a business partner and investment destination also hinder the relations of Greek small and medium-sized enterprises (import or export) with their non-Greek partners (suppliers or customers).

As observed by executive in a company that has begun a serious attempt to expand abroad:

'Apart from the costs that we all pay because of capital controls in the inside of the country, the impact on exports is very serious and led us to a state of economic suffocation'.

The failure from the state to take the appropriate measures acts as a brake on the activities of this and thousands of other export-oriented SMEs. Therefore, all necessary steps must be taken immediately to complete the total obviation of capital control as soon as possible, in

order to create a climate of confidence for the return of Greek deposits from other countries, attract new private capital from abroad and restart the economy.

Slowly evolving VC market

Venture Capital plays an important role in developing the economy and supporting new or existing businesses aiming to a high added value. In Greece, Venture Capital is at an early stage of development and shows a relatively slow evolution, although there is clearly a possibility for further development. The slow growth is not only due to the lack of entrepreneurial culture by young entrepreneurs but also to the absence of private investors willing to take the risk and to support innovative efforts. As stated by the founder of Starttech Ventures:

'Unfortunately, there is no culture of cooperation in Greece. Everyone wants to have his little shop to feel king and investors are discouraged and do not put their money'.

Greece's performance in attracting investment funds is poor. But despite the difficult situation of the Greek economy and the adversities faced by entrepreneurs at this critical juncture, there are examples of companies in which Greek VCs have invested, as well as significant acquisitions by multinationals companies of successful Greek start-ups. This shows the positive prospects of Greek businesses that are distinguished by extroversion, innovation and efficient administration, but they are not the norm, there should be coordinated moves to reverse the negative climate in the economy in general. The following referred from a new venture co-founder is typical of what most respondents shared:

'At some point, like any new company, we had no more money and we had to look more closely for funding, something very difficult due to the financial situation in Greece. We had to work very hard and focus our efforts to highlight our strengths. It was very tough, but made us stronger and eventually we found a way to fund our further expansion. Not all are that luck though.'.

However, in order for foreign funds to come to Greece and take the risk of investing in such a difficult time for the Greek economy, there should be state support and incentives to cover investors in some way for possible early damage. Respondents who have encountered these problems when requesting investment illustratively stated:

'Those who invest in a new company want specific results from the company they support and at specific times. Their mindset escapes the narrow boundaries of Greek territory and if they invest they will have specific and high demands. Fulfilling these is often put at risk by the unfavourable financial and regulatory context'.

These two codes, '***Capital controls as major blockage'*** and ***'Slowly evolving VC market'***, lead to the identification of the category **Financial Dry-Out** that emphasizes the existence of serious economic distortions in the market by capital control and the lack of funding. The removal of restrictions and the appropriate institutional framework, for creating a friendly investment and business environment, will stimulate the restarting of the economy, the restoring the credibility and the confidence of citizens and markets. Otherwise, any perspectives for the recovery of the Greek economy and the improvement of the living and social level of citizens will gradually be undermined. The big bet for Greece is the emergence of strong growth prospects through the creation of a friendly investment environment and the framing of a new, serious national reform strategy will give impetus to develop a competitive economy within the euro zone and to restore social cohesion.

We assign this category to the Context in the paradigm model, as it is an aspect that is purposefully managed and shapes the innovation conditions in the crisis context.

New funding schemes emerging

Interviewees in support structures and venture capitalists painted a picture quite different from that of entrepreneurs when it came to venture funding. While a representative quote for entrepreneurs was:

"There is no VC in Greece",

venture capitalists were keen to emphasize both an increasing number of VC schemes and amount of VC funds, as well as new forms of VC making its ways to Greece:

"The landscape is different now and it changes fast, there is a whole different dynamism compared to just a few years back".

Secondary data confirm a certain availability of VC in Greece, and the emergence of new schemes such as Equifund, the Greek Government's fund of funds. This scheme is a Public Private Partnership between the EU, national funds and private funds. It operates through three stages; Innovation, Early Stage and Growth Stage, and disposes of some 300 million Euros[7].

Evidence is still weak on the effectiveness of newer funding schemes for Greek startups. One factor that continuously put breaks on the development is the hostile business climate and the resulting migration of young successful firms creating compensatory institutions for example in terms of headquartering abroad:

"The mobility of ICT though meant that many of the success cases soon migrated outside the country, in order to have easier access to funds that are paired with expertise and to grow within a friendlier business environment"[8].

Customer correlated funding

There have been some windows of funding opening during the recent years, e.g., from 2017 and onwards. As the founder of several startups before and during the crisis years explained:

"If you have real customers, real paying customers, just a few, but real folks paying for what you sell, then funding is there to match. Then you can always find some source of funding, and then you enter into a successive interplay where you bargain for funding as yo keep growing your customer base with the previous funding, and so on."

Similar experiences were shared by several interviewees; when the proof of concept is there, and the startup has made it to paying customers on its own. Some funding opportunities will be there.

These two codes, **'New funding schemes emerging'** and '**Customer correlated funding'** lead to the category **Metered Flows of Funding** that shows the modest, but still existing, availability of funding for innovation investments and venture growth during the crisis years.. We assign this category to the context dimension in the Paradigm Model.

[7] https://equifund.gr/wp-content/uploads/2018/02/EquiFund-Brochure.pdf

[8] Ratinho, T., & Mitsopoulos, M. S. (2017). Emerging Models of Business Incubation in Greece. *Available at SSRN 3045110*.

6.2.4 Informal Institutions: Organizational Culture

The concept of organizational culture plays a particularly important role in the creation and favorable development of business because it affects employees and organizational functions at all levels (e.g., Kotter & Heskett, 1992; Ravasi & Schultz, 2006). For the success of a business, it is important to have a strong organizational culture because that means that the majority of its members accepts and is influenced by its main features. The degree and the speed at which individuals adapt to the culture of the organization is also a determining factor of success.

During an economic recession, such as the one in Greece for over a decade, we uncovered that the organizational culture of each company plays a key role in creating strong links within the business, in order to ensure security and stability. In these cases, organizations rely on their organizational culture as a fixed point in a turbulent reality, to change their focus in an effort to differentiate themselves from others, to innovate and to offer different solutions, for the sake of survival in difficult circumstances.

Challenges, in times of financial turmoil, of becoming more flexible and outward oriented, continuously analyzing and adapting to the environment requests confidence and a deeply culturally rooted trust between managers and employees and between employees themselves is very important, as it strengthens cooperation and commitment to overcome the difficulties, mainly without large staff decrease. Suitable preparation will help the firm to be ready in difficult times, in view of faster and more efficiently organization than its competitors, gaining thus a large comparative advantage.

Invest in people

The established firms studied, all shared an approach of improving the skills and providing training of staff is prerequisites for the making it through and even evolving during the crisis.. The organizational culture is considered to be particularly important, as it is seen to be directly related to the economic outcomes, but mainly to the sustainability of the organizations.

The success of a business comes mostly from its people. Brain drain made companies realize that employees are their most important assets, since through their dedication and hard work they are the driving force behind the continuous development and growth of the company, contributing to achieve its goals. A manager of a big telecommunications company stated:

'Our Group provides a sustainable work environment for employees, guided by the values as expressed in the Corporate Behavior Principles. We encourage the growth of our employees, recognize good performance, ensure equality of opportunity and promote cooperation, providing a safe and healthy working environment for all of our people: employees, customers and partners'.

The training of human resources improves the efficiency of an organization, making it more competitive in its field. The improving of company's internal environment operation is strengthened by the continued specialization and training of its employees. The co-founder of a dynamic start-up company with a steady upward trend despite the crisis illustratively mentioned:

'Flexibility, co-operation, and specialization are essential components for a company during a crisis. In our company the role of our educational program is important as it strengthens our people and makes them capable professionals ready to meet any need'.

The economic recession of Greece has left no part of economic and social life unaffected, as is the case for all enterprises in Greece, regardless of sector. The strength of a business, nevertheless, seems to be its ability to adapt and innovate. Many companies in an effort to reverse the negative climate exploited their strong points and invested in their people. With the appropriate and continuous training, their employees acquired the skills required in the difficult and constantly changing competitive environment that has been aggravated by the crisis, so that the company survives and ensures its future. As pointed out by a manager of a large group of companies:

'We have a dream in our company, to which we are all committed: we want a people's culture where our employees work in an ideal and safe environment, grow professionally,

with unhindered prospects for development and fair rewards. And this tactic has paid off for our company and that is shown by its good results, despite the huge market problems'.

Consistency – Honesty - Continuity

In this difficult period of social and economic crisis experienced by Greek society, almost all businesses, have suffered the consequences. The winners will come out from these companies which would find themselves one step ahead of the competition and manage to respond and adapt to the new conditions imposed by the market.

A very important factor that determines the good working environment and, hence, the efficiency of a company is the trust between management and employees. No company is perfect and even in those that are distinguished there are many issues that can be improved. However, consistency and trust based on honesty, communication and mutual respect among all the players in a company determine to a large extent the continuity of the business. This was reported illustratively by an executive of a big family-controlled food company known for the proper management of its staff:

'We realized in time that effective organization and administration is not enough to achieve our goals. For us, values such as honesty, trust, consistency, which our parents and grandparents have bequeathed to us are key elements of our business and seem to be more effective for the continuity of our business despite the difficulties'.

Each company has its own philosophy for its internal function. However, in order to achieve a good business environment, dialogue, communication, honesty, consistency, interest and continuous interaction are needed to ensure the basic conditions for business continuity. With common denominator the developed sense of trust between management and employees, several of the modern enterprises are trying to gain a good working environment. The Corporate Communications Executive Director of a large telecoms group noted explicatively:

'Our relationship with our employees is a relationship of trust. And this relationship is built only with honesty, consistency and continuity. In recent years, our contribution to society, the environment, the economy and the development of our people is an integral part of our business practice and remains a priority despite the crisis'.

Consistency in entrepreneurship is of paramount importance for a variety of reasons, especially in terms of pulling together the founding team, integrating the first employees, and acquiring and keeping customers. The business must provide security to its employees and also to society that it will be faithful to its commitments constantly. As Jim Rohn (American Businessman, Writer, Speaker) said demonstratively: *'Success is neither magical nor mysterious. Success is the natural consequence of the consistent application of basic principles'.*

These two codes, '***Invest in people'*** and '***Consistency – Honesty – Continuity'***, lead to the category **Islands of Excellence in a Rugged Landscape** that emphasizes the importance of the organizational culture for the success of a business and the need to adapt it to the demands of the era in order to ensure the sustainability of the organization. We assign this category to the Outcomes in the Paradigm Model, as it is an aspect that is purposefully managed and results from conscious management of innovation conditions in the crisis context.

6.2.5 Informal Institutions: Culture in the Greek Society

Business culture refers to the environment where someone has an incentive to innovate, create, take risks and at the same time can be able to acquire business skills and management skills. This environment is absent in Greece in general terms. The Greek family, the education system, the media, the politicians and other social actors have never before set a priority to create a business-friendly environment, unlike most European Union countries.

In the Greek society there are deeply rooted negative perceptions about entrepreneurship. The family, which is s the most important foundation of Greek society, providing emotional and economic support to the individual, and where relationships remain extremely close[9] affects children's decisions, even in their professional orientation, by promoting them primarily in higher education in order to find secure and permanent employment, either in the public sector or in the private sector. Starting a new business, and its risk-taking dimension, was not

[9] https://culturalatlas.sbs.com.au/greek-culture/greek-culture-family

a reasonable way out of employment for the Greek family, but only as a continuation of the family business.

This is much due to a lack of appropriate education that prepare for entrepreneurship and develop entrepreneurial skills. Instead, young people are being driven to a gigantic collection of educational titles, which have little connection to the skills required by the labor market and businesses. In Greece, there has never been systematic planning for young people's entrepreneurial education, but only some fragmentary actions without a more general strategic plan.

Lack of persistence and patience, and weak commitments

The decision to start a business venture is never easy, as it is always accompanied by great uncertainty about its prospects. To succeed, a business idea requires the ability to combine creativity and innovation with good management and also the capacity to adapt, in order to optimize its growth throughout its life cycle phases. This is a process that goes far beyond the daily management as it relates to the goals and strategy of a business.

It is a very common phenomenon especially for a new professional not to have perceived the breadth and frequency of the difficulties encountered in entrepreneurship. So, many are disappointed after one or two failures and abandon the effort to maintain their business. Secondary data from IOBE (Foundation for Economic and Industrial Research) / GEM (Global Entrepreneurship Monitor) show that in virtually all years of participation in the GEM studies, since 2005, Greeks are emerging as world champions in fear of failure.. This fear of failure is a brake on entrepreneurship, not only at the level of early stage entrepreneurs, but also at the well-established entrepreneurs in Greece (IOBE, 2016).

As Mr. Michalos, Chairman of the Commercial and Industrial Chamber of Athens, stated in an open discussion:

'[Entrepreneurship] needs resistance to disappointments and failures on the one hand and strength to rebound on the other. It takes strength and courage to get up and continue your endeavor. Or start over again from the beginning, by faith in the goal. By believing in your talents and abilities'.

Entrepreneurship requires much patience, persistence, ambition, knowledge of the subject and of the market's rules. These features in connection with hard work significantly increase the chance of success. The solution to the difficulties is not resignation, but the constant effort to achieve the goal, as a successful serial entrepreneur put it:

'The lack of persistence and patience from companies often leads them to failure. And there is more to it; you can often not rely on business partners or customers to actually follow through with their commitments. In spite of the crisis, opportunism and hopping in and out of commitments remains a strong characteristic of the business reality.

The fear of business failure and the possible resulting social stigmatization, together with lack of persistence and weakness of commitments act as disincentives for the emergence of innovation and new entrepreneurship in Greece. As a co-founder of a start-up said, when he decided to take up business action, his parents raised important objections:

'Where will you find the money to do this business? Will you be able to find another job if something goes wrong? And do you really have the skills and the ability to lead this project?'

Non-interest in public sphere

The key barriers to entrepreneurship in Greece are to a large extent related to the deeply rooted suspicions in Greek society itself about entrepreneurship, the lack of a more general framework of national policies, the ineffectiveness of those innovation and entrepreneurship policies that sporadically are launched, complexity of tax and legal conditions, bureaucracy, and a general inefficiency of the operation of public bodies due to both formal and informal institutions. Significant obstacles to entrepreneurship are still due to the difficulty of accessing finance, the high barriers to entry and the wider political and social environment. All these malfunctions create great uncertainty and denial towards the public sphere on the part of business owners and managers, and also on the part of citizens in general. The results in a feeling of being let down or even being discouraged by public institutions to pursue the struggle that innovation and entrepreneurship entails. As characteristically stated by a start-up founder:

'If we receive so much discouragement and face so many irrational difficulties [with the state], how to promote our idea on the market and push it in consumers – and, most importantly, how to keep up our own faith in it?'

The lack of interest in the wider public sphere is more deeply rooted in the Greek society as an informal institution. According to the seminal works of Geert Hofstede in comparative intercultural research, Greece is characterized by a "we" defined culture, where people from birth onwards are integrated into the strong, cohesive in-group, especially represented by the extended family (Hofstede Insights, 2019)[10]. This creates a 'we' vs. 'them' culture, where the latter –the common and the public- is of little interest.

Strong polarization

Greece has been experiencing a profound economic crisis for over a decade, which has substantially restructured its social fabric. The country entered the crisis with a high level of income inequality already in relation to the other EU countries, which grew even more in the early years of the recession and was then kept at the same high level. Austerity coupled with wage and pension cuts, increased income and real estate taxes, deep recession, high unemployment and poverty are the main reasons for the severe increase in inequality in Greece, which has had a severe impact on society and the economy and discouraged the spirit of entrepreneurship. As stated in an interview in Bloomberg (2014) Paul Krugman who received the 2008 Nobel Prize for Economics:

'The breakdown of income inequality at record levels has not boosted growth, ... On the contrary, there is a lot of evidence that it is actually bad for growth'.

The result has been a revival of earlier polarizations between the haves and have-nots, the ruling and the ruled, which also have long historical roots going back to the 1967-74 military junta, the 1946-49 civil war, the 1910-22 national schism, and even further back in history. As discussed in the literature review, informal institutions, such as this polarization, which are socially embedded and deeply rooted, take very long -up to a century or even more- to change. As an EU advisor for the economy of Greece stated:

[10] https://www.hofstede-insights.com/country/greece/ (accessed 18-4-19).

"It becomes evident for any foreign observer that stays longer in the country and takes an active part in society and societal life that Greece is strongly polarized between groups were bridges never have been built and where there is no will from either side to ever build any"

The Greek economy has undergone a painful fiscal regulation, without additional social protection for the economically weaker groups, leading to large inequalities in the distribution of income. Nevertheless, large inequalities and the polarization of the economy do not bring the desired growth outcomes, but contrariwise they have burdened every level of life, whether economic, social or political. The following quote from a starup advisor is a common answer among many respondents:

'The creation of large inequalities and, by extension, the polarization of the economy does not create conditions for sustainable and without exclusions growth but has adverse effects on the political, social and economic levels'.

Studies on the subject have shown that in times of crisis and fiscal adjustment, support for socially disadvantaged people is an important factor in the success of programs' adaptation. Combating inequalities, poverty and the polarization of the economy is critical and indispensable for the re-emergence of positive growth rates and is another actor that helps to exit from the crisis sooner.

These three codes, '***Lack of persistence and patience',*** '***Non-interest in public sphere***' and '***Strong polarization'*** lead to the category **Discontinuous Cultural Cognitive Model** that emphasizes the complex issue of the lack of entrepreneurial culture in Greek society that causes obstacles to entrepreneurship. It also highlights the need to plan corrective interventions to combat inequalities and develop entrepreneurship, in order to Greece can escape from the vicious circle of recession. We assign this category to the context in the paradigm model.

6.3 Innovation Systems

Following the literature review, the Innovation System parameters investigated were Actors and Networks, Knowledge Development and Resources, and Training and Employment Incentives. The data structure for innovation systems is presented in Figure 20.

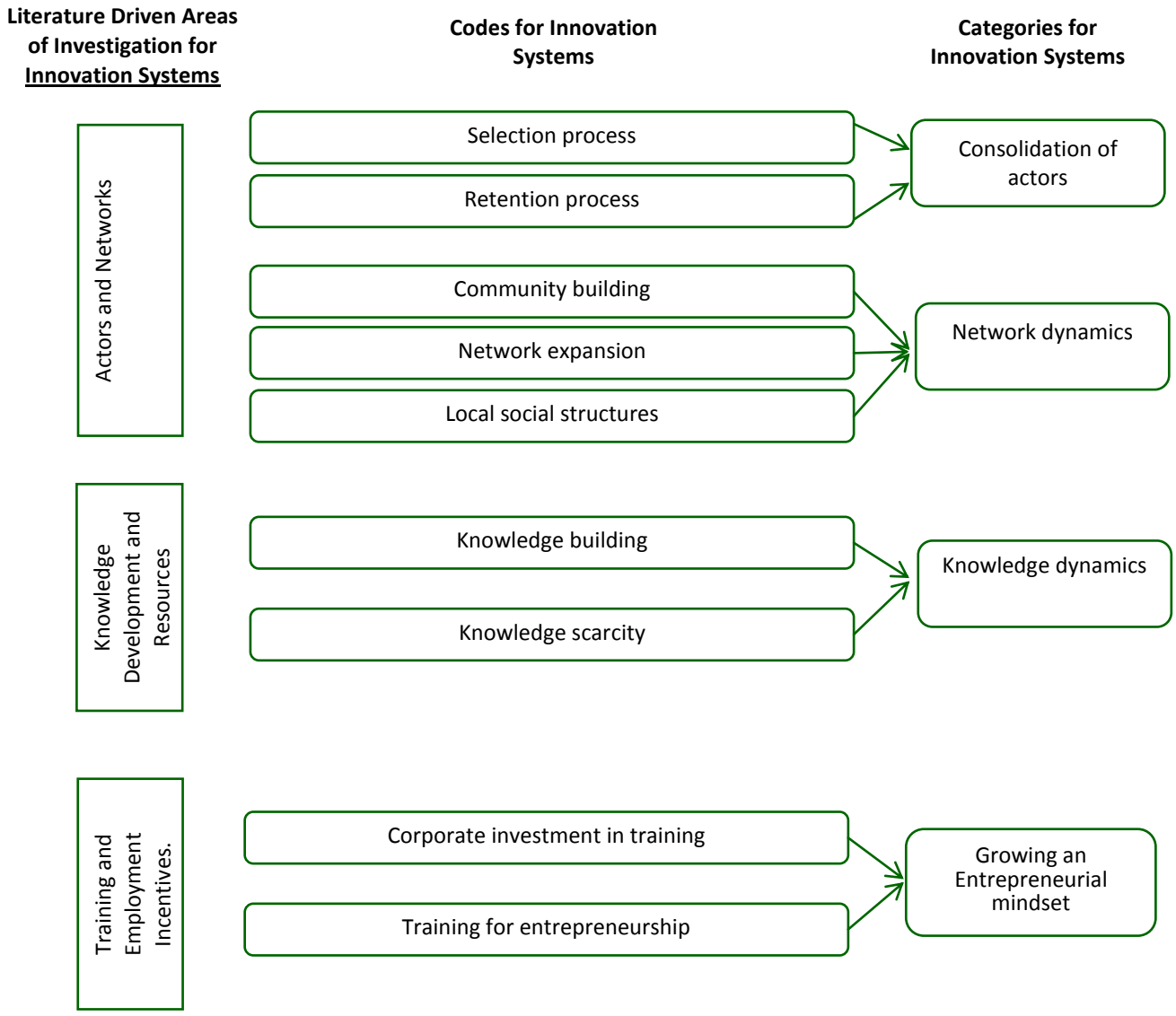

Figure 20. Data Structure for Innovation Systems.

6.3.1 Actors and Networks

As identified in the literature review, numerous actors of various kinds have emerged in the Greek innovation system during the crisis years. Both secondary and primary data show that this variation in the economy has been followed by selection and retention processes that rhyme with the classical literature in the field (e.g., Aldrich, 1979; Nelson, 1994; Baum and McKelvey 1999). The selection and retention processes have concluded in a consolidation of actors as analysed below.

Selection process

Endeavor Greece has done a systematic mapping of players in the Greek entrepreneurship scene, as referred in the literature review. This secondary data, both published (e.g., Endeavor, 2017-1; 2017-2; 2016; 2015; 2013) and also unpublished (shared with the researcher), show an explicit selection pattern across categories of players, e.g., Finance-, Network-, Knowledge- and Inspiration-focused support entities (c.f. the literature review, section 3.2).

Following a boom in births of initiatives between 2009 and 2012, the subsequent period, 2013-2016 saw the number of players decrease, both through fusions due to synergies and true out-selection of player not reaching critical mass, or not being relevant or strong enough to sustain their activities. The net decrease of players identified and mapped by Endeavour was in the order of 20% between 2012 and 2015.

A characteristic quote concerning the selection process comes from an early interview with a venture founder in 2014:

"What are the good support actors for innovation and entrepreneurship? Well, it's pretty obvious: those that can prove a record of doing substantial things for people like us and our peers on the startup scene. These we continue to work with, the others… - don't bother".

Retention process

From the strongly market-driven selection process, the retention process has been underpinned by a concentration of resources. Those players that were selected, can more

easily build a critical mass, both of qualitative resources like human capital, relational capital, attraction of qualified mentors, to mention a few of the most essential, and financial resources for own growth/development and for enhancing the services and support provided to entrepreneurs alike.

From the researcher's own analysis, the net variation in number of players between 2015 and 2018 has been less than 5%. A handful of new players have emerged, starting, however, from a strong entrance backed by public and/or private resources and know-how from activities outside Greece. Some of the more prominent include Equifund[11], a fund of funds program advised independently by the European Investment Fund, and UniFund[12] which provides pre-seed and seed funding to scalable ventures exploiting disruptive technologies and emerging markets in targeted sectors.

Representative quotes for the retention process include:

"Consolidation of players has been important. Now we see those that are most relevant and do a good job - finally".

"I think that the boost of startup and innovation support was good, but it took time to sort out and make sense of what support and by whom actually makes sense" [Incubator Manager].

"Fragmentation was ridiculously apparent some years ago. Now these is a health concentration taking place. Still, however, I think too many players are around, so the process will continue".

These two codes, '***Selection process***' and '***Retention process***', lead to the identification of the category **Consolidation of Actors** that emphasizes the gradual diminution of the number of players, either by ceasing or by mergers/concentration. We assign this category to the Context in the paradigm model, as it is an aspect that is emerging and that innovators both to some extent influence themselves, but also need to adapt to.

[11] https://equifund.gr/

[12] https://uni.fund/

Community building

The severe financial crisis affecting Greece has created difficult conditions in terms of competitiveness, extroversion and innovative entrepreneurship that could boost growth in the economy. Climate reversal implies improving competitiveness through a new production model and adapting business to new data with the suitable preparation. However, in order to achieve this goal, the appropriate business environment should be developed to help enterprises exploit new challenges and be motivated.

In Greece, particular mobility has been observed with numerous initiatives by groups and institutions, for the purpose to encourage and support innovation-based entrepreneurship, aiming to confront the problems that have arisen from the adverse economic environment through a focus on entrepreneurship, using models of incubation processes and lean startup in line with good practices from abroad.

As identified in the literature review, numerous initiatives have emerged, and as discussed above, after the variation stage of emergence and creation, they have gone through a selection and retention process ending up in a more steady state with a limited number of players doing substantial work.

In the later stages of data collection, marked by the retention phase, interveiwees emphasized the networking effects taking leading to the building of communities for innovation and entrepreneurship. As the CEO of an established group of companies, sereial entrepreneur, initiator and active member a number of entrepreneurship initiatives put it:

“The entrepreneurship community is in fact a network of loosely coupled smaller communities, each focusing on a particular technology filed, or a particular type of business. It consists of people who have passed through 1000 waves {Greek expression} and now have gained some confidence, both in themesleves and with respect to each other”.

This shows a level of maturity and it is also a state described by incubators and entrepreneurship support organizations, as the manager of an incubator explained:

“During the last couple of years {referring to 2016-18}, the community is stabilizing and there is a clearer state in terms of who does what, and how each one contributes”.

Voices are also raised calling for a more inclusive approach to the community building:

"The enhancement and diffusion of new knowledge in the field of administration and modern management is a vital element in the development, survival and growth of Greek entrepreneurship. We have to prepare our business and co-shape present and future in modern terms". Mr. Konstantinos Bitsios, Vice President of the Association of Enterprises and Industries (SEV), in a presentation of an initiative of (SEV). Source: https://www.eea.gr/arthra-eea/afieroma-diktya-ypostiriksis-epixeirimatikotitas-2/.

Support from all actors is necessary, with the objective to create a favorable ecosystem based on interconnected communities of education, organization and networking that are indispensable for any business that come face to face to the challenges of international competition and markets.

Network expansion

The entrepreneurship and innovation community is now in a phase of expansion, creating a larger network also focusing on establishing links with relevant players internationally (BCG, 2018). Encouraging partnerships between stakeholders as well as promoting research and development cooperation between companies, universities and startups are the necessary tools and practices for Greek companies to meet the challenges of the time. The Co-Founder and President of a large software company (Upstream, Mr. Markos Veremis) illustratively denoted:

'In modern entrepreneurship, increased cooperation between all actors of knowledge and entrepreneurship is very important. Thus, the development and dissemination of new administrative skills and practices is a prerequisite for business extroversion and innovation whiles the possibility to adapt to ever-changing data for people and businesses are given'. Source: http://www.epixeiro.gr/article/114509

The existence of a friendly environment when starting and developing a business is very important for achieving its goals. Economic turmoil such as the crisis, which has plagued Greece, creates the need for closer cooperation between businesses to cope with the negative effects of the recession as well as the increasing competitiveness. The creation and operation of networks that exploit the comparative advantages of a geographical area and the business opportunities that exist, the exchange of know-how among their members, and new technologies, compose competitive business models, produce innovative products and

services while achieving economies of scale and clearly more favorable survival and growth conditions in today's unfavorable economic conditions.

Driven by this, many businesses have begun to cooperate in networks, so as to bring together their products or services and compete with common actions. Especially for small businesses, which are not generally characterized by openness and due to crisis have an uncertain future, their participation in a network is important, since they will acquire a competitive advantage from the know-how and the experience that they gain by their incorporation. The Director of Business Development and Technology of Corallia, Dr. Nikolaos Vogiatzis illustratively stated:

'Cooperative schemes are now an important tool for promoting innovation and competitiveness across Europe. They provide significant benefits to stakeholders while also promoting regional economic development'. Source: https://www.insurance-eea.gr/arthra-insurance/to-eea-stirizei-energa-tin-epixeirimatikotita-kai-tin-kainotomia/

In this context, many organizations have set up entrepreneurship support networks to address the problems that have arisen in companies that continue to operate despite the unfriendly economic environment. In these networks the enterprises upgrade and complete the skills of their employees and modernize their company, by adopting organizational innovations (Antoniadis et al, 2018). A key member of an incubator referred characteristically:

'Being aware of the importance of innovation and extroversion in the development of the Greek small and medium-sized enterprise, we place particular emphasis on collaborations that can function supportively so that the enterprises can meet the requirements of international competition'.

Network expansion of the stabilized Greek entrepreneurship and innovation communities was thus and important factor at the basis of an emerging innovation system.

Local Social Structures

In terms of local social structures in support of innovation and entrepreneurship, as advanced in the literature as essential for the emergence of a functioning innovation system, an informal network has taken shape over the last years in Greece, consisting of a mix of:

- Seasoned business leaders,

- Serial entrepreneurs,
- CEOs and other executives in young firms,
- New venture founders,
- Industry experts, University professors, and
- A few investors

It is a loosely coupled network where the ties are partly relational, partly based on complementarity of each individual's profile, interest and intention. Incubator mentoring and support/evaluation in entrepreneurship competitions are the major activities that regularly bring these individuals together. Hence, the individuals in this network migrate between different formal support initiatives, and in each specific activity, e.g., judging in a start-up competition or mentoring in an incubator, there is some differentiation in terms of the morphology of the network.

The observed advantages are continuity and an aggregate view of the start-up landscape. The disadvantages can be a 'closed-club culture' and some risk of sameness in the advice given and in the visions deployed for the start-up landscape.

As a new venture founder put it:

"The 'piazza' {expression used in Greek} *of entrepreneurship is small in Greece, both start-uppers and people engaging in and supporting innovation and entrepreneurship are the 'usual suspects'. It can be good for continuity and gradual development of the scene for entrepreneurship, but sometimes we discuss with peers and some might say 'hey, will I be judged again by the same people, will I pitch again to the same financers'* [that were not necessarily very supportive last time].

A major strength in the emerging local social structures, mentioned by virtually all startup interviewees was the mentoring activities offered in incubators and also in some startup competitions. Successful entrepreneurship can be achieved by someone who develops sensitivity and understanding of how people think, how they are influenced, how they make decisions and finally act. Mentoring can provide new entrepreneurs with those tools, mindsets

and insights that will gradually give them the ability to take the control of their venture[13]. The founder of a startup spinning off from a university stated:

"We were a bit skeptical to the mentoring; we were focused on our tech and we thought this will be like a professor talking about theories. We could not have been more wrong. We worked with three mentors during our two years of incubation and they completely changed our view on what we were doing. Without them we would never have taken off in the market".

Better communication, stress management, energy and time management, correct targeting and efficient performance of complex processes are just some of the areas in which mentoring can play essential tool for managing human behavior. A business consultant with many years of experience as a mentor explained his view on the topic:

'Mentoring is a whole philosophy that requires much more than experience and credentials. It requires self-knowledge, self-sufficiency, emotional intelligence, profitability, consistency of words and actions, patience and perseverance in the face of any difficulty, updating knowledge, open minds in change and any new technological innovation'.

To live up to the expectations and deliver the utmost, however, mentors must adapt to developments and be fully up to date with the business and technology context of the firms they will be mentoring It has been observed that in a variety of entrepreneurial events consultants or mentors repeat the same things, not to say that the same people are being recycled. Thus, as stated by the manager of a consulting firm, any organization that propose mentors, the mentors themselves, and the mentees must pay attention to the quality of the process delivered:

'We live in an era, where everything is redefined. In my opinion, the professional titles of the past are of little value, if the professionals carrying the titles do not adapt to the developments of their time. I'm sorry but from my experience of the past two years, I can say that there are many out there who don't realize this'.

