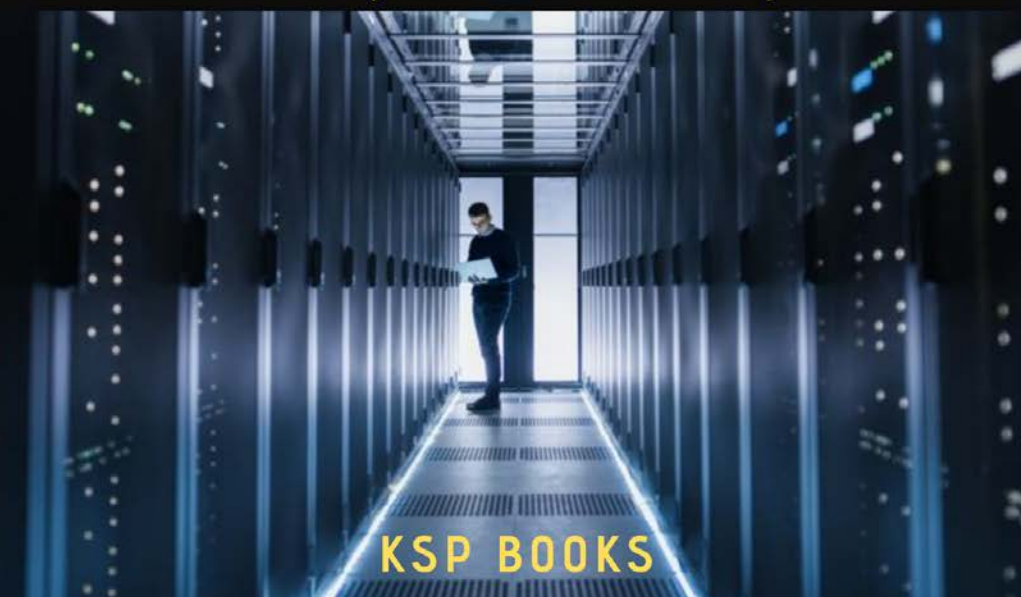
Charis Vlados

Stra.Tech.Man

Strategy Technology Management

Theory and Concepts



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Strategy Technology Management (Stra.Tech.Man) Theory and Concepts

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Content

Introduction

This volume presents some fundamental elements to the Stra.Tech.Man approach, which the author of this book tried to develop during the last few years. The main challenge of the Stra.Tech.Man approach is to synthesize interpretatively the analytical spheres of strategy, technology, and management, upon the effort of any socioeconomic organization to innovate, survive, and develop. The following chapters search to define and apply in particular the multiple applications of the Stra.Tech.Man concept. They use this approach as an analytical mechanism to perceive in the context of the current transformative phase of globalization the aspects of competitiveness, innovation, and change management.

This volume includes the following chapters that apply the aspects of the Stra.Tech.Man analysis:

I. The Greek firms into globalization: The Stra.Tech.Man approach

Globalization is not a static and finished status quo: it is subject to a continuous transformation and restructuring. At the same time, globalization is not a timeless, a historical, and automatically homogenizing phenomenon. Every attempt of scientific understanding, interpretation, and prediction of the partial socioeconomic dynamics and developments is becoming increasingly infertile and disorientating, insofar as the rigid

analytic division between the "national" and the "international" continues unaltered; globalization is a complex, dialectic, and evolutionary phenomenon. The study of globalization through the examination of the synthesizing and co-evolving incorporation of partial socioeconomic structures (social, economic and sectoral) and corporate subsystems in terms of strategy, technology, and management ("Stra.Tech.Man" triangle) constitutes a new approach for the study of the globalization process.

II. Innovation in Stra.Tech.Man terms

Contrary to the conventional neoclassical perspective, the approaches focusing on the evolutionary nature of the capitalist firm are probably more comprehensive in the study of innovation. This chapter attempts a theoretical refocusing in the analysis of innovation, by following a perspective of "biological" type. It highlights the synthesis of "strategy-technology-management" as the organic center that generates and re-generates the phenomenon of innovation within the socioeconomic organizations.

III. Innovation in economics and management: The Stra.Tech.Man synthesis

Economics and the theoretical analysis of entrepreneurship and organizational theory keep up with producing innovation theories with remarkably various forms and analyses. This chapter suggests that economics and management science can be "analytically bridged" if we reposition the phenomenon of innovation into the evolutionary/physiological Stra.Tech.Man "core" of the organization. In this theoretical perspective, the firm as a "living organism" operates as structural co-creator of the economic sectors and the socioeconomic systems that host its entrepreneurial activity.

IV. Change management and innovation in Stra.Tech.Man terms

In the current context of globalization's restructuring, the concepts of change management and innovation are co-evolving. A counter-proposed theoretical perspective in terms of the evolutionary Stra.Tech.Man triangle is useful for the successful innovative action of all socioeconomic organizations. This chapter

suggests the concept of change management in Stra.Tech.Man terms in five consecutive steps as a novel approach to the phenomenon of organizational change.

V. Fostering micro and meso compeririveness in Stra.Tech.Man terms

In the current restructuring phase of globalization, since all partial socioeconomic systems are inescapably entering an ever-deeper process of "organic restructuring," the content of competitiveness is changing structurally. To this end, it seems that a repositioned developmental economic policy is necessary, which can focus on fostering the competitiveness of the locally operating entrepreneurial actors. This chapter proposes specifically the concept of competitiveness as a synthesis of the three fundamental micro, meso, and macro levels that create and reproduce the systemic competitiveness. It also presents the Stra.Tech.Man perspective on the proposal of creation of the Local Development and Innovation Institutes (LDIs) as useful dimensions to strengthen local business systems in combined terms of meso- and micro- competitiveness.

In conclusion, the "Stra.Tech.Man approach" attempts to define a unifying and evolutionary field of research, by initiating its exploration on the inner "physiology" of the socioeconomic organization. This approach extends analytically from the micro- to the meso- and macro- level of socioeconomic system dynamics and vice versa.

C. Vlados
June, 2019

Acknowledgment

The fellow members of the research group “Stra.Tech.Man Lab” deserve to be mentioned in this volume. Thanks go to Dr. Nikolaos Deniozos, Dr. Andreas Andrikopoulos, Fotios Katimertzopoulos, Ioannis Blatsos, and especially Dimos Chatzinikolaou for his work and contribution in the editing of this volume.

1 The Greek firms into globalization: The Stra.Tech.Man approach*

Introduction

At its starting point, in this perspective, the socio-economic area is the undisrupted, dialectic-historic network of four central subsystems, which includes and unifies: the broader social system, the economic system, the sectoral system, and the enterprise (Spilanis & Vlados, 1994; Vlados, 1996) (figure 1).

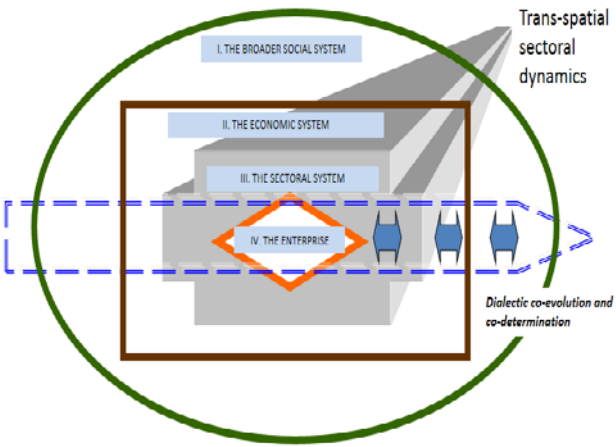

Figure 1. *The socioeconomic space as a systemic entity of four structural subsystems*

These four structural components of every socioeconomic formation, in every level of space (local, national, supranational), are always tied in a systemic relationship of co-determination and

co-evolution. These articulate the structural substratum of the socioeconomic space itself synthetically; on this socioeconomic space every historically particular "regime" of accumulation, together with its resulting manner of regulation and adjustment is rooted and develops, then goes through a period of crisis, and, finally, is overturned (see for the "School of Regulation," the following: Aglietta, 1979,1997; Boyer, 1986; Boyer & Drache, 1996; Boyer & Durand, 1998; Boyer & Saillard, 1995; Vlados, 1992).

Consequently, the broader operational environment of every socioeconomic activity/initiative (of private or public nature alike) can constitute an object of analysis as dialectic resultant of three distinct but tightly co-evolving structural dynamics: the dynamics of reproduction of the socioeconomic space; the entrepreneurial dynamics; the political (interventional/legal) dynamics (figure 2).

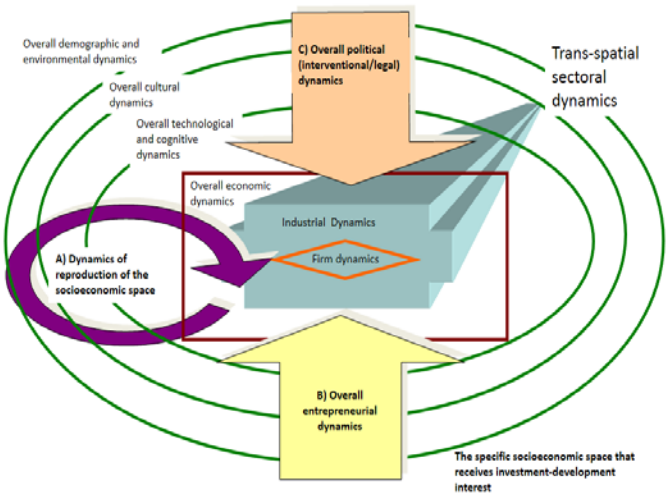

Figure 2. *The broader external socioeconomic environment as an open-interactive system*

This external dynamic environment, at any spatial level of its examination, consists of the dialectic synthesis of the following three basic structures-agents:

a) The particular historical "physiognomy" of the spatially-established social formation which assimilates/reproduces the system's background;

b) The evolutionary sum of the actions of the enterprises operating in its interior; and, finally,

c) The evolutionary sum of the public intervention that regulates it.

Based on the above, this article builds its theoretical "canvas" on top of the broader thematic of the "dynamics of the global economy" (Boyer, 1997; Braudel, 1985, Gilpin, 2000; Hymer & Rowthorn, 1971; Michalet & Delapierre, 1976; Michalet, 1985; Michalet *et al.*, 1983; Palloix, 1975; Porter, 1990; Veltz, 1996; Vernon, 1971, Wallerstein, 1979).

In particular, within this thematic context, it activates the methodology of the "modern industrial economics" within a trans-spatial perspective (Angelier, 1997; Du Tertre, 1989; Gaffard, 1990; Hamel & Prahalad, 1994; Piore & Sabel, 1984; Marshall, 1879, 1890; Vlados, 1992).

The aim is to host and re-formulate in its interior the particular question concerning the insertion of Greek firms into globalization. It focuses on the gradual adjustment/ continual readjustment in the specific terms of the Greek firms' strategic and organizational development, and transformation (Ambrosini, Johnson & Scholes, 1998; Andrews, 1971; Ansoff, 1985; Aoki, Gustafsson, & Williamson, 1990; Bower *et al.*, 1995; Campbell; 1997; Chandler, 1962, 1977; 1990; Collis & Montgomery, 1999; Goold & Campbell, 1998; Grant, 1991; Hamel, 1996, 1998; Hamel & Prahalad, 1985, 1989a, 1989b, 1991, 1993, 1994; Hill & Westbrook, 1997; Hitt, Ireland & Hoskinsson, 1997; Johnson & Scholes, 1999; Learned *et al.*, 1965; Ohmae, 1982; Schendel, 1994; Seeger, 1984; Stalk, Evans, & Shulman, 1992; Thiétard, 1984; Von Newmann & Morgenstern, 1944).

Thus, according to its particular research orientation, the present study can be classified simultaneously within three interconnected thematic-research areas:

- It is an attempt to activate/control the principles of *the* "theory of global economy," specifically focused (spatially and functionally) on the Greek socioeconomic system in the last years of the 20th century.
- It is an attempt to reformulate the diagnostic methodology of strategic management by commencing from a rationale of

organic-evolutionary interpretation of the activity of the modern enterprise.

❖ It is an attempt to partially re-structure, apply, and control the conclusions of the "French School" (Morvan, 1991) in industrial economics in the particular case of the Greek industries.

The adaptation of the enterprise and the global dynamics

In this study is being proposed, structured and assessed experientially a method for analyzing the globalizing process that focuses on the interpretative dimension of the resulting (and essentially co-produced) evolutionary "physiology" of the living enterprise itself (Coriat & Weinstein, 1995; Geus, 1997; Zeleny, 1980). It studies the evolutionary physiology of the enterprise experientially, and in terms of the internal philosophy and applied processes, and according to the ways it makes decisions, acts, and adapts to competition (figure 3).

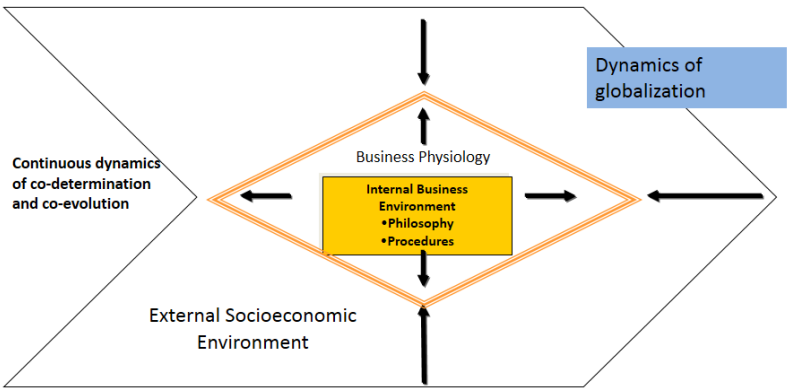

Figure 3. *The business initiative as a dynamic synthesis between the internal and external corporate environment within globalization*

More particularly, this involves a new theoretical approach of the enterprise as an evolutionary socioeconomic institution-organization, which transcends its theoretical examination as an

analytic entity that is ostensibly static, automatic, one-dimensional, and uniform.[1]

In direct contrast to the central assumptions of the conventional economic theory, the present study understands the enterprise as a living social organism, an organism-institution that is "conflictual" by nature, heterogeneous, and "heterogenetic" simultaneously (Gest, 1986; Handy, 1993; Mintzberg, Ahlstrand, & Lampel, 1998; Nonaka & Takeuchi, 1995; Quinn, 1992; Stacey, 1992).

In particular, this study understands the enterprise as a living and evolving organism, and a socioeconomic institution of crucial importance and in continuous dialectic evolution. Thus, it does not understand the enterprise as a static mechanism, which is ever and everywhere homogeneous and immutable; sadly, too often, the conventional economic theory still suggests the opposite.

This study claims that this living enterprise can impress on it, through the successive phases of transmutation of its physiological structure, the evolution of globalization itself; in a way analogous to a tree's rings which impress the climatic changes of its natural environment. On this particular point, crystallizes the central theoretical tool of this study: the dynamic triangle of strategy, technology, and management of the enterprise (the "Stra.Tech.Man" triangle).

The Stra.Tech.Man dynamic triangle of the enterprise

The concept-center of this study and its central innovation in explanatory terms lies, in particular, in studying the evolutionary synthesis of the three central dimensions of the enterprise: the strategy, technology, and management that every enterprise produces and reproduces, aiming at the innovation that will allow its competitive survival and development within globalization (figure 4).

[1] In parallel, globalization is not a rigid "black box," ostensibly external to any historical and socioeconomic determination. In this manner, the present approach lies at the very opposite of the traditional approaches of neoclassical microeconomics.

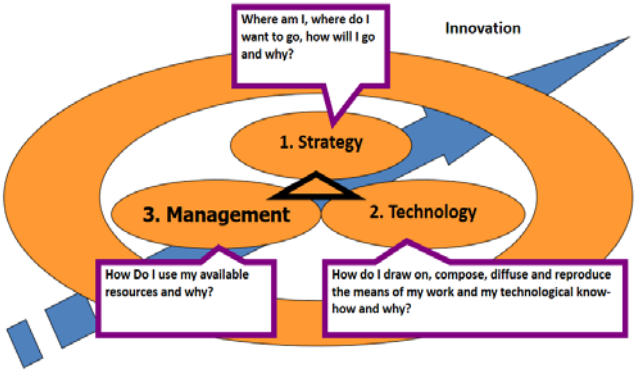

Figure 4. *The Stra.Tech.Man core of the enterprise*

These three innate, but also dynamically adaptable dimensions (an enterprise's strategy, technology, and management) define, ultimately, in a continuous and dialectic fashion, the particular structural Stra.Tech.Man triangle that characterizes the enterprise: the Stra.Tech.Man triangle, which in essence always regulates the evolutionary course of every enterprise in its environment (figure 5).

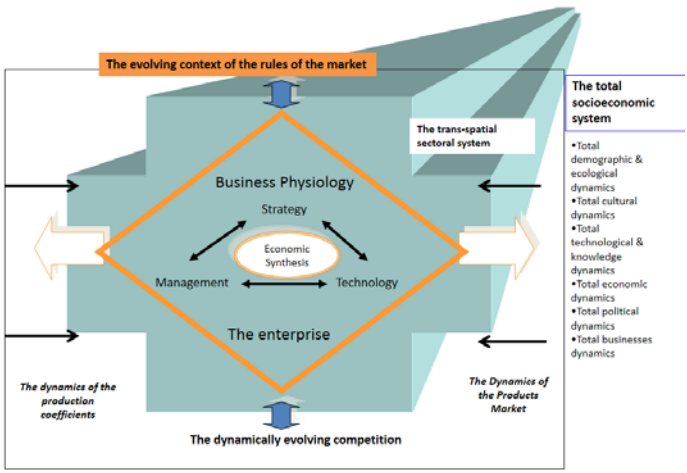

Figure 5. Every *capitalist enterprise operates within the restrictions imposed by its broader evolutionary socioeconomic environment*

In particular, these three dimensions—which all too often are understood erroneously as by nature independent, structurally

autonomous and functionally separate—are proven from our study to exist within a more and more tight relationship of synthesis and physiological co-adaptation within globalization, aiming each time at the competitive survival and development of the contemporary enterprise. In this manner, although these three spheres of the enterprise's strategy, technology and management do display a formal analytic self-existence, the enterprising practice proves that they are always structurally-defined together and co-evolve.

In particular, in the case of every studied capitalist enterprise inserted to globalization dynamics, and according to the overall conclusions of our research, these three spheres are always composed within a unique synthetic architecture (Stra.Tech.Man triangle), more or less systematic, in analogy to the particular physiological type of the enterprise. This synthetic architecture of business Stra.Tech.Man is always trying to actualize, in a unique manner, a threefold enterprising targeting and taking into consideration the unique socioeconomic and sectoral environment of the enterprise:

- Strategic effectiveness
- Technological development
- Managerial efficiency

In this manner, the enterprise's dynamic Stra.Tech.Man triangle constitutes the central analytic instrument of dynamically approaching the insertion and adjustment of enterprises—of different industries, spatial determinations, and evolutionary physiologies—within the dynamics of globalization. It is becoming tangible that the "physiological" Stra.Tech.Man engine of the enterprise can potentially constitute a new dialectic-historic category of analysis of the globalizing evolution per se. The dynamic Stra.Tech.Man triangle can operate as a systemic "recipient" but also as a "high-fidelity transformer" of the socioeconomic changes that are being produced within and by globalization.