[13] Leventis, L. (2017), Why do the New Generation of Professionals Need a Mentor? Capital.gr: https://www.capital.gr/me-apopsi/3187851/giati-i-nea-genia-epaggelmation-exei-anagki-apo-enan-mentora (accessed 3-5-19).

These three codes, '***Community building***', '***Network expansion***' and ***Local Social Structures***, lead to the identification of the category **Network Dynamics** that emphasizes the strategic importance of networks to promote entrepreneurship and innovation. The problems that have been created in business from the adverse economic environment can be resolved through business partnerships, led by experienced consultants at governmental and other organizational centers. These organizations provide integrated services to businesses to enhance their competitiveness, based on knowledge and innovation. We assign this category to the Intervening Conditions in the Paradigm Model.

6.3.2 Knowledge Development and Resources

In a period of rapid technological development, leading to production processes and knowledge-based products, knowledge management is becoming central. Knowledge management should take place in every part of the knowledge chain, from the creation of new knowledge to its diffusion and transformation into innovative actions, as well as its exploitation and exploitation by enterprises. Knowledge, Research and Innovation are the most important tools for a modern and competitive economy.

A very important role is played by all the education and training institutions, as parts of the central building blocks of any innovation system, for the acquisition and diffusion of knowledge: the constant alteration of technological standards, changes in demand and supply make it necessary to continuously improve the knowledge and skills of the workforce. The ability of the business to use modern mechanical equipment and hence to show productivity expansion depends on the degree of skilled workers.

Research and innovation have the potential to be one of the main pillars of the country's recovery, this is a shared opinion in virtually all studies, reports and declaratipns by relevant ators reviewed as secondary sources in the research. If strong incentives are given to enable new scientists now working abroad to return to Greece, and to venture capitalists from Greece and abroad to make investments, coupled to a simplification of any related administrative procedures and financial incentives tthis vision could become reality. Strengthening the relationship between research, education and innovation is a major challenge for all countries. However, in Greece there is little funding for R&D and investment in this field, far below the EU average, and, even more importantly, 'the monster of bureaucracy [Greek expression used by numerous interviewees] seems impossible to tame

even during the pressure that has been exercised in this direction from the European mechanisms during the crisis.

Moreover, according to the European Commission (2014)[14], although Greece has high rates of involvement of enterprises in innovation activities, it belongs to a group of countries with moderate innovation performance. It is certain that the current way of leading and managing the wider public sector and many Greek enterprises organizations is inadequate to create value in the Greek economy and lead to social prosperity.

Knowledge building

In order for knowledge to be created, diffused and transformed into innovations and used by businesses, there are certain conditions. Initially, the state must support and fund basic research at the same time with private actors to present scientific and technological knowledge. Another key factor in producing knowledge is the number of researchers and their specialization.

In this direction, it is important to prevent brain drain and motivate Greek scientists to come back, in order to high-level human resources to be capitalized on Greece. There is also a need to align university education in technological areas, but also in administrative, organizational and production areas, with modern training programs like in advanced countries. At a festive event for the 60th anniversary of the National Research Foundation (October 2018), a senior executive of SEV (I. Karagiannis) underlined:

'Research, development and innovation go along with business and investment. When there is a connection between them, the conditions to make the research an innovative industrial product to be exported are created, to help the country's development and to employ human resources, to prevent brain drain and bring Greek scientists in our country. It is also the responsibility of our business to invest in R & D and to capitalize on the human resources, with the intention of taking the place we deserve in the global chessboard'.

Another important tool for the development and dissemination of knowledge is IT and telecommunications, which allow the direct communication, interconnection and transfer of large volumes of data to each edge of the globe. ICTs offer the appropriate infrastructure to

[14] European Commission, Innovation Union Scoreboard 2014. http://ec.europa.eu/DocsRoom/documents/6993/attachments/1/translations/en/renditions/native

develop entrepreneurship, communication, information on new market trends, production methods, cultivation of human resources skills and innovation. Manager of a large telecommunication business characteristically stated:

'It is essential that the diffusion of new innovative technologies across the spectrum of the functioning of a modern state, ie both in the public sector and in the business sector, as also in the citizens, ..., but an appropriate institutional framework is required, which will give the incentives for th adoption of new innovative digital services by citizens across the country and of course across the spectrum of public administration, the province, small and large businesses. Also, through the strengthening of broadband networks, there is an opportunity to promote education and research in all sectors'.

The optimal performance of R&D systems depends on various factors, such as a strong scientific basis for the unimpeded involvement of the private sector in innovation activities, as well as the continuous flow of knowledge between R&D actors, coupled with the creation from the state of the right conditions for entrepreneurial innovation. The Governor of the Bank of Greece, Giannis Stournaras, speaking at the event of the Initiative for Education and Development (PRO.PEDIDA), entitled: "Universities, Research, Innovation Entrepreneurship and Development" stressed illustratively:

'Scientific research requires serious and continuous funding, meritocracy, extroversion and close collaboration with the scientific community. It also requires a culture of business risk, investing in innovative activities that will yield profits in the long run. The private sector has to trust the innovative talent of young Greek scientists'.

As can be concluded from the above, there are certain areas where new knowledge is building up in Greece and there is advanced R&D activity going on in some places and in some technologies. However, there is important lack of critical mass from an innovations system perspective, especially lack of industrial infrastructure to take up R&D results.

Knowledge scarcity

Innovation, knowledge management and the development of in-house technology capabilities are the key to sustained dynamic growth and the rational operation of businesses. However, it has been noted (EE, 2014) that although Greece has a high rate of involvement of enterprises in innovation activities, it has a low innovation performance. In general, business cooperation in Greece with research centers appears at very low rates. The limited links between Research

Centers, Universities and Enterprises are a key cause of the hurdle of knowledge diffusion in Greece. In an interview given by Carlos Moedas, European Commissioner for Research, Science and Innovation, he stressed, among other things[15]:

'I believe that strengthening the link between research, education and innovation is one of the greatest challenges for European states. Science and innovation are indispensable for public and private investment. Unfortunately, what you are seeing today in certain areas of Europe is the absence of private investment. It is therefore necessary to create the conditions for a flow of private capital to research, science and innovation'.

Also the lack of appropriate technological infrastructure is a major obstacle to the diffusion of knowledge. The role of digital technology is crucial to effectively support the knowledge management. Of course, technology alone is not the solution, but without it, knowledge management is doomed to be just a theory without practical outlets. Greece's ability to promote digital technologies in the economy and society is critical. Therefore, cooperation between the state and the universities and the private sector is essential for Greece to move to the necessary digital transformation for its modernization. The Governor of the Bank of Greece, Mr. G. Stournaras, said in this respect[16]:

'The penetration of digital technology in European economies is a priority for the European Union and it is considered to be a key catalyst for the economic development and prosperity of its member states, ... A distinctive difference in the working environment of the future is that it will use much more executive skills than simple management, which will gradually become less useful. Education that will equip young people with these most essential skills is crucial'.

Finally, many interviewees, but young entrepreneurs and more seasoned leaders/managers, expressed the paradox of lack of access to skilled workforce, in spite of the very high unemployment rates of young graduates. Illustratively:

"It's very hard to find skilled IT staff, in particular programmers."

[15] Interview given in the context of the participation of the European Commissioner for Research, Science and Innovation at the Euro-Mediterranean Initiative PRIMA (Partnership for Research & Innovation in the Mediterranean Area), held in Athens on 25 September 2017.

[16] Speech by the Governor of the Bank of Greece Mr. G. Stournaras on "Connecting University, Research Centers and Businesses in Greece: Present and Future" at the Bank of Greece on 23/05/2017.

"Business skills are lacking dramatically in young graduates from science or engineering schools."

"Among business graduates, many still have no real clue about accounting and finance – how you make your ends and how you plan your financial flows."

Hence, certain knowledge areas and skill sets are lacking in the market and make them scarce knowledge for companies to access.

These two codes, '***Knowledge building***' and '***Knowledge scarcity***', lead to the identification of the category **Knowledge Dynamics** that emphasizes the need to link science and business to create the conditions for the transfer and exploitation of knowledge in the business sector and to create new production capacities in fields with high growth potential in order to address the accumulated social and economic challenges. The cooperation between the forces of knowledge, of healthy entrepreneurship and civil society is a prerequisite for the recovery and consolidation of prosperity. This category is assigned to the intervening conditions of environmental nature in the Paradigm Model.

6.3.3 Training, Career and Employment Policies

Vocational training in Greece is quite underdeveloped and it has been impossible to find models that could cope with the need for re-qualification stemming from the financial crisis and the economic downturn, which raised unemployment rates to unpredictable levels. In Greece, the lack of links between higher education, vocational training and employment is a major problem that needs urgent solutions through a general redefinition of education policy[17]. It is particularly important in relation to the crisis, as its negative impacts, the rapid technological developments and the changes in the international division of labor form a totally different socio-economic reality than the one reflected in the educational system and policies.

Greece needs to harmonize by redefining its vocational training strategy. Although over the past decade, greater emphasis has been placed on professional training and lifelong learning

[17] Lifelong learning, vocational training, employment and the economy: New data, priorities and challenges, 2017, Institute of Small Business (GSEVEE) and Institute of Labor (GSEE), https://www.inegsee.gr/wp-content/uploads/2017/04/dia_biou_book.pdf

programs, Greece needs a fundamental reform in education that takes into account the new requirements of qualification and connects different levels of education to the needs that exist in society and with employability as an overreaching goal.

Corporate investment in training

The development of new technologies and their application in the workplace has boosted the institution of in-house corporate training on a global scale, to cope with new and increased needs for training of employees during their professional lives. The education of human resources, through continuous practice and training, enables countries in general and businesses in particular to keep up with technological developments and thus maintain or even improve their competitiveness. Similarly to the competitiveness of a business, the economic prosperity of a nation is directly linked to the ability to learn faster than others. An executive at a major food company stressed:

'We consider our people are the most important factor in achieving our strategic goals. We enable every employee to grow and evolve within the company. The people are our resource base for competitive advantage. We endeavor to enrich their knowledge and skills with education and training programs'.

In companies that provide proper and continuous training, the flexibility and adaptability of employees grows, helping them to learn how to react, how to cope faster with change and adapt to the new environment. Systematic staff training leads to increased employee productivity and contributes to the overall development of the organization[18]. That is why the expenses of education should be seen as an investment rather than a cost, because in reality this investment returns to the business by increasing its efficiency and competitiveness. The co-founder of an emerging company with penetration already in several countries abroad said:

[18] Study: Training, Employment, Educational Policy. Exploring the link between vocational training and employment, 2013, Center for the Development of Educational Policy of the General Confederation of Workers of Greece.

https://www.kanep-gsee.gr/sitefiles/files/Katartisi_MELETH_FINAL.pdf

'The development of Human Resources is a primary factor for our company, as it is the driving force of our productive and dynamic growth. We invest in training through specialized educational seminars that complement the skills and knowledge of our executives'.

In Greece, however, the lack of strategic planning and coordination for education and training is evident from the state's inability to develop effective programs. A former HR Director in a multinational pharmaceutical company put the finger on a major blockage in the educational policy:

"Education in Greece is a laboratory animal for ideological experiments. What is built up by one government is ruined by the next. Over the last years, there has been a turn towards more bureaucracy and less market interactions in the legislation voted for higher education. Also, incentives for excellence have been dismantled. This is very problematic, both for business and for the country in the longer term."

However, high productivity and highly skilled human resources are needed for a country, especially in order to innovate itself out of a crisis. This requires a substantial reform of education and training programs in the long run and their direct link with market needs intending to tackle unemployment and increase jobs[19].

Training for entrepreneurship

Support for entrepreneurship in Greece has never been as important as today. The country needs a productive reconstruction plan to cope with the prolonged recession and the problems created, such as unemployment and especially youth unemployment. In this context, the strengthening of entrepreneurial education in schools, in vocational education institutions and universities will have a positive impact on Greece's entrepreneurial potential, intending to

[19] Starra, E., S., 2014, Linking Education and Vocational Training to the Labor Market as an investment and a strategic asset for promoting growth and competitiveness in the EU, EVEA

boost the employability of young people in particular and to strengthen their entrepreneurial spirit. A counselor to a large incubator said:

'Our center offers support to researchers and potential young entrepreneurs in order to deploy innovative concepts and help them providing the knowledge and the tools required during the design of their products'. Working with students and young graduates, we cater to a huge need that is completely outside the curriculum of virtually all university programs in the country.

Some universities have paved the way for developing and promoting courses, seminars and competitions aimed at developing an entrepreneurial mindset and related skills, often supported by European programs. The objectives of these programs are to familiarize young people with entrepreneurship, to provide knowledge about the concept of business in the modern world, to develop entrepreneurial initiatives and skills. As explained by a professor leading such initiatives in her[20]:

'The concept of entrepreneurship was misunderstood in Greek education due to distortions and prejudices. Today there is a diffuse climate in favor of it, especially in the Universities field, and the need to link education to the business sector has been perceived'.

However, although many activities are in progress at all levels of education, the most of them are not integrated into the curricula and the related initiatives are often isolated. They are the fruits of individual drive and initiative, and not of a conscious and nation-wide innovation system framework. The findings of a related study[21] stated illustratively:

'The Greek economy needs to return to sustainable growth as quickly as possible so that we can tackle the huge unemployment problem. Among the prerequisites for this is the alignment of the business community and the education system with the requirements of a carefully crafted new development model of the country. This requires radical redesign of curricula and students allocation, effective re-qualification programs and a series of joint actions by businesses, universities and the state'.

[20] Economic Review, March 2019, Issue 980, Interview with Apostolos Lakasas.

[21] Study conducted jointly by EY, Athens University of Economics and Business ("AUEB") and Endeavor Greece, entitled "Education, Entrepreneurship and Employment: Approach Required"

Entrepreneurship in schools is often treated as an out-of-school activity or as part of a seminar. But the situation has changed in universities, where entrepreneurship is taught more systematically and competitions of innovation and entrepreneurship are conducted, supported by many universities. However, it is necessary to set up Innovation and Entrepreneurship Centers for the development of a culture and strategy for Innovation and Entrepreneurship at all levels of education, starting with primary education.

These two codes, '**Corporate investment in training**' and '**Training for entrepreneurship**', lead to the identification of the category **Growing an Entrepreneurial Mindset** that emphasizes the need for a more coordinated and substantial effort and for a national strategy for lifelong learning in the context of the modernization of society and the economy and, of course, to tackle enormous unemployment, boost employment and the productive rebuilding of the Greek economy. It is an absolute necessity for the human resources to acquire the skills required by the modern labor market through the establishment of programs and coordinated education and training actions, in order to allow Greece to consort with the developments of the European environment and enter into a development path. We assign this category to the outcome dimension in the Paradigm Model.

6.4 Innovation and Entrepreneurship Policy

Following the literature review, the Innovation and Entrepreneurship Policy System parameters investigated were Create Dynamic Startup Markets, Stimulate Entrepreneurship, Increase R&D Intensity, and Stimulate Innovation & Entrepreneurship Culture. The data structure for policy is presented in Figure 21.

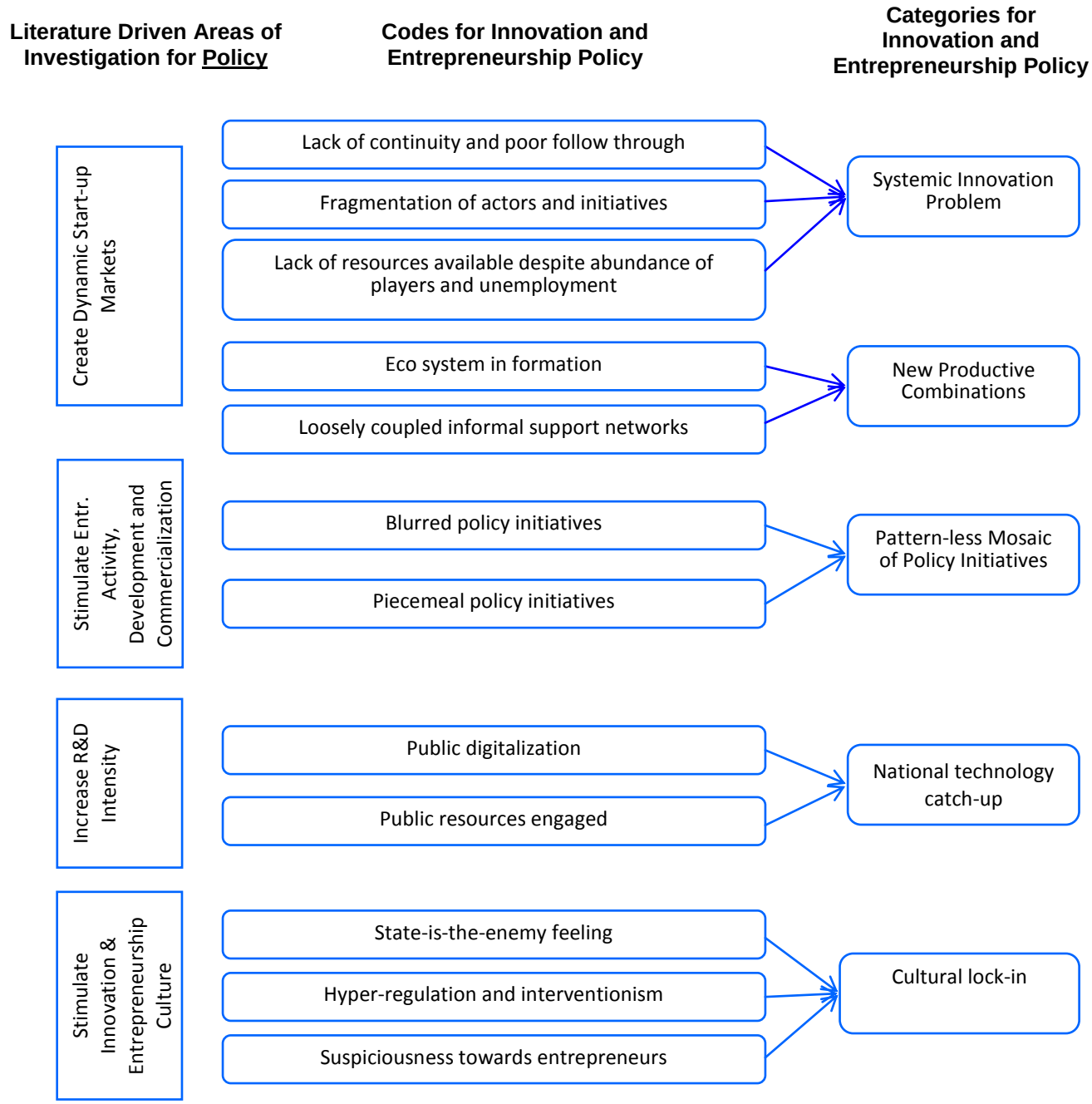

Figure 21. Data Structure for Innovation and Entrepreneurship Policy.

6.4.1 Create Dynamic Startup Markets

The economic crisis may have restricted the access to the labor market, but reinforced the incentive for entrepreneurship. Some insisted and took it as a challenge, turning crisis into opportunity. With enthusiasm, decisiveness, creativity and having as their main weapon the innovation, some emerging companies have tried hard and created or gained new market share. Having many difficulties, some of the young entrepreneurs dared and succeeded with hard work and endless hours of personal employment. Nevertheless, the hard work and a good idea is never enough for a successful company. Apart from the personal sacrifices, there is a need for logistical infrastructure, offices, guidance, funding and first of all the support of the state, which should provide the necessary tools for the proper functioning of a business, especially of a startup and limit the obstacles emerging during its development.

In this context, the state must support these efforts more systematically and as an institutional regulator make the necessary changes, as to give development opportunities to any company that presents innovative momentum. The state must provide the necessary tools and its support, as to make these companies self-sustaining and provide to them the possibility to succeed. This will allow the new entrepreneur not to be afraid of the risk and the stigma of failure and to work for his business success by providing cumulative growth dynamics with multiple outcomes. Unfortunately in Greece, the situation is much the contrary.

Lack of continuity and poor follow through

Business innovation is not always an easy process. Many enterprises encounter serious barriers in their efforts to develop innovative activity. The main inhibitory agents are the lack of a stable business environment, financial, intra-company and some other external factors. The economic obstacles include the high cost of research, diffusion and implementation of an innovative idea, as well as the lack of sources of finance, the risk taken by a business and the very long depreciation time of innovation. Also, too often a business cannot meet the costs required to be in constant search for innovations. A senior executive in food industry stated illustratively:

'Our company has a continuous process for innovation, but few companies have invested in the innovation's culture in Greece. Therefore, a dialogue must begin aiming to identify the most effective strategies and the successful examples that do work in practice in orders to stimulate innovation'.

Also, inadequate information on technology and market trends is likely to lead to failure. The weakness of the legislative framework for rights protection and the lack of the state to support innovation, often make the entrepreneurs reluctant to take innovative action. As one venture founder stated:

'Public programs have been of very little use. There is so much bureaucracy and piecemeal funding based on filling templates helps no one. Rather it diverts you from pursuing your ideas and focusing on clients'.

Indeed, interviewees expressed disappointment with most public innovation and entrepreneurship programs, including those funded by ESPA. The main criticism can be summarized as follows, with representative quotes:

'It is about chasing selection criteria and not about doing business'

'Evaluation feedback and support mechanisms were very weak'

'It cost us far more in time to take part in [particular program] than what we got back'

'No follow-up whatsoever, money was portioned out randomly and delays made it basically useless at the end of the day'

So although the initial setup and conditions seemed relevant to many, the implementation fell short due to lack of continuity and lack of follow-through in the mechanisms accompanying most public innovation and entrepreneurship support programs.

Fragmentation of actors and initiatives

Both secondary and primary data sources confirm that in the lack of a coherent national innovation policy, and a united carrier of innovation support initiatives and such a policy, actors and initiatives in Greece are highly fragmented. Fragmentation is characteristic for both public and private initiatives. As a seasoned entrepreneur put it:

'Every university, business association, industry syndicate, telecom provider, or commercial bank went along to create its own startup initiative. Although admirable, and helpful in some cases, the system effect is very limited'.

Without downplaying the contribution of singular activities and initiatives, many of which have grown and become institutionalized (as discussed under Actors and Networks in the analysis of the Innovation Systems codes and categories), the problem of fragmentation persists and can only be remedied by a national innovation policy.

An effort to remove barriers and facilitate innovation through a coherent plan of measures could create the bases of a research - innovation - entrepreneurship ecosystem, as to establish a new sustainable and competitive economic model. As pointed out by the President of the Commercial and Industrial Chamber of Athens[22]:

'We have pointed out in any way, for a long time: if the rate of growth is not accelerating, the Greek economy will soon be back in deadlock. The conditions for changing the country's productive model must now be shaped'.

Creating a new productive and entrepreneurial model for the Greek economy requires initially tackling serious problems that hinder the development of entrepreneurship. One of the biggest obstacles is the lack of funding. Ensuring the smooth and low-cost financing of the Greek economy, that will allow the gradual restoration of bank support to the private sector and the attraction of investment, will help to accelerate economic recovery. Key factors which create distortions in business operations as well are the volatile tax and institutional environments that exacerbate existing structural problems. Also, the high tax rates applied in Greece for businesses are a major investment disincentive. The co-founder of a startup, who is trying to find investment abroad stated:

'High taxation and constant changes in the tax framework do not allow a foreign company to invest in Greece. There must be stability in these areas so that interested investors know the data from the outset'.

[22] K. Michalos, in the Board of Directors of EVEA, December 2018.

https://www.euro2day.gr/news/economy/article/1654482/mihalos-terastio-provlhma-h- elleipsh-fthnhs-hrhmat.html

Bureaucracy and inefficient Public Administration are also hinders for developing a coherent innovation policy23. For the EU, reducing of bureaucracy is a crucial factor for the improvement of the international competitiveness of European businesses in the globalized economy and also the main objective of the Lisbon strategy. The founder of a startup with great growth prospects said:

'We can say that the two main obstacles in the field of developing new ideas are the bureaucracy and delays that characterize the structures of the countries and the lack of direct capital sources that will contribute to the immediate development of the idea'.

There is also limited investment in R&D in relation to other EU countries, and there is generally small or very small cooperation between universities - research centers and businesses, although there has been some gradual improvement in recent times, giving hope for the future. Moreover, the lack of a culture of innovation in businesses is a reality in Greece that all innovation measurement indicators have shown[24]. Businesses need to invest a lot more in research and innovation. This means to invest also in human resources and in training for new technologies and knowledge, since without properly trained staff, innovation will not bring beneficial effects to the enterprise. Many companies also, fail to use their valuable resources of their employees, such as imagination, creativity, original thinking, because they have not created a culture of innovation in their environment.

Lack of resources despite abundance of players and unemployment

A significant intra-company factor that prevents the development of innovations is the lack or insufficiency of skilled human resources[25]. In combination with organizational rigidities, it

[23] Research as a lever for the growth of the Greek economy, German Institute for Economic ResearchDIW Econ, 2016

https://www.dianeosis.org/wp-content/uploads/2017/01/research_policy_gr_final.pdf

[24] Research as a lever for the growth of the Greek economy, German Institute for Economic ResearchDIW Econ, 2016

https://www.dianeosis.org/wp-content/uploads/2017/01/research_policy_gr_final.pdf

[25] Research as a lever for the growth of the Greek economy, German Institute for Economic ResearchDIW Econ, 2016

https://www.dianeosis.org/wp-content/uploads/2017/01/research_policy_gr_final.pdf

can potentially cause problems for the success of an enterprise's innovations. Innovative companies are knowledge-based, so specialists are important as a condition for innovation. Furthermore, the organizational structure of an enterprise must have the ability to create, transfer and disseminate knowledge through internal communications in all the relevant departments. Thus, on the one hand, the lack of suitable staff and on the other hand, the organizational inability of an enterprise to properly manage and disseminate knowledge may lead to internal stiffnesses for the innovation process. In a speech[26], the Governor of the Bank of Greece stressed:

'The modern world of the labor market in Europe is constantly seeking more graduates with knowledge and skills from Higher Education. Greek Higher Education Institutions have to respond to challenges by developing links with the labor market, as well as partnerships between university institutions, research centers and businesses. The aim is to link innovation, namely the research material produced, with the labor market, giving a dynamic and qualitative dimension to the country's development process'.

The skills of human resources in Greece are at some distance from the requirements of present-day enterprises, as the country continues to lag behind in life-long learning. And this is reflected in labor market researches, which show that there is a great mismatch between skills developed by workers and those sought by businesses. This gap results from the education system in Greece, which is not adequately linked to the labor market. Thus, the paradox that many resources sought for by entrepreneurs are not available despite the abundance of programs, players and, above all, unemployment among the youth. Although skills required have changed dramatically in recent years, Greece has not adapted university curricula accordingly, with the exception of postgraduate courses (Endeavor, 2017)[27]. Employees' knowledge and skills need to adapt quickly to developments and to be continuously upgraded, as to be in line with market needs. Co-founder of a growing young business venture said:

[26] Speech by the Governor of the Bank of Greece, Mr. Yiannis Stournaras, on "Linking Universities, Research Centers and Businesses in Greece: Present and Future" Bank of Greece Athens, May 23, 2017

[27] Endeavor, 2017: Education, entrepreneurship and employment: approach required

'The difficulty of finding skilled workers in some sectors of the economy is due both to brain drain and to the lack of linkage between education and production, in order to mitigate the mismatch between supply and demand'.

According to a survey by a leading Greek bank[28], the mismatch registered in Greece between job vacancies and the number of job seekers is mainly due to:

- The transformation of the country's productive model during the recession, as reflected in the strengthening or weakening of certain industries,
- The technological developments of the last decade,
- The phenomenon of intense outflow of high-quality human resources abroad (brain drain).

Appropriate training programs must be developed to prepare satisfactorily young people, as to become acquainted with what the job market is looking for. Within this framework there should be close co-operation between the state, education and business in order to deploy the necessary modern curricula and young people acquire the skills that will help business and the economy to be flourished[29]. The following quite from a new venture co-founder is illustrative of what most interviewees shared:

'It is necessary to redefine the types and forms of scientific and professional specialization, aiming to create a human potential of young scientists able to design and implement the necessary actions of introducing innovations in the enterprise in which they are employed'.

Enterprises on their own side should realize that there is a need in a contemporary competitive environment for continuous training of employees, as to adapt to business needs and increase their performance. Also, attracting skilled executives must be the aim of every

[28] Alpha Bank, Unemployment: skills mismatches in labor supply and demand (weekly bulletin for the last quarter of 2018).

[29] According to a survey by Adecco Greece (Human Resource Solutions company), on "Employability in Greece 2017" Human Resource Solutions company

company in order to stay competitive. Generally, creating the appropriate climate from the business will enable employees to achieve, bringing success to the business itself.

These three codes, 'Lack of continuity and poor follow through', 'Fragmentation of actors and initiatives' and 'Lack of resources despite abundance of players and unemployment', lead to the identification of the category **Systemic Innovation Problem** that emphasizes the need to improve policies and institutions for entrepreneurship and facilitate innovation through a coherent plan of measures that will remove malfunctions in businesses, by laying the foundations for a new sustainable and competitive economic model that creates real value and not impeccable prosperity. We assign this category to the Context of innovating in the crisis in the Paradigm Model.

Eco system in formation

Employment and satisfactory growth rates are key factors for a strong economy. Greece needs high growth rates aiming to get into the normality that traditional economic activities cannot provide in a short period of time (The Greek Startup Manifesto, 2014)[30]. Start-ups with their innovative and rapid growth features can create new quality jobs and contribute to the growth of the Greek economy (Hellenic Startup Association, 2011)[31].

The Greek innovation eco system, during the period of study, appears to be getting more mature and show some prosperous prospects for the future. In the difficult economic environment, some companies were able to stand out, display rapid growth and attract capital from domestic investors and from international funds. Israel's Ambassador to Greece, in an interview on the subject in March 2019[32], stated illustratively:

'I have seen an important development in the Greek ecosystem, it becomes more mature, understands what are the needs to create a truly viable and efficient ecosystem […] We see the emergence of major business accelerators across the country, not only in Athens, there is a very interesting community in Thessaloniki, Crete, Patras and other parts of Greece. This is very encouraging. I think we all see more and more young people getting into this area'.

[30] http://www.startupmanifesto.gr/

[31] http://hellenicstartups.gr/

[32] Interview of Israel Ambassador Irrit Ben-Aba at startupper.gr, 21.03.2019.

Until very recently, there was no organized help or support for new innovators, let alone for established. Today, things seem to be a little easier than the past, since some support structures have been created in recent years, in particular a number of sustainable incubators with several consecutive years of operation, entrepreneurship competitions with increased professional support including links to incubators and accelerators, co-working spaces set up to explicitly promote synergies and cross-fertilization between startups and young firms occupying[33]. The co-founder of a startup and participant in one of the important startup competitions referred[34]:

'Every year the contest attracts remarkable businesses that through the seminars, the access to very high level mentors and the osmosis between us, give strong boost to reach the next step. Proof is, that several companies from previous cycles have excelled either technically or commercially, or by securing financing from domestic and foreign investors'.

However, the institutional framework of Greece does not facilitate the startups to take action. Bureaucry, as well as the lack of assistance from the state, are pushing many startups to carry their official headquarters abroad. It is a fact that Greece needs a friendlier institutional framework to accelerate the growth rates of its startup businesses and to create a strong and favorable environment for start-ups with a view to stay and continue to grow based in the country. Besides, jobs and business growth will bring only positive results to the state, the Greek economy and the labor market. Of course, in addition to state support and investment initiatives, training will play a key role and, in particular, entrepreneurship programs at all levels of education, as also the interconnection of academics and the business community[35]:

'Academic cooperation with the business community is a sector that still has much room for improvement. The good fortune is that in recent years significant progress has been made in this area, but we are still embryonic in relation to what we could achieve with mutual benefit to both sides […]. However, we have fortunately begun to understand the problem, to change the perception and to make significant progress in the right direction'.