In particular, the guiding theoretical idea can be the following. The physiologically evolving enterprise, always trying to combine effectively its strategic, technological, and managerial potential, to the extent that it manages to produce/reproduce its particular

innovation as the necessary dimension for defending/increasing its profitability and development, constitutes, in practice, globalization's more in-depth evolutionary "engine" and, simultaneously, its "mirror".

The central theoretical hypothesis of the research

According to the above, the theoretical hypothesis of the research is the following:

- If globalization is indeed a totalizing and evolutionary process, which today is at a stage of substantial expansion/structural transformation,
- If, indeed, the enterprise can be validly analyzed in terms of synthetic dynamics by its strategy, technology and its management (Stra.Tech.Man triangle),
- If, indeed, these evolutionary Stra.Tech.Man formations of an enterprise produce/reproduce the global dynamics in a concurrently structural and adaptive manner, and each time according to the enterprise's particular physiology and rationality,

Then the total outcome of the phenomenon of any enterprise's insertion into globalization materializes an observable transformation in each of the "Stra.Tech.Man" dimensions and within the organic Stra.Tech.Man system that the enterprises are entering globalization compose.

Therefore, one should expect empirically certifiable transformations in Stra.Tech.Man terms, which can culminate in a continuous reproduction the physiological heterogeneity of the enterprises (possibly through quantitative accumulations but also through qualitative transitions), and always with a co-evolutionary content, interwoven with that of the globalizing evolution.

More simply formulated, if globalization does affect and penetrate the Greek socioeconomic environment and if at the same time, the enterprises remained unchanged in Stra.Tech.Man terms, then this hypothesis would have to be rejected. The Stra.Tech.Man triangle would have failed to follow and interpret the evolutionary insertion of Greek firms into globalization.

Practically speaking, according to this hypothesis, only in two cases / logical possibilities, could the examined enterprises appear evolutionarily unchanged in Stra.Tech.Man terms:

(1) The Greek firms into globalization: The Stra.Tech.Man approach

A. either the process of globalization surrounding them is not an active and real one—therefore, since nothing essential changes in their environment, the enterprises themselves have no reason to change either,

B. Alternatively, the dynamic Stra.Tech.Man triangle, as a theoretical construct, cannot assimilate or express the internal transformations of the enterprise theoretically, as the dynamics of globalization generate these.

Given that the logical path 'A' was gradually ruled out in the face of the empirical data that was collected and of the theoretical convergences which were attempted already from the outset of this study, only the logical option 'B' remained open for rejection. Eventually, however, this option was not rejected.

On the contrary, a host of empirical data showed clear and multiple evolutionary changes in Stra.Tech.Man terms in the physiology of the enterprises under examination, and which are operating in Greece during the process of their adaptive insertion into globalization—a process that is deepening further on.

The conclusions of the study

Eventually, in the background of the validation of the study's central hypothesis were revealed certain central theoretical conclusions of particular importance.

The insertion of the Greek socioeconomic formation into globalization

The insertion of the Greek socioeconomic formation into the modern global economy is materializing within a composite and open historical process which is subject to continuous transformation and transmutation. This continuous and intensifying process of deep systemic socioeconomic co-evolution essentially defines the particular qualitative content of the globalization dynamics.

Consequently, the cohesive and reliable study of the insertion of the Greek socioeconomic formation into globalization can no longer withstand or allow of any static, final, wholly homogenizing and strictly deterministic simplification.

(1) The Greek firms into globalization: The Stra.Tech.Man approach

To understand the composite dialectic-historical process of insertion of a socioeconomic formation into globalization demands as a "sine qua non" condition—and indeed every time it is attempted. It requires a renewed historical co-evolutionary understanding of the dynamics of both levels on which the phenomenon can be analyzed: on the one hand, the understanding of the socioeconomic system undergoing the insertion itself, and that of globalization as a totalizing evolutionary entity.

The unifying power of globalization

In particular, the globalization dynamics itself cannot be reliably understood exclusively via the different, and usually only partially examined/invoked indexes and gauges of the international market transactions.[2]

According to all the empirical data of the study, it becomes understood that for Greece also, globalization is neither a windfall nor an exogenous reality.More generally, all the socioeconomic dynamics developing nowadays with increasingly denser systemic content:

- Are being composed (and re-composed unstoppably) within the influence of globalization dynamic.
- Are defining (and constantly re-defining) the globalization dynamic itself.

Globalization is the producer and the product of its history simultaneously. Moreover, globalization itself is an unstoppable evolutionary synthesis which is increasingly defining and unifying increasingly every partial socioeconomic dynamics and at every level on the planet (figure 6).

[2] On the contrary, the genuinely valid way to approach the insertion and incorporation of any socioeconomic subject (enterprise, socioeconomic formation, state entity) into the global process, is always obliged to go deeper into the particular qualitative and structural dimensions of the changes which this process effects upon the historically specific socioeconomic subjects it includes.

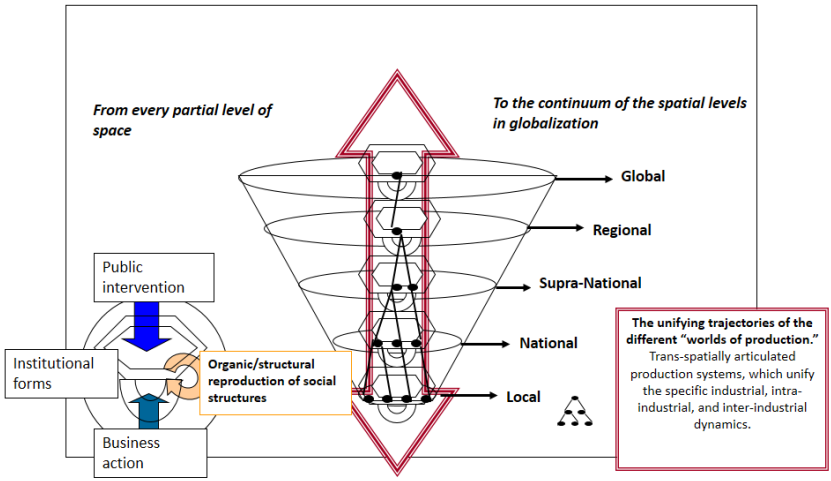

Figure 6. *The dialectics of unification of the socioeconomics territories in the global process*

The partial territorial dynamics cannot express globalization through a simple summation process. That a shift is necessary, from attempting to separately comprehend the various inter-spatial economic dynamics (commercial, productive, technological, or monetary-financial), to a synthetic socioeconomic conception of globalization, whose foundation lies on the great engine-recipient of the global process: that is, the modern enterprise, within its industrial context of operation

The continuous re-structuring of the industrial structures on a worldwide scale.

At the same time, the globally developing industrial (sectoral) structures and dynamics were proven, within this study, to be by nature, evolutionary socioeconomic entities-contexts of activity. Their evolution will not obey narrow economic determinations and priorities.

In particular, the sectors of economic activity emerged as evolutionary socioeconomic entities of increasingly dense systemic structuring, which, in the last thirty years, have been ceaselessly expanding functionally, re-structuring and re-shaping (Coriat & Dosi, 1995; Dosi, 1982, 1990; Nelson & Winter, 1982; Winter,

1984),with a tendency to extend to a planetary level (Coriat, 1991; Delapierre, Moati, & Mouhoud, 2000; De Woot, 1988; Freeman, 1982; Ruigrok & Van Tulder, 1995; Stopford & Strange, 1991).

It became clear that the same inter-sectoral globalization dynamics leads to a process of continuous reproduction of the heterogeneity of the socioeconomic subjects concerned, of all kinds and at all levels of analysis.[3]

Ultimately, the today's globalized world is dealing with industry dynamics in the process of globalization, which, in evolutionary order, are culminating into the Greek socioeconomic formation, acquiring a diachronically increasing structural effect: they penetrate and gradually transforming the current national production and consumption model, both in quantitative and in qualitative terms. In this manner, they are gradually re-configuring, at their most fundamentals, the total of the national socioeconomic formation, the existing status quo of accumulation, and the co-assembled mechanisms of regulation and adjustment of the system.

On the basis of this procedure, the dynamics of the multinational enterprise assumes an especially strong interpretative position: the multinational enterprise itself is proven to be a key factor for the organic understanding of the insertion into the globalizing process of all kinds of enterprises operating in Greece, irrespective of size, sectoral and/or particular spatial focusing. Thus, the multinational enterprise constitutes a lever of crucial importance in articulating the broader dynamic transformation of the Greek socioeconomic system inside globalization.

The evolutionary insertion of Greek firms into globalization

Even more, as far as the enterprises operating in Greece are concerned, and on which we conducted field case studies, it became clear that in reality, they are not subject to any imposed

[3] In this sense, globalization is not "the end of history," is not a course of automatic "uniformization" of the coefficients/components of the global economy, as, sadly, all too often is claimed in relevant modern literature.

ostensibly one-dimensional and uniform behavior of viable insertion into globalization—as, sadly, a significant section of the relevant literature still seems to be erroneously claiming.

In reality, for these enterprises, there is no inescapable and universal one-way of viable competitive reaction and adaptation into the continuously evolving lattice of globalization. There is no "unique best way" in Stra.Tech.Man terms for every enterprise within the globalization. In this direction, neither the model of the "massive" enterprise (with a strategy of mechanistic perspective, a technology of serial logic, and management focused on narrow specialization) is retired from the field of global antagonism. Nor the "flexible" enterprise (with a strategy of dialectic perspective, a technology of network architectonic, and management focused on broad employee's participation) represent the predicted dominant model of enterprise in Greece, within the globalization.

On the contrary, two emerging realities have been crystallized. First, there is a "new model" (insufficiently studied in the relevant international literature, until now) of enterprise that we call "monad-centric" (with a strategy articulated on owner's intuition, a technology based on sporadic choice, and management dominantly focused on everyday experiences of employees). Second, there is the continuously hybrid mutation of all enterprises, regardless of the distinct physiological type (Vlados, 2004).

Precisely, there is a large and expanding variety of possible and applied viable strategic behaviors, in concordance with the physiological differentiation and variety of the enterprises themselves, in Stra.Tech.Man terms, and according to the evolutionary typology constructed at an analytic level.

The reproducing multiplicity of the viable trajectories of competitiveness for the enterprises in Greece

At the deepest level, a continuous and proliferous multiplicity of viable trajectories of competitiveness is emerging: there are no imposed one-ways of competitiveness, supposedly common in all enterprises. There is not (nor will there ever be) either a universal disaster or any universal "salvation" for Greek enterprises within

globalization. On the contrary, a broad and expanding multiplicity of viable strategic paths is emerging and confirmed, cross-fertilized with an intensively reproducing variety in the particular evolving physiologies of the enterprises expressed in Stra.Tech.Man terms, and always in the particular historical conditions set by the specific sectoral and spatial levels at which these enterprises operate.

There are not—neither has there ever been nor will ever be—any effective pre-constructed solutions of competitiveness, common to all kinds of enterprises, and which, ostensibly, could last forever. Instead, there are unique environmental conditions of socio-economic nature, which may favor or not specific types/trajectories of the "physiological" transformation of the enterprises.

Every successful enterprise, thus, is obliged to seek the particular effectual competitive path that suits it and according to the particular Stra.Tech.Man physiology that characterizes and binds it in evolutionary terms. In practice, all logically possible "roads of strategic success" are never simultaneously open and feasible for all enterprises, irrespective of their physiological status, capabilities, and predispositions—contrary to what a big part of the international literature on the strategy of enterprises is still, erroneously, claiming.

Thus, on the whole, the present study can be synoptically characterized as yet another attempt to doubt, systematically and empirically, specific rigid theoretical approaches which continue to support the supposed existence of "one and only effective" (and what is more, of one that can be applied globally) rationality of the capitalist enterprise inside globalization. Namely, it argues against the perception of the capitalist enterprise as supposedly autonomous and independent from every specific "spatiotemporal" historical and socioeconomic determination.

References

Aglietta, M. (1979). *A theory of capitalist regulation.*London: NLB

Aglietta, M. (1997). *Régulation et crises du capitalisme*. Paris: Jacob.

Ambrosini, V., Johnson, G., & Scholes, K. (1998).*Exploring techniques of analysis and evaluation in strategic management*.Englewood Cliffs, New Jersey: Prentice Hall.

Andrews, K.R. (1971). *The concept of corporate strategy*. New York: Dow Jones Irwin.

Angelier, J.P. (1997). *Economie industrielle, une méthode d'analyse sectorielle*. Grenoble, P.U.G.

Ansoff, I. (1985).*Corporate strategy*. London: Penguin.

Aoki, M., Gustafsson, B., & Williamson, O.E. (Eds.). (1990). *The firm as a nexus of treaties*. London: Sage.

Bower, J.L., Bartlett, C.A., Uyterhoeven, H.E.R., & Walton, R.E. (1995). *Business policy: Managing strategic processes*. Chicago: Irwin-Mc Graw Hill.

Boyer, R. *et al.* (1997). *La mondialisation au-delà des mythes.* Paris: La Découverte.

Boyer R., & Drache D. (1996). *States against markets. The limits of globalization.* London, Routledge.

Boyer, R. (1986). *La théorie de la régulation: une analyse critique*. Paris: La Découverte.

Boyer, R., & Durand, J.-P. (1998). *L'après-fordisme*. Paris: Syros.

Boyer, R., & Saillard, Y. (1995). *Théorie de la régulation: L'ètat des savoirs*. Paris: La Découverte.

Braudel, F. (1985). *La dynamique du capitalism.* Paris: Flammarion.

Campbell, D.J. (1997). *Organizations and the business environment*. Oxford: Butterworth-Heinemann

Chandler, A.D. (1977). *The visible hand*. Cambridge, MA: Harvard University Press.

Chandler, A.D. (1962). *Strategy and structure: chapters in the history of the industrial enterprise.* Cambridge: M.I.T. Press.

Chandler, A.D. (1990). *Scale and scope: the dynamics of industrial capitalism*. Cambridge, MA: Belknap Press.

Collis, D.J., & Montgomery, C.A. (1999). *Competing on resources: strategy in the 1990's*. New York: Harvard University Press. 10.1016/B978-0-7506-7088-3.50005-X

Coriat B., & Dosi, G. (1995).*Évolutionnisme et régulation: différences et convergences*. Paris: La Découverte.

Coriat, B. (1991). *Penser à l'envers: travail et organisation dans l'entreprise japonaise*. Paris: C. Bourgois.

Coriat, B., & Weinstein, O. (1995). *Les nouvelles theories de l'entreprise*. Paris: LGF - Livre de Poche.

DeWoot, P. (1988). *Les entreprises de haute technologie et l'Europe*. Paris: Economica.

Delapierre, M., Moati, P., & Mouhoud, E. M. (2000). *Connaissance et mondialisation*. Paris: Economica.

Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, *11*(3), 147-162. 10.1016/0048-7333(82)90016-6

Dosi, G. (1990). *Technical change and economic theory*. London: Pinter.

DuTertre, C. (1989). *Technologie, flexibilité, emploi: Une approche sectorielle du post-taylorisme.*Paris: L'Harmattan.

Freeman, C. (1982). *The economics of industrial innovation* (2nd edition).London: Francis Pinter.

Gaffard, J.-L. (1990). *Économie industrielle et de l'innovation*. Paris: Dalloz.

Gest. (1986). *Grappes technologiques. Les nouvelles stratégies d'entreprise*. Paris: Mc Graw-Hill.

Geus, A. (1997). The Living Company. *Harvard Business Review*, *75*(2), 51-59.

Gilpin, R. (2000). *The challenge of global capitalism: The world economy in the 21st century*. Princeton, NJ: Princeton University Press. 10.1515/9780691186474

Goold M., & Campbell A. (1998). Desperately seeking synergy, *Harvard Business Review, 76*(5), 130-143.

Grant, R.M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review, 33*(3), 114–135. 10.2307/41166664

Hamel, G., & Prahalad, C.K. (1985). Do you really have a global strategy?.*Harvard Business Review, 68*(4), 139-148. 10.1002/tie.5060270306

Hamel, G., & Prahalad, C.K. (1989a). Collaborate with your competitors – and win. *Harvard Business Review, 67*(1), 133-139.

Hamel, G., & Prahalad, C.K. (1989b). Strategic intent. *Harvard Business Review, 64*(3), 63-75.

Hamel, G., & Prahalad, C.K. (1991). Corporate imagination and expeditionary marketing. *Harvard Business Review, 69*(4), 81-92.

Hamel, G., & Prahalad, C.K. (1993). Strategy as stretch and leverage. *Harvard Business Review, 71*(2), 75-84.

Hamel, G.,& Prahalad, C.K. (1994).*Competing for the future.* Boston, MA: Harvard Business School Press.

Hamel, G. (1996). Strategy as revolution. *Harvard Business Review, 74*(4), 69-81.

Hamel, G. (1998). The challenge today: changing the rules of the game.*Business Strategy Review, 9*(2), 19-26. 10.1111/1467-8616.00062

Handy, C. (1993). Understanding organizations.London: Penguin.

Hill, T. & Westbrook, R. (1997). SWOT analysis: it's time for a product recall. *Long Range Planning, 30*(1), 46-52. 10.1016/S0024-6301(96)00095-7

Hitt, M.A., Ireland, R.D., & Hoskinsson R.E (1997). *Strategic management: competitiveness and globalization*. Minneapolis/St. Paul, MN: West Publishing Company.

Hymer, S., & Rowthorn R. (1971). *International big business.* Cambridge, UK: Cambridge University Press.

Johnson, G., & Scholes, K. (1999).*Exploring corporate strategy*. London; New York: Prentice Hall.

Learned, E.P., Christensen, C.R., Andrews, K.R., & Guth, W.D. (1965). *Business policy: texts and cases*. Homewood, IL: R.D. Irwin.

Marshall, A. (1879). *Economics of industry*. London: Macmillan.

Marshall, A. (1890). *Principles of Economics*. London: Macmillan.

Michalet, C.A., & Delapierre M. (1976). *Les implantations entrangères en France: stratégies et structures*. Calmann-Lévy.

Michalet, C.A. (1985). *Le Capitalisme mondial*.Paris: P.U.F.

Michalet, C.A., Delapierre, M., Madeuf,B., &Ominami,C. (1983). *Nationalisations et internationalisation: Stratégies des multinationales françaises dans la crise*. Paris: La Découverte.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (1998). The strategy safari: the complete guide through the wilds of strategic management. Englewood Cliffs, NJ: Prentice Hall.