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[33] http://entre.gr/oi-startups-stin-ellada-epistrofi-anaptiksi/

[34] Interview with Demosthenis Doumenis, co-founder of Quantimetrica, June 2018, participated in MIT Enterprise Forum Greece, https://citycampus.gr/%CF%83%CF%85%CE%BD%CE%AD%CE%BD%CF%84%CE%B5%CF%85%CE%BE%CE%B7-%CE%BC%CE%B5-%CF%84%CE%B7%CE%BD-quantimetrica/

[35] http://www.corallia.org/en/si-news/4-corallia/el/news/news/4108-pramatari-interview.html, 31-5-2018

Greece is yet to make the critical shift of its production model from low-value adding products and serices to a knowledge-based economy, investing in innovation, entrepreneurship and co-operation in the long term[36]. An ally in this shift will be the use of all the country's comparative advantages, which among other things is the high level of human potential due to the very high percentage (87.2%) of tertiary students studying for a bachelor degree[37]. Strengthening the ecosystem of start-ups can attract foreign investment, making it a powerful lever for innovation development, something that Greece needs to pursue and succeed.

Loosely coupled informal support networks

The local social structures that have emerged (as discussed under Actors and Networks in the analysis of the Innovation Systems codes and categories), make up a loosely coupled network where the ties are partly relational, partly based on complementarity of each individual's profile, interest and intention.

It is important to take part in the networking activities that emerge from this. Illustratively, for almost all interviewees independently of size and age of company, an incubator manager stated:

"Making all, new and established businesses, to see the importance of networking is a major mission of ours. What we do is brokering, we make connections to enhance the value for all and build a stronger ecosystem for innovation and growth".

These two codes, '***Eco system in formation***' and '***Loosely coupled informal support networks***', lead to the identification of the category **New Productive Combinations** that represent the pool of resources that emerge and that need to be intelligently combined by innovators and entrepreneurs, coupled to an adequate support from innovation and entrepreneurship policy. We assign this category to the Causal Conditions in the Paradigm Model.

[36] SEV, SPECIAL REPORT- STARTUPS IN GREECE, ISSUE 31 June 27, 2018, http://www.sev.org.gr/Uploads/Documents/51392/SR_BCG_27_6_2018.pdf

[37] https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics#Participation.

6.4.2 Stimulate Entrepreneurial Activity

Entrepreneurship is a key factor for enhancing the competitiveness of modern economies and achieving economic growth. It has a significant impact on employment levels and boosts productivity through increased competition in the economy. Entrepreneurship also limits social exclusion by providing employment opportunities to excluded groups of the population and leading to greater prosperity in local communities. In recent years, entrepreneurship has been the subject of a variety of initiatives at national and European Union level[38].

However entrepreneurship in Greece is suffering from bureaucracy, tax burdens, labyrinths of legislation, legal impasses and even traps, anti-entrepreneurial mentality, and state interventionism[39]. Making significant changes and improvements in areas such as education, business tax status, efficiency and effectiveness of public sector services are prerequisites for supporting and encouraging Greek Entrepreneurship and for the creation of a positive attitude towards it. To arrive at this goal, a comprehensive policy framework is required rather than fragmented initiatives or arrangements, and in conjunction with a favorable macroeconomic environment will lay the foundations for achieving the aim of a strong, sustainable and balanced growth.

Blurred policy initiatives

Greece should implement effective structural changes, to create incentives for the private sector, to restore investor confidence and at last to enable the Greek economy to enter into a positive development path. The opportunities that exist should be properly exploited, so that Greece's development strategy can adapt to the needs of the era[40]. The adoption of the best practices and the implementation of all the necessary reforms are prerequisites. Co-founder of a start-up business, who encountered problems in starting his business, stressed:

[38] National Documentation Centre, Issue 110 | December 2017-February 2018, Tribute to the issue: Small and medium-sized enterprises: innovation, extroversion, access to finance and support structures the keys to their development

[39] Hellenic Federation of Enterprises, 2010, Business without Barriers. http://www.sev.org.gr/Uploads/pdf/30embodia_big_2_12_2010.pdf

[40] Greece: A Growth Strategy for the Future, May 2018, https://www.naftemporiki.gr/cmsutils/downloadpdf.aspx?id=1352919

'The state must undertake a series of coordinated actions to promote entrepreneurship, in order to facilitate entrepreneurs and create a favorable business environment. This is a demand and also a need for the whole business world'.

Increasingly strong arguments are being raised that it is high time for policy-makers to wake up from their excessively interventionist[41] mindset, and develop a grass-root model for innovation support, instead of a top-down interventionist agenda (e.g., Dolfsma & Seo, 2013; Komninos, et al, 2014; Huggins et al 2018). As stated by the European Commissioner for Research, Science and Innovation, Carlos Moedas in an interview with the NCD (2017):

"So far, we have policies to promote innovation that were applied from top to bottom […] while it should be the opposite, that is, instead of telling you what innovation I need, tell me what innovative you can build. Personally, I believe that this freedom should be given to people, come up with pioneering ideas and encourage them to move forward and also we must find the best innovative researchers and let them do what they want"[42].

Innovation policy in Greece has been described as asymmetric and failed[43]. Characteristically, Komninos and Tsamis (2008) start their pre-crisis review of the Greek innovation policy with the following quote:

"There is almost no single study or report examining the competitiveness of the Greek economy that does not point to the country's weak innovation capacity and its poor performance in most of the indicators/metrics that describe research activity, knowledge creation and technology and innovation development"[44]

[41] Karagiannis, N. (2001). Key economic and politico-institutional elements of modern interventionism. *Social and Economic Studies*, 17-47.

[42] Carlos Moedas, European Commissioner for Research, Science and Innovation, an interview with the National Documentation Center (EKT), 2017.

[43] Komninos, N., & Tsamis, A. (2008). The system of innovation in Greece: structural asymmetries and policy failure. *International Journal of Innovation and Regional Development*, *1*(1), 1-23.

[44] Komninos & Tsamis (2008), op cit, p. 2.

From their account, spanning from the late 1990s to 2008, they conclude that the technology and innovation policies in Greece demonstrate the following weaknesses[45]:

1. Dominance of public sector R&D activity compared to the private sector,
2. Asymmetry between innovation creation and absorption / adoption activity – absence of demand-side policies ,
3. Imbalance between few and small innovative sectors and the rest of the economy,
4. Very strong spatial concentration of innovation-related activities,
5. Dominance of linear rather than systemic approaches,
6. Limited funding of R&D and innovation – much lower than EU average share of R&D funding in government budget,
7. Ineffective implementation with no policy feedback.

Due to this numerous weaknesses, Greece has become an innovation laggard that never catches up. In other words, the situation is not just a problem of weaknesses, but rather a permanent pathogeneses of the Greek economy.

Unfortunately, the data confirm that very few improvements have been made. The few policy initiatives launched are seen by innovators in our study as poorly designed and haphazardously implemented. Thus, the policy landscape remains weak and the initiatives blurred.

What are required are well-coordinated public policies and initiatives with a predictable economic environment in the medium term, concrete measures rather than fragmentary moves and conflicting regulations. There is a need for a system of policies with integrated measures, interventions and actions that will be implemented at the appropriate time in a coordinated manner.. The Governor of the Bank of Greece, Yiannis Stournaras noted illustratively[46]:

[45] Komninos & Tsamis (2008), op cit, p. 3 ; pp. 15-17.

[46] In his speech at the Hellenic American Union Conference on "Seeking Reform in Newer and Modern Greece", 20-10-2017, https://www.capital.gr/oikonomia/3248885/g-stournaras-pos-tha-enisxuthei-i-epixeirimatikotita

'The Greek economy should acquire the characteristics of a modern economy, so that based on its powerful comparative advantages can ensure sustainable growth […] There are great opportunities today that should not be left untapped. In order to take advantage of these opportunities, we must mainly adapt our development strategy accordingly'.

Piecemeal policy initiatives

A determinant of competitiveness is the quality of all the rules governing the functioning of markets[47]. They should promote competition, investment and entrepreneurship. Rapid and effective integration of reforms should clearly aim at liberalizing product and service markets, eliminating unnecessary and distortive regulations and strengthening the independence of regulatory bodies.

Some of the distortions that complicate the operation of businesses are the co-responsibilities of ministries and agencies and the lack of co-ordination of services. This ends up in policy-initiatives being unsystematic and partial over time. Although state reform is a very complex process, Greece urgently needs to transform itself into a modern state with efficient public administration capable of consistently implementing public policy and addressing public problems with responsibility and knowledge. The manager of a newly-founded company expressed his concern about the issue:

'There is a need for coordinated state efforts to upgrade and simplify the business environment, the regulatory framework and the institutions that support entrepreneurial activity'.

The need for the Greek economy to be recovered is imperative, after the tough fiscal adjustment and the deep recession that is still under way. Prerequisite for all this is to strengthen policies that promote innovative entrepreneurship, through a mechanism that will

[47] Speech by Giannis Stournaras, Governor of the Bank of Greece, at an event by the Hellenic Association of Manufacturers of Famous Products on "Towards a New Sustainable Development Model with a Designation of Origin",

https://www.bankofgreece.gr/Pages/el/Bank/News/Speeches/DispItem.aspx?Item_ID=412&List_ID=b2e9402e-db05-4166-9f09-e1b26a1c6f1b

enable knowledge to be transformed effectively into competitive economic activity[48], in an effort to economic and social reconstruction of the country. As stressed at a Conference by Dr A. Tsakanikas[49]:

'The Greek economy needs to improve its structural competitiveness, upgrade the knowledge content and quality of domestically products and services in a way that is attractive to international markets and not just these […] It is necessary to strengthen policies that promote innovative entrepreneurship, as a mechanism for effective exploitation and transformation of "economically useful" knowledge into sustainable and internationally competitive economic activity'.

In Greece however, entrepreneurship was not always addressed through systematic and integrated programs, but with fragmented arrangements and slow pace, without a clear direction. There have never been the prospects of extrovert growth that require a modern economy, nor a holistic approach to the arisen problems. The interventions are mainly due to the European Union, with the incorporation of its directives into the Greek legal order, without the essential and effective assistance of the state. In this context, the manager of a newly-founded company expressed illustratively his point of view:

'The low dynamics of Greek entrepreneurship is mainly due to factors that have a tendency to inhibit its stimulation and the lack of a more general framework of national policies and targeted strategies'.

Entrepreneurship is a process of interaction between many factors, on which the business outcome depends, among them a very important one is its support from the state. In the IOBE Annual Entrepreneurship Report[50], Greece has been ranked last in entrepreneurship support programs in the European Union, with obvious weaknesses about the number, targeting and

[48] European Commission, EUROPEAN SEMESTER THEMATIC SUMMARY, RESEARCH & INNOVATION, 16.11.2017, https://ec.europa.eu/info/sites/info/files/file_import/european-semester_thematic-factsheet_research-innovation_el.pdf

[49] Conference organized by the European Investment Bank and The Crisis Observatory "Promoting Innovation for Small and Medium-Sized Enterprises and the Fight against Juvenile Unemployment", 27/05/2014, Athens.

[50] Annual Entrepreneurship Report 2017-2018: Fewer new ventures, improvement in employment prospects, November 2018, *http://iobe.gr/docs/research/RES_02_21112018_REP_GR.pdf*

effective management of state programs. However, in order to provide incentives for entrepreneurship, a new growth model should be adopted to provide solutions to the long-standing business problems, to promote extroversion, innovation and investment, as to improve the economic climate. One of the co-founders of a start-up said:

'The domestic market presents a small gradual dynamics, which could be considered as positive, if there was a similar interest in entrepreneurship and it was easier for young entrepreneurs to get into it'.

To sum up, both secondary and primary data indicate two opposing trends regarding policy that have unfolded during the crisis. The first, the positive, is an awakening of the need -a real, almost existential need- to develop consistent and durable conditions favorable of innovation and entrepreneurship through a clear and integrated long-term innovation policy. The second, the negative, is exactly what has been developed above; that the crises has even further weakened the policy-making resulting in continued or even increased blurring and fragmentation in the attempted policies for innovation and entrepreneurship in Greece.

These two codes, '***Blurred policy initiatives***' and '***Piecemeal policy initiatives***', lead to the identification of the category **Pattern-less Mosaic of Policy Initiatives** that represent the policy situation for innovation and entrepreneurship in Greece during the period of the research, and, as it seems from secondary data, also long before. We assign this category to the Intervening Conditions in the Paradigm Model.

6.4.3 Increase R&D Intensity

The theory of innovation and entrepreneurship policy emphasizes the increase of R&D intensity as an important policy goal. Indeed, the conditions that have been shaped in Greece due to the economic crisis have made imperative the development of a new strategic development plan, placing restructuring and strengthening of R&D and innovation.

Although the Greek R&D system has some strong points, such as high-quality human resources, islands of excellence in public research institutions and the private sector, many

publications of Greek scientists (higher than the EU average)[51] , both primary and secondary data confirm that these resources remain unconnected and under-explored, in particular when it comes to the interconnections with industry.. There are some signs of catching up though, particularly in the private sector R&D. According to data provided by the National Documentation Center, in 2017 R&D expenditures surpassed 2 billion Euros for the first time, an increase mainly driven by the private sector. However, despite this increase, the R&D intensity remained at around half of the EU average[52].

Public digitalization

Digital technologies are a key factor for economic development and also in the improvement of quality of life. As the vice-president of a big credit rating agency stated[53]:

'Digitization will be a key driver of reforms for public administrations in Europe in the coming years'.

However, in Greece there is a much lower penetration of digital technologies compared to other EU countries. There is need to catch up on this retard and secondary sources indicate that an upgrading of digital technologies can significantly contribute to restart the Greek economy, create new jobs, reduce bureaucracy, contribute to fiscal savings, increase public revenues, and also combat geographical and social exclusions[54].

Digitization plans for the public sector have been repetitively announced during the crisis years, without, however, much of implementation and real results. For example, a major reform launched in 2017 was the digital signature and its acceptance as valid for signatures in the public sector[55]. Potentially significantly cost-saving[56], its implementation in the public

[51] Speech by the Governor of the Bank of Greece, Mr. Yannis Stournaras, on "University, Research, Innovation, Entrepreneurship and Development" at the Bank of Greece, Athens, 23 May 2017.

[52] http://www.kathimerini.gr/990488/article/oikonomia/epixeirhseis/sthn-ereyna-strefontai-oi-epixeirhseis .

[53] Olivier Chemla, vice president of Moody's - senior analyst and editor of the report "Sovereigns -- Europe, Digitalization offers public administrations significant opportunities amid short-term challenges".

[54] Business & Digital Economy, New Jobs, SEV, ELTRUN, 2015, http://www.sev.org.gr/Uploads/Documents/48731/digital_economy_summary_april_2015.pdf

[55] http://www.aped.gov.gr/

sector is estimated by the researcher, using various sources and observations, to less than 10% after 2 years of existence due to complete lack of implementation guidelines and incentives, and blurred regulatory framework. A C-level manager in the biggest telecommunication company in Greece stated:

'In today's modern age, a country's competitiveness is indissolubly linked to digital maturity and the penetration of technology into its economy and society. The private sector is in on this, but the public administration is lagging behind'

Hence, the goals ambitiously set up, e.g., digital signatures, digital documents and exchanges with the public services and the platform "Hermes" as a single location for digital interactions between the public and citizens, have resulted in very little concrete results[57]. The lack of progress in digitalization is particularly problematic as it offers a unique tool for tightening controls and for the achieving of significant savings of public money.

Greece is at a historic crossroads and must finally seriously address the challenges of the future. Take all the necessary initiatives and change its position on the European digital map, where it occupies the penultimate position in all 28 EU Member States[58]. It is now imperative to speed up the processes of digitization of the public sector by consistency,, in order to the state and its operation be modernized and to create a lever for the country's productive reconstruction. Founder of a fast-growing young business, who faced a lot of bureaucratic problems when he started his business, stated:

'As long as the implementation of a digital agenda is delayed, both Greece's productivity and competitiveness will be diminished, investment will be discouraged, and the outflow of good human resource will continue'.

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[56] http://iobe.gr/research_dtl.asp?RID=108

[57] https://www.kathimerini.gr/1000367/article/epikairothta/ellada/me-ry8moys-xelwnas-to-e-dhmosio .

[58] Digital Economy and Society Index 2018 DESI, Country Report for Greece, http://ec.europa.eu/information_society/newsroom/image/document/2018-20/el-desi_2018-country-profile-lang_4AA59C97-CC3B-7C25-9CE4F07248577AD8_52343.pdf

Public resources engaged

Unfortunately most efforts of digitalization have gone through a vicious cycle of pompous launch, hesitant implementation, losing of pace, and then oblivion. Often has then followed a re-definition, re-designed and re-launched in a slightly different shape and with slightly different conditions and regulations. The result of this supposed re-birth of the initiative has more often been the final nail in the coffin as, with it, the regulatory and administrative context will have become too complex and inefficient for any implementation to be practically relevant and even desirable.

One exception identified, however, is the development of Greece's 4G network supported by a nation-wide fiber network. Here, a well-functioning symbiosis between the state and the leading telecommunications operator has resulted in concrete progress and factual results.

Policy-makers, government and administrators are now up to proof that this is not just the exception that confirms the rule of the vicious circle described right before.

These two codes, '***Public digitalization***' and '***Public resources engaged***', lead to the identification of the category National **technology catch-up** that illustrates that a certain activity of closing the Greek technology gap is under way. In particular, this happens on the side of increased industry R&D investment, while the public policy and public investment activities have been largely absent or at least disappointing. We assign this category to the Intervening Conditions in the Paradigm Model.

6.4.4 Stimulate Innovation and Entrepreneurship Culture

In the context of the economic crisis that Greece is facing, the huge public debt, the rising unemployment and the disconnection of the social fabric are huge problems that the state is called upon to restore. These unfavorable developments in the country reinforce the need to focus and invest in innovation as a means of increasing productivity, economic growth and, of course, social progress[59].

What is needed is a 'business culture' in society, which means an environment where someone has an incentive to innovate, create, take risks and be able to acquire business skills and management skills[60]. In Greece, however, it has never been a priority to create an

[59] http://www.corallia.org/images/stories/documents/Events-2010-12-14-doc001.pdf

[60] www.coralia.org, op cit.

environment that fosters entrepreneurial and innovative culture at all levels. There is no national strategy or even a policy for business education. Excerpt actions have been put in place from time to time, following the guiding principles of European strategic objectives, but they have not been part of any systematic approach.

State-is-the-enemy feeling

The Greek state, by its structure, appears overly hostile and cautious in the way it frames entrepreneurship and interacts with entrepreneurs, creating mutual distrust. At a critical time for the sustainability of the Greek economy, this unfavorable, volatile and sometimes hostile business environment has led a large number of companies and professionals to leave Greece, by moving their headquarters or by setting up new companies in other countries, as to benefit from more favorable entrepreneurial arrangements. Thus, unemployment rates are raised and any new investment in the country is discouraged. Reviewing the literature and anslyzing primary and secondary data, a healthier environment for investments and growth seems to be an eternal wish, that insofar \never seems to come true. As a managers of a large group of companies said illustratively:

'The improving of business conditions and the stimulation of innovation will come to Greece, if the state exploits some of the public spending on the necessary structural reforms linked to entrepreneurship, something that has already begun, but, risking to become repetitive, much more remains to be done'.

While the state is unable to collect billions of owing taxes, which would be sufficient to cover a large percentage of the budget deficit, it puts energy in creating and enforcing legal, bureaucratic and procedural disincentives for the creation or expansion of businesses. The following quite from a new venture co-founder is illustrative of what most interviewees shared:

'The state does not seem to understand the needs of business, especially in this difficult economical time. Our businesses are burdened with many taxes, either indirect or direct, which make it difficult to plan our operating costs. We need a stable environment to work and invest'.

Moreover, the Greek market is one of the most over-regulated in Europe[61], with bureaucracy that directly affects investment. In addition, there are huge delays in courts for cases on investment projects[62], resulting in the loss of international investment funds that the economy is in absolute need. This creates a perception of a state which, instead of overseeing economic activity in order to make competition work, undermines it.. Indeed, business hostility in Greece in relation to the new EU countries is disproportionate to the tax burden on businesses[63].

There are also deep historical roots to the widespread feeling that the state is the enemy. This feeling goes far beyond a mutual mistrust between privately- / self- and publicly employed. Many claim it goes back as far as to the Ottoman rule (1453-1821). More recent events have continued to nurture the state-is-the-enemy feeling, including the 1946-49 civil war, the 1960s political instability and political murders, the 1967-74 military dictatorship, and the current crisis with the 2010-18 bailout programs and supervision of the so called Troika – the European Commission, the European Central Bank and IMF (e.g., Hatzis, 2018). Such a deeply rooted and repetitively nurtured informal institution -that the state cannot be trusted, that the state is the enemy- is of course extremely difficult to change. Relating to Wiliamson's (2000) theorization about informal institutions, it would need several decades of effective state apparatus and high quality, high value adding public services to overcome this phenomenon.

[61] SEV, ISSUE 79 | January 12, 2017, Over-taxation and over-regulation, barriers to the country's prosperity

[62] Aristides Chatzis, Article in Kathimerini: How to avoid the fifth memorandum, 21.05.2017 http://www.kathimerini.gr/910415/opinion/epikairothta/politikh/pws-na-apofygoyme-to-pempto-mnhmonio

[63] Business Taxation in Crisis: Updated Proposal 2016 on the reform of the tax system, 3-2-2016, Studies and Research Centre, Athens Chamber of Commerce and Industry.

Hyper-regulation and interventionism

The foundational cause of the persistence and even increase of red tape in all that concerns the public sector is a political unwillingness to drive through real change in formal and systematically attempting to do so in informal institutions. Secondary sources confirm this both in the early and the late crisis years[64]. There has been a longstanding political conviction, across parties, but particularly strong in the period 2015-19, of the need of interventionism and detail-control of economy and markets. Hence the stifling bureaucracy of the Greek state has become an institution in itself.

Greece needs a new production and growth model that will attract investment from both domestic and foreign capital and, above all, a redefinition of the role of the state and its interaction to entrepreneurship, so that its interventions ensure the smooth functioning of the markets and more generally of the economy, but they must be not unlimited. One of the managers of a large group of companies said:

'The intervention of the state has made the system slower, less efficient and less innovative - threatening its development even in pre-crisis times. This creates a huge disorganization to the good operation of our businesses'.

The market often shows some deficiencies, imperfections, which cannot be dealt with, unless the state intervenes and takes some concrete measures to regularize these situations. But the state is so expanded in order that, there is no sector of economic activity to which it is not directly or indirectly intermixed, as has often been said. The limits and the quality of State intervention must be such as to be efficient, so as not to hinder the flow and distort the economy. As a manager of fast-growing young businesses stated:

'State interventions should be limited to the smooth functioning of the market mechanism and the economy in general, and should not discourage new business initiatives by imposing new taxes or forcing minimum wages on workers'.

[64] Lyrintzis, C. (2011). Greek politics in the era of economic crisis: reassessing causes and effects, *Hellenic Observatory, The European Institute*, LSE.,

Stavrakakis, Y., & Katsambekis, G. (2014). Left-wing populism in the European periphery: the case of SYRIZA. *Journal of political ideologies*, *19*(2), 119-142.

Theocharis, Y., & Deth, J. W. V. (2015). A Modern Tragedy? Institutional Causes and Democratic Consequences of the Greek Crisis. *Representation*, *51*(1), 63-79.

Moreover, the Greek market is one of the most over-regulated in Europe, with bureaucracy that has a widespread impact on investment. A complex administrative and taxation system creates legal, bureaucratic and procedural disincentives. With the continuous production of rules of law, the rules often lose their general, abstract and permanent character, and on the other, all laws are considered temporary. The result is the appearance of multiplicity. The successive arrangements on the same subject, the amendments, the supplements, unnecessarily many times, create malignity and distortions in the efficient operation of the state. As noted by the President of SEV[65]:

'Over-regulation, as well as over-taxation, leads large companies to loss of competitiveness and jobs, and the small businesses in the underground economy'.

Suspiciousness towards entrepreneurs

The state often acts in a way that shows strong suspicion to entrepreneurs, and this is apparent from the absurd and bureaucratic procedures that exist in Greece. The result is mutual mistrust between the state and business, that are reflected both by the low government tax revenue from business and by the highly hostile business environment that prevents businesses from increasing their turnover and therefore contribute to public funds. The lack of management or administrative structures in public sector, the time-consuming and complex procedures lead to incredible business delays, resulting in the loss of precious time, especially in the difficult conditions for entrepreneurship created by the crisis. As expressed by the CEO of a fast-growing young company:

΄The lack of trust between the state and the entrepreneurs is a source of dysfunction, which seriously affects the business world and undermines the principles of a modern society, but also the economic future of the country'.

The state must therefore concentrate on rebuilding the trust between the state and business, as to remedy the distortions and delays that arise. Hence, in order to fully implement all measures aimed at creating a friendly environment for businesses, the state needs to move

[65] In a message from the President of SEV, Mr. Fessas, with a view to the conference "The Future of Work After the Memorandum" organized by SEV on 24/10/2017

forward to the rapid reconstruction of its services and to its modernization, which are preconditions for bringing the country to economic recovery.

These three codes, '***State-is-the-enemy feeling***', '***Hyper-regulation and interventionism***' and '***Suspiciousness towards entrepreneurs'***, lead to the identification of the category **Cultural lock-in** that emphasizes the substantial changes that the state has to make for creating a friendly business environment, where the state must supervise and regulate the economic activity, but without oppressing the enterprises. What Greece needs is the appropriate institutional framework that will ensure the necessary oversight, properly structured modern public services, a high-quality regulatory environment, the wiping out of corruption and incentives to invest, in order to get away from the prolonged recession. We assign this category to the Context dimension in the Paradigm Model.

7 AN INTEGRATED ILLUSTRATION OF THE CONCEPTUAL CATEGORIES: THE COSMOTE CASE

In order to reinforce the validity of the results from the cross-case and secondary sources analysis presented in the previous chapter, and add conceptual richness to the emerging categories, an integrated case study was conducted of Cosmote, the Greek national telecom product and service provider and leading player in its sector.

The results of this additional step of data collection and analysis are presented below, again structured along the four main literature streams and indicating additional evidence for the categories identified in the first step.

7.1 Company Profile

OTE was created in 1949, initially as a public entity and until 1998 it had the monopoly in the Greek telecommunications market. In 1996, OTE became the first listed company in the Athens Stock Exchange and began to be privatized gradually. As a result, the Greek government today holds only 5% of the company's shares. In 1998 the group entered the mobile phone market and in 2001 the fixed telephony market in Greece was liberalized. Deutsche Telekom has been participating in group's share capital since 2008 and nowadays holds 45% of the company's shares.

In 2010, within the general context of the economic crisis, OTE was trapped in a vicious cycle resulting in very low competitiveness, high revenue reduction, high debt, loss of customers and high operating costs. A surplus was imposed on group, through a control-adjustment, based on its operating costs. In the midst of all these distortions, the Group proceeds in 2011 with a holistic strategic plan, reversing almost all the bad forecasts for its future. The objective was to create a new dynamic of the organization and begin the path to growth. With the vision of transforming OTE into a modern, efficient and competitive, the company began the reversal of the negative climate. Today, 2019 the company has emerged as a leader in technology in relation to its competitors. Innovations have brought new sources of revenue and even doubled earnings in four years.

The successful transformation of OTE Group into a modern competitive company, focused on innovation and development, was achieved by changing its culture and adopting a customer-centric philosophy. The commercial image of fixed and mobile telephony was consolidated and a common brand called COSMOTE was created. Customer service was

improved and functions and costs of services were optimized. Approximately 2,000 new staff was recruited and the existing staff retrained in new technologies and at the same time in customer service. The results of the operational transformation have been spectacular, both in the gradual recovery of revenue as well as in the increase of customers and the reduction of net debt of the Group. Continuous monitoring of the implementation of the new strategic plan, the cooperation between the members of the organization, and the deployment as well as continuous staff training has succeeded.

COSMOTE continues to be the largest telecommunications provider in Greece and in combination with its numerous subsidiaries is considered one of the most established telecommunications groups in South-Eastern Europe. It is the largest technology company in Greece and one of the three largest on the Athens Stock Exchange, while its shares are traded on the London Stock Exchange. Deutsche Telekom holds 45% of the share capital and the Greek State holds 5%. OTE Group also operates in South-Eastern Europe, providing fixed, mobile and broadband services, as well as pay-TV and ICT. In Greece, he is active in the fields of maritime communications, real Estate and education.

The Group has invested in new technologies and infrastructure in Greece, investing heavily in New Generation Networks, creating growth prospects. Investments in Greece in recent years have exceeded € 2 billion, while the Group is expected to invest another € 2 billion by 2022, offering higher speeds and coverage for both mobile and fixed telephony. The Group has the largest fiber optic network in Greece (43,000 km) and is constantly expanding its networks, aiming to cover one million customers with Fiber To The Home (FTTH) by 2022. Furthermore the group is preparing heavily for the next generation of wireless 5G, which will carry speeds many times faster than today's 4G.

Research and innovation are systematically promoted and the Group's involvement in various pioneering research projects funded by the European Union is high. There is collaboration with all Higher Education Institutions of Greece and a joint technology lab has been established with the Athens University of Economics and Business in order to exchange know-how and co-operate on technical and business issues. Entrepreneurship is systematically promoted through various events and competitions (COSMOTE StartUp, COSMOTE HACKATHON and internal HACKATHON).

The group provides a safe environment for its more than 20,000 employees, providing equal growth opportunities, cultivating open communication and above all, aiming at satisfying its

human resources. It is ranked number one among top employers and according to a recent survey by Athens University of Economics and Business ranked 4th among the 10 companies where young people want to work in Greece.

With the motto of "one world, better for all", COSMOTE has set as its priority to diffuse the potential that technology offers to all, in order to create a better tomorrow. In addition, the Group has incorporated sustainable development as an integral part of its strategy, thus contributing actively to the economy, society and the environment. It also supports a range of actions, supporting vulnerable social groups, local communities, culture, sports, education and entrepreneurship.

7.2 Group Financial Data

The turnover announced by the Group for 2018 is € 3,798.7 million. Adjusted cash flow increased significantly and amounted to € 344.7 million. The Group's adjusted net lending remained unchanged at € 0.7 billion.

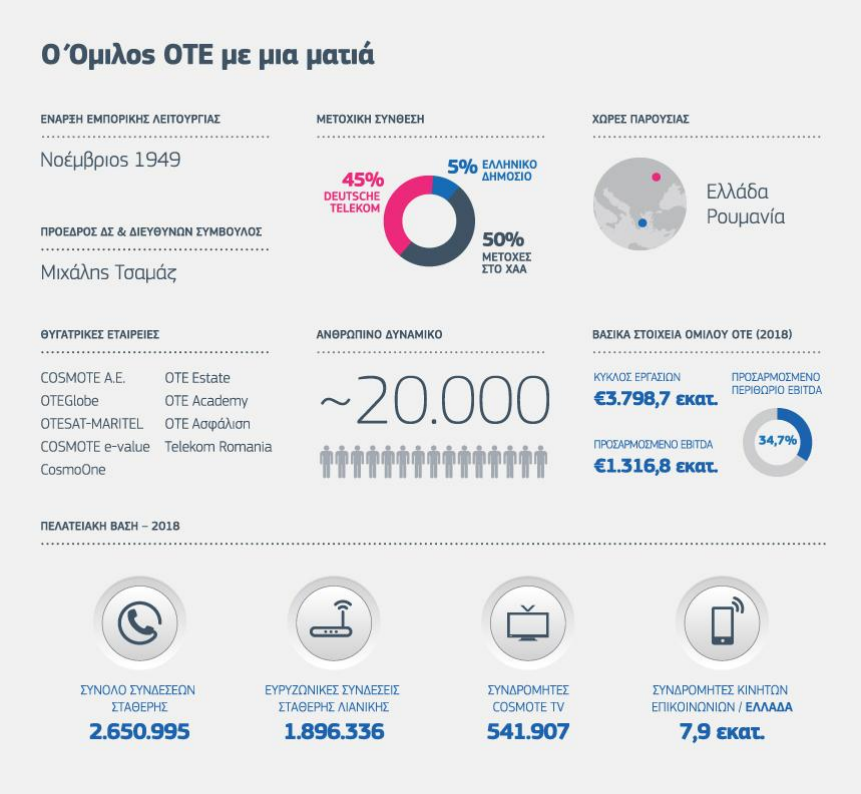

Figure 22. OTE Group at a Glance. Source: COSMOTE.