Morvan, Y. (1991). *Qu'est-ce que l'économie industrielle?*.Paris: Economica.
Nelson, R.R., & Winter, S.G. (1982). *An evolutionary theory of economic change*. Cambridge; London: The Belknap Press of Harvard University Press.
Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: how Japanese companies create the dynamics of innovation*. New York: Oxford University Press. 10.1016/0024-6301(96)81509-3
Ohmae, K. (1982). *The mind of the strategist*. New York: McGraw-Hill.
Palloix, C. (1975). *L'Internationalisation du capital: éléments critiques*.Paris: François Maspero.
Piore, M.-J., & Sabel, C.-F. (1984).*The second industrial divide. possibilities for prosperity*. New York: Basic Books.
Porter, M. (1990). *The competitive advantage of nations*. New York: Free Press. 10.1007/978-1-349-11336-1
Quinn, J.B. (1992). *Intelligent enterprises*. New York: Free Press.
Ruigrok, W., & Van Tulder, R. (1995). *The logic of international restructuring: the management of dependencies in rival industrial complexes*. London: Routledge.
Schendel, D. (1994). Introduction to competitive organizational behavior: toward an organizationally-based theory of competitive advantage.*Strategic Management Journal*, *15*(S1), 1-4. 10.1002/smj.4250150901
Seeger, J.A. (1984). Reversing the images of BCG's growth share matrix.*Strategic Management Journal*, *1*(5), 93-97. 10.1002/smj.4250050107
Spilanis, I., & Vlados, C. (1994). Development dynamics in southern Europe: towards a new approach for the 'environment' of sustainable development. *Studies in Regional & Urban Planning*, (3), 301–316.
Stacey, R.D. (1992). *Managing the unknownable: strategic boundaries between order and chaos in organizations*. San Francisco: Jossey-Bass
Stalk, G., Evans P., & Shulman L.E. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review*, *70*(2), 57-69.
Stopford, J.M., & Strange, S. (1991). *Rival states, rival firms: competition for world market shares*. Cambridge: Cambridge University Press. 10.1017/CBO9780511549830
Thiétard, R.A. (1984). *La Stratégie d'entreprise: formulation et mise en œuvre. Paris:* Mc Graw-Hill.
Veltz, P. (1996). *Mondialisation: villes et territoires*. L'économie d'archipel. Paris: P.U.F.
Vernon, R. (1971). *Sovereignty at bay: the multinational spread of U.S. enterprises*. London: Longman. 10.1002/tie.5060130401
Vlados, Ch. (1992). *Les dimensions technologiques dans la théorie de la régulation et la contribution de Coriat sur la conception analytique de la production de la technique et de la science*. Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche mineur sous la direction de B.Madeuf. Université de Paris X-Nanterre.
Vlados, Ch. (1992). *Politiques industrielles et stratégies des groupes multinationaux dans les secteurs de base-industrie des matériaux en Europe*. Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche majeure sous la direction de M.DELAPIERRE (CEREM). Université de Paris X-Nanterre.
Vlados, Ch. (1996). International restructuring dynamics of competitive advantages. *Middle East FORUM*, (1), 233–252. 10.2139/ssrn.3217975
Vlados, Ch. (2004). *La dynamique du triangle strategie, technologie et management:*

(1) The Greek firms into globalization: The Stra.Tech.Man approach *l'insertion des entreprises Grecques dans la globalisation* (Thèse de doctorat de Sciences Économiques. Université de Paris X-Nanterre). [Retrieved from].

Von Newmann, J. & Morgenstern O. (1944). *Theory of games and economic behavior*.Princeton: Princeton University Press.

Wallerstein, I. (1979). *The Capitalist World Economy*. London: Cambridge University Press.

Winter, S.G. (1984). Schumpeterian competition in alternative technological regimes. *Journal of Economic Behavior & Organization*, *5*(3–4), 287–320. 10.1016/0167-2681(84)90004-0

Zeleny, M. (1980). *Autopoiesis: a theory of living organizations*. New York, N.Y: Elsevier Science Ltd.

2 Innovation in Stra.Tech.Man terms*

Introduction

The central importance of innovation dynamics, for any socio-economic organization of any kind—at any spatial or functional level of analysis—is progressively becoming indisputable in the literature of economics and management in the 21st century (Brynjolfsson, & McAfee, 2015; Carlino, & Kerr, 2015; Gordon, 2017; Hall, Mairesse, & Mohnen, 2010; OECD, 2014; OECD, 2015; OECD, 2016; Paunov, & Guellec, 2017). However, the assimilation of a coherent view of innovation dynamics proves particularly difficult process in the practice of the majority of decision makers and socioeconomic actors. The traditional and conventional economic theory, not only of neoclassical but also of orthodox Keynesian inspiration and direction, it constantly fails to fully perceive the overall discipline of innovation (Colander, 2000; Colander, Holt, & Rosser, 2004; Howson, 2001; Marshall, 1879; Marshall, 1890; Marshall, 1919; Rueff, 1947; Samuelson, 1951).

Conventional neoclassical theory and the innovation dynamics

In principle, the conventional neoclassic business and economic development theory examines the function of the market as a simple—and in fact an isolated from any broader socioeconomic system—resource allocation mechanism. For these theories, the demand functions interact with the supply functions in order to set

prices, achieve and maintain a steady market equilibrium (Aspromourgos, 1986; Morgan, 2015).

In the absence, however, of any broader and more coherent socioeconomic perspective, the various 'players' within this system are most commonly regarded as static 'rational beings'—endowed with absolutely static and non-historical rationality and without any socioeconomic interconnection and/or influence (Walras, 1874). The capitalist enterprise is therefore considered here, in the vast majority of the relevant conventional theories, as a static 'black box' which exists to simply carry out an automatic transformation of economic inputs into outputs (Aoki, 1984; Arrow, 1974; Baudry, & Tinel, 2003; Boyer, & Durand, 1993; Coase, Gillis, & Thiébault, 1987; Holmstrom, 1999; Williamson, 1991; Williamson, 1999; Williamson, 2000).

In particular, in neoclassical theory, the pace of technological change affects the pace of economic growth although is not affected respectively. That is, the reverse does not apply: The relationship appears strictly as one-way direction (Sollow, 1957).

So where does the technological change and progress stem from, according to this theoretical approach?

In the interpretative depth of this approach, technological change is ultimately determined simply by some 'luck'. In short, when a socio-economic system is fortunate, then technological change is being accelerated while, on the contrary, when there is less fortune, the pace of technological progress is slowing down—and, ultimately, there is nothing we can do to influence this pace, according to this theoretical approach. Innovation is always being triggered by independent exogenous variables and mechanisms and, therefore, the socioeconomic actors operating with consistent logical criteria can control the innovation system to a certain extent but cannot influence its pace and direction (O'sullivan, & Sheffrin, 2003; Veblen, 1898; Veblen, 1900).

In overall, strategic, technological and organizational innovations are not explained by the neoclassical economic theory. They are simply seen as autonomous forces incorporated into the capital or knowledge, as prerequisites to manage the invested capital, organizational and human resources. At the industry level, these innovations are understood as choices made by businesses,

in order to ensure 'temporary monopolist positions' to maximize their profits (Arena, & Lazaric, 2003; Hodgson, 2002; Weinstein, & Azoulay, 2000).

The way of thinking of this approach is rather simple: Since innovations disturb market equilibrium, then there needs to be some time until market mechanisms can react and restore a healthy balance between supply and demand. In this way, innovation becomes a temporary source of monopolistic power that provides some greater earnings than usual. In short, innovation remains, under this theoretical approach, as something unnatural but ultimately assimilated by the previous balance, while the socioeconomic context that surrounds it, remains stable and, by definition, inalienable (Machlup, 1959).

On a deeper sense, the neoclassical-oriented economic science traditionally finds it difficult to comprehend and interpretatively assimilate the dimension of knowledge. For conventional neoclassical economists, the key issue remains the use of existing knowledge, which is condensed simply on price information (Cohendet, & Llerena, 1999; Foss, 1999; Hart, 1989; Holmstrom, & Roberts, 1998; Prahalad, & Hamel, 1990; Wernerfelt, 1984). According to the market mechanism in the model of full competition, all companies have the same standing knowledge that makes them possible to maximize their profits; each company does not create different knowledge (Argyris, 1977; Levitt, & March, 1988; Loasby, 2009; Nonaka, & Konno, 1998; Tarondeau, 1999). Thus, since the beginning of the neoclassical thinking, economists have been ignoring the enormous amount of inconsistent and explicit knowledge of economic subjects outside the price signals (Hailey, & James, 2002; Rowley, & Hartley, 2017). They have not dealt at all with knowledge creation and have not examined the business as a creator of knowledge.

The conventional Keynesian tradition and innovation dynamics

In a parallel view, the conventional Keynesian tradition does not appear to be more open interpretively to the study of innovation dynamics. Despite a clear divergence from the neoclassical perspective—especially in terms of an economic

system achieving an automatic equilibrium—it also does not seem able to welcome the innovation discipline in a more complete and structured way (Coddington, 1976; Sweezy, 1946)[4].

A key point in Keynes' analysis concerns, of course, the approach of private investment as an important determinant of the macroeconomic equilibrium of the system (Hayes, 2008). He clearly emphasizes in his writings that it is impossible to rationally calculate the future returns of new investments and stresses the importance of trust in the economy and the decisive role of the entrepreneurs' animal instinct. However, in his General Theory, Keynes (1936) neglects the investments as an engine of introducing faster and more efficiently new technologies that are, in fact, the direct expression of this entrepreneurial animal instinct.

As Freeman & Soete (Freeman, Soete, & Mothe, 1995) rightly point out: "In fact, in General Theory, Keynes retreated to positions that neglect technology when he introduced the widely artificial concept of a temporary fall in the marginal profitability of capital without correlating it with real changes in technologies and capital stocks ... For Keynesians, it was hardly important to determine what were the new technologies and the fast-growing industries".

Focusing on the evolutionary nature of the capitalist enterprise

If the economic thinking does not remove the conceptual and interpretive constraints and the analytical myopia of traditional economic logic, both of neoclassical and Keynesian origin, then a more complete and reliable perception of innovation dynamics that drive our modern world cannot be achieved.

And it becomes progressively understood that the modern economic and organizational thinking and science has a lot to gain from a theoretical refocusing, centered on the evolutionary dynamics of the capitalist enterprise (Alchian, 1953; Aoki, 2007;

[4] However, this critique of the conventional neoclassical and Keynesian tradition does not imply that there is no important progress and evolution in these schools of thought nowadays. See, for example: (Vernengo, 2010; Weintraub, 2002).

Augier, & Teece, 2008; Chassagnon, 2011a; Chassagnon, & Hollandts, 2014; Coriat, 1995; Coriat, & Weinstein, 2010; Mäki, 2004).

Critique of the conventional approach to Firm's theory

In the conventional model of economic theory, the concept of the capitalistic enterprise was built on the basis of some extremely simplistic and crude assumptions regarding the innovation dynamics.

However, especially since the 1960s, many theoretical contributions have come out to make a consistent critique of this rigid, traditional and conventional neoclassical and Keynesian model of perception of the capitalist enterprise and its innovation dynamics. Their source is twofold: it stems from both Modern Organizational Theory and Modern Economic Science, under the Evolutionary and Institutional orientation (Dosi, 1995; Dosi, & Winter, 2003; Favereau, 2011; Fehr, Hart, & Zehnder, 2011; Foss, & Ishikawa, 2007: Hart, & Holmstrom, 2010; Hodgson, 2012; Lawson, 2012; Lewin, & Phelan, 2000; Nooteboom, 2009; North, 1990; North, 2005).

In particular, more and more research contributions, specifically articulated in the thematic field of Firm's theory, have argued with numerous arguments that we must renegotiate and re-examine the evolutionary dynamics that the capitalist enterprise incorporates and activates (Archibald, 1971; Chandler, 1962; Chamberlin, 1933; Coase, 1988; Menard, 1994; Penrose, 1952). Progressively, on the orbit of these theoretical developments, it is becoming increasingly visible that the capitalist enterprise is at the same time:

An evolutionary structured socioeconomic organization (Baumol, 1959; Shackle, 1967; Simon, 1982; Sraffa, 1926), a historical institution (Baudry, & Chassagnon, 2010; Chassagnon, 2010; Chassagnon, 2011b; Roberts, 2010), a complex and versatile system that constantly pursues the preservation and reproduction of the mechanisms of homeostasis and negative entropy that it possesses in 'chaotic conditions' (Arbib, & Lecci, 1972; Ashby, 1961; Baker, & Gollub, 1996; Forrester, 1980; Gulick, 2012; Harle, & Jouanneault,

1984; Kautz, 2011; Lesourne, 1978; Senge, 1993; Von Bertalanffy, 1973; Wiener, 1948) and, finally, a living organism with internal physiological determinations (Chassagnon, & Vivel, 2013; Loasby, 2007; Penrose, 1952).

Under this new and evolutionary approach, the enterprise ceases to be considered as merely a passive acceptor of some changes that 'fall out of nowhere' and is finally perceived as one of the most critical—the most critical in fact—producer of fundamental changes that invade the reality experienced at all levels; through its—incessant and imperative for its survival—innovative action.

All the previous steps have progressively gained special importance and today they prove to be absolutely necessary on an interpretative level, as globalization has come out to make the outline of the capitalist venture even more fluid and its dynamics even more complex under the context of the reshaped 'New Global Economy' (Abélès, 2012; Acemoglu, Gancia, & Ziliboti, 2015; Adda, 2012; Aghion, Boulanger, & Cohen, 2011; Alfaro, & Charlton, 2013; Altomonte, *et al.*, 2016; Arkolakis, *et al.*, 2013; Baldwin, 2012; Boyer, 2015; Cohen, 2011; Corm, 2010; Fontaine, Goulard, & Bodman, 2010; Graz, 2013; Sapir, 2010).

The evolutionary physiology of the firm

It is becoming progressively visible, in the relevant international literature, that the role of the entrepreneur—of entrepreneurship and innovation—as the most critical factor of action and overturn cannot be overlooked without very serious explanatory losses (Schreyögg, & Kliesch-Eberl, 2007).

Under the perspective presented in this paper, at least four critical questions concerning the evolutionary existence of the business hold a central position (Cyert, & March, 1963; Galbraith, 1967; Leibenstein, 1978): Who and how shapes the future path of the business (Strategy)? Who and how implements the function of acquiring, exploiting, and using of information, knowledge and tools (Technology)? Who and how manages the organization and coordination of production (Management)? Who and how synthesizes all the above dimensions (Synthesis of Strategy, Technology and Management—Stra.Tech.Man), the innovation

processes within them, and creates, in general, new fields of action in capitalism?

In such analytical direction, recently, a very important research effort is trying to develop a coherent theory and narrative of economic development focused on innovation (Aghion, *et al.*, 2005; Perez, 2003). The economics of innovation, therefore, attempt to respond to the fundamental problem concerning the overall growth of productivity and productive factors (total-factor productivity) (Scherer, & Ross, 1990; Antonelli, 2003).

Innovation economists believe, in particular, that the most important element of the economic growth process in today's knowledge-intensive economy is not exhausted to the mere accumulation of capital, as the conventional economic thought supports, but to the innovation dynamics motivated by the appropriate institutional, technological and cognitive externalities, as the modern evolutionary economics supports (Abell, Felin, & Foss, 2008; Becker, Lazaric, 2009; Bellone, Musso, Nesta, & Quéré, 2008; Boulding, 1991; Cohen, 2007; D'Adderio, 2008; Silva, & Teixeira, 2009; Witt, 2008).

Development, in the perspective of evolutionary economics, is thus reflected as the ultimate product of innovative knowledge, and thus refers to the policies that facilitate business and innovation, technological diffusion and interactive relationships between cooperative enterprises, while at the same time explore the structural effects on the innovation systems that create, reproduce and extend to the innovative environments in which they operate (Algan, Cahuc, & Shleifer, 2013; Chaney, 2016; Leromain, & Orefice, 2014).

The concept of innovation in the Stra.Tech.Man approach

But the principal question still remains unanswered: Which could be a different, an evolutionary and dialectical way of capturing the concept of business and its innovation dynamics by focusing on its particular evolutionary potential?

According to the Stra.Tech.Man approach, that advocated in this paper, the 'heart' of every living, real enterprise is and always being formed, in the innermost level of analysis, within the three

(2) Innovation in Stra.Tech.Man terms

fundamental structural spheres: Strategy, Technology and Management—spheres that already possesses and mobilizes. Within these fundamental functional spheres, each business compiles and reconsolidates its available potential (both material and intangible) for effective innovation that will allow to compete for survival and growth within its ever-evolving socioeconomic environment (see Figure 1).

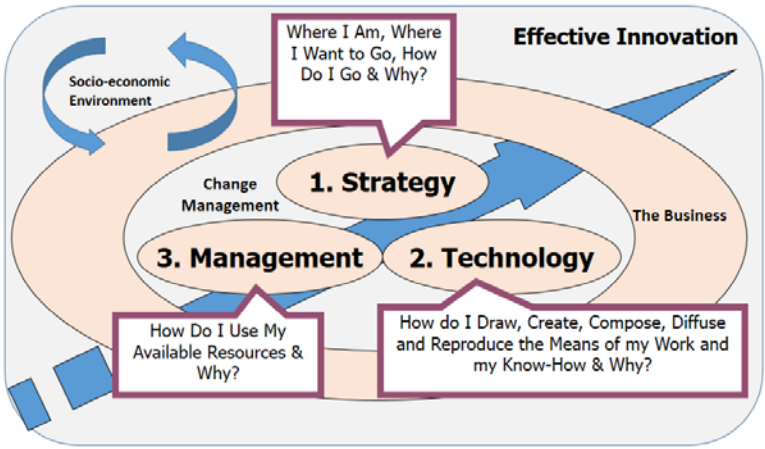

Figure 1. *The evolutionary core of business.*

Each sphere is being built, coexists and co-evolves with the rest, although with a distinct role. More specifically:

1. Strategy corresponds to "Where I Am, Where I Want to Go, How Do I Go & Why?"
2. Technology to: "How Can I Create, Composite, Diffuse & Reproduce the means of my Work and my Know-How & Why?"
3. And Management to: "How Do I Use My Available Resources & Why?" (Spilanis & Vlados, 1994; Vlados, 1992a; Vlados, 1992b; Vlados, 1996; Vlados, 2004; Vlados, 2005; Vlados, 2007; Vlados, 2012; Katimertzopoulos, & Vlados, 2017; Vlados, Deniozos, & Chatzinikolaou, 2018a; Vlados, Deniozos, & Chatzinikolaou, 2018b; Vlados, Deniozos, Chatzinikolaou, & Demertzis, 2018a; Vlados, Deniozos, Chatzinikolaou, & Demertzis, 2018b; Βλάδος, 2006; Βλάδος, 2007; Βλάδος, 2014; Βλάδος, 2016; Βλάδος, 2017).

The Stra.Tech.Man dynamic triangle

These three-tier inner dimensions, in a continuous and dialectical way, determine the unique, specific and ever-evolving dynamic Stra.Tech.Man triangle. This evolutionary triangle uniquely characterizes every business, of every size, of every type, of every industry. Each business builds its own dynamic Stra.Tech.Man triangle, in a more or less explicit and systematical way, in order to effectively innovate and take a profit out of it: This is the core that always regulates, in the depth, its overall evolutionary course.

This triangle is, as such, in our view, the evolving, organic identity of every business. And under this understanding, the "biological type" and "natural selection" priorities are now placed in the central plan of the analysis of the evolutionary dynamics of Firm (Buenstorf, 2006; Festré, & Garrouste, 2009; Hawley, 1950; Hodgson, 2010; Hodgson, & Knudsen, 2007; Nelson, 2007; Prigogine, 1976; Wenting, 2009; Winter, 2006).

The dimensions of Strategy, Technology and Management are often inadequately perceived as inherently independent, autonomous and functionally separate from each other: this is defective and analytically disorienting. Instead, in reality, these dimensions are always in a close relationship of evolutionary synthesis and physiological co-adaptation—as the business is in fact a living and evolving organism. All three together, in their composition, define the Evolutionary Physiology of the Business.