7.3 Vision, Mission and Strategy of the Group

The Group's vision is first and foremost to ensure its growth and maintain its market leadership, while offering the best and highest quality services to its customers both domestically and in Southeast Europe, as to build a better tomorrow66.

The Mission of the Group includes the following:

• To offer the best communication services, connecting people and providing unique entertainment.

• To ensure its profitability by safeguarding its market share and creating new sources of revenue, ensuring although sustainable growth.

• To improve customer relationships by providing high quality services and new innovative technologies.

• To develop and expand broadband service offerings while reducing prices for the services provided.

• To develop the capabilities and skills of its human resources at all levels.

• To support the economy and society and uphold the principles of corporate responsibility.

Taking into account the difficulties both at economic and social level, the key strategic goals of the Group have been shaped appropriately and basically are the following:

• Provide innovative solutions for high-speed by completing the necessary network infrastructure, as to create value for shareholders and for society more generally.

• Expand the penetration of broadband into the domestic market and maintain OTE's leading position by maximizing the competitive advantages of the company by providing innovative products, services and integrated telecommunications and IT solutions.

• Improve the level of customer service with immediate and effective technical support after the sale of products and services.

• Expand and upgrade OTE's network, in order to gradually move to the next generation network.

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[66] Main sources: https://www.cosmote.gr/cr2010/cr2010_el/orama-apostoli-epixeirimatiki-stratigiki.html, https://www.cosmote.gr/cs/otegroup/gr/orama_kai_strathgikh.html

• Integrate corporate responsibility principles with the Group's business planning.

7.4 SWOT Analysis

Subsequently an attempt is made to develop a SWOT analysis for the Group, in the context of the key questions posed in the thesis, and in order to understand COSMOTE's business environment and its transformation from a problematic to a modern technology contributing to the digital development of Greece in a time of deep economic crisis. This analysis assesses the internal strengths and weaknesses of the company and outlines the opportunities and threats presented in its external environment.

Strengths

1. A strong point of the company is its leadership in the telecommunications sector. Its large number of stores (including GERMANOS stores, which are now owned by the Group) helps in attracting new customers as well as offering products other than products for mobile telephony. This large sales network, which someone can find in all geographical regions of Greece, enables the company to significantly increase its turnover. This strength supports the categories Local tech leadership and National technology catch-up.
2. Its operation in the Balkans and the more favorable tax treatment in these countries give the company additional strength. This strength relates to the category Rule of law under continuous stress, as it drives a compensatory action.
3. The Group's transformation from a troubled company to a modern one and the innovative services it has launched, have attracted a large percentage of customers, who have decided to switch networks or remain in the company by showing their confidence in its new face. This strength relates to the category Innovation stamina.
4. The company's collaboration with world-renowned suppliers and its distinctions both in Greece and abroad have created the conditions to gain a better reputation and to attract new customers more easily. This strength also relates to the category Innovation stamina.
5. The innovation demonstrated by the company (broadband, new generation networks, mobile internet speeds) and the certifications it received for quality, environmental protection and health and safety issues (in accordance with ISO9001, ISO14001 and

OHSAS18001), gave the Group prestige and a much better image than it had in the past. This strength relates to the categories Back office technology focus and Product ownership.

6. The continuous training and information of the staff, the placement of each employee in the position where he can work better and the ability of the company to give to each one of the personnel the opportunity to be promoted in a better status, depending on his qualifications and capacities, have contributed greatly in the positive image of the Group, which has placed it first in the telecommunications sector. This strength relates to the category Growing an entrepreneurial mindset.
7. The Group's leading role in telecommunications, the trading of its shares in international stock markets, the strategic units it has developed in both Greece and Southeast Europe, the excellent working conditions it offers to its staff, as well as the integration of corporate and social responsibility into its business strategy have created a model image for the company, that has all the potential to evolve further, leaving behind the distortions and malfunctions of the past. This strength relates to the category New productive combinations.

Weaknesses

1. The harsh regulatory principles and the restrictive operating rules, to which the Group has been obliged, create problems for its competitiveness, which must be balanced in other ways. This weakness relates to the categories Financial dry-out and Disturbing government intervention.
2. The small diversification of products and services between companies operating in the telecommunications sector is a challenge for Cosmote to try further, as to deliver new innovative products. This weakness relates to the category Stability of the playing field.
3. The lack of networks in the inaccessible and remote areas of Greece is a challenge that the company has taken on and is required to cover for the next two to three years. This weakness relates to the category National technology catch-up.
4. The high business taxation in relation to foreign countries, but also the high indirect taxation of the mobile broadband service in Greece are problems that need to be resolved. This weakness relates to the categories Financial dry-out and Disturbing government intervention.

5. Rapid advances in technology have meant that what is innovative today loses quickly its value. This weakness relates to the category Systemic innovation problem, as Cosmote’s innovation activities have not been pulled forward by demanding markets and demanding state.

Opportunities

1. Greece's geographical coverage from the company with a stronger network and improved signal will give to Cosmote a greater market share. This opportunity relates to the category National technology catch-up.
2. The entry of the Group into new markets, as well as the conclusion of agreements with new well-known suppliers can lead to increased turnover and profits. This opportunity relates to the category New productive combinations.
3. A possible reduction in prices after the period for which the Group has been subject to regulatory restrictions will bring new customers, who will prefer Cosmote because of the high quality of services that offers over its competitors. This opportunity relates to the category Stability of the playing field.
4. The potential for synergies and economies of scale, as well as the further development of new products and services, will have a positive impact on the Group's growth. These opportunities relate to the categories Innovation stamina and Consolidation of actors.

Threats

1. The economic crisis that is affecting Greece, has created side effects in the telecommunications sector and therefore in the Group. This threat relates to the category Productive base undermined.
2. The fierce competition created between mobile phone companies, and the entry of new competitors is a major threat to the Group. It includes new technologies that replace fixed telephony, such as SKYPE, VIBER and WHATSAPP This threat relates to the category New productive combinations as an external contextual factor.
3. Strict regulatory authorities and the fines imposed on the Group in 2011 are a threat, which severely limits the company's profits and competitiveness. This threat relates to the category Stability of the playing field.

4. The fiscal instability in Greece is a major discouraging factor for further investment. This threat relates to the category Metered flows of funding.
5. The reduced consumer disposable income and the increased operating costs for the Group, due to environmental standards pose serious threats. This threat partly relates to the category Productive base undermined.

In the following, the data collected from the Cosmote case is analyzed following the structure in the previous section. This allows to enrich the results of the research and add important elements to the emerging conceptual model.

The Cosmote case adds input in 12 categories out of the total 23 generated in chapter 6. All four theoretical lenses are informed, although the case adds more information in the coevolution and institutional perspectives.

7.5 Categories for Coevolution

TECHNOLOGICAL ADVANCES

Back Office Technology Focus

Cosmote's major technology offering, both in terms of equipment and services is supportive, back office technology. These technologies play an important role as the backbone for enabling faster, more secure and globally synchronized telecommunications in Greece.

The continued expansion of fiber-optic landline networks, providing high-quality broadband services to more and more customers is a key objective for the next three years. Also, the continuous upgrading of specialized networks, such as satellite solutions, provided by the group for government agencies, maritime communications, rescue and search centers, is in full swing and progressing in a coordinated manner. In addition, developments in mobile telephony networks and infrastructures have increased significantly, covering virtually all of Greece's territory.

Local Tech Leadership

From its position as the largely dominant player in the telecoms sector in Greece, Cosmote has a lead in telecom services and infrastructure development. The company is pushing new

technology investments and installations through the rough crisis conditions and its strategic plan explicitly emphasizes technology leadership in order to provide the most synchronous technologies and services in the Greek market. Cosmote is also pioneering in areas such as telehealth and smart home applications, providing state-of-the-art technology infrastructure.

Cosmote has maintained its leading position in fixed and mobile telephony, despite intense competitive pressures and the demanding macroeconomic environment, optimizing sales channel strategy and marketing performance, but also focusing primarily on customer needs. It has thus promoted a combination of fixed and mobile telephony services, offering innovative services to its customers and meeting all communication and entertainment needs, with programs allowing the use of the services wherever the user is located.

The company's investments are aimed at modernizing the existing fixed line network into a single New Generation network, as well as nationwide 4G coverage and promotion of 5G for the next years to an ever increasing number of customers, investing thus in the speed and quality of networks in the mobile telephony. The intention of continuous investments is to keep the Group at the forefront of technology in fixed and mobile telephony, always giving priority to customers' confidence and the quality of offered services. The company also aims to secure its leadership in the emerging markets of broadband, ICT, cloud, M2M and pay-TV in Greece, thus creating new sources of revenue and validating in this way its leading position in telecommunications in Greece.

GLOBAL INTERDEPENDENCIES

Opportunities from Frugality

The group is the largest telecommunications provider in Southeastern Europe, with fixed, mobile and broadband services, pay-TV and ICT. In Greece Cosmote holds the first place in fixed and mobile telephony, but also in TV. In Romania, it also holds the leading position in fixed telephony, third in mobile and second in TV. Similarly, Cosmote holds the second place in mobile telephony with 1.8 million customers in Albania.

Cosmote has as a top priority the development of innovation, investing not only in high-speed broadband services, but also in pay-TV and ICT services. Especially in ICT, the Group has strengthened its leadership in the business-to-business field, signing important contracts in both the private and public sectors. Emphasis was placed on digital transformation projects in

the public sector, as well as sectors such as Health, Shipping, Finance and Energy, which are areas with huge investment interest and momentum.

Concerning the Group's activities abroad, various actions are promoted, such as participation in the Asia Africa Europe-1 Submarine Cable Consortium. LTE Roaming and SMS Hubbin services have also been developed aimed at mobile network providers. The Group has also developed a new backbone network, based on leased dark fiber optics, linking Greece with Western Europe via Italy. Strengthening the company's commercial presence in the Middle East and North Africa through extensive partnerships, as well as the Group's continued efforts to engage in overseas markets, demonstrates its potential and commitment to implement its strategic plan and also to be further developed.

All these international operations and collaborations have allowed Cosmote to keep its financial health at a satisfactory level, and to evolve in the frontline of new technologies. The frugality characterizing the Greek crisis context has provided opportunities for transferring new technologies to the Greek market, and co-evolve with sporadic governmental efforts of upgrading the digital infrastructure.

Efforts have been made to mitigate the effects of the crisis and to ‘normalize’ them as far as the group is concerned. The fundamental tool used was the new strategic plan, which was crafted to take into account all the parameters that characterized the difficult economic, business and social situation that Greece found itself in.

By offering new innovative products and services, Cosmote has succeeded in growing their bottom line even during the crisis. Key success factor has been differentiating products and services from competitors by focusing on customer experience. With innovations, not only in the products offered, but also in the services provided to customers, through better customer experience at all levels, either in terms of service offerings or technical support and in general, the company has come out stronger from the crisis.

In any case, the good customer experience is a key requirement for Cosmote. Through continuing satisfaction surveys, the Group looks forward to improve its services by expanding their depth and breadth in retail networks, in an effort to offset the negative consequences of the crisis. Recognizing the difficulty of the period and not just balancing its losses, but pursuing the positive growth path, the company lays the groundwork for enhancing its good performance, by prioritizing its competitive advantages.

Stability of the Playing Field

In order to cope with all the pathogenic situations of the past and mitigate the consequences of the crisis, COSMOTE has prepared a new strategic plan to create the conditions for a stable operating platform of the Group. This strategic plan has attempted to take into account all the parameters that characterize difficult times, like the one that Greece is going through. A long-term horizon has been set for the company's future goals and, above all, for the exit from the recession of previous years. Thus, in 2014 the Group made significant progress in stabilizing its revenue after a prolonged seven-year downward trend. It has made significant investments at all levels of its operation, taking into account current developments in the telecommunications sector and adapting them to Greek data.

Special attention was given to customer good experience and service, aiming to be the company the first choice for integrated services. Thus, the functions and the operating costs were improved and particular emphasis was placed on new innovative services and products, as also on human resource strategy. Furthermore, the 2 billion investments in next-generation networks and 4G plus service, as also the others innovative products that Cosmote first brought to the cabin, established the company as a technology leader. The Group's management, although aware that it would be difficult to introduce these innovative products and that the regulatory environment did not favor such a move, made these investments and succeeded in establishing them despite the difficulties of the crisis.

The current economic crisis, both domestically, but also at European and global level, as other endogenous causes, have created serious problems for the group. A big problem for their competitiveness was the imposition by regulation of an overvaluation based on its operating costs. Because of this regulation COSMOTE could not lower the prices below a specific level, resulting in many customers leaving the company because they found better prices in their competitors. Problems were also presented by the different regulatory frameworks per country. The lack of economies of scale, the limited potential for investments and the considerable lag in innovation as well, cost a lot to the company and put it in a vicious circle of low competitiveness.

In general, electronic communications in Greece are regulated in accordance with the European Regulatory Framework, which is incorporated into national law, which in turn consists of laws, ministerial decisions, presidential decrees and decisions of independent

administrative authorities. All those create complexity and therefore delays in approval of packages and promotions that would benefit consumers. For this reason, the Group seeks fair treatment by regulators in view of maintaining the high quality of its services and the ability to provide them with competitive prices.

MANAGEMENT LOGICS

Innovation Stamina

The high operating costs, the low competitiveness, the maintenance of the old networks, which cost much more, created enormous problems for the group, which tried to solve through a flexible strategic plan, in order to tackle all these pathogenic situations. An effort has been made to renew the obsolete network through new innovative technologies. COSMOTE also introduced new innovative processes.

The Group's management has introduced innovations that have ultimately generated revenue in such difficult times, when realized that innovation is the key prerequisite for a company to be a market leader. Through innovative as also qualitative products and services, the Group retained customers and gained new market share, although sometimes was slightly more expensive than its competitors, but offered a better and more reliable product.

The results of the Group's operational transformation have been significant. Focusing on the customer through innovations in terms of service, better communication, and management has proven to the benefit of the company. Because the group not only introduced technological innovations, but also brought the customer to the forefront using innovative methods. All these changes have worked positively for the company. The number of customers has grown and returned from competing companies.

The Group systematically promotes research and innovation, covering a wide range of cutting-edge technologies, from the very beginning of their emergence, thus acting as a carrier of innovation. These technologies, such as 5G Networks, IoT, Cloud, SDN / NFV, smart energy grids, Intelligent Transport Systems, e-health, NextGen Emergency Services, Security / Privacy, Terrestrial / Satellite Backhauling, etc., provide significant benefits beyond that many sectors contribute to the sustainable development of COSMOTE.

The Group is involved in many innovative research projects funded by the European Union and has developed collaborations at international level with more than 800 stakeholders from the academic community and industry. Also, the organization of entrepreneurship promotion programs through innovation and technology has identified the Group as an important source of innovation promotion. Moreover, the collaboration with all Higher Education Institutions in Greece, as even the creation of a technology lab in coaction with the Athens University of Economics and Business, with the purpose to exchange know-how in business and technical matters, show the group's disposition for investment in innovation. Throught its customer focus, and its engagement in a range of innovation activities, Cosmote acts as a resource for innovation for many partners and collaborators.

Through its strategic plan, Cosmote has set as a bet to lead the digital transformation of Greece and to become the top provider of the country and take one of the best positions at the European level. Besides, the development of telecommunication can offer a multifaceted approach to the emergence of the country abroad (via live streaming, for example), giving people the opportunity to get acquainted with monuments of great cultural value, museums, etc., even though they are thousands of kilometers away. The digitization of cultural sites even allows visitors to issue an electronic ticket, easily, quickly avoiding long waiting times.

All this will positively promote our country to the citizens of other countries, contributing to economic development (through tourism, etc.). It is very important for a country to have the appropriate digital infrastructure and to highlight its potential, its beauty and its cultural heritage through technology. Also good telecommunication infrastructure enables professionals to support and promote their work both internally and abroad by promoting extroversion.

Besides, telecommunications are an essential tool for the competitiveness of modern businesses. Proper telecommunications infrastructure can help companies both in their setup and operation. In fact, the new services can make a significant contribution because the capabilities offered are huge and are constantly enriched. Specifically, a small and medium-sized company can use cloud services that are more feasible than purchasing expensive Sup programs. Thus, with its huge know-how and the modern digital tools it offers, the Group can provide innovative products and services to its corporate clients, contributing to the extroversion of Greek businesses.

Over the coming years, there will be investments of more than 2 billion Euros in new generation networks, as well as in finalizing the 4G plus service. Despite the difficulty of establishing innovations in the market and obtaing relevant returns, Cosmote has maintained a stable and continuous innovation activity over all the crisis years and even rejuvenated and reinforced its innovation organization, structure and output, leading to a perception in the market of a technology leader.

Cosmote strives to be a technology leader and promotes everything innovative and new. Moreover, investments and innovation helped the company this difficult period for Greece. The 3 billion Euros of investments made between 2011-2017 and the investments that company will make between 2018-2020 promote new innovative products and services. The company put a long-term horizon on its plans, because its investment in broadband is too high. In addition to the funds received from Deutsche Telecom, the company has also been helped in the know-how, as well as in structuring the business plan and in optimizing the processes.

The overall design of the group in the coming years includes the creation of an All-IP network across the range of its infrastructure and services. Specifically, the group's fixed line network and Digital Centers will be transformed into an IP-based network and to next-generation networks / infrastructures. The transformation of the network to IP is the technological background for improving the quality of existing services, for developing new innovative services and the faster disposition to consumer, as well as the good Internet connection for all kinds of networking devices (Internet of Things).

COSMOTE was the first in Greece, which introduced Hybrid Access technology, in collaboration with a major mobile phone company. This technology 'unites' the world of fixed and mobile broadband to provide even faster speeds and better customer experience.

The next big bet for the Group is the development of 5G networks, which are a catalyst for the digital economy and thus for the development of the Greek economy as a whole. This wireless technology is the only one that can support the development of new innovative solutions and thus be a source of revenue. It also enables existing innovations to be largely adopted in industry, services, in every sector of the economy and, of course, in public administration, which is plagued by bureaucracy and inefficiency.

Product Ownership

The mission that exists does not work in the short term. It is long-term and needs a program to be implemented: “We draw up a strategic plan and set the tactics to be followed. Starting from the highest level, we specify the needs reaching down to the lowest level of analysis, something absolutely necessary to take into account all the parameters and to begin implementation and monitoring. Adaptation of the plan is deemed necessary whenever failure occurs.”

The Group's strategic plan emphasizes its digital transformation and further exploitation of synergies with Deutsche Telekom. Digital transformation is a major concern for customer service processes as well as internal corporate processes. Customer care is at the heart of the Group, which strives at every opportunity to provide quality service with personalized support. The technological superiority and the know-how of the Group is utilized to deliver flexible and up-to-date solutions that make customer service more immediate and fast and is tailored to each person's profile. At the same time, the Group will continue to invest heavily in new technologies, infrastructures and TV content, as to be competitive and meet the needs of its clients in this difficult macroeconomic environment.

Cosmote invested enormous amounts (2.4 billion) to develop new generation networks during the crisis. The company is the first which bring the fiber up to the cabin (VDSL) and the first in Greece with 4G + commercial network operation, with speeds of up to 375Mbps.

The expansion and coverage of COSMOTE's 4G / 4G + network will continue, with the aim of maintaining its technological prestige through the application of new technologies (such as the MIMO 4x4) and the fully exploitation of the spectrum available to COSMOTE. The Group is active in the field of IT convergence and has entered into strategic partnerships for the implementation of complex ICT projects. Thus, the company strengthens its leadership position in ICT and as ideal partner for businesses seeking advanced solutions in the fields of health, tourism, data security, energy, data centers, the Cloud and Internet of Things (IoT). The group was also, one of the first companies worldwide and the first in Greece, that put on the market LTE Advanced Pro Technology (December 2016), delivering speeds of up to 500Mbps through new innovative technologies.

7.6 Categories for Institutions

FORMAL: ROLE OF GOVERNMENT

Disturbing government interventionism

In 2014, OTE and COSMOTE had differences with the National Telecommunications and Postal Committee on a number of regulatory and administrative issues. The regulatory environment did not ensure infrastructure in networks and investments and caused many delays, such as licensing times. But the lack of stability in the rule of law creates nervousness and stress on the market. There is a need to simplify and resolve pending issues at the regulatory level, so that planned investments can be realized more quickly.

Due to the policy pursued by the regulating Authority, the group is not allowed to offer cheaper services to consumers. Thus, one of the demands made by the Group is the fair and transparent regulation by the Authority so that all telecommunications companies are treated equally. What COSMOTE really wants is for ex post retail regulation, as each product and offer cannot be approved in advance.

Furthermore, according to the Group's leadership, the regulating Authority is generally delaying to approve COSMOTE's programs, resulting the average approval time exceeding 4 months. Ensuring the rapid validation of the submitted group’s financial plans, as well as the gradual withdrawal of relevant price approval obligations in services, that have developed competition, will create a stable regulatory environment, which will encourage investment by the company and especially those related to the development of new generation networks.

FORMAL: RULE OF LAW

Rule of law under continuous stress

The lack of respect for formal rules and regulations, on, what seems, the part of Government and the Regulation Authority, has created significant delays in alignment with the European regulatory framework for electronic communications and has created a recession in the Greek telecoms market. Greece's ability to enforce the regulatory decisions and measures required was limited and this made it more difficult to achieve the objectives of the Europe 2020

broadband strategy. However, the adoption of the new telecoms law accelerated market growth, giving more impetus to competition.

Furthermore, the continuation of the dialogue within the EU institutions on the development of the new European framework for electronic communications, which will have multiple impacts on the various aspects of the company's activities and, consequently, its business choices, will defend the position of the Group and will create the conditions for its further development.

The multiplicity and the inconspicuous telecommunication laws have created serious problems in the field of telecommunications and this was particularly visible in COSMOTE. The codification of legislation and its implementation procedures are necessary to avoid bureaucracy and the development of e-Government. The adoption of the new telecommunication law 3431/2006 has boosted the market and clarified the landscape in the telecommunications sector. For the next few years, a very important issue is the transition to Next Generation Networks. Legislation should prevent distortions during the transition period, which is crucial for the timely and correct implementation of this great project, which will push the country's economy.

Another issue that causes malfunctions is the process of changing a broadband provider. Despite a legal obligation that has been in place for more than four years and requires a facilitation process, the national regulatory authority has received a large number of complaints. This suggests that switching to a broadband provider is still problematic for customers and the procedure needs improvement.

INFORMAL: ORGANIZATIONALCULTURE

Islands of Excellence in a Rugged Landscape

OTE Group provides a sustainable working environment for employees, guided by the values as expressed in the internal document “Corporate Behavior Principles”. It encourages the development of its employees, recognizes good performance, ensures equality of opportunity and promotes cooperation. The Group's priority is to be an attractive employer for young people and to provide a safe and healthy working environment for employees, customers and

partners. Respect for human rights, fair work, non-discrimination, equal treatment for men and women and the fight against child or forced labor form the basis of the OTE Group's Labor Relations Policy.

OTE Group Chairman and Managing Director Michalis Tsamaz said: "Investing in young people is an investment in the future. The first OTE-COSMOTE Graduate Trainee Program invests in young people and provides them with the means to develop into excellent, integrated managers. We want to put our best potential candidates on the market and show off our talented employees. We want new people with distinguished personalities. Today's OTE is a big school and it can create the leaders of tomorrow. "

It is a priority for the company to attract skilled and trained executives, to educate them, to evaluate them with high criteria, and to constantly encourage them to face new challenges. The aim of COSMOTE e-value is the representatives of the company to be an extension of customers, understanding their needs, developing the culture of the company and making the provided services or products “their own”.

The development of a single corporate culture, the renewal of human resources and the development of the existing one, with emphasis on specially designed education programs, leadership and talent programs (internal and external), improvement of functions and the introduction of modern organizational structures in 2015 constituted the basis for achieving the human resources strategy.

MyHR of Cosmote manages cases about human resources issues and processes, while its services are continuously enriched to provide immediate and quality service to all employees.

The two companies continued to invest in the development of modern skills for existing workers through re-skilling, up-skilling, innovation and creative thinking programs. Particular emphasis was placed on programs for the development and strengthening of leadership capabilities of executives at all levels of government and for the first time an internal talent development program for employees of the OTE Group of Companies.

The group, in order to fulfill its commitments, relies primarily on its people, which considers as the most important pillar of its strategy. In the Digital Age, businesses need people to combine know-how with interpersonal skills, so the Group has developed many programs to support these features. The new digital culture within the company encourages mobility at work and promotes a flexible working environment, aiming to create a new model of employer in the Greek market. At a time when many Greek graduates are looking for

opportunities abroad, the Group gives the motivation to remain talented young people in the country.

OTE's Executive Director of Corporate Communications, Depe Tzimea, noted: "The relationship between OTE Group and its partners is a relationship of trust. And this relationship is built only with honesty, consistency and continuity. In recent years, our contribution to society, the environment, the economy and the development of our people is an integral part of our business practice and remains a priority despite the crisis. We believe in Sustainable Development and we prove it in action. "

For the Group, the responsible business is a prerequisite. Continuous Sustainable Development Actions reinforce its positive impact at all levels. Consequently, the Group systematically reduces its energy footprint and incorporates the principles of the circular economy into its operations. The result is satisfactory because it recycles more than 90% of the waste generated by its activities. The reduction of greenhouse gas emissions from its operation and the improvement of efficiency in the use of electricity have also been integrated into the policies and mechanisms developed to address these problems. The company's culture ensures the safe and responsible use of technology and the confrontation of corporate risks, in order to build a trustworthy relationship with society and ensure a better tomorrow for the coming generations.

7.7 Categories for Innovation Systems

ACTORS AND NETWORKS

Consolidation of Actors

As the dominant player it is, Cosmote is naturally selected as a dominant player in its industry, but the importance of the strategic plan as a means to mitigate the effects of the crisis and laying out a strategy taking into account all the parameters that characterize this difficult periodwas strongly reinforcing its position as the natural sector leader. The dominant role of Deutsche Telecom, successively, between 2008 and 2018, increasing its shareholding from 25% to 45%, has provided long-term stability both for strategic planning and financial needs. In addition to the funds Cosmote has received from Deutsche Telecom, they also have

been helped in the know-how, as well as in the business plan and know-how structure and in the optimization of procedures, which would not have been achieved if they remained in Greek reality and had not took into account current developments in the sector. What they did was to adapt them to Greek data and to evolve them in that direction.

Thus, the business model of the company was adapted to the adverse macroeconomic environment in Greece, in order to cope with the high challenging telecommunications market. Through its strategic plan, the Group sought to ensure its financial well-being and enhance its operational performance, while providing qualitative and immediate customer service that, which now was placed at the heart of its culture.

As of 2019, the current business and operative model of Cosmote is retained as a solid a viable business structure. The strategic plan plays a key role as the negative elements of the group were identified and targets set for transformation and development for the next five years. The rate and quality of customer service have been increased, as well the rate of debt repayment significantly reducing the group's debts.

By offering new innovative products and services. By differentiating the company from their competitors in customer experience. With innovations, not only on the products offered, but also on the services provided to customers, through better customer experience at all levels, either in terms of service offerings or technical support in general.

The organizational, product and technological superiority of the Group, due to the various elements already described, secured through the investments and structural stability, indicates that Cosmote is retained as a dominant and dynamic player for a foreseeable future Moreover, the ongoing effort to optimize operation costs and to reduce its tariffs, allow the Group to make significant savings and ultimately increase its viability.

Network Dynamics

Community Wireless Networking Infrastructure and Hosting Services is a laboratory of experimentation and exploration to develop new knowledge about communication tools and interaction between individuals and communities. Never before did people have the ability to determine the direction in which the tools they use are being developed. Today they have the

opportunity, using these infrastructures, to enrich their knowledge and to actively participate in the use and development of new services by citizens for citizens.

All services developed through this infrastructure contain a unique know-how and can be the nucleus of entrepreneurial development by young people. A very useful service would be, for example, an online group collaboration tool for cooperatives of agricultural producers. This could be developed by a community in a rural area and later offered as a cloud service to other rural cooperatives in the country. This kind of community-building is important because it has the potential to bring about qualitative changes in the daily life of the people. The needs in everyday living are the motivation for network progress and development.

The expansion of the OTE Group's New Generation Networks continues, with the ultra-high VDSL and 4G speeds reaching gradually all over the country. The COSMOTE4G network is growing at a very fast pace. COSMOTE's4G network offers the largest coverage in Greece, as it already covers all towns with more than 50,000 inhabitants, many smaller cities in all over the country and all popular tourist destinations, offering more than twice the coverage of other networks.

Investing constantly in the upgrading and expansion of its advanced network, COSMOTE is now able to deliver incredibly fast mobile internet, having one of the fastest and most qualitative networks in Europe (according to audience measurements at SpeedTest by independent OOKLA, the most widespread global internet measurement, and the internationally recognized network measurement company, P3 Communications).

These technical aspects of network expansion are enabled by collaborative and organizational networks that Cosmote builds.

The Group has already begun collaborations on the development of 5G pilot networks, which marks the start of the realization in Greece of significant technological innovation in the telecommunications sector, for the benefit of the citizens and the business community. Initial collaborations are set up with selected Local Government Organizations. At the same time, transnational cooperation is being promoted for the implementation of the Balkan Corridor, which will be covered by 5th generation networks, opening a new path of development and changing the daily life of everyone. Opportunities to develop ecosystems around 5G networks will be fostered by encouraging the development of networks between innovative

businesses and the active involvement of the academic community, which will greatly help the business affected by the crisis.

Cosmote has invested in the development of modern skills for existing workers through programs of re-skilling, up skilling, innovation and creative thinking through various initiatives, including startup competitions and hackathons. Particular emphasis iss placed on programs for the development and strengthening of leadership capabilities of executives at all levels of government and for the first time an internal talent development program for employees of the OTE Group of Companies was implemented. So many employees, depending on the results they had in the retraining programs, went to other positions, serving the company according to their capabilities.

Besides, the company's goal is to provide a work environment where every employee can perform to the best of his abilities and to equip its human resources with all those digital skills needed to move to the new digital age.

7.8 Categories for Innovation and Entrepreneurship Policy

INCREASE R&D INTENSITY

National Technology Catch-up

On the part of government, various steps have been taken, including establishment of the Ministry of Digital Policy, Telecommunications and Information, development of a National Digital Strategy, and the Equifund Development Law.

This as a response to the fact that Greece is lagging behind in the digital rankings due to lack of continuous digital policy, fragmented cooperation, lack of a modern institutional and regulatory framework. From the state's point of view, the establishment of the Ministry of Digital Policy and Telecommunications is a positive progress, showing that it is absolutely necessary to diffuse new innovative technologies across the spectrum of the functioning of a modern state, i.e. both in the public sector and in the citizen’s business sector. It should be stressed that there is a strategic plan for the National Digital Policy, which should have been developed before many years.

It should be noted that COSMOTE also took part in the development of digital policy with observations and comments on the issue. There is some support and information from state actors in adopting these technological innovations, but it has to become more "into the point". This is because there are operators that adopt some innovative applications, such as Trikala (Trikala Municipality), but for the moment they are the exception. We need more carefully planned support, and initiatives to maintain those who try to innovate technologically. Particular emphasis should be placed on this. Also, information on these issues needs to be made more compact, in order for many actors to adopt new innovative technologies, and in the case of failure of some of their projects to know that they will be supported.

Greece has recently designed its Digital Strategy and is significantly behind other European countries at national level. With new generation networks and the expansion of broadband, Greece can look ahead with optimism and the big bet of Cosmote is to lead the digital transformation of the country, which is a one-way street for its survival and growth.

However, in addition to the creation of a National Digital Development Plan, which acts as a lever for economic and social development, there must be a willingness to materialize, in order to enable Greece to move on to a new track of progress. Therefore, an appropriate institutional framework is needed, which will give mainly incentives for new innovative digital services to be adopted by citizens throughout the country and of course across the spectrum of public administration, the region, small and large enterprises. Also, through the strengthening of broadband networks, education and research should be promoted in all areas.

There has also been cooperation with the state, through various subsidized programs, announced by the EU, in order for the group to invest in difficult areas such as remote rural areas with fewer inhabitants or inaccessible mountainous areas or remote islands where the cost is disproportionate to the economic benefit the company will have. The group has collaborated with the specific actions to make viable the plan covering those areas of no commercial interest.