In fact, the three dimensions necessarily coexist and are structurally co-defined nowadays, monitoring and restructuring at the same time the current dynamics of globalization (Artus, & Virard, 2015; Balland, Suire, & Vicente, 2013) (see Figure 2).

(2) Innovation in Stra.Tech.Man terms

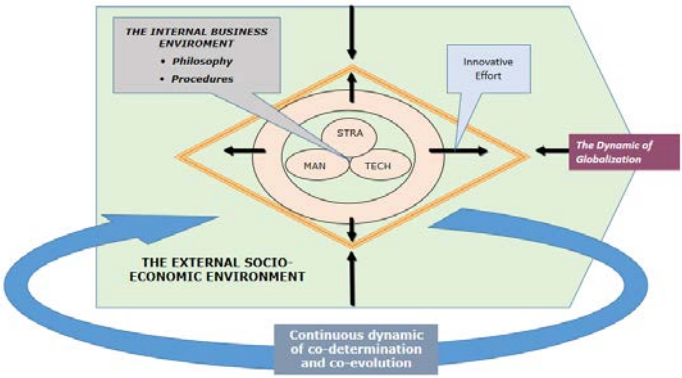

Figure 2. *The business initiative as a dynamic synthesis of internal and external business environment through globalization.*

In practice, this dynamic Stra.Tech.Man triangle of the Business, operates as a systemic recipient, but also as a high-flux transformer, of the overall socioeconomic changes that are being produced—and produce respectively—globalization. The business' internal Stra.Tech.Man potential, structured on the continuous dialectical determination of Philosophy and Processes that characterize it, constructs its innovative effort as a survival and growth response to the environmental pressures it faces (see Figure 3).

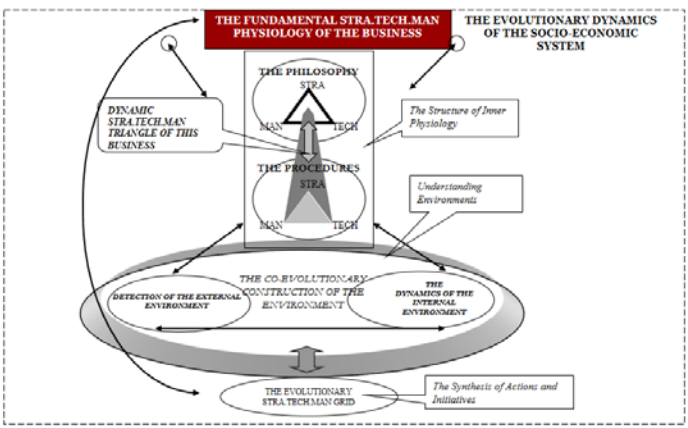

Figure 3. *The evolutionary socioeconomic 'game' and the Stra.Tech.Man structure of a business.*

(2) Innovation in Stra.Tech.Man terms

In the light of this awareness, it becomes clear that businesses, like living organisms of all kinds, change and evolve to the limits of their local, national, and international environment, and actively affect the overall 'climate' of globalization through their innovative efforts[5].

The evolutionary physiology of firms

The above described view of Stra.Tech.Man provides the possibility to make some theoretical clarifications:

I. Strategy, Technology and Business Management, although considered as independent dimensions in analytical terms, are inseparably interlocked and, inevitably, co-evolve in the evolutionary process. The competitive success of a business never concerns only one sphere individually, but all three together, in the specific way that their composition manages to provide effective responses to the constant changes of the environment.

II. Each business has its own 'biological' identity, which contains all the 'genetic information' that determines the possibility of its biological development. Specifically, the biological 'core' of any living and real business is always determined evolutionarily within these three fundamental and interconnected analytical spheres: strategy, technology and management, both in terms of inner philosophy and applied procedures (routines), are produced and reproduced by the business with the purpose of competitive survival and development, in the constantly evolving environment.

III. The physiological evolution of the business takes place, in practice, through dialectical conflicts, between:

- The Philosophy Stra.Tech.Man that characterizes it
- The Procedures Stra.Tech.Man that it uses (see Figure 4)

[5] This scientific hypothesis was empirically tested (Vlados, 2004) for the Greek productive 'ecosystem'. It was proved, particularly, that the Greek economy has a peculiar 'fauna' of businesses (Βλάδος, 2006).

(2) Innovation in Stra.Tech.Man terms

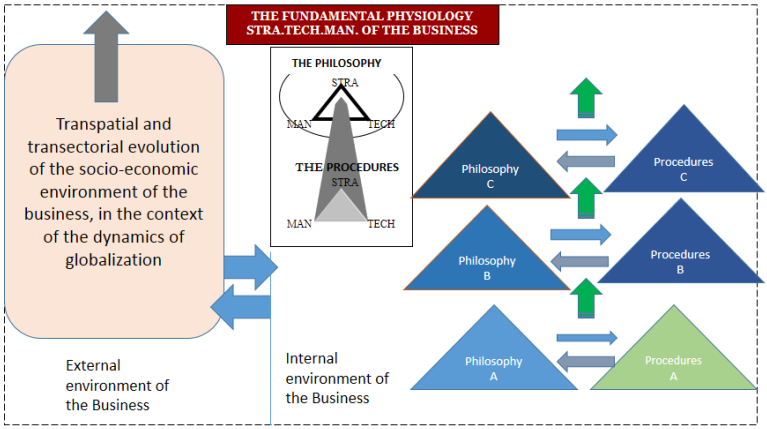

Figure 4. *The Stra.Tech.Man physiological transformation of the business.*

IV. The business is a qualitative sum of its particular Stra.Tech.Man behavioral capabilities that define its kind. These capabilities are not formed by any unrealistic voluntarism or the mere 'desire' of its people. A business, more specifically, builds and transforms its distinct physiology as a synthesis of the applied business philosophy and business processes. It constructs the mechanisms of understanding its surroundings. It composes its initiatives. And it articulates its actions and evaluates them after the implementation.

V. Every successful business is led to the Stra.Tech.Man compositions and reconstructions which are materializing the specific in space and time business logic—the business rationality. Accordingly, this business physiology reproduces evolutionarily its own heterogeneity.

VI. All businesses, regardless of their size, like all living organisms, are understood as different natural species (they are different 'animals"): In this sense, the size of a business is not of central analytical significance in this view.

VII. The combined Stra.Tech.Man evolution of the internal and external business environment of the enterprise becomes the center of the overall process of innovation; it represents the 'natural selection' between the production systems and the overall socioeconomic development. The Stra.Tech.Man triangle is, in the long run, the perpetual engine of change for

the business and for the surrounding environment (Vlados, 2004; Βλάδος, 2006; Βλάδος, 2016; Βλάδος, 2017).

The Stra.Tech.Man triangle as the innovative engine of a business

According to this Stra.Tech.Man analysis, every innovation is always and necessarily characterized by the particular organic Stra.Tech.Man triangle. All innovations, constantly and necessarily, contain a part of Strategy, a part of Technology and a part of Management (Deming, 2000; Follet, 1977; Garratt, 1987; Juran, 1988; Masaaki, 1986; Nonaka, & Takeuchi, 1995).

There are no innovations that can exist and be realized effectively without changing at the same time all three inner Stra.Tech.Man spheres of a socioeconomic organism. As a result, every kind of innovation is necessarily of Stra.Tech.Man reach.

Of course, innovation can be perceived to emerge only from one of the Stra.Tech.Man spheres, and be focused only in one functional area but, in the long run, every innovation requires always combined relocations and re-adjustments for the entire organization:

- For the strategy: And/or for the relationships with the customers, and/or for the markets, and/or for the value proposition, and/or for the product mix.
- For the technology: And/or for the tools, and/or for the working means, and/or for the particular know-how, and/or for the production process.
- For the management: And/or for the planning, and/or for the organization, and/or for the staffing, and/or for the management, and/or for the control, and/or for the coordination and communication.

And, in the background, every innovation bears internally a Stra.Tech.Man business 'gene' that has created that particular innovation.

(2) Innovation in Stra.Tech.Man terms

Innovation within the operational structure of the business

By studying the world of innovation nowadays, it becomes apparent that innovation can be born everywhere inside the business that interfaces with its external environment (customers, suppliers, or partners) (Brandenburger, & Nalebuff, 1997; Hamel, & Prahalad, 1994; Kim, & Mauborgne, 2005; Moss, & Kanter, 2009; Nordstrom, & Ridderstrale, 2007; Porter, 1991; Porter, 1996; Porter, & Heppelmann, 2015; Schumpeter, 1934; Schumpeter, 1942) (see Figures 5 & 6).

Figure 5. *The core of business and innovative dynamics.*

Figure 6. *Contact points with the environment and innovation dynamics.*

(2) Innovation in Stra.Tech.Man terms

Everything in the innovative effort works, both by necessity and by design, in combination: Organizational functions, environments and actions. Together they 'get out of comfort' and rebalance evolutionarily, endlessly, throughout the innovative game. This is necessary and inevitable. And all these lead to the continuation of the business itself in terms of the Stra.Tech.Man triangle.

Naturally, innovations can vary widely and may include many types of 'overturning'—all innovations do not have the same evolutionary dynamics and profitability. Whether they derive from an initiative coming from the 'base' (Hamel, 2000; Prahalad, 2004), the 'top' (Kotter, 1996) or the 'core body' of the organism, they always touch and affect the entire organism, on all sides.