A key tool in telecommunications is the NSRF (ΕΣΠΑ), which helps everyone have access to the internet, regardless of how far they are located (either in remote islands or in inaccessible areas). Without the help of these subsidies, the renewal and expansion of networks in the country would be very difficult. Besides, in all government programs there is also a social profile, where profit is not the main goal.

8 A MODEL OF INNOVATION AND ENTREPRENEURIAL ACTIVITY IN A DEEP CRISIS CONTEXT

In order to proceed to an integrated model, the aggregate dimensions emanating from the previous data analysis were first generated by re-analyzing the categories developed along the dimensions of the paradigm model, Causal Conditions, Context, Intervening Conditions and Outcomes (Strauss & Corbin, 1990). As discussed in the methods section, this is called axial coding and consists of going back to the data and look at the categories identified from the open coding process through a new prism that focuses on the emerging themes in each literature-driven area, represented by the categories, and relate these to the paradigm model dimensions. This step in the data analysis process paves the way fro the development of an integrated model grounded in the data.

8.1 Causal Conditions for Innovating in the Crisis Context "Proactive Stance on Technology, Rules and Collaborations"

The causal conditions represent phenomena of driving nature emerging from the data. In the frame of the present study these categories were found in the coevolutionary areas of 'technological advances' and 'managerial logics', in the institutional area of 'rule of law' (formal institution), and in the policy area of 'creation of dynamic startup markets'. They act as motors for the central phenomenon "Innovation in the Crisis Context".

Figure 23 illustrates the structure of the data analysis leading to the identification and conceptual labels –names- assigned to the three aggregate dimensions that emerged as causal conditions.

The overreaching theme of the causal conditions was that successful innovators in the crisis context had adopted a proactive stance on technology, rules and collaborations.

To **take ownership of technology and innovation** means two fundamental things:

1. To invest in R&D activity for the product and/or service technology that the company sells, and move away of a service provider or outsourcing partner logic. This drives competency development and positions the company as a strategic innovation partner to its customers.
2. To invest in process and other enabling technology in order to gain a productivity, cost or other efficiency advantage. Ownership of process technology in the sense understanding the

capabilities that new 'back office' technology can offer opportunities for product/service innovations as well.

Depending on the nature of the companies studied, established companies were found to tap into a tradition of innovation, which for some was rejuvenated due to pressure induced by the crisis. Other established companies had the strength and resources to take a local technology leadership in their field, both in product/service technologies, and in process technologies. For young firms, the winning approach was recognition of owned exploitable technology as their core capability.

Common to both established and young firms was to place innovation at the top of the agenda, exploit resources and explore new paths in a focused and enduring way with strong leadership support and cultural anchoring in the business, what we labeled as innovation stamina.

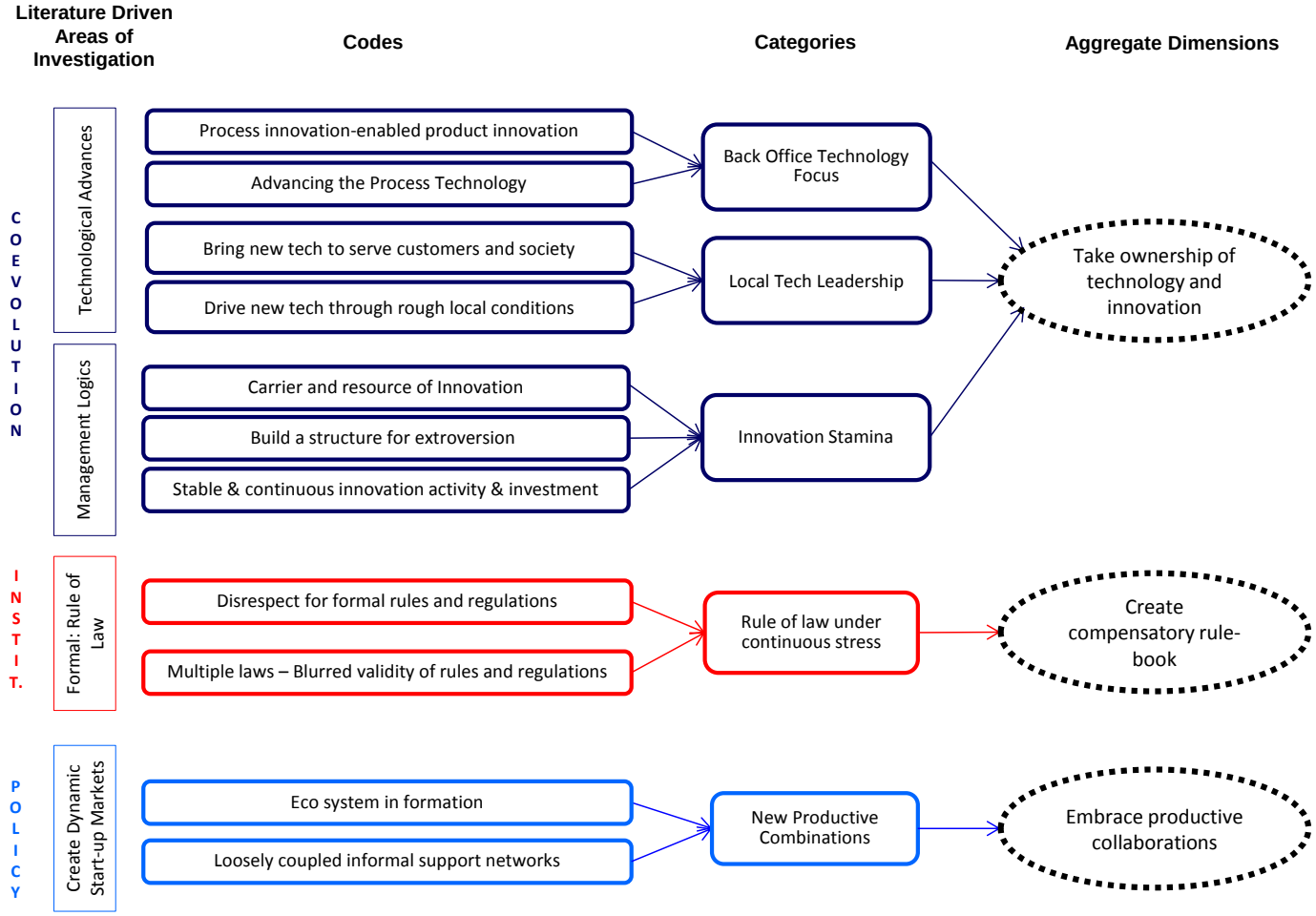

Figure 23. Data Structure - Causal Conditions.

To **create compensatory rulebook** was mostly something that young firms were trying to do. Start-ups, building their financial logic under the capital control condition, innovatively have developed compensatory institutions including establishing headquarters in countries with stable and favourable institutional conditions while operating and investing in Greece, exploiting opportunities through crypto currencies, or creating keiretsu-like cross ownerships to ensure cash flow and short- to mid-term investment capital. Hence, a pro-active stance has to be adopted, not only to building the core innovation offering and/or an innovative business model, but equally importantly to creating the conditions around the business that compensate for absence and dysfunctions of institutions in the home market – Greece (Gkotsi Koroni & Soderquist, 2018).

To **embrace productive collaborations** is a third important driver for innovation in the crisis context. Larger firms were found to engage in collaborations both from an inbound and outbound perspective, to borrow a terms from the open innovation literature. Inbound collaborations are those where the larger company engages with smaller and/or younger firms in order to use their technology expertise as suppliers of products or services. Outbound collaborations are when the established company offers advice and support, which could be in the shape of mentoring, training or other forms of direct advice, or in the shape of indirect support of incubators where new ventures grow.

For young firms, productive collaborations are the very lifeblood of growth and development. Successful startups shape the ecosystem and are very important as role models for other startups. Thus, from a policy perspective it is of utmost importance to encourage growing startups to share their experiences and become part of the flexible informal support network that has emerged in Greece during the crisis years.

8.2 Context of Innovating in the Crisis Context

"Proactive Stance on Resources, Identity and Gaps-Bridging"

The context represents phenomena where the core category "Innovation in the Crisis Context" takes place and unfolds. In the present study these categories were found in the coevolutionary area of 'social movements', in the institutional areas of 'capital markets' (formal institution) 'culture in the Greek society' (informal institution), in the policy areas of

‘stimulate innovation and entrepreneurship culture’ and ‘create dynamic startup markets’, and in the innovation system area of ‘actors and networks’.

Figure 24 illustrates the structure of the data analysis leading to the identification and the conceptual labels –names- assigned to the three aggregate dimensions that emerged as context.

The overreaching theme of the context was that successful innovators in the crisis context had adopted a proactive stance on resources, identity and gaps-bridging.

To **take dynamic resource control**, means to recognize the resource scarcity that characterizes the crisis context and take all the necessary steps long before this scarcity creates too much damage. Studied companies focused on anticipation, and prepared to be strengthened against the difficulties that thus anticipation indicated the crisis might bring. They developed their capacity to adapt to the new economic environment and to the new circumstances. Depending on the case, successful companies saw the crisis as an opportunity, took as controlled risk as possible to innovate despite the hostile context, predicted correctly, adapted to the new reality, and managed to distinguish themselves from competition. Those who succeeded are now well ahead of the competition, with very good prospects for the future.

Although resource control of tangibles, such as infrastructure and capital, was important, the most characteristic approach in larger firms was to take dynamic control of soft resources. Making employees and external collaborators feeling safe, so they can do their best, passed through recognizing the strategic role of human capital, investing in employees, ensuring security and confidence, and giving rewards corresponding to the performance and capabilities of each one. This approach ensured a positive control of resources that contributed to significant business results.

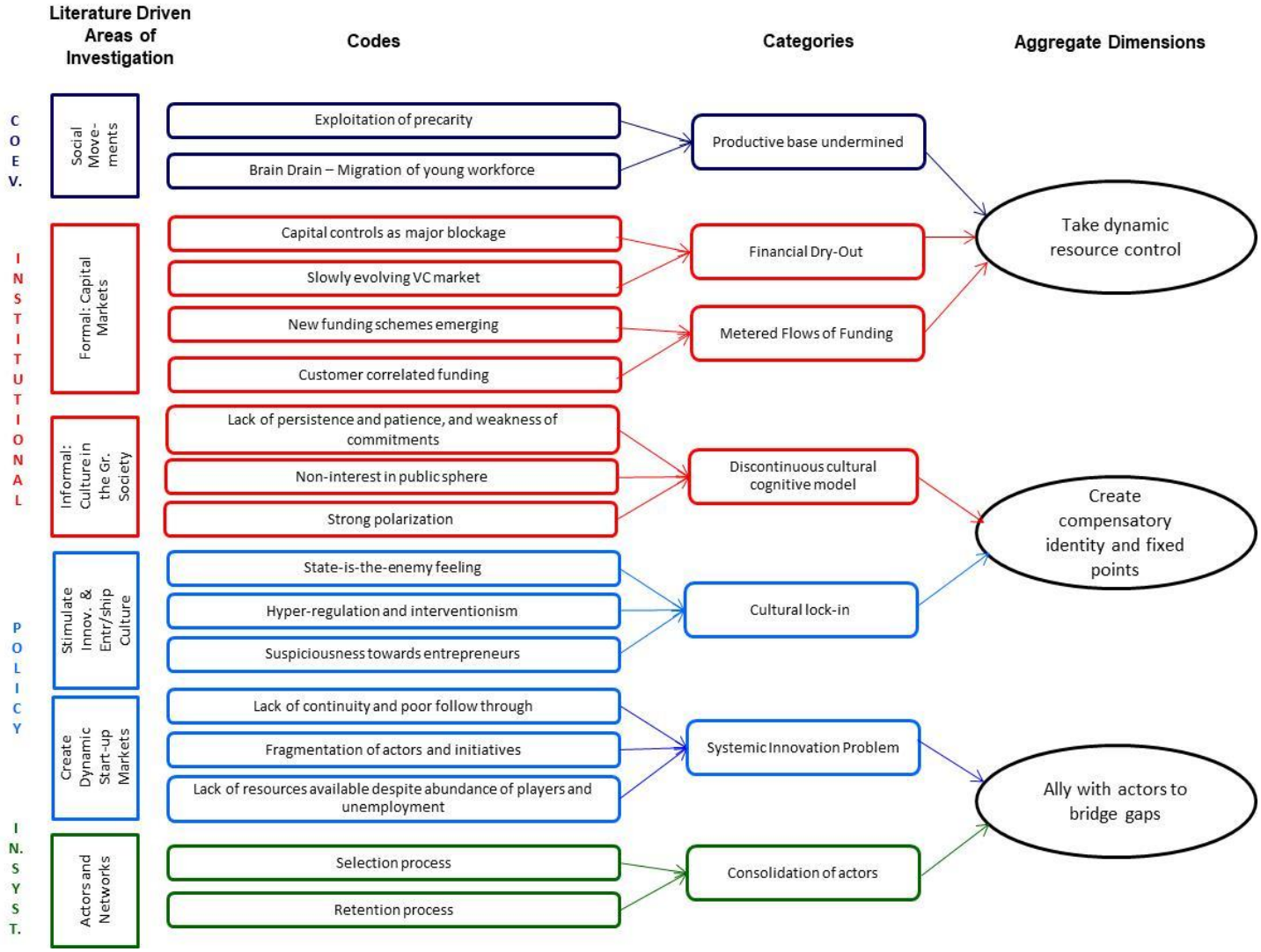

Figure 24. Data Structure - Context.

Another important factor, that made some companies stand out, is their emphasis on consumer behavior and the targeted synergies with strategic customers. They approached holistically the needs of their customers by providing products or services that would satisfy their crisis-induced needs and requirements. So, they optimized their marketing, sales and production strategies, as well as the customer service and reward mechanisms. This systematic investment in customer relations management has given these companies deep knowledge of the total value that a business exchanges with its clients, helped in the growth of sales and, of course, increased profits, even in the midst of the crisis.

To affront the contextual phenomena of a discontinuous cultural cognitive model and cultural lock-in, both established and new firms were observed to be **creating compensatory identity** and **fixed points**.

The **compensatory identity** refers to elements of organizational culture and leadership, as a complement to the compensatory rulebook of structure and organization set up as a response to the problematic regulatory situation in Greece during the crises (discussed in the previous section). Two fundamental approaches to creating compensatory identity were identified:

1. Established firms invested heavily in their human resources to create a sense of unity and purpose. Further, they worked on reinforcing and more strongly emphasizing their brand. In particular, tradition was brought to the surface in order to support a culture of continuity instilling faith among employees and partners that the company will remain strong and competitive, and viably make it through the crisis.
2. Bedsides the necessary condition of a viable and scalable business model, anchored in meeting unmet or unimagined needs, young firms were found to work very hard to build their network of trusted partners so as to co-create with them an eco-system that can function as a cosmos of kindred spirits. It is about finding a niche were representatives of all relevant players in their eco-system can be found, e.g.; other entrepreneurs, industrialists, venture capitalists and competent customers.[67]

The creation of **fixed points** refers to establishment of clearly defined and solidly fixed anchors in organization and processes. For example, in organization, in both young and established firms were identified:

1. Regular innovation events, e.g., creative brainstorming, knowledge sharing sessions, tech demo sessions, hackathons,
2. Specific innovation roles, e.g., domain/technology specialist, innovation consultant, in financially connected groups of companies and/or in cellular networks of collaborating companies.

And in processes:

[67] These reflect to a large extent the actors in the theory of complementary competencies, and a coevolutionary perspective of the formation of entrepreneurial eco systems, as will be further discussed in the theoretical contributions.

1. Institutionalized (repetitive over time and integrated into planning and workflows) participation in innovation and entrepreneurship events, like competitions, conferences and seminars. Young firms in the role as receivers of support or competing parts, established firms as givers of support and sponsorship,
2. Infusion of innovation activities in the process workflow of the firms, e.g., innovation integrated in KPIs / annual evaluations, innovation explicitly integrated in market research and CRM.

The fixed points give organizational members the stability and security needed in order to 'dare' to innovate. They are a tangible response to the cultural discontinuities of, e.g. strong polarization and suspiciousness towards entrepreneurs, and the policy discontinuities of, e.g., hyper-regulation and state interventionism.

To sum up, the creation of compensatory identity and fixed points aims at developing a context of consistency, efficiency, reliability and flexibility, which can provide a cultural, organizational and procedural platform for innovation and growth. Focus on the human resources and relational eco systems to build internal and external confidence to resist against the crisis induced difficulties, are the key characteristics.

All studied companies were well aware of the dramatic situation many firms found themselves in due to the prolonged duration of the crisis. Uncertainty and panic of business leaders and managers led to serious mistakes, such as dismissal of skilled staff, cut spending on research and development, incapacity to keep up with quality levels, and ignorance of customers led to disaster. Hence, they did their utmost to maximize their resilience and success.

To **ally with actors to bridge gaps**, some businesses have formulated a new productive model customized to the demands of the time, as to counterbalance the negative effects of the crisis. They were based on R&D, technological development, innovation, continuing training of the staff, in order to create a wall of resistance to the distortions created by the recession.

There were several examples of companies building bridges for the diffusion and exploitation of knowledge and the development of innovations. These were acts of consolidation among the private players in business ecosystems in order to compensate for the systemic innovation problem in Greece, e.g., lack of continuity, fragmentation and lack of many resource categories.

Successful startups often had a record of participating in entrepreneurial competitions, then incubators, and finally in venture capital schemes. The consolidation of actors has created a system of private and semi-private players that at the end of the research process (first quarter of 2019) can offer a productive path of startup support along the stages of growth of a promising new business venture.

The key success factor when immersing in such activities is to build alliances that will support both the development of the startup's resource base and its customer base. This requires perseverance and patience; to follow a long-term strategy because although it may not bring immediate results, it creates a positive business and investment climate and regains the confidence of investors and customers.

8.3 Organizational Intervening Conditions when Innovating in the Crisis Context "Leveraging of Conditions"

The intervening conditions represent phenomena of shaping nature emerging from the data. Two dimensions of intervening conditions were identified: organizational and environmental.

The organizational intervening conditions were found in the coevolutionary areas of 'social movements', 'global interdependencies' and 'management logics'. These intervening conditions act as factors shaping organizational adaptation in order to innovate in the crisis context. The structure of the data analysis leading to their identification is shown in Figure 25.

The overreaching theme of the organizational intervening conditions was that successful innovators in the crisis context had leveraged these conditions in the way they organize their companies.

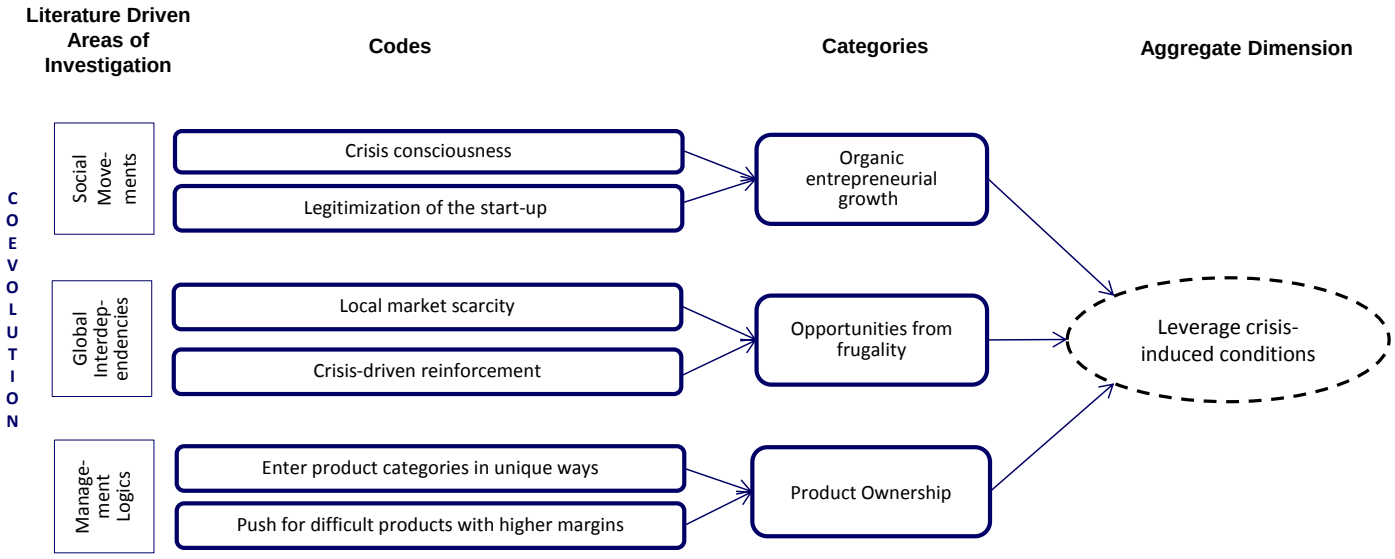

Figure 25. Data Structure – Organizational Intervening Conditions.

To **leverage crisis-induced conditions** was a proactive stance shared among the studied companies. This refers to purposeful strategic plans and managerial actions developed in order to achieve controlled growth, seize opportunities that emerged in the frugal crisis context and take ownership of their core value offer.

Some companies realized very early that the upcoming crisis would be serious and took preventive measures to ensure their operations and customer base. Their management team tried to cope with the situation quickly, but also with coolness. Early awareness of the approaching difficulties has made these companies less affected by the crisis and some of them have positive results as well.

The crisis changed the employment landscape and overturned deep-rooted attitudes in Greek society. Since civil servants have not only lost their privileges but have also suffered a great reduction in their earnings, young people, many of whom have a good level of education and specialization, have begun to turn to self-employment and entrepreneurship. These conditions induced by the crisis has increased the number of start-up companies and has exonerated entrepreneurship.

Efforts to combat the effects of the crisis by some businesses have helped them cope with and continue their course of development. Being aware of the problems that arose, they showed responsibility, diversified their structure, developed new models of operation, following them

consistently and flexibly and finally managed to be less affected by the recession and even more to have positive results.

It was also very important that some incubators, fully aware of what would follow, set as a priority to thoroughly inform about the distortions due to the crisis and to strengthen the start-ups, as to be able to cope with the consequences and make the crisis an opportunity.

All of the established businesses that have been studied, have invested in innovation, extroversion, continuous modernization in production and management, and have adopted advanced technologies. Some of them even lowered the prices of their products or services, focused on maximizing their performance and on the quality they offered. The use of the data they had, the networking and the collaborations they pursued, ensured their viability and their development. By redefining their offering, they took the bold but, as several cases show successful, decision to innovate themselves out of the crisis.

Early-stage entrepreneurs innovated in-line with the crisis. This could mean both to take advantage of the lowering cost of operation to provide higher end services, or develop radically more economic solutions for crisis-starved customer segments. Self-confidence, courage and deep knowledge of their technology, business and customers led to innovative and original products or services to be developed. Incubators played an important role in making startups understand and intelligently align with the crisis context so as to leverage the conditions induced.

8.4 Environmental Intervening Conditions when Innovating in the Crisis Context "Engaging with Institutions and Leveraging Dynamics"

The environmental intervening conditions were found in the coevolutionary area of 'global interdependencies', in the institutional areas of 'role of government' (formal institution), in the policy areas of 'stimulate entrepreneurial activity' and 'increase R&D intensity', and in the innovation system areas of 'actors and networks' and 'knowledge development and resources'.

These intervening conditions act as factors shaping extrovert behavior of the studied companies in order to innovate in the crisis context. The structure of the data analysis leading to their identification is shown in Figure 26.

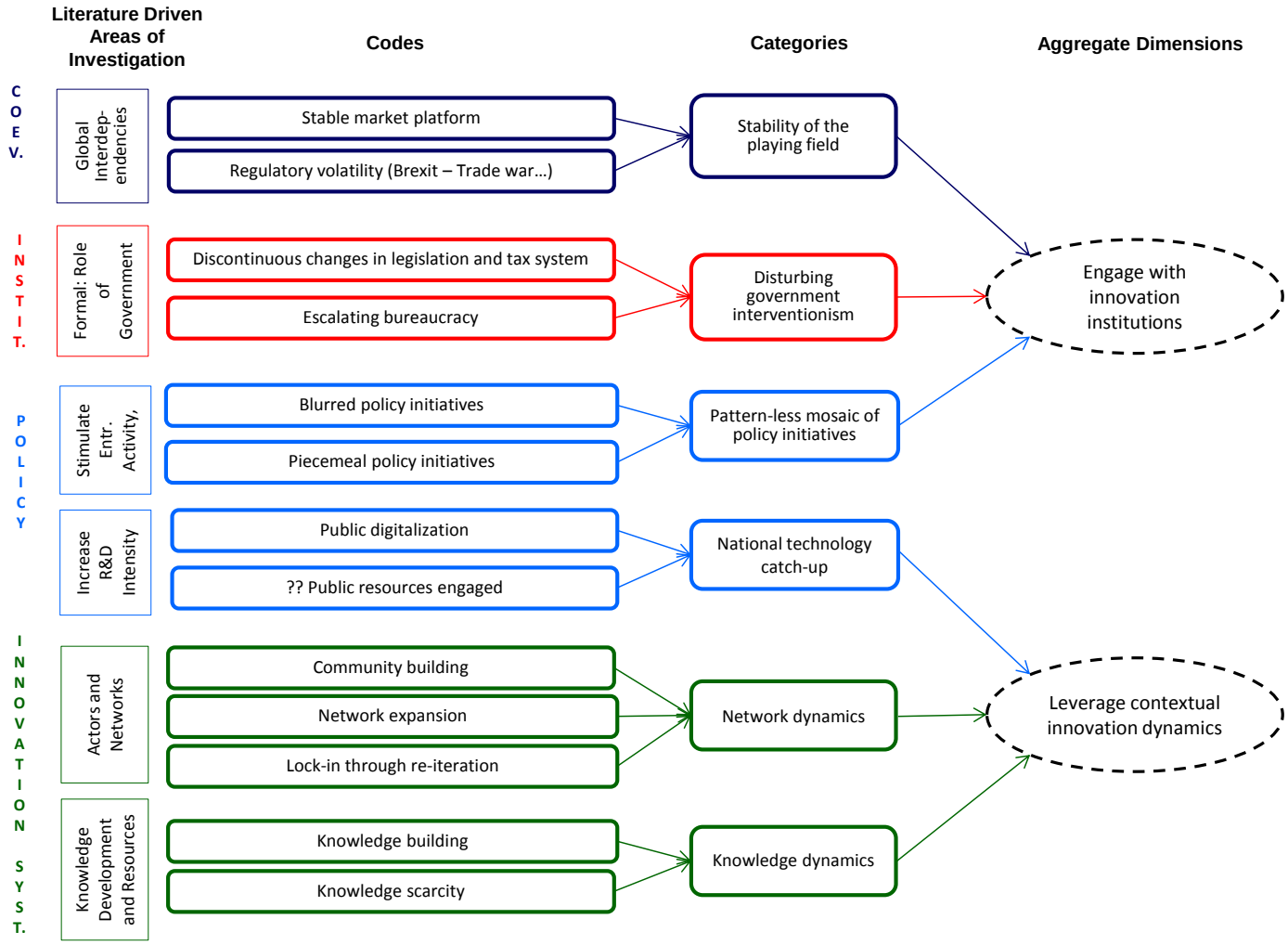

Figure 26. Data Structure – Environmental Intervening Conditions.

The overreaching theme of the environmental intervening conditions was that successful innovators in the crisis context engaged with institutions and turned those innovation dynamics that the crisis induced into advantages, leveraged in their strategies and actions.

To **engage with innovation institutions** means that companies proactively tried to shape some part of the institutional conditions they are facing. Very large companies were found to engage with rule-makers and co-evolutionary work towards stabilizing rules and regulations, as well as technological choices in the playing field. To this end, they developed specific and firm market policies, both in Greece and internationally, grounded in confirmed technology and market trends, resulting new strategic plans to enhance and preserve their stamina during the difficult period. Also, some of the large companies, who had already been successful in

foreign markets, brought these well-tested business models to the Greek market and their Greek operations in order to reinforce the impact on local institutions.

Smaller firms and startups opted for engagement with market-based institutions, so as to avoid institutions characterized by interventionism and blurred policy initiatives. These acts of engagement involved local and international ntworks of incubators, entrepreneurship support structures (e.g., Endeavor, Global Entrepreneurship Monitor, ventue funding structures). The most significant actions, however, were to counterbalance the instability and regulatory volatility (tax, multiplicity of laws, etc.) by creating compensatory rulebooks and identity, as discussed above.

To act on policy was seen as very difficult, almost impossible, by all interviewees that discussed the issue. The main reason is the deep politicization of the Greek state. Innovation and entrepreneurship policy are not developed by strong independent institutions. Rather it is the playground of ideologically driven experiments, or even, as during the period from 2015, met with indifference. Firms are indeed willing to engage in policy dialogues, but such processes have not been activated during the crisis years.

Continued institutional changes, e.g., in legislation, amendments, ambiguities, contradictory directives, and in general the weak regulatory system, bureaucracy and annoying intervention by the state were counter-balanced by internal mechanisms of resistance and balancing.

To **leverage contextual innovation dynamics** was part of the actions of all the studied firms. Some could ride on the specific wave of technology catch-up in telecommunications infrastructure, while others leveraged the growing innovation and entrepreneurship networks taking shape during the crisis – both for direct business and for relationship and competency building. The latter then was linked to an explicit focus of growing the knowledge capital, both in the technology/product and in the business model/organizational domains.

All studied firms, in order to meet the challenges posed by the deep recession, have made new or significantly improved technical changes to their equipment, organization, products or processes relating to production or distribution of products, and invested in the continuous and high quality training of their staff.

The use of innovative digital systems by some companies has improved inter-administrative communication and collaboration, contributing significantly to the provision of innovative products and services that could not otherwise be achieved, by facilitating inter alia, cooperation between businesses and public bodies. Thus, by interacting continually with the environment in which these businesses evolve and operate, they facilitate their liturgy, contributing to the efficient management, collection, organization, retrieval and transmission of knowledge. The competitiveness of a business today is indissolubly linked to digital maturity and the penetration of technology in its operation. From the study it seems that the companies that have made digital upgrades have managed to prevail in competition.

Examples of actions implemented to leverage contextual innovation dynamics included: New production models, building of networks and communities, enhancing the diffusion of new knowledge in these eco-systems, and embracing new technologies. In particular, the creation of networks gave them the opportunity to exploit the comparative advantages that each company had, to exchange knowledge and experiences and to be developed despite the adverse economic conditions.

Among the established companies that have been studied, those who have embraced the innovation and the continuous training of the staff in their philosophy and created the conditions for transferring and disseminating knowledge, have been able to cope with the difficulties of the crisis and also survive and be developed.

Among the newly established companies, those who got the right guidance from incubators were empowered to manage the upcoming difficulties and have been prepared through their mentors with the skills required, as to be able to take the control of their business and grow.

8.5 Consequences from Innovating in the Crisis Context "Vehicles and Mindsets for Innovation"

The consequences represent phenomena that result from the sum of the actions and interactions taking place in the unfolding and management of the central phenomenon under the influence of the causal conditions, context and intervening conditions.

In the present study there were also some specific categories that directly represent outcomes of the central phenomenon "Innovation in the Crisis Context". They were found in the institutional area of 'Informal [institutions]: Organizational Culture' and in the innovation systems area of 'Training, Careers and Employment Policies'.

Figure 27 illustrates the structure of the data analysis leading to the identification and the conceptual labels –names- assigned to the aggregate dimension that emerged as consequence.

The overreaching theme of the outcomes was that successful innovators in the crisis context have become vehicles for innovation and also have developed specific mindsets for innovation.

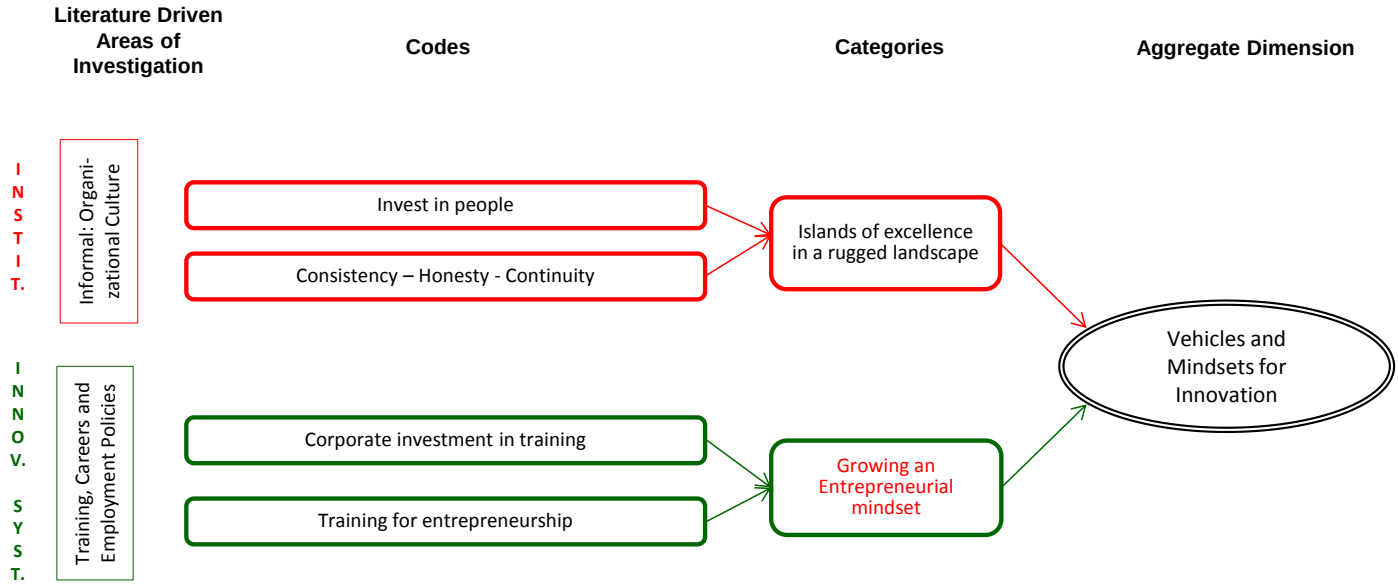

Figure 27. Data Structure – Outcomes from Innovating in the Crisis Context.

The recent economic crisis that Greece is facing created extreme conditions that are seriously threatening to the business environment and the domestic market. The creation of a new strategic plan for balancing the business situation was now more than imperative.

The research identified a number of enterprises that we characterize as **islands of excellence in a rugged landscape**. These organizations, few and in some sense unique, i.e., 'islands', had consistently and continuously strived for excellence, e.g., in product or process technology innovation, in business model innovation, in organizational innovation, all while operating in the tough and unpredictable context –'rugged landscape'- of the crisis. The rugged landscape metaphor was originally used in management research by Levinthal (1997) for describing discontinuous peaks –representing challenges / difficulties- appearing in the context where organizations exist. More broadly, he used it to analyze diversity of organizational forms reflecting diversity in the environments where they operate. Thus, it is a

strong notion for characterizing the Greek crisis which and also relates directly to the innovator–institutions interplay.

One fundamental key to excellence was investment in people. The internal environment, and more specifically a solid base of a strong culture and qualified and motivated human capital is something that can be controlled, even in a turbulent period of crisis. Smaller and younger firms placed great emphasis on recruitment and fit of new collaborators. Larger established firms focused on enhancing the human capital by providing employees with the appropriate tools and incentives. The investment of people paid off in several dimensions, including creation of strong internal but also external links between employees, collaborators and customers, ensuring stability during the crisis, and enabling the necessary flexibility requirements in the rugged economic environment. This gave them a great comparative advantage over their competitors.

The second element characterizing the islands of excellence was an organizational culture founded on consistency, honesty and continuity. To be clear on targets and strategies, to implement and follow through with these targets and strategies, and to communicate openly and transparently allowed companies to reinforce their internal platform for excellence.

Growing an entrepreneurial mindset relied on the one hand on investment in training in larger and established firms, and on training for entrepreneurship in universities, colleges, incubators and other support structures. Systematic investment in staff included safe work environment, training and competency development, equality of career opportunity and enhanced cooperation through team structures and project organizations. Incorporating staff training as an investment rather than a cost helped companies not only to cope with the crisis but also to increase their competitiveness through internal resilience based on a steadily increasing entrepreneurial mindset, which, in turn, also could become an engine for innovation. Two of the studied companies had established in-house development centers through which they identify the training needs of the participants and select executives who, after a specific training period, will be able to take on positions with higher responsibility. In this way, they were able to strategically manage employees' training needs and relate them to goals and strategies.

The companies studied aimed for employee loyalty, rather than the traditional approach of control and pressure. Cultivating such a climate of mutual trust and respect between

management and staff has been a key component of success, despite the enormous problems encountered in the market.

Training for entrepreneurship focused on developing entrepreneurial skills and mindsets was found more generalized in universities and incubators and also took place through entrepreneurship competitions and other initiatives between larger companies and various public and private structures such as hackathons and specific initiative for idea generation on particular challenges. The data confirmed a firm shift in the mindset of the public towards a more positive stance towards entrepreneurship.

If the informal institution of opinion towards entrepreneurship has changed, the formal institutions that influence entrepreneurship have, unfortunately, not evolved in any positive direction during the crisis. In particular, bureaucracy and inconsistency of tax and regulatory frameworks have worsened.

8.6 Integrated Conceptual Model

This section presents the integrated model of innovation in a deep crisis context grounded in the empirical research and relates the results to the research questions.

Figure 28 presents the integrated model developed from the research. It represents the structuration of the aggregate theoretical dimensions developed in the preceding analysis in accordance with the Paradigm Model.

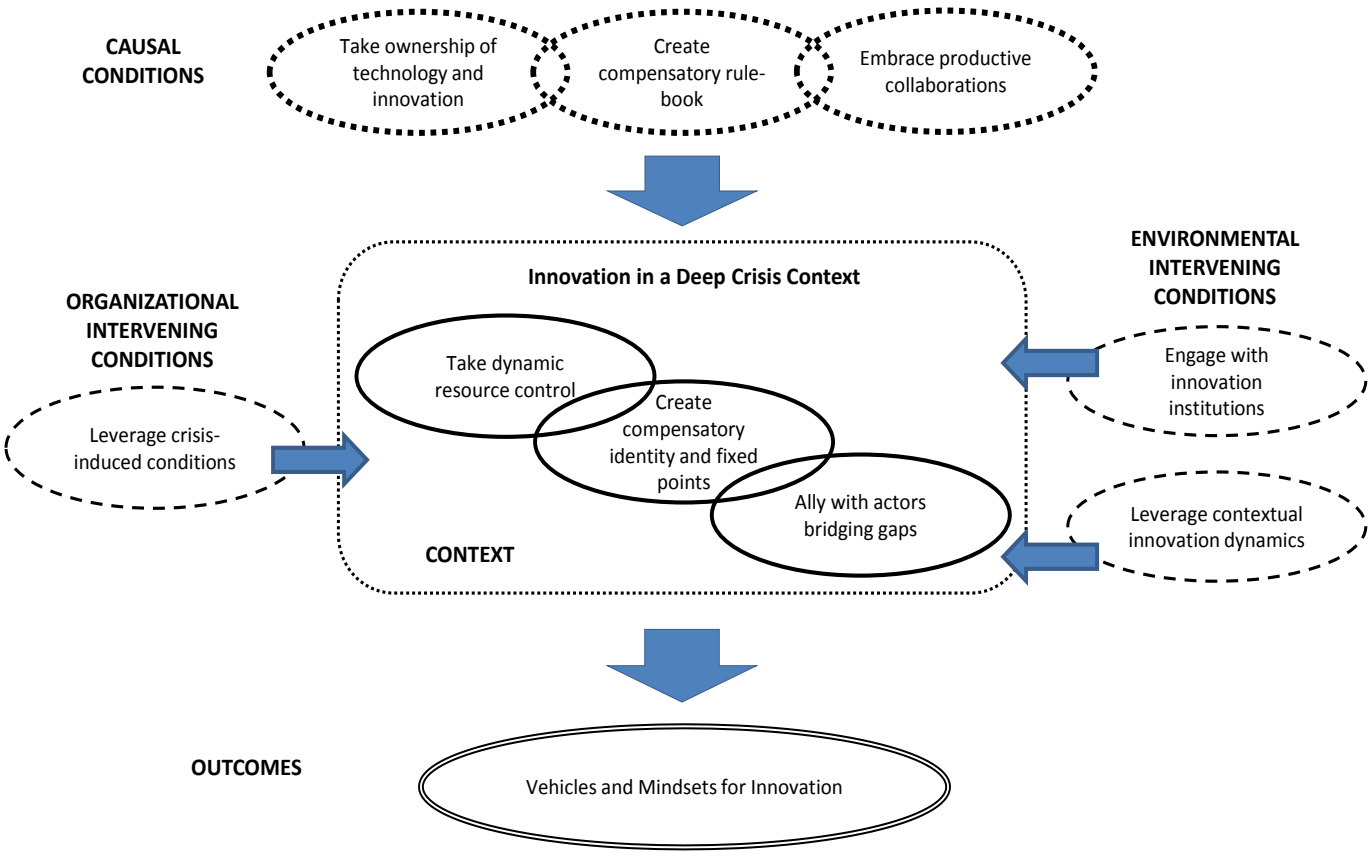

Figure 28. An Integrated Conceptual Model for Innovation and Entrepreneurial Activity in a Deep Crisis Context.

The model provides, in its different parts, and as an integrated model, the answers to the research questions addressed in this doctoral thesis:

1. What are the crisis-induced conditions that drive innovation and how do companies respond to these to use innovation as a way to affront the crisis?
2. What are the crisis context-specific conditions that act for, or against, innovation?
3. What are the conditions that intervene in the innovation process, both from the crisis context and as a reaction to the crisis context?
4. What are the most appropriate mechanisms that can affront specific crisis-driven problems?
5. What could an integrated model of innovation and entrepreneurial activity in a deep crisis context look like, and how could it be used to design company actions, support initiatives and policies to moderate the effects of the crisis by creating and sustaining innovation?

In the following we summarize the answers to each of the above questions and discuss action / interaction strategies identified in connection to managing the related issues. We recall that the action / interaction strategies represent actions devised to manage, handle, carry out or respond to a phenomenon under a specific set of causal, contextual and intervening conditions.

8.6.1 Crisis-Induced Conditions

The conditions induced by the crisis that mostly and significantly affected the innovators interviewed and studied were:

- **Resource constraints at all levels** driving a necessity to develop and leverage back-office technology. This triggered actions of improving/optimizing existing and developing new process technology, both for enabling product, service and business model innovations, and for maximizing the efficiency of production, service delivery, organization and administration.

The resource constraints also led companies to activate and cultivate an innovation stamina, which triggered actions of reviving and revitalizing their innovation roots, place innovation at the center of the strategy –with a logic of 'necessity is the mother of invention', and also restructure for more openness and extroversion towards their environment as broadly as possible.

- **Lagging adoption and development of new technology** driving an opportunity to develop local technology leadership. This triggered actions of technology development, for most of the studied companies in niche markets where they already has a strong hold and expertise. For COSMOTE, it triggered a large scale drive of technology upgrade across the country in terms of fiber optics network and 4G, including paving the way for 5G and enhanced digital services to households and businesses.
- **Deteriorating institutional quality and weakening of the state-governed-by-law** driving a necessity to create compensatory rules and arrangements to work around these fallacies. This triggered development of alternative business models, in particular for solving financial difficulties, and for accessing competency and knowledge in shortage in Greece.
- **Emerging entrepreneurship eco-system** driving opportunities to develop new productive combinations. This triggered actions of partnering, collaboration, joint participation in projects and other innovation-enhancing activities. In general, it had a positive impact on the organization for innovation and the innovation outcomes.

8.6.2 Crisis Context Conditions

The most significant conditions that have taken shape during the crisis, and that constitute the context in which the studied organizations innovate and/or support innovation and entrepreneurship were:

- **An undermined productive base** with shortage of financial resources, competent workforce, customers and partners in innovation, as well as absence of functioning capital markets. All this drives a need to take dynamic control over all resources needed to operate, basically and initially, and then also to innovate. Action strategies to respond to this included active recruitment of talent, combatting tendencies of exploiting the crisis context with respect to employees, and innovating in the development of adequate

funding schemes for operating and investing. The necessary mindset underlying such actions is to be proactive at all times to anticipate developments and ensure dynamic resource control.

- **Cultural blockages** driving a necessity to create compensatory identity and fixed points. Identity-building triggered actions of investing in people and brand, reviving or creating corporate stories of tradition and/or success, and also building reliable networks of trusted partners. The creation of fixed points triggered actions of time pacing, i.e., impose milestones of innovation activities, define specific innovation roles, and infuse innovation activities in processes and workflows.
- **A discontinuous innovation landscape** driving a need to bridge gaps by allying with those actors that dynamically can bridge the gaps a company faces. The discontinuity comes both from the longstanding lack of consistency and the fragmentation of innovation actors, and from a turbulent process of out-selection of players during the crisis. This triggered actions of alliance and partnership-building to pool resources, matched with the development of incubators capable of supporting the various stages of venture growth.

8.6.3 Intervening Conditions in the Innovation Process

Intervening conditions of two kinds were identified. First were those that intervene from the crisis context, i.e., phenomena that are triggered or provoked by the crisis context which makes up the environment of the organization. The most significant environmental intervening conditions in the innovation process were:

- **Instability from interventionism** driving a need to engage with innovation institutions in order to anticipate moves and, to the extent possible, create compensations for the unpredictable institutional and policy interventions. This triggered actions of developing specific market strategies where larger firms could have some impact on stabilizing rules, regulations, and technological choices in the playing field. Smaller firms engaged with market-based institutions, so as to avoid institutions characterized by interventionism and blurred policy initiatives.
- **Innovation dynamics in spite of the crisis**, which consist of network and knowledge dynamics, as well as national technology catch-up that act as drivers for innovation to

some extent. These, relatively punctual (tech catch-up) and weak (knowledge dynamics) intervening conditions were indeed marked by the crisis, but not really driven or triggered by it. Companies here took actions in order to upgrade their technological infrastructure, but also to enhance knowledge sharing in networks and ecosystems.

Second, we also identified organizational intervening conditions, i.e., conditions that intervene as a reaction to the crisis. The most significant organizational intervening condition in the innovation process was:

- **Organic growth through frugality and product ownership** which were conscious decisions made to leverage the conditions created by the crisis. These decisions triggered actions of internal competency-building, of reinforcing the organization by tracking down any form of waste and improving operational efficiency and the quality of offerings and of carefully assessing the technological core competencies to keep or even reinforce the ownership of key technologies and their value-creating integration in products.

8.6.4 How do Companies Affront the Crisis? Three Distinctive e Integrated Paths

The integrated conceptual model of innovation and entrepreneurial activity in a deep crisis context (Figure 28) was developed from the systematic analysis of all the data collected from startups, young firms, SMEs, large companies, and innovation/entrepreneurship support organizations. To this was added al large volume of secondary data. The data analysis followed Strauss & Corbin (1990 & 1998) which are by far the most widely cited templates for inductive qualitative research underpinned by a grounded theory approach (over 110.000 citations on Google Scholar).

In order to propose an actionable model, with both theoretical value and practical implications, the aggregate dimensions emerging from the data analysis, which constitute the building blocks of the model, were formulated using action-oriented labels (Ramus et al, 2017). As discussed in the methods section, this reflects the nature of the data –words, sentences and formulations- expressed by the interviewees in a general discourse of imagining, developing, implementing, evaluating and evolving a range of different actions to drive and support innovation and entrepreneurial activity in the crisis context.

The proposed model is one answer, emerging from the particular research set-up and approach in the present PhD, to the question of what an integrated model of innovation and entrepreneurial activity in a deep crisis context could look like.

The interconnections among the identified aggregate dimensions are multiple. We highlight three different integrated paths, synthesized from distinctive approaches followed by the studied companies. These paths that show different but complementary approaches to pursue innovation and entrepreneurial activity in a deep crisis context, and lead to specific outcomes each.

'Resource Control' Integrated Path

The 'resource control' integrated path (Figure 29) reflects a leadership and management approach where the initial step consists of taking ownership of technology and innovation, which then acts as a trigger for pro-actively taking control of all resources needed to develop innovation as a response to the crisis. Innovation dynamics in the environment, including technology catch-up, the formation of networks and knowledge development are leveraged to strengthen the internal resources companies build to enhance innovation. The outcomes in companies following the 'resource control' integrated path were:

- An **explicit structure** and **operational process model** in terms of *vehicles for innovation*, and
- A belief and shared vision of **innovation as a core identity** in terms of *mindset for innovation*.

From a **coevolutionary** perspective, this integrated path is driven by strong interplay between technological advances and management logics; the opportunities that both product and process technology bring are matched by a conscious management model placing innovation at the center, both as a resource and a capability. This interplay drives firms to take dynamic resource control as their central response to the crisis context. Moreover, the contextual innovation dynamics comprise national technology catch-up, a policy driven factor, with network and knowledge dynamics that theoretically origin in innovation systems theory. Hence, coevolutionary processes across levels of analysis as well as interplay between internal and external factors underpin this path.

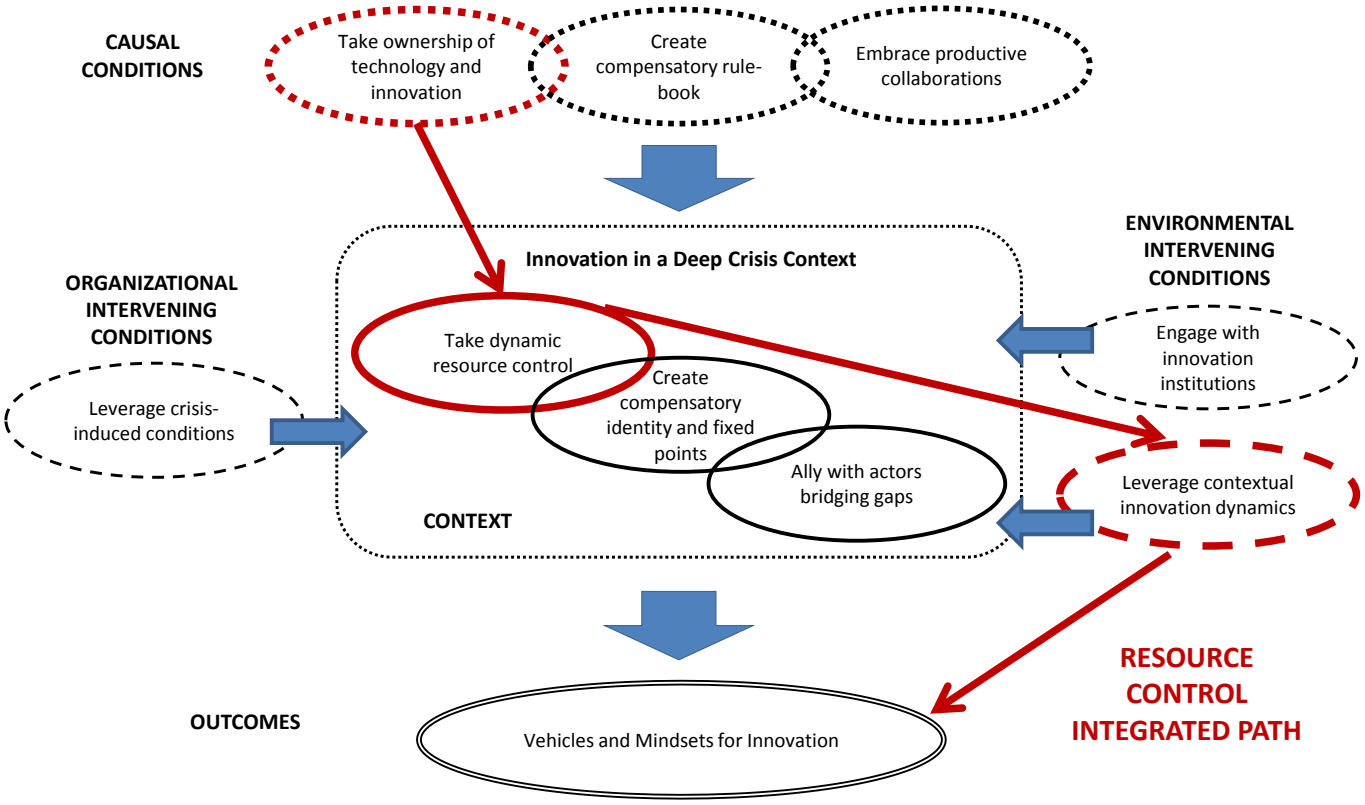

Figure 29. The 'Resource Control' Integrated Path.

From an **institutional** perspective, the 'resource control' integrated path is formed by the scarcity of funding and capital, reflecting the problematic formal institution of capital markets. Together with the undermining of the productive base (resulting from the coevolutionary social movements of exploitation of precarity and brain drain) this drives companies to take dynamic resource control.

From an **innovation systems** perspective, this path integrates the leverage of actors and networks, as well as the integration of knowledge from outside sources.

From an **innovation policy** perspective, the contribution to the 'resource control' integrated path comes from the national technology catch up that a few companies leveraged as an environmental intervening condition.

To sum up, the 'resource control' integrated path is most strongly underpinned by coevolutionary theory. From the above we see that coevolution is present also in the explanations that stem from institutional, innovation systems and innovation policy factors.

'Compensatory Institutions' Integrated Path

The 'compensatory institutions' integrated path (Figure 30) reflects a leadership and management approach where the initial step consists of creating a compensatory rulebook to compensate for institutional flaws and fallacies in the crisis context. In particular, this was observed in startups and young firms in response to the rule of law being under continuous stress during the crisis. This, in turn, acts as a trigger for creating a compensatory organizational identity and fixed points in both organization and processes to be able to develop innovation as a response to the crisis.

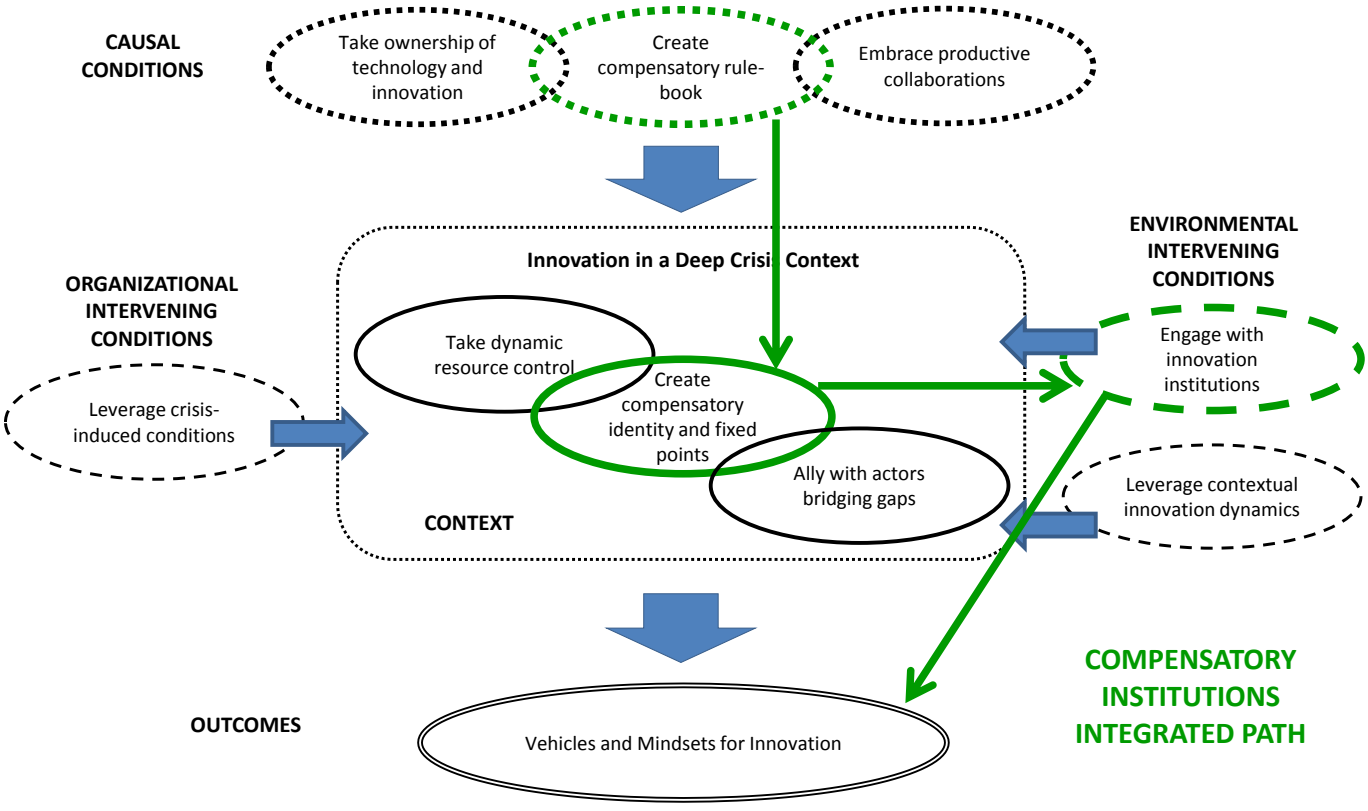

Figure 30. The 'Compensatory Institutions' Integrated Path.

The effectiveness of compensatory rules and compensatory identity depends on the quantity and quality of engagement of the company with innovation institutions. This, which at first might seem like a paradox, emphasizes the importance of understanding government's legislating as well as policy-making branches, so that the appropriate compensatory actions can be anticipated. The outcomes in companies following the 'compensatory institutions' integrated path were:

- A **panoply of arrangements** to **compensate for fallacies in formal and informal institutions** in terms of *vehicles for innovation*, and
- A belief and shared vision of **understanding, anticipating and, if possible, influencing formal and informal institutions** in terms of *mindset for innovation*.

From a **coevolutionary** perspective, this integrated path is driven by global interdependencies regarding the development and stability of the playing field, a factor important in many of the studied tech companies and in the Cosmote case. Together with the institutional factor of disturbing government interventionism, this is part of the factors that prompt companies to engage with innovation institutions.

From an **institutional** perspective, the 'compensatory institutions' integrated path is formed by the discontinuous rule of law as a formal institution and the discontinuous cultural cognitive model in Greece as an informal institution. Further, this path takes shape under the influence of the disturbing government interventionism as a formal institution.

From an **innovation policy** perspective, failed policies characterized by lack of continuity, fragmentation and lack of resources are factors that prompt the creation of compensatory identity and fixed points, under the simultaneous influence of the discontinuous cultural model in the Greek society as an informal institution.

The 'compensatory institutions' path does not have a direct driving link from the **innovation systems** theory.

To sum up, the 'compensatory institutions' integrated path is most strongly underpinned by institutional theory, as all three building blocks to a large extent originate in institutional factors. Both formal and informal institutional factors are decisive for shaping this path as an

approach to innovation in the crisis context, and the responses largely consists of creating compensational institutions – rulebook and identity. We also see that institutions are present in the explanations that stem from coevolutionary and innovation policy factors.

'Innovation Network' Integrated Path

The 'innovation network' integrated path (Figure 31) reflects a leadership and management approach where the initial step consists of embracing productive collaborations, enabling companies to tap into the important resources and structures that have developed in Greece during the crisis years in terms of innovation and entrepreneurship support structures. It is both about leveraging the emerging ecosystem components and interconnections, and the more loosely coupled informal support networks that have emerged. This facilitate the meeting of common challenges, the improvement of operating methods and the expansion of products, services and markets, through a continuous exchange of resources and know-how, as a response to the crisis.

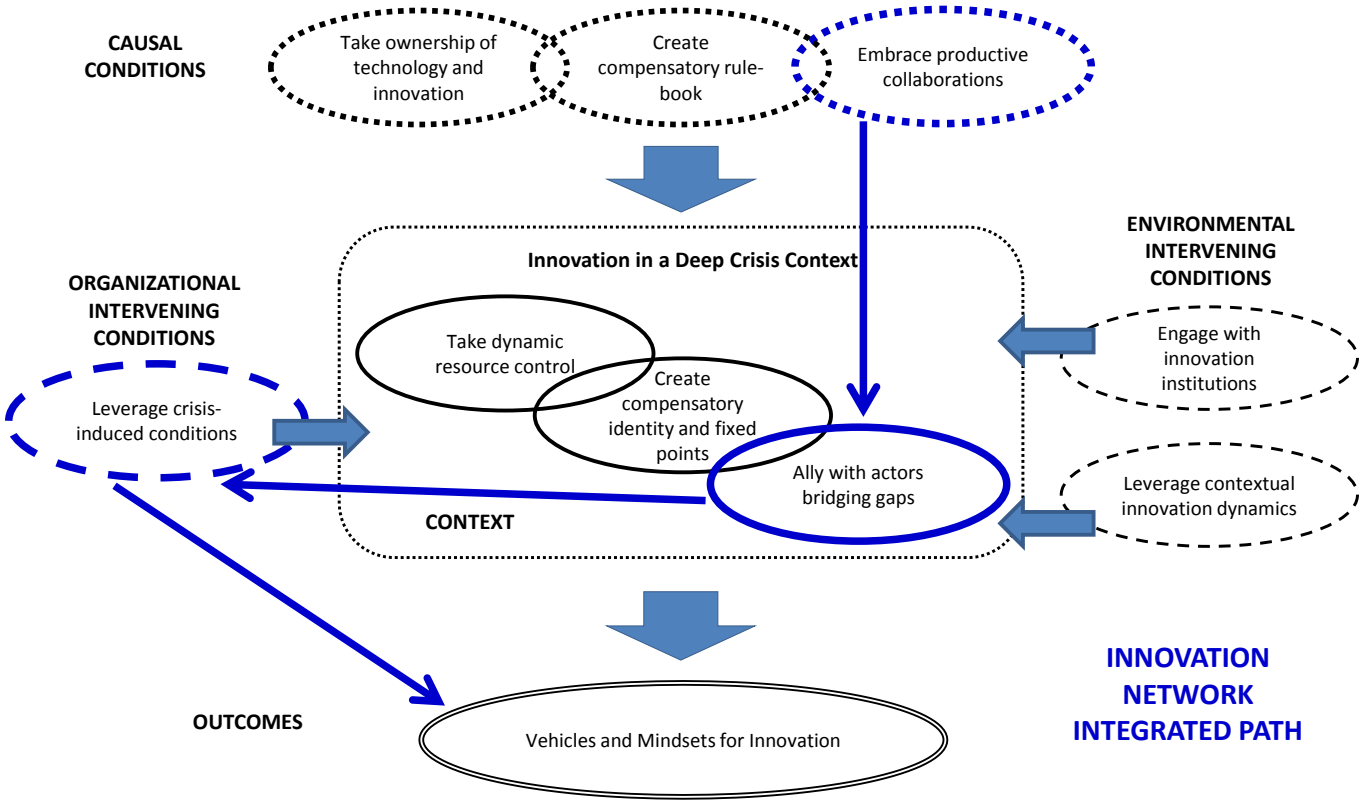

Figure 31. The 'Innovation Network' Integrated Path.

This, in turn, acts as a trigger for allying with those actors that have consolidated their activities and presence over time, and that strive to bridge the gaps in the Greek innovation landscape. These partnerships reduce operational risks and allow for joint investment in the development of businesses partnerships. Also, collaborations with higher education institutions, research centres and research support organizations create positive prospects and help businesses overcome the crisis.

Through the outward-looking collaboration focus, these companies became better than others in leveraging the conditions induced from the crisis. This means to use the frugality induced by the crisis as drivers to innovate by finding solutions to problems created from the crisis. The outcomes in companies following the 'innovation network' integrated path were:

- The **exchange of knowledge, experience and best practices among trusted and complementary partners** in terms of *vehicles for innovation*, and
- A belief and shared vision of **openness and a collaborative stance to strategic and operational challenges** in terms of *mindset for innovation*.

From a **coevolutionary** perspective, the leverage of crisis-induced conditions stems from three coevolutionary elements, namely social movements (crisis consciousness in the business landscape and legitimization of the startup in society), global interdependencies highlighting the local-global market interplay during the crisis, and management logics focusing on product offerings. This also promotes a new culture of innovation and collaboration among entrepreneurs, contributing substantially to meet the new challenges.

From an **innovation systems** perspective, this path integrates the participation of actors in networks that gives a real impetus to innovation, because knowledge and information are exchanged. This inter-organizational interchange contributes decisively to business development and therefore to the economic growth of the country.

From an **innovation policy** perspective, the 'innovation network' integrated path embraces the idea of creating dynamic startup markets. Despite the systemic innovation problem that stems from absent or blurred policy, companies in this path arrive at 'cherry picking' the best features of the eco system in formation. This includes participation in and/or contribution to programs and networks that support the cooperation of businesses and innovation empowerment centers, both locally and internationally.

The ‘innovation network’ path does not have a direct driving link from the **institutional** theory.

To sum up, the ‘innovation network’ integrated path is most strongly underpinned by innovation systems and innovation policy theory, as two of the three building blocks originate in innovation system or policy factors. The dynamics in the Greek startup market are leveraged by networking, which also allows to bridge gaps in innovation system and policy. We also see that policy and innovation system factors are present in the explanations that stem from coevolution; opportunities from frugality are explored through networking and organic entrepreneurial growth is supported by some policy interventions that have been right during the crisis.

8.6.5 The Model as an Integrated Firm-Level Innovation System

The identification and conceptualization of the three distinctive paths answers the research question of how an integrated model of innovation and entrepreneurial activity in a deep crisis context-could it be used to design company actions. They also provide a framework for how support initiatives and policies to moderate the effects of the crisis could be developed.

The three distinguished integrated paths correspond to different responses developed by companies to sustain and develop innovation in the crisis context. Each is driven by different factors, activates a specific set of managerial actions and produces different outcomes in terms of vehicles and mindsets for innovation. Each path is also underpinned by a different theoretical explanation model.

Depending on the type, situation and aspirations of each organization, one of these highlighted paths might be more urgent or more relevant to pursue at a particular point in time. However, it is important to emphasize that the paths by no means are mutually exclusive. On the contrary, although the studied organizations were focusing on one of the paths, the majority were actively engaged in parts of the other paths as well.

The simultaneous presence of all three paths (Figure 32) can therefore be seen as an integrated firm-level innovation system (c.f., Pisano, 2015).

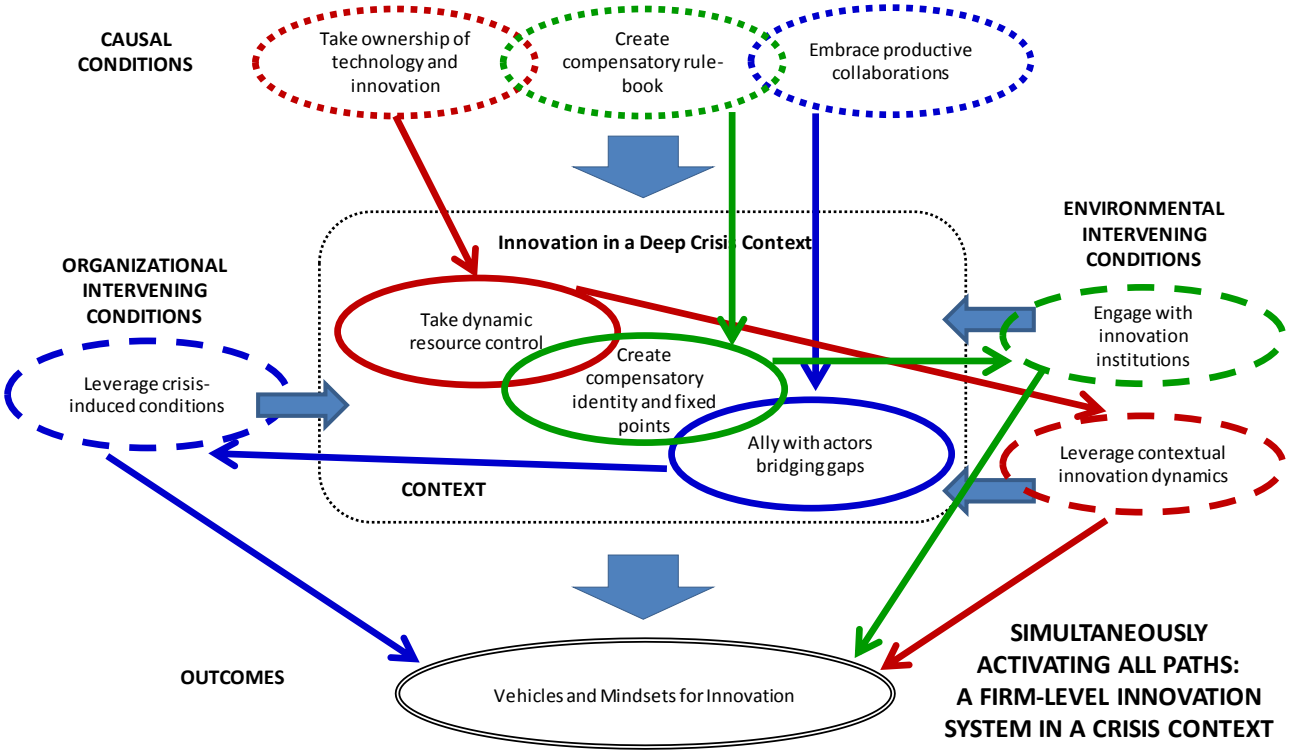

Figure 32. Simultaneous presence of all three paths.

In such an integrated firm-level innovation system, innovators, entrepreneurs and managers can:

- Find guidance for how to develop coherent strategies and actions along three distinctive paths;
- Apprehend how alternative paths can be more or less relevant to affront specific problems and circumstances, and
- Navigate between paths depending on how external and internal conditions evolve.

This has also implications for innovation and entrepreneurship support initiatives and for policy, as will be discussed in the next chapter.

9 THEORETICAL, MANAGERIAL AND POLICY CONTRIBUTIONS

The findings of the study present several implications for theory and practice. In the following the theoretical contributions will be discussed in relation to each of the theories used in the design and execution of the research; Coevolution, Institutions, Innovation Systems, and Innovation and Entrepreneurship Policy.

The managerial contributions will be presented in relation to new ventures, established firms, and leaders/managers of support structures respectively. Finally, the research's contribution to policy is presented.

9.1 Theoretical Contributions

In this section we discuss how the different theoretical lenses applied in the field research, and used as underpinnings for the data analysis, namely coevolution, institutions, innovation systems and policy theories, contribute to the explanation of how innovation and entrepreneurship can come about in a deep crisis context. We also discuss how the research findings contribute to the body of knowledge in each of these theoretical perspectives.

Contributions from Coevolution Theory

The central result of the present research, the integrated conceptual model, represents a coevolutionary explanation model of how innovation and entrepreneurship can come about in a deep crisis context.

As identified in the literature review, the fundamental characteristics of coevolution are:

a) *Specificity,* that the evolution of one entity is due to the evolution of other entities, and that evolution occurs between entities belonging to different populations,

b) *Reciprocity,* that different identified entities coevolve through interdependence, and

c) *Simultaneity,* that different identified entities coevolve concurrently.

Coevolution theory emphasizes that different coevolving entities and factors need to be in sync to reach desired goals (Marks & Gerrits, 2017). The research challenge thus is to

uncover complex webs of interrelated factors, presenting specificity, reciprocity and simultaneity, that can explain outcomes in a specific field of research.

Four coevolutionary processes were uncovered and identified as determining for the ability to innovate and grow entrepreneurially in the crisis context. These are listed in Table 7 together with their elements of specificity, reciprocity and simultaneity. Moreover, we indicate their explanatory power of innovation and entrepreneurial growth in a deep crisis context.

Coevolutionary Process	**Specificity**	**Reciprocity**	**Simultaneity**	**Explanatory Power to innovation and entrepreneurial growth**
To take ownership of technology and innovation	New process technology offers cost reductions, essential for responding to the crisis. Management models evolve to embrace this opportunity, and place innovation at the center of strategy	Process innovations enable product innovations as a secondary positive effect, besides cost reductions. This pushes developments in strategy towards new product categories, markets and niches.	The interplay between process enabled product innovation and new market strategies was concurrent and mutually reinforcing.	Better control and stronger strategic integration of technology create confidence that innovation and entrepreneurial growth are possible also in the crisis context.
To take dynamic resource control	Precarity and brain-drain are social factors that together with financial dry-out in the institutional environment alters the management models towards a stronger emphasis on resource control.	Social and institutional constraints reinforce each other and pushes companies to an edge where they have no other choice but to implement specific resource-control measures.	The interplay between social and institutional factors was concurrent and mutually reinforcing.	Managers realize that nothing no longer can be take for granted. Many resources go from scarce to inexistent. This leads to taking a more broad and detailed control of resources to secure a platform from which innovation can take place.
To leverage crisis-induced conditions	Social factors of crisis consciousness and legitimization of the startup interact with a management logic of product ownership, which allow to tap into the opportunities that the crisis also has created.	Increased entrepreneurial activity was a prerequisite for exploitation of opportunities created from the frugality of the crisis.	The interplay between entrepreneurship as a response to the crisis, the opportunities created from frugality, and the response in terms of focusing development on value adding products was concurrent and mutually reinforcing.	Identifying and exploiting opportunities that have surfaced during the crisis was a major driver for innovation. Resource control was also an enabler behind the ability to develop ownership of higher value-adding products.

Table 7. Coevolutionary Processes and their Explanatory Power

Coevolutionary Process	Specificity	Reciprocity	Simultaneity	Explanatory Power to innovation and entrepreneurial growth
To engage with innovation institutions.	Blurred policy is a result of government interventionism. Unclear policy triggers even more government interventionism.	Policy (innovation systems factor) and government interventionism (institutional factor) are strongly interdependent.	The interplay between policy and government interventionism was concurrent, but, for the most, mutually undermining. With this also interferes global technology and standards development that both policy and rulemaking must integrate.	Engaging with innovation institutions was instrumental for innovators and entrepreneurs in order to work around the weaknesses and hopefully later positively influence innovation institutions.

Table 7. Coevolutionary Processes and their Explanatory Power (Continued).

From the above we can establish the four specific processes as coevolutionary, and it also shows that they play an important role in explaining innovation and entrepreneurial growth in the deep crisis context analyzed in the present research.

In terms of management, i.e., purposeful acts of goal formulation, implementation, evaluation and modification of goals (Van de Ven & Pool, 1995), the 'resource control' integrated path developed in the previous chapter is underpinned by coevolutionary theory. As such, this path to innovation and entrepreneurial activity in a deep crisis context contributes to coevolutionary theory as an integrated path with explanatory power of how to achieve specific outcomes in terms of vehicles and mindsets for innovation.

Institutional Theory

Among the institutional explanations of the Greek failure identified in the literature, the research provided evidence of all:

- Concerning *extractive institutions* (institutions through which a small group of individuals do their best to exploit the rest of the population), this applied strongly in Greece during the crisis, as formal institutions became the symbol for extracting incomes and wealth from the Greek people (one subset) to benefit the loan-givers (a different

subset). It significantly augmented political contempt, as politicians were held responsible for the mismanagement of the economy and seen as a subset having exploited the Greek people for decades.

- Concerning *resistance to reforms*, the crisis indeed caused some shake-up in the consistent and strong resistance to virtually any reform experienced in the decades before its outbreak. Nevertheless, reforms kept lagging and targets remained largely unmet. This lack of effectiveness of formal institutions to implement reforms was reinforced by the informal institution of political contempt resulting in a vicious circle of stalemate, especially of reforms that could have eased the burden on entrepreneurship, innovation, self-employment and vocational public education.
- Concerning *institutional deficit*, (lack of efficient institutions necessary for growth) interviewees referred to weaknesses of both formal and informal institutions. Not only are formal institutions in support of innovation and entrepreneurship missing, the formal institutions an entrepreneur has to encounter are at the best ill-adopted, at the worst hostile to the needs of business development.

Besides the obvious weaknesses of formal institutions, interviewees also frequently referred to the lack of business culture in society as an informal institutional problem. A product of coevolution with formal institutions, including the Greek family, the education system, and the business ecosystem, political leaders and other social actors have never before set as priority the creation of an entrepreneurial environment. A trend can be identified, of higher acceptance of entrepreneurship as possible career path, but it remains to be seen, on the horizon of at least one more decade, if this will entail a true shift in the informal institution of a public sector or high-status profession career model in the broad layers of society.

Parallel to coevolution, institutions were thus found to also have a strong explanatory power of the ability and willingness to innovate and engage in entrepreneurial activity in the crisis context. Going back to the foundational claims concerning institutions and entrepreneurship, identified in the literature review, there was strong evidence of the interaction of institutions with individuals and organizations, and the signalling emitted by institutions and received, unfortunately mostly for bad, by innovators and entrepreneurs. Moreover, both formal and informal institutions mostly constrained innovation activity, and in the absence of their ideal

role of reducing uncertainty and transaction costs, many innovators were developing compensatory institutions.

This was reflected in the 'compensatory institutions' integrated path, which confirmed the need for innovators to create compensations for the imperfections in existing institutions. The data confirmed the characteristics of Greece as a country with low social control on economic activity through informal institutions and higher friction created by formal institutions In such contexts, managers, entrepreneurs and innovators need to create their own structures of stability and their own playbooks of operations. In order to create innovation momentum in the deep crisis context, a pro-active stance was adopted not only to building the core innovation offering and/or an innovative business model, but equally importantly to creating the conditions around the business that compensate for absence and dysfunctions of institutions. Thus, the results expand the compensatory institutions theory to also contain the creative building of conditions favouring innovation and not only rule-bending activities to compensate for failed institutions.

Innovation Systems Theory

Concerning *actors and networks*, the research identified processes of selection and retention where the large variation in terms of support initiatives and 'wannabe' entrepreneurs that took place in the early ears of the crisis has gone through a painful but necessary process of consolidation. This has resulted in actors with a qualitative level that enables them to sustain and grow their business, in the case of companies, and institutionalize and enrich their activities in the case of support initiatives.

In the latter case, indicators of the quality of support services provided include:

- Continuous expansion of mentoring networks coupled with a careful assessment of both new and existing mentors,
- Formal collaborations with universities to ensure a scientific underpinning and relevance of activities provided,
- Continuous expansion of funding and sponsoring entities coupled with a careful evaluation and strict audit of both new and existing funding partners, and
- Expanded collaborations with successful entrepreneurs and successful larger businesses, again coupled with a careful evaluation process.

High quality of *actors* leads to high quality nodes in innovation networks. Then, the quality of the *links* is the next crucial step for an innovation system to function effectively. Here, the research contributes with the identification of a loosely coupled network based on local social structures. The ties are partly relational, partly based on complementarity of each individual's profile, interest and intention. This creates a stable base from which individuals in the network can migrate between different activities and interventions depending on the needs of both support players and acting entrepreneurs. We further saw how this tie structure finally enables high quality *interactions* leading to steadily increased efficiency and effectiveness of the network in its support for innovation and entrepreneurship. A final factor important to weigh in for the continuously high performance of the network is that the latter needs inflow of new actors and continuous monitoring of the quality and dynamics of the actors, ties and interactions to avoid a potential problem of closed culture and sameness in the support provided to entrepreneurs and innovators with different needs.

The above findings answer to the call in the literature to open up the black box of components and relationships in innovation systems, by specifying elements related to actors, links and interactions that influence the quality on networks in innovation systems.

The findings also highlight the coevolution between actors, links and interactions; the actions and behaviors of some players will have effects on the actions and behaviors of other, and this is the driving force behind the selection and retention processes in the innovation system.

Further, the great importance of *fit* between support initiatives and the reality of the 'objects' of the support, i.e., innovators and entrepreneurs, was evidenced in the research, in particular due to the specificities of the deep crisis context. We found that the notion of fit is partly *static* when concerns the definition of support initiatives based on a specific situational and chronological context at hand (as is). It is also partly *anticipative* as when it aims at creating the impetus and conditions for envisioned new system constituents, which will materialize through specific new initiatives (to become).

Finally, *alignment* of support initiatives with the components (actors, links and interactions) of the innovation system is crucial in order to potentially enhance innovation in the spatial and/or functional area in question. Compared to the partially static and partially anticipative notion of fit, the notion of alignment is dynamic in that it refers to how the support initiative enables the supported entity to coevolve with its environment and actually reach the anticipated outcome or transformation (Gkotsi Koroni & Soderquist, 2017).

Innovation and Entrepreneurship Policy Theory

There is a strong interdependence between innovation systems characteristics and performance on the one hand, and policy on the other. Pro-business market reforms are almost anonymously advanced as a panacea for enhancing innovation performance and entrepreneurial development (e.g., Allard et al, 2012).

The empirical data in the present research also almost unanimously support this standpoint, calling for clear policy grounded in the real needs of innovators and entrepreneurs. Virtually all interviewees expressed a longstanding discontent with policy, and that policy had further deteriorated during the crisis. Blurred and piecemeal policy initiatives gave rise to the category 'Pattern-less Mosaic of Policy Initiatives', which represents the fact that policy initiatives were not lacking, but they remain disconnected, contradictory and, what many interviewees referred to as the worst characteristic, unrealistic and overly bureaucratic to benefit from.

A first contribution to policy theory is that innovation and entrepreneurship policies should be interconnected and developed jointly. Using the integrated model of innovation and entrepreneurship policy of Lindholm Dahlstrand & Stevenson (2010), identified in the literature review, proved to fit very well with the aspirations of innovators and entrepreneurs. Both informants in companies and support structures emphasized that the crisis should be used by policy-makers as an opportunity to 're-boot' policy and build an integrated framework starting off in the simultaneous recognition of the systemic nature of innovation, where the latter needs entrepreneurs as catalysts transforming inventions and new ideas into products, services and processes that meet unmet market or societal needs. Hence, science, innovation and entrepreneurship policy should go hand-in-hand.

A second contribution to policy theory is the confirmation that pro-market reforms will have little effect if the political environment remains unstable and institutional quality remains poor (Allard et al, 2012). Leaning on the findings related to coevolution and institutions, policy initiatives developed in isolation will have little or no effect. Coevolutionary theory tells us that policy should aim at solving the institutional shortcomings that make it difficult for innovators and entrepreneurs to perform effectively, before there is any meaning of launching piece-meal initiatives that, as confirmed in the research, often end up as useless or even counter-productive.

9.2 Managerial Contributions

At the level of managerial implications, this doctoral thesis makes a significant contribution through the multi-faceted exploratory research into the factors associated with successfully innovation and engaging in entrepreneurial activity during the crisis. In this context, the strategic decisions made, and the structural and organizational choices implemented by the studied companies to adapt, protect themselves and even exploit opportunities from the crisis to achieve their goals, were thoroughly explored.

Thus, in this difficult period of social and economic crisis experienced by the Greek society, where almost all businesses suffered the negative consequences, some of them managed to respond and adapt to the new conditions imposed by the market and be able to face the competition. These successful businesses **took a proactive stance** when they realized that the crisis was approaching. They made specific moves to compensate for the difficulties. The common point among established firms and start-ups was that they had **put innovation at the top of their agenda**, exploited the resources offered and aimed at continually exploring new paths, with innovation as a key component of their culture; what we labeled as 'innovation stamina'.

Depending on the nature of the companies studied, it was found that the established ones used innovation, which already has been traditionally applied, but also some of these firms **renewed and redirected their activities in an innovative way**, as to have another comparative advantage. Indeed, due to their capabilities and resources, some have been able to become local technology leaders in their field, both in product or service technology, as also in process technology. Process innovation, initially engaged for efficiency and cost reduction reasons, was found to also enable enhanced product or service innovation; what we labelled 'process innovation-enabled product innovation'.

In the case of new businesses, they have sought to offset the pathogenesis of the financial crisis by building their own financial rationale. They created the right conditions and shielded their business, thereby **compensating for the absence of entrepreneurship support policies and the malfunctions** caused by the violent fiscal adjustment that affected the entire spectrum of the economy. Thus, they attempted to take countervailing measures, including establishing their headquarters in countries with stable and favorable institutional conditions, operating and investing in Greece at the same time.

Moreover, in order to bridge the gaps, some firms have developed a **new business and productive model**, adapted to the requirements created by the crisis. They modified their strategic choices, setting specific goals. They were aware that their business plan should be flexible, given the high volatility of the market, where uncertainty was the only sure thing. They have therefore focused on coordinating internal and external processes, so that it was possible to determine how the organization interacts with its partners, distribution channels and customers.

So they innovated at the business model level, offering their customers value proposition in a different way. The concerted effort from early on to invest in an innovative business model has helped many to rise to the top of their industries very quickly. The **flexible innovative business models** they created gave them the opportunity to reconfigure their position and to change lines if needed. In this way, they were able to stay ahead of the competition and adapt to the new market conditions. After all, innovation at the business model level is the key to sustainable innovation and hence to the viability of a business.

The study of these companies also revealed their commitment to **the introduction and application of new technologies**. They focused on technology, both process and product. This was seen as an important strategic choice for both the established companies and the startups. So they invested in process technologies that allowed them to benefit from productivity, cost and efficiency.

In addition, the delay in adopting and developing new technology by businesses in Greece in general, has led some of the companies studied to **seize the opportunity and be the leader locally in technology**. Thus, through 'local tech leadership' they focused on developing process technology capability and then promoted this knowledge internally or to other companies, as a less expensive alternative than to buy technology from abroad.

We identified several cases where companies **developed a new product line and then used this technology for a greater variety of products**. Indeed, some of them were able to establish themselves in markets that already had strong experience in the respective sectors, offsetting the distortions created by the crisis. From a coevolutionary perspective, they linked technology to the social dimension as an inevitable factor in the context of the crisis. With this logic in mind, they set the goal of their development agenda to **produce products or services with social value added and affordable prices**.

A very important observation is that the companies studied showed that they had a **strong organizational culture**, which played a crucial role in their favorable growth, as respondents repeatedly emphasized. Their strong organizational culture influenced human resources and played a key role in **building strong relationships within the business, as to ensure security and stability**. Relying on their organizational culture as a pivotal point in this critical time, these companies have shifted their focus to trying to differentiate themselves, innovate, and offer different solutions, as to survive and thrive in the difficult conditions.

This **proper preparation** has helped businesses to anticipate the effects of the crisis, and flexibly build more efficient organization than their competitors, thus gaining a comparative advantage. Generally, in times of economic turmoil, the challenges for greater flexibility, continuous analysis and adaptation to the environment require confidence and a deep cultural trust between managers and employees, as well as between employees themselves. This is very important, as the cooperation and commitment of all to overcome the difficulties is strengthened, especially without a significant reduction in staff.

Besides, all the companies studied consider their **human resources as a key component of their success**. One very important parameter that was noticed is that the larger companies had realized, in time, that effective organization and management were not enough to achieve their goals. Thus, they invested heavily in their employees and sought to create a sense of unity and purpose, based on honesty, trust and consistency, which appeared to be more effective for their business despite the difficulties.

In addition, it has been observed that the development of human resources among the established companies studied is an essential element of their operation and culture. They thus **invest systematically in training** through specialized seminars that complement the skills and knowledge of their executives. The common ground among respondents was that with appropriate and continuous training, employees' flexibility and adaptability were increased, helping them learn how to react, respond to change faster and adapt to the new environment. So they considered that training costs are an investment rather than a cost and that this investment returns to the business by increasing its efficiency and competitiveness. And that was more than necessary at this critical time that Greece has been through.

Another important factor that made these companies stand out was the **emphasis they place on customers and on targeted synergies with strategic customers**. They sought to holistically cover customer needs by providing products or services that could meet their

needs and demands arising from the crisis. In doing so, they have optimized their marketing, sales and production strategies, as well as customer service and reward mechanisms. These companies, with the systematic investment in customer relationship management, have gained deep knowledge of their customers, which has contributed to increased sales and of course their profits, even in times of crisis.

In conclusion, the companies surveyed shared innovation at all levels, saw the crisis as an opportunity, took controlled risk and presented innovative products and services. Despite the hostile environment, they envisioned numerous ways to adapt and counter-balance to the new reality and managed to stand out, coming well ahead of the competition and with very good prospects for the future.

To sum up, the research has highlighted a number of critical characteristics of managerial relevance related to innovation and entrepreneurial activity in a deep crisis context. In particular, anticipation, preparation, internal excellence in structure, organization and HR management, and continuous commitment to innovation enabled these companies not only to survive, but even to come out stronger from the crisis. Therefore, given the impact of the financial crisis on the operation and profitability of Greek businesses and the need to find alternative ways forward the strategic, tactical and operational moves made by the studied companies can act as a roadmap for a successful path through a deep systemic crisis.

9.3 Contributions to Support Initiatives and Policy

At the level of policy implications, the research provides several results that could be used as partial inputs to the formulation of policies to set a new ground for innovation and entrepreneurship when Greece is now slowly, but hopefully surely, exiting from the crisis.

The most problematic issue, shared by all interviewees, was that Greece is characterized by a **deeply politicized state mechanism** and that any government change provokes significant modifications in the institutions, creating discontinuities in decision-making and delays in their implementation. This problem is so well known, so much debated and so long-lasting that it has become a pathogenesis. Because it is self-reinforcing through political instability and strong polarization, it is even more difficult to disrupt. Based on the research, the only relevant suggestion seems to be to **de-couple innovation and entrepreneurship policy from the state-mechanism, and rely on compensatory institutions**, such as those private or semi-private support initiatives that have emerged during the crisis.

Resulting from the politization are the inefficiency and still escalating bureaucracy in the public administration. Each successive political leadership, and this does not necessarily means change of government, but can be related to a change of cabinet ministers, leads to discontinuity. And during the crisis years, 2009 – 2018, Greece saw eight Minsters of Finance, and eleven Ministers of Development pass, under five Prime Ministers. It goes without saying that under such conditions, any reform being launched is extremely difficult to complete, which was one of the major problems emphasized by interviewees. All interviewees also stated that frequent changes in legislation, retrospective amendments to laws, unclear, contradictory or inadequate tax regulations, and weak regulatory systems create rigidities and difficulties on the one hand, and uncertainty on the other with respect to any development of innovation and entrepreneurship.

Hence, an important policy implication is a **hands-off approach**, focusing on the causes of uncertainty for innovation, such as discontinuity and poor institutional quality, and leaving the effects, i.e., targeted innovation and entrepreneurship support, in the hands of players with a proven record of delivering results, such as private or semi-private support organizations. Their role could be upgraded to canalize funds between, for example, the European Union and innovators. These support organizations, which of course need to be assessed, should **operate without any intervention of any politically controlled entity**. To ensure transparency and meritocracy, an umbrella agency, mandated by government, but not

government controlled, like for example the Swedish innovation agency Vinnova[68], could be founded.

A more stable institutional environment is also crucial for the **implementation of long-term investment plans** and the attraction of foreign investments. The latter must not only be at the top of the government's agenda, as has often been mentioned, but also an un-politicized mechanism must coordinate the efforts, as to implement the measures taken by each government in this direction. All interviewees urgently requested simple and consistent institutions and rules.

Data also pointed to the need for **modernization and simplification of legislation**, in order to avoid the ambiguity and complexity of laws, which seriously undermine the validity and reliability of the legal system of the country. The negative impact on the efficiency of government services affects directly the daily lives of citizens and business activities, leading Greece to a vicious cycle of inefficiencies with many adverse effects.

Tax reforms is another obvious priority, indeed at the top of the agenda of the new government that took office in July 2019. It all boils down, again, to the **need for stability and an end of the discontinuous, pattern-less measures** that partly were due to the imposed measures by the credit providers, but also much self-provoked by the successive government's fiscal measures. The damage caused by the capital controls that took effect in 2015, of course only qualitatively assessed in this research, is profound. It led to a general anxiety in society, created huge problems for all businesses, caused a decline in exports and a reduction of billions of Euros in bank deposits. It should be noted, however, that shortly before the final text of the dissertation, specifically in September 2019, the end of capital controls was announced by the new government, finally ending four years of additional difficulties for businesses and not only.

In a longer-term perspective, policy-makers and innovation support structures must **address the invention – innovation gap** that is very strong in the country. It seems to be of utmost importance to make the comparatively small in volume but high in quality basic research conducted in Greece reach outside the doors of the, mostly state-funded and controlled, research labs of the country. Riding on the wave of legitimation of entrepreneurship **the status of innovation compared to invention must be upgraded**. If invention (turning

[68] Jacob, M. (2006). Utilization of social science knowledge in science policy: Systems of Innovation, Triple Helix and VINNOVA. *Social Science Information*, *45*(3), 431-462.

money into ideas[69]) is accepted and full of status, but innovation (turning ideas into money[70]) is not, there is an obvious problem in making innovation a substantial part of the Greek economy and its growth out of the crisis. There are many prerequisites for the creation, dissemination and conversion of knowledge into innovation for business use. Government indeed must **continue to support and fund basic research**, but at the same time private entities must be supported to be able to take research outputs further and transform them into valuable new offerings for adopters[71].

Related to this, at the level of startups, their role in transforming research outputs into innovations is often instrumental. As such interviewees requested **more holistic and needs-driven support initiatives, focusing on viability and self-reliance of the startup**. That most support programs are too much invention-driven and too little innovation-driven, was a common opinion.

In this context, Greek higher education institutions must respond to the challenges by developing links with the market, as well as **partnerships between universities, research centers and businesses**. A dynamic and qualitative dimension must be given to the country's development process and there must be a correspondence between the skills developed by employees and the skills that businesses are looking for, while adapting university curricula to the new requirements. Also, during the interviews, the need for a more coordinated and meaningful effort and a **national strategy for lifelong learning** were considered necessary in order to tackle unemployment due to skewed skills profiles of many, even young, people, with respect to the needs of the economy.

Both the secondary and primary data sources have confirmed that, due to the lack of a coherent national innovation policy and a united body of innovation support initiatives, the actors and initiatives in Greece are highly fragmented. An effort to remove barriers and facilitate innovation through a coherent plan of measures could lay the foundations of a research - innovation - entrepreneurship ecosystem as to create a new viable and competitive economic model. There has been a process of selection and retention of support initiatives, which lays a good ground for such a systematic effort.

[69] After Larry Hirst, former Chairman, IBM Europe at the Lisbon Council's 2010 Innovation Summit.

[70] After Larry Hirst, op cit.

[71] "Innovation is the creation of a new viable offering" (Keely et al, 2013, p. 5),

What Greece needs is the proper institutional framework to ensure the necessary oversight, but without an overly interventionist culture. The country needs well-structured modern public services, a stable regulatory environment, elimination of corruption and boost of the investment incentives. Likewise, well-coordinated public policies and initiatives with a predictable economic environment in the medium term, concrete measures rather than fragmented moves and conflicting arrangements.

The recommendations and suggestions of those involved in the research could be a source of information for good practices as well as help policy makers developing an effective and flexible framework for entrepreneurship and innovation in Greece.

10 GENERAL CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

Although the financial cycles, with booms and crises successively unfolding, dramatically impacting the economies of most countries, there is very little research done that relates crises conditions to innovation (Filippetti and Archibugi, 2011). Thus, even though Schumpeter had already emphasized the key role of innovation in business cycles (e.g., Schumpeter, 1934; 1942), the topic is still largely unexplored.

The present research contributes to this emerging field by proposing an integrated model and distinctive paths of how to innovate and engage in entrepreneurial activity in a deep crisis context, using qualitative data from a range of Greek companies of various size and operating in different sectors, and from support initiatives such as incubators, venture funding and high-impact entrepreneurship support organizations.

The research is underpinned by a multi-theory framework guiding the data collection and allowing to relate the emerging findings with their theoretical roots. As discussed in the previous chapter, a range of theoretical, managerial and policy contributions can be developed from the research.

In this concluding chapter, before discussing the limitations and future research directions, we also relate the main findings to the emerging topic of innovation in a crisis context by briefly discussing them in relation to a few recent studies on the topic, published most recently in peer-reviewed academic journals. Some central findings in recent studies include:

- *Innovation persistence emerges in times of crisis* (Antonioli & Montresor, 2019). The present research comes to a similar conclusion, and we advance innovation stamina, process innovation and product ownership as important elements giving further precision to this claim. Antonioli & Montesor identified policy initiatives towards SMEs as playing a supportive role, something that was absent in the context studied in the present research. The present research also exemplifies that managers should consider that persisting in innovation is interlinked with other strategic choices in times of crisis, what (Antonioli & Montresor, 2019) propose in their discussion.
- *Maintaining strong internal and external knowledge capabilities enables firms to mitigate the effects of the financial crisis* (Zouaghi et al, 2018). In the present research, this was exemplified by the ‘resource control’ integrated path where ownership of technology dynamic resource control and leveraging of contextual innovation dynamics played central roles.

- *Institutional characteristics of innovation systems (effective vs. non effective institutions) largely influence innovation in a crisis context* (Nguyen & Duong, 2019). The authors find empirical evidence for the heterogeneity of the effects of the crisis across Europe in countries with effective (e.g., Finland and Austria), vs ineffective (e.g., Greece and Lithuania) institutions – both formal and informal. The present research exemplifies how and why this happens in the Greek context, and also proposes the 'compensatory institutions' integrated path as a strategic and managerial response to the institutional fallacies.
- *Maximizing adaptation to the crisis by 'commitment to expansion' ensures survivability in contrast to implementing cuts-cutting actions* (Martin- Rios & Pasamar, 2018). The authors draw these conclusions from research into 97 leading service firms across Europe. The present research reached similar conclusions from the qualitative cross sectoral study we conducted and exemplifies how commitment to expansion can be done, essentially through the 'resource control' integrated path.

From the above, obviously not comprehensive, but still indicative review of very recent papers focusing on innovation and entrepreneurship in a crisis context, the present research is well aligned and allows to exemplify and delve deeper into the 'whats' and 'hows' of the topic under investigation.

10.1 Limitations

This PhD, although carefully designed, cannot cover all facets of the studied subject. Moreover, each research approach, quantitative and qualitative respectively, has its inherent weaknesses. In this section, we identify the main limitations and discuss them, in order to pave the way for future research.

As in all qualitative research, an inherent limitation is that the results cannot be generalized with the same certainty as in quantitative research, where statistical significance and mathematically modeled relationships can be established. Moreover, qualitative results cannot be generalized to a broader population. These limitations are countered by making analytical generalizations, i.e., relating case and interview findings to an existing or emerging theoretical body in order to extend existing theory (Yin 2009) and/or develop new theory

(Strauss & Corbin, 1990). "If two or more cases are shown to support the same theory, replication may be claimed. The empirical results may be considered yet more potent if two or more cases support the same theory but do not support an equally plausible, rival theory" (Yin, 1989, p. 38). Based on this logic, the integrated model for innovation and entrepreneurial activity in a deep crisis context, and the three paths identified within it, constitute a scientific and valid contribution from the present research. Analytical generalization also enables theoretical concepts from the study to be used to develop further theory. In the present research, findings can be generalized to the theoretical discussion of crises conditions and innovation, as discussed above.

Another limitation is that respondents have control over the content of the data and will select, according to their judgement, what they share and what they do not share, and how they share it. Indeed, judgmental data is generally desirable in qualitative research (Yin, 2009) because it enables to identify significant aspects that truly concern and are of importance to the interviewees. However, this also brings a risk of bias in the findings, which is difficult for the researcher to objectively verify. The coding process applied, where common patterns are identified across numerous interviews, reduces the negative impact of such bias. This problem was also limited by applying the principle of theoretical saturation (Glaser & Strauss, 1967). When used in interviews and cross-interview analysis, it consists of ceasing interviews within a category of informants, or ending repetitive interviews with the same individual, when the research judges that no significant new information can be extracted from further data analysis on the categories identified.

Moreover, the researcher may have a bias in the understanding of the observations and the way they are interpreted since personal experience and knowledge influence the observations and conclusions related to the research problem. Again, this limitation is countered by the methodology applied, in particular the cross-interview analysis, triangulation of data and retention of common themes. In addition, a few interviews were blind coded by the researcher and the supervisor independently, in order to develop the researcher's analysis techniques and sensitivity regarding data (Strauss & Corbin, 1990) and avoid biased analysis as far as possible.

Another limitation arises from the choice of the research context, which refers exclusively to Greece. How companies react to a crisis certainly will vary from country to country, as will the causes of a crisis and how to deal with them on the part of support activities, government intervention and policy. Thus, a corresponding investigation would probably produce

different results if it had taken place in another country. However, the results tell their tale in relation to the specific context. And as causalities are made explicit the research provides a significant example of how innovation and entrepreneurship can come about in this context. Of course, comparing and even testing parts of the proposed framework in different national contexts would be of great interest.

Another limitation was the difficulty in finding companies and executives to interview. Smaller sample sizes of qualitative research can be an advantage, but they can also be a disadvantage because a small sample is not always representative of a demographic population, even if there are deep similarities between the entities and individuals involved. As discussed above, the method of theoretical saturation was applied satisfactory. Still, there are many companies and young firms in the market that potentially would have been very interesting to include in the sample, but access was not possible to obtain. There were also some difficulties related to cancellations from interviewees and repetitive reschedulings, which often delayed the data collection efforts. Some interviewees also declined a second meeting, limiting the depth of the information collected. When specific findings of the present research are to be published, it might thus be necessary to complement the current data with inputs from a few additional data sources, to reach more in-depth insights on particular issues.

The research has evolved gradually, starting from pilot interviews in 2014, through expert interviews, case studies, observations and secondary data, to final interviews early 2019. This means that the crisis context has evolved over this time span, which mostly was an advantage, as evolving context and reactions to this context could be observed. However, this is also a limitation in the sense that some data points collected early vs. late in the research process might contain conflicting evidence as they refer to a context that has evolved.

A final limitation is that while the researcher maintains all interview records, the names and identities of the respondents had to be kept confidential, in accordance with established practice in qualitative research (e.g., Dattée et al, 2018; Ramus et al, 2017; Wright & Nyberg, 2017) and the strong desire of virtually all interviewees. Therefore, most statements quoted cannot be publicly linked to specific identifiers or roles, let alone to specific individuals.

10.2 Future Research

This dissertation contributes to the emerging area of research investigating the relationships between innovation, entrepreneurship and economic crisis in Greece, which was the European country hardest hit by the global financial crisis that bust out in 2008.

Related to some of the limitations discussed above, a number of future research directions would be interesting to pursue, including:

- Identifying subsets of variables in the integrated model, and analyze them from a quantitative perspective, applying methods that, for example, could analyze the mediating and/or moderating effects of intervening conditions (e.g., Leverage Crisis-Induced Conditions, Engage with Innovation Institutions, and Leverage Contextual Innovation Dynamics in the model) on different innovation outcomes,
- Operationalizing some of the more intriguing conceptual categories generated in the research (e.g., 'Organic Entrepreneurial Growth', 'Opportunities from Frugality', 'Innovation Stamina', 'Financial Dry-out'. 'Network Dynamics', 'Systemic Innovation Problem', and 'Cultural Lock-In') in view of testing them in a quantitative and modelling-based research approach,
- Testing the conclusions, model and paths developed from the research in other crisis contexts by systematically comparing the findings with studies done in other countries, possibly through a meta-research approach.

These possible research directions would also involve the collection of data from surveys of quantitatively large samples.

Specialized research on larger samples of startups, SMEs and larger companies would allow for a much more precise identification of the differences among these types of companies in the way they approached innovation during the crisis than what was possible in the present study.

In particular, SMEs are very important to understand better as they are the backbone of the Greek economy, and many of the other European economies hardest hit by the crisis. It is also at the level of SMEs and startups that relevant policy is most important.

Similarly, studies analyzing specifically different business sectors, for example high-tech vs. low-tech, product-based vs. service-based would also allow for more precise findings to be developed.

Another area for future research, preferably also qualitative, would be to investigate in more detail how the crisis affected innovation efforts at both the policy and business level. This could also be linked to the extent to which the innovation capacity of companies and of the country has been affected during the crisis.

There is also a need for further development and exploration of innovative solutions to the mechanisms governing new technologies and telecommunications. Further research on businesses providing digital communication and content services is very important. It would be a good idea to look at innovative communication services and how they can help accelerate Greece's digital transformation. It would also be interesting to explore whether incorporating subversive and innovative services and technologies into a company's business model and its operations could help the firm to remain competitive in critical times.

The future research discussed above will provide additional data on the questions that have been asked in the present research, and also allow for formulating and addressing several additional questions, in order to advance further the knowledge about innovation and entrepreneurship during crises, and additionally verify the findings of this research. The field is particularly important to bodies such as governments, educational institutions, research centers, scientists, and businesses, but so far it has not been adequately explored, not only in Greece, but also globally.

A final remarque is that research delving into the characteristics and implications of a deep crisis context, on innovation or any other topic, can be done only in real-time during such a crisis, or *ex-post* relying on retrospective data. The present research had the privilege of unfolding in parallel with the crisis and thus reflects, in its modest way, what actually happened and how the crisis was actually perceived by the informants constituting its empirical base.

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12 APPENDICES

12.1 Interview Guide for Startups

1 Που οφείλεται η επιτυχία του μοντέλου της εταιρείας σας και ποιο κενό κάλυψε στην αγορά;

2 Ποιο πιστεύετε ότι ήταν το καθοριστικό στοιχείο για την επιτυχία σας;

3 Τι είναι αυτό που σας ξεχώρισε από τον ανταγωνισμό;

4 Πώς μπορεί μια ελληνική εταιρεία να μεγαλώνει ακόμη και εν μέσω οικονομικής κρίσης;

5 Πως, ως επιχείρηση, μπορέσατε να αντισταθμίσετε τις αδυναμίες και τις ελλείψεις, που υπάρχουν στην ελληνική πραγματικότητα (failing institutions and institutional frameworks)

6 Τι δυσκολίες συναντήσατε μέχρι τώρα, καθότι ήδη από τα πρώτα σας βήματα ήρθατε αντιμέτωποι με την κρίση ;

7 Πως μπορέσατε να προσελκύσετε επενδύσεις σε αυτήν την δύσκολη περίοδο;

8 Πώς μπορεί μια ελληνική εταιρεία να μεγαλώνει ακόμη και εν μέσω οικονομικής κρίσης;

9 Σκεφτόσαστε να επεκταθείτε στο εξωτερικό; (αν ναι τότε ποιο είναι το κλειδί της επέκτασής σας)

10 Στην Ελλάδα το επιχειρηματικό πλαίσιο δεν ενθαρρύνει τις επενδύσεις. Συμμερίζεστε αυτή την άποψη; Τι κατά την γνώμη σας πρέπει να αλλάξει για να προσελκύσουμε επενδύσεις και κυρίως από το εξωτερικό;

11 Ποιοι παράγοντες μπορούν να βοηθήσουν μια επιχείρηση να επιβιώσει ή ακόμα και να αναπτυχθεί μέσα στην κρίση;

12 Πως θα μπορούσε να βοηθήσει το κράτος αποτελεσματικότερα την επιχειρηματικότητα την δύσκολη αυτή περίοδο που διανύουμε;

13 Κατά την τελευταία δεκαετία έλαβε η επιχείρηση οποιαδήποτε δημόσια οικονομική υποστήριξη για καινοτομικές δραστηριότητες, μέσω φορολογικών κινήτρων ή επιδοτούμενων δανείων, επιχορηγήσεων, ΕΣΠΑ, ευρωπαϊκών προγραμμάτων;

14 Αν ναι, πώς αξιολογείτε την εν λόγω υποστήριξη;

15 Μπορεί η οικονομική κρίση να δημιουργήσει επιχειρηματική κουλτούρα στην Ελλάδα;

16 Ποια είναι τα ισχυρότερα εμπόδια που δυσχεραίνουν το επιχειρείν στην Ελλάδα της κρίσης;

17 Τι ρόλο παίζει η τεχνολογία στην εταιρία σας και ποιου είδους τεχνολογίες χρησιμοποιείτε που είναι βασικοί παράγοντες επιτυχίας; (technology factors & knowhow που είναι απαραίτητα)

18 Τελικά δημιουργεί η κρίση ευκαιρίες;

12.2 Interview Guide for Established Firms

1 Πώς η δραστηριότητα στην καινοτομία και η επιχειρηματική σκέψη έχουν επιτρέψει στην εταιρεία σας να μεγαλώσει και να αναπτυχθεί κατά τη διάρκεια της κρίσης;

2 Πως διαφορετικοί παράγοντες στο θεσμικό πλαίσιο επηρέασαν την επιχείρησή σας από την άποψη της καινοτομίας και της ανάπτυξης;

3 Πως, ως επιχείρηση, μπορέσατε να αντισταθμίσετε τις αδυναμίες και τις ελλείψεις που υπάρχουν στην ελληνική πραγματικότητα;

4 Κατά πόσον έχει επηρεάσει την απόδοση και την αναπτυξιακή πορεία της εταιρείας σας η υφιστάμενη οικονομική κρίση και σε ποιες κινήσεις έχετε προβεί για να «θωρακίσετε» την επιχείρησή σας;

5 Πώς επηρεάστηκε η θέση σας στην ελληνική και τη διεθνή αγορά από την οικονομική κρίση;

6 Πως μπορεί μια επιχείρηση να γίνει ελκυστική όχι μόνο στην εγχώρια αλλά και στην παγκόσμια αγορά ξεπερνώντας τις δυσκολίες, που έχουν δημιουργηθεί στη διάρκεια της παρατεταμένης οικονομικής κρίσης;

7 Πως καταφέρνετε να έχετε αύξηση ή διατήρηση των κερδών σας ακόμη και σε αυτή την περίοδο βαθιάς κρίσης;

8 Κατά την τριετία 2014-2017 έλαβε η επιχείρηση οποιαδήποτε δημόσια οικονομική υποστήριξη για καινοτομικές δραστηριότητες μέσω φορολογικών κινήτρων ή επιδοτούμενων δανείων, επιχορηγήσεων, ΕΣΠΑ, ευρωπαϊκών προγραμμάτων;

9 Αν ναι, πώς αξιολογείτε την εν λόγω υποστήριξη;

10 Η εταιρεία σας έχει σαν βασικούς στόχους την άριστη ποιότητα των προϊόντων, την μέγιστη ικανοποίηση του καταναλωτή και την συνεχή καινοτομία. Πόσο έχει συντελέσει η καινοτομία στην επιτυχία της επιχείρησής σας;

11 Η εταιρεία σας έχει σαν προτεραιότητα, σύμφωνα με τη φιλοσοφία που την διέπει, την κατανόηση των αναγκών του πελάτη, αλλά και των αλλαγών της αγοράς. Πόσο σημαντικό είναι αυτό στην ανάδειξη καινοτομιών;

12 Τι ρόλο παίζει η ‘’παράδοση’’ στην επιχείρηση σας; Θεωρείτε πως μέσω της ‘’παράδοσης’’ μπορείτε τελικά να καινοτομήσετε;

13 Σε ποιους τομείς καινοτομίας και Επιχειρηματικότητας επενδύετε τακτικά;

14 Κατά το διάστημα της τριετίας 2014 έως και 2017 η επιχείρησή σας εισήγαγε νέα ή βελτιωμένα προϊόντα;

15 Κατά το ίδιο διάστημα εισαγάγατε νέες ή βελτιωμένες μεθόδους παραγωγής προϊόντων ή διαδικασίας ή διανομής αγαθών;

16 Οι καινοτομίες αυτές αναπτύχθηκαν από την ίδια την επιχείρηση ή σε συνεργασία με άλλες συναφείς επιχειρήσεις;

17 Για τις καινοτομίες αυτές, ποιοι ήταν οι πλέον σημαντικοί παράγοντες επιτυχίας και ποια ήταν τα πλέον σημαντικά προβλήματα σχετικά με το οικονομικό περιβάλλον;

18 Τι ρόλο παίζουν οι νέες τεχνολογίες στη διαμόρφωση του επιχειρηματικού σας μοντέλου και στον τρόπο με τον οποίο διεξάγετε την επιχειρηματική σας δραστηριότητα;

19 Πώς διαχειρίζεστε το ανθρώπινο δυναμικό για την μέγιστη συμβολή του στη καινοτομία;

20 Ποια πιστεύετε πως είναι τα ιδιαίτερα χαρακτηριστικά του επιχειρηματικού σας μοντέλου, που συντελούν στην επιτυχία της επιχείρησής σας;

21 Πώς έχει εξελιχθεί η εξαγωγική σας δραστηριότητα στην περίοδο της κρίσης;

22 Τι είδους αλλαγές προβλέπετε για τα προϊόντα σας ώστε αυτά να προσαρμόζονται στις μεταβαλλόμενες απαιτήσεις της αγοράς;

12.3 Interview Guide for Incubators

1. Ποιος είναι ο βασικός στόχος της θερμοκοιτίδας;
2. Πως είχατε την έμπνευση να δημιουργήσετε τη θερμοκοιτίδα;
3. Έχετε λάβει βοήθεια από την πολιτεία;
4. Με ποια κριτήρια επιλέγονται οι ομάδες;
5. Ποια είναι τα στάδια λειτουργίας της θερμοκοιτίδας;
6. Ποιες είναι οι εξειδικευμένες συμβουλευτικές υπηρεσίες που παρέχει η θερμοκοιτίδα;
7. Με τι κριτήρια επιλέγονται οι μέντορες;
8. Κάθε πότε έρχονται σε επαφή με τον υπεύθυνο παρακολούθησης, τον εξειδικευμένο μέντορα και τους εξειδικευμένους συμβούλους;
9. Ποια είναι τα πιο σημαντικά χαρακτηριστικά της start-up σας, και ποια της διαδικασίας που ακολουθήσατε για την ανάπτυξή της, προκειμένου να πετύχει στην περίοδο της κρίσης;
10. Εκτός από προβλήματα εν μέσω οικονομικής κρίσης, εμφανίστηκαν και κάποιες ευκαιρίες; Αν ναι, ποιες και πως εκμεταλλευτήκατε αυτές τις ευκαιρίες;
11. Ποιες τεχνολογίες παίζουν ρόλο στη start-up σας, τόσο στο προϊόν / στην υπηρεσία, όσο και σαν βοηθητικές τεχνολογίες υποστήριξης των προσφερομένων προϊόντων/υπηρεσιών; Περιγράψτε τον ρόλο της τεχνολογίας στην επιχειρηματική σας ιδέα και στο επιχειρηματικό σας μοντέλο.
12. Πως, οι start-ups μπορούν να αντισταθμίσουν τις αδυναμίες, τις ελλείψεις και τα προβλήματα που υπάρχουν στην ελληνική πραγματικότητα, δηλαδή
    - στα θεσμικά πλαίσια / στους θεσμούς, π.χ. νομικό πλαίσιο, φορολογικό πλαίσιο, γραφειοκρατία, δομικά προβλήματα, (structural problems), τραπεζικό-χρηματοοικονομικό πλαίσιο;
    - στις αγορές, π.χ. αρνητική ανάπτυξη/στασιμότητα, αλλά και έλλειψη κατάλληλων πόρων όπως προμηθευτές και ικανό ανθρώπινο δυναμικό παρά την ανεργία;
    - στην κοινωνία, π.χ., αίσθηση ανασφάλειας, αναταραχές, αυξημένες αντιπαραθέσεις στη κοινωνία, συγκρουόμενα συμφέροντα που έχουν έρθει στο προσκήνιο λόγω της κρίσης, αλλά και όχι μόνο;
13. Ποιες είναι οι δράσεις που έχετε αναλάβει και οι δομές που έχετε κτίσει για να αντιμετωπίσετε ή / και να παρακάμψετε τέτοιες αδυναμίες και τέτοια προβλήματα;
14. Έχουν θεσπιστεί πολλοί θεσμοί σχετικά με την επιχειρηματικότητα. Ποια είναι τα δυνατά και τα αδύναμα σημεία του επιχειρηματικού οικοσυστήματος στην Ελλάδα;
15. Εκτός από τη συμμετοχή σας στη θερμοκοιτίδα, έχετε συμμετάσχει σε άλλες πρωτοβουλίες για υποστήριξη της επιχειρηματικότητας όπως π.χ., Διαγωνισμοί, Δημόσια προγράμματα, Προγράμματα χρηματοδότησης / VC, Πρωτοβουλίες δικτύωσης….; Ποιό / Ποιά; Για 1 ή 2, περιγράψτε συνοπτικά την εμπειρία σας – τα θετικά και αρνητικά που βιώσατε.
16. Ποια τα βασικά πλεονεκτήματα που προσφέρει μια θερμοκοιτίδα και ποια μειονεκτήματα έχει;
17. Ποια είναι η κοινωνική διάσταση και ποια τα οφέλη που προκύπτουν από τη λειτουργία μιας θερμοκοιτίδας;
18. Θεωρείτε αναγκαία την επέκταση του θεσμού των θερμοκοιτίδων σαν αναπτυξιακό εργαλείο πρώτης γραμμής;
19. Ποια είναι τα στρατηγικά οράματα σας;

12.4 Interview Guide for Support Organizations

1 Πως εμφανίζεται το επιχειρηματικό τοπίο στην Ελλάδα του σήμερα;

2 Ποια είναι τα δυνατά και ποια τα αδύνατα σημεία της επιχειρηματικότητας στην Ελλάδα;

3 Ποια είναι τα θετικά και αρνητικά χαρακτηριστικά των επιχειρηματιών;

4 Ποια είναι τα πιο σημαντικά χαρακτηριστικά ενός επιχειρηματία για να τα καταφέρει αυτή την περίοδο κρίσης;

5 Η οικονομική κρίση επηρέασε τους Έλληνες στο να καινοτομήσουν;

6 Εκτός από προβλήματα εν μέσω οικονομικής κρίσης, εμφανίστηκαν και κάποιες ευκαιρίες;

7 Σε ποια ηλικιακή ομάδα εντοπίζεται η πλειοψηφία των επιχειρηματιών;

8 Οι γυναίκες επιχειρηματίες εξακολουθούν να αποτελούν μειοψηφία;

9 Οι σπουδές παίζουν καθοριστικό ρόλο στην ανάπτυξη της επιχειρηματικότητας;

10 Το εκπαιδευτικό σύστημα στην Ελλάδα παρέχει στους φοιτητές τα απαραίτητα εφόδια για να καλύψουν τις ανάγκες των αγορών;

11 Σε τι οφείλεται η μεγάλη ανεργία των νέων;

12 Ο ρυθμός ανάπτυξης των Startup έχει αλλάξει από την προηγούμενη έρευνά σας;

13 Οι εξωστρεφείς επιχειρηματίες, έχουν πιθανότητες (ή δυνατότητες) να ανταγωνιστούν σε διεθνές επίπεδο;

14 Ποια είναι τα εμπόδια που αντιμετωπίζουν οι νέοι επιχειρηματίες;

15 Έχουν ιδρυθεί πολλοί θεσμοί σχετικά με την επιχειρηματικότητα. Αυτό, δείχνει μια αυξανόμενη τάση για επιχειρείν;

16 Υπάρχει διάθεση από την πολιτεία, να υποστηρίξει και να ενδυναμώσει την επιχειρηματικότητα;

17 Τι χρειάζεται να κάνει η πολιτεία για να μετατρέψει το επιχειρηματικό κλίμα;

18 Ποια κίνητρα πρέπει να δοθούν από την πολιτεία προκειμένου να αναπτυχθεί η επιχειρηματικότητα;

19 Ποιες κατά τη γνώμη σας είναι οι κύριες αναπτυξιακές ανάγκες;

20 Πόσο καθοριστική είναι η ενίσχυση της έρευνας της τεχνολογικής ανάπτυξης και της καινοτομίας για την προώθηση της επιχειρηματικότητας;

21 Τι προτεραιότητες θέτουν οι επιχειρήσεις για την επόμενη τριετία;

22 Ποιες συμβουλές θα δίνατε στις επιχειρήσεις που ανταγωνίζονται στο δύσκολο ανταγωνιστικό περιβάλλον;

23 Ο ΟΑΕΔ προσφέρει σύγχρονα προγράμματα για την καταπολέμηση της ανεργίας;

12.5 Interview Guide Cosmote Case

1 Πώς η δραστηριότητα και η επένδυση στην καινοτομία των ευρυζωνικών δικτύων έχουν επιτρέψει στην εταιρεία σας να μεγαλώσει και να αναπτυχθεί κατά τη διάρκεια της κρίσης;

2 Πως, ως επιχείρηση, μπορέσατε να αντισταθμίσετε τις αδυναμίες και τις ελλείψεις, που υπάρχουν στην ελληνική πραγματικότητα;

3 Κατά πόσον έχει επηρεάσει την απόδοση και την αναπτυξιακή πορεία της εταιρείας σας η υφιστάμενη οικονομική κρίση και σε ποιες κινήσεις έχετε προβεί για να «θωρακίσετε» την επιχείρησή σας;

4 Πώς επηρεάστηκε η θέση σας στην ελληνική αγορά και τη διεθνή αγορά από την οικονομική κρίση;

5 Πως καταφέρνετε να έχετε αύξηση των κερδών σας ακόμη και σε αυτή την περίοδο βαθιάς κρίσης;

6 Οι καινοτομίες που εισήγαγε ο όμιλος σχετικά με τις τηλεπικοινωνίες δημιούργησαν έσοδα;

7 Πως μπορέσατε να απεγκλωβιστείτε από τον φαύλο κύκλο της χαμηλής ανταγωνιστικότητας;

8 Ποια ήταν τα αποτελέσματα του λειτουργικού μετασχηματισμού της εταιρείας σας; Υπήρξε ανάκαμψη εσόδων, αυξήθηκαν οι πελάτες, μειώθηκε το κόστος λειτουργίας και το καθαρό χρέος;

9 Τι συνετέλεσε στην επιτυχία του προγράμματος μετασχηματισμού;

10 Επενδύσατε μέσα στην κρίση, σε μια πραγματικά δύσκολη εποχή για την οικονομία, στην ανάπτυξη Δικτύων Νέας Γενιάς. Θεωρείτε ότι ήταν μια σωστή ενέργεια από πλευράς ομίλου; Γιατί;

11 Έχουν γίνει σημαντικές επενδύσεις τα τελευταία χρόνια από την εταιρεία σας για την επέκταση της ευρυζωνικότητας. Θα μπορούσατε να μας αναφέρατε τα ποσά που επενδύθηκαν;

12 Χρειάστηκε να συνεργαστείτε με άλλους φορείς για την υλοποίηση του μεγάλου αυτού έργου;

13 Τι πιστεύετε ότι θα προσφέρει η τεράστια αυτή επένδυση στην οικονομία;

14 Στο business plan σας φαίνεται ότι επενδύετε σε νέες τεχνολογίες και υποδομές για τα επόμενα χρόνια. Θεωρείτε ότι τα πλάνα σας είναι υλοποιήσιμα; Και αν ναι, πιστεύετε ότι θα υπάρξει σημαντική ωφέλεια στην οικονομία της χώρας μας;

15 Σε τι ύψος επενδύσεων προβλέπεται να προχωρήσει ο όμιλος την επόμενη πενταετία, σχετικά με την ευρυζωνικότητα;

16 Πού οι ανταγωνίστριες εταιρείες πλεονεκτούν ή μειονεκτούν σε σχέση με την COSMOTE;

17 Πόσο δύσκολο είναι να αναπτυχθούν αυτές οι νέες τεχνολογίες στην Ελλάδα, λόγω της ιδιαίτερης γεωγραφίας της; (νησιά, βουνά, απομονωμένες περιοχές).

18 Είναι οι τηλεπικοινωνίες βασικός πυλώνας οικονομικής και κοινωνικής ανάπτυξης;

19 Είναι οι τηλεπικοινωνίες σημαντικός παράγοντας για την ανάπτυξη, την προβολή και την εξέλιξη του πολιτισμού μας;

20 Πέρα από την ταχύτητα ποιο ή ποια άλλα πλεονεκτήματα έχει η ευρυζωνικότητα;

21 Η ταχύτερη και αποτελεσματικότερη διείσδυση της ευρυζωνικότητας, για την παροχή καινοτόμων υπηρεσιών και εφαρμογών πόσο βελτιώνει την καθημερινότητα του πολίτη;

22 Ποιος είναι ο ρόλος της καινοτομίας και των τηλεπικοινωνιών ως σημαντικών οικονομικών και αναπτυξιακών εργαλείων για τα επόμενα χρόνια (3-5 και ίσως περαιτέρω);

23 Σε μια τόσο κρίσιμη για τη χώρα μας εποχή όπου κάθε καινοτομία και ανάπτυξη νέων τεχνολογιών μπορεί να τονώσει την οικονομία της, ποια είναι τα οφέλη που θα αποδώσει η ευρεία χρήση της ευρυζωνικότητας;

24 Η ευρυζωνικότητα ποιες καινοτόμες δυνατότητες παρέχει;

25 Οι προηγμένες Τεχνολογίες Πληροφορίας και Επικοινωνιών πως βοηθούν την οικονομία;

26 Βελτιώνεται η ποιότητα ζωής με την ευρυζωνικότητα και με ποιον τρόπο;

27 Με τις νέες αυτές τεχνολογίες διευκολύνονται οι μικρομεσαίες επιχειρήσεις, που αποτελούν την κινητήρια δύναμη ανάπτυξης και καινοτομίας σε όλες τις οικονομίες;

28 Η παγκόσμια οικονομία μετασχηματίζεται με μοχλό τις ψηφιακές τεχνολογίες που δημιουργούν ένα νέο πρότυπο επιχειρηματικής ανάπτυξης. Τι επιδράσεις έχει στους διάφορους κλάδους της οικονομίας, στη λειτουργία του κράτους και της δημόσιας διοίκησης;

29 Με ποιο τρόπο η Ελλάδα πρέπει να διασφαλίσει πρόσβαση όλων των πολιτών σε ένα περιβάλλον με ευρυζωνικές ψηφιακές υπηρεσίες προκειμένου να αναπτυχθεί και να δημιουργήσει μια ανταγωνιστική αγορά υπηρεσιών;

30 Ποιες πολιτικές μπορούν να συνεισφέρουν στην υλοποίηση έργων ανάπτυξης της ευρυζωνικότητας προκειμένου να υπάρξει ανάπτυξη στην οικονομία, στην εκπαίδευση και γενικά στην πρόοδο της κοινωνίας;

31 Με ποιο τρόπο μπορούν να βελτιωθούν ουσιαστικά οι παρεχόμενες υπηρεσίες του κράτους προς τους πολίτες και τις επιχειρήσεις με την εγκατάσταση ευρυζωνικών δικτύων και υποδομών;

32 Η εγκατάσταση ευρυζωνικών υποδομών μπορεί να γεφυρώσει το ψηφιακό χάσμα σε απομακρυσμένες περιοχές δίνοντας πρόσβαση σε μια μεγάλη ποικιλία εξελιγμένων υπηρεσιών;

33 Υπάρχει επαρκής υποστήριξη και ενημέρωση από κρατικούς φορείς στην υιοθέτηση αυτών των τεχνολογικών καινοτομιών;

34 Θεωρείτε ότι η ανάπτυξη αυτών των υποδομών και υπηρεσιών είναι τελικά στρατηγικής σημασίας για την Ελλάδα;

35 Πόσο σημαντική είναι η δυνατότητα παροχής ευρυζωνικής πρόσβασης σε ιδιώτες αλλά και σε όλους τους φορείς δημόσιας και ιδιωτικής ζωής;

36 Στον ψηφιακό χάρτη της Ευρώπης τι θέση κατέχει η Ελλάδα;

37 Ποια είναι τα αίτια της υστέρησης της χώρας μας στον ψηφιακό εκσυγχρονισμό;

38 Ποια μέτρα έχει πάρει η πολιτεία για να ανταποκριθεί στις ανάγκες για ψηφιακή σύγκλιση με την ΕΕ.;

39 Τα έως τώρα κανονιστικά και ρυθμιστικά πλαίσια σχετικά με τις τηλεπικοινωνίες βοήθησαν την εξέλιξή τους;

40 Αν όχι τι θεωρείτε ότι πρέπει να αλλάξει για να υπάρξει προώθηση των εξελιγμένων τηλεπικοινωνιακών μορφών;

41 Τι απαιτείται να κάνει η πολιτεία για την επιτυχή σύγκλιση της χώρας και την αναβάθμισή της στον Ευρωπαϊκό ψηφιακό χάρτη;

42 Ποια μέτρα πρέπει να ληφθούν από την πολιτεία ώστε να είναι διαθέσιμη η ευρυζωνικότητα το συντομότερο δυνατόν σε όλους τους πολίτες της χωρίς αποκλεισμούς;

43 Τι μέτρα θεωρείτε ότι πρέπει να πάρει η Ελλάδα, προκειμένου να έχει συμμετοχή στη νέα ψηφιακή εποχή;

44 Η υστέρηση στην εκτέλεση έργων υποδομής για ανάπτυξη της ευρυζωνικότητας οδηγεί τη χώρα σε δυσμενέστερη θέση στην παγκόσμια ανταγωνιστική οικονομία;

45 Θεωρείτε ότι ο ψηφιακός μετασχηματισμός της Ελλάδας είναι σημαντικός για την επιβίωση και την ανάπτυξη της χώρας;

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