Nowadays, by studding the empirical field, it becomes clear that a healthy and dynamic 'tree' (organization-business) should be able to produce many 'apples' (innovations), so that the increasingly competitive conditions of the future can be looked forward with optimism. It has been observed that, very often, many companies are wasting their innovative potential carelessly. Often, innovative applications emerging within organizations are ignored, neglected and spent pointlessly. How many good applications within some organizations, how many smart solutions, how many fertile initiatives, how many fruitful initiatives have not being hampered, jeopardized, and blocked? In this paper is estimated that modern innovative enterprise has to refuse, actively and systematically, this misuse. Any modern efficient business should deny this innovative waste. Instead it should collect, group and preserve its innovative initiatives in a way that they will be compiled, coordinated and fertilized. The authors of the present research believe that, in practice, every organization has to learn to look at the depth of innovation. It has to detect within the innovations the special features of Stra.Tech.Man they possess. It must analyze, deep down, their particular composition.

It must realize, first and foremost, that the emerging innovations are often 'organically relevant' to each other, whether these are born from this combination of Stra.Tech.Man functions or implemented in one such functional business area. And, very

often, innovations accumulate in groups—like 'bunches': In practice an innovation gives birth to some other, more or less, relevant innovations (Gest, 1986) (see Figure 7).

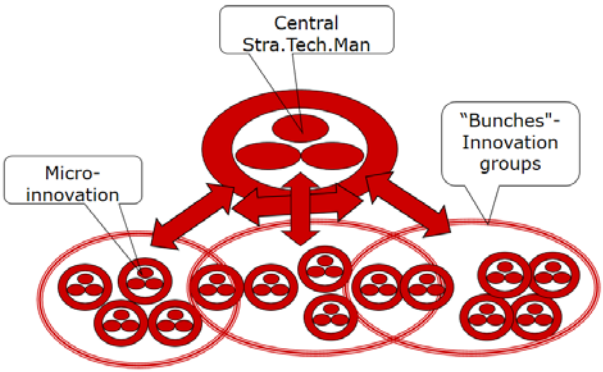

Figure 7. *Central Stra.Tech.Man 'bunches'—Innovation groups and micro-innovation.*

The central administration of each organization has to 'graft' the innovations of the organization with any additional components may be required in order to make them more effective; to become distinct and acquire a specific 'personality' within the competition. Ultimately an innovative business should seek to give a greater satisfaction to the customer and the market, either by providing a higher quality coverage of their needs, or by offering more attractive prices, or even both. In doing so, a new competitive dynamic for the organization is created.

Obviously, the most important aspect is how the business will manage these inherent structural changes so that it can cultivate, develop, preserve, diffuse and produce effective innovations; these innovative changes, ultimately, that would enhance the survival and development prospects, according to the specific in space and time external organizational environment (Covey, 1992; Duck, 1993; Elias, 2009; Jaques, 2017; Martin, 1993; Oreg, 2003).

And this realization is always on the basis of understanding the particular limits and prospects of the Stra.Tech.Man business physiology. Ultimately, in order for any to business survive it has to rebuild and transform the Stra.Tech.Man's physiology according

to the specific external and internal environment. Keeping always in mind that Stra.Tech.Man defines the particular 'genetic code' that can be traced back to every 'organizational cell'—namely every initiative and action.

In parallel, it becomes apparent in our assumption that modern organizations should, on the one hand, try to organically understand the innovation process and, on the other hand, to assimilate an integrated biological perspective of their innovative effort. And they should progressively realize that nowadays innovation of the most advanced businesses is born from a deep dialectic fertilization and thinking. The era of unilateralism, of mere addition, of direct confrontation, and of the imposition of one sphere over another seems to have irreversibly been surpassed (see Figure 8).

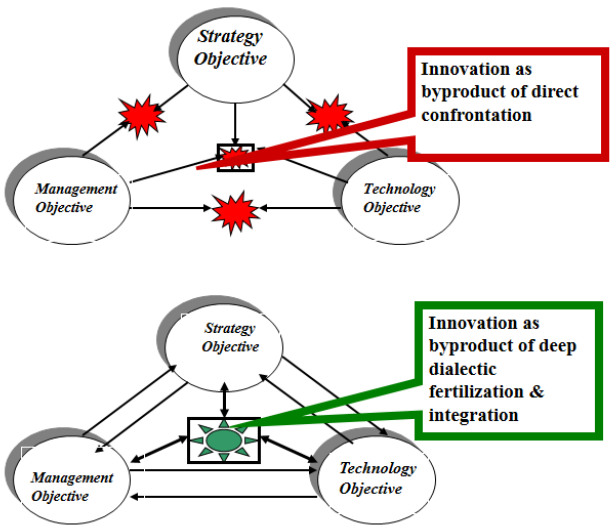

Figure 8. *The Stra.Tech.Man logic: From the past to the future.*

In conclusion, in order for a synthesis of Stra.Tech.Man to prove effective, it has to transfigure the multifaceted internal potential of the organism (material and immaterial) according to the specific conditions set by the external environment. All innovations nowadays are always taking place within the global dynamics, that

define, in turn, the competitiveness of all organizations—namely the ability to survive and develop.

References

Abélès M., (2012). *Anthropologie de la globalisation*. Paris: Payot.

Abell, P., Felin, T., & Foss, N. (2008). Building micro-foundations for the routines, capabilities, and performance links. *Managerial and Decision Economics*, 29(6), 489-502. doi. 10.1002/mde.1413

Acemoglu, D., Gancia, G., & Zilibotti, F. (2015). Offshoring and directed technical change. *American Economic Journal: Macroeconomics*, 7(3), 84-122. doi. 10.1257/mac.20130302

Adda J., (2012). *La mondialisation de l'économie*. Paris: La Découverte.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., & Howitt, P. (2005). Competition and innovation: An inverted-U relationship. *The Quarterly Journal of Economics*, 120(2), 701-728.

Aghion, P., Boulanger, J., & Cohen, E. (2011). Rethinking industrial policy. No.2011/04. Brussels: Bruegel, 2011.

Alchian, A.A. (1953). Biological analogies in the theory of the firm: comment. *The American Economic Review*, 43(4), 600-603.

Alfaro, L., & Charlton, A. (2013). Growth and the Quality of Foreign Direct Investment. *In* Stiglitz, J.E., & Lin, J.L. (eds.). *The Industrial Policy Revolution I* (pp. 162-204). London: Palgrave Macmillan. doi. 10.1057/9781137335173_12

Algan, Y., Cahuc, P., & Shleifer, A. (2013). Teaching practices and social capital. *American Economic Journal: Applied Economics*, 5(3), 189-210.

Altomonte, C., Bas, M., Bugamelli, M., Colantone, I., Fontagné, L., Forlani, E., ... & Ottaviano, G.I. (2016). Measuring competitiveness in Europe: Resource allocation, granularity and trade. *Bruegel Blueprint Series Volume XVIV*, January 2016.

Antonelli, C. (2003). *The economics of innovation, new technologies, and structural change*. London: Routledge.

Aoki, M. (1984). *The co-operative game theory of the firm*. Oxford: Oxford University Press.

Aoki, M. (2007). Endogenizing institutions and institutional changes. *Journal of Institutional Economics*, 3(1), 1-31. doi. 10.1017/S1744137406000531

Arbib, M.A., Lecci, A. (1972). *The metaphorical brain: Introduction to cybernetics as artificial intelligence and brain theory*. John Wiley & Sons Inc.

Archibald, G. C. (ed.) (1971). *The theory of the firm*. Harmondsworth: Penguin Books.

Arena, R., & Lazaric, N. (2003). La théorie évolutionniste du changement économique de Nelson et Winter. *Revue économique*, 54(2), 329-354. doi. 10.3917/reco.542.0329

Argyris, C. (1977). Organizational learning and management information systems. *Accounting. Organizations and Society*, 2(2), 113-123. doi. 10.1016/0361-3682(77)90028-9

Arkolakis, C., Ramondo, N., Rodríguez-Clare, A., & Yeaple, S. (2013). Innovation and production in the global economy (No.w18972). *National Bureau of Economic Research*. doi. 10.3386/w18972

Arrow, K.J. (1974). *The limits of organization*. New York: WW Norton & Company.

Artus, P., & Virard, M.P. (2015). *Croissance zéro, comment éviter le chaos?*. Paris: Fayard.

Ashby, W.R. (1961). An introduction to cybernetics. Chapman & Hall Ltd.

(2) Innovation in Stra.Tech.Man terms

Aspromourgos, T. (1986). On the origins of the term 'neoclassical'. *Cambridge Journal of Economics*, 10(3), 265-270. doi. 10.1093/oxfordjournals.cje.a034999

Augier, M., & Teece, D. J. (2008). Strategy as evolution with design: The foundations of dynamic capabilities and the role of managers in the economic system. *Organization studies*, 29(8-9), 1187-1208. doi. 10.1177/0170840608094776

Baker, G.L., & Gollub, J.P. (1996). *Chaotic dynamics*. Cambridge: Cambridge University Press. doi. 10.1017/CBO9781139170864

Baldwin, R.E. (2012). Global supply chains: why they emerged, why they matter, and where they are going. *In* Elms, D.K., & Low, P. (eds.). *Global Value Chains in a Changing World* (pp. 13-60). Lausanne: World Trade Organization Publications.

Balland, P.A., Suire, R., & Vicente, J. (2013). Structural and geographical patterns of knowledge networks in emerging technological standards: Evidence from the European GNSS industry. *Economics of Innovation and New Technology*, 22(1), 47-72. doi. 10.1080/10438599.2012.699773

Baudry, B., & Chassagnon, V. (2010). The close relation between organization theory and Oliver Williamson's transaction cost economics: A theory of the firm perspective. *Journal of Institutional Economics*, 6(4), 477-503. doi. 10.1017/S1744137410000147

Baudry, B., & Tinel, B. (2003). Une analyse théorique des fondements et du fonctionnement de la relation d'autorité intrafirme. *Revue économique*, 54(2), 229-251.

Baumol W.J. (1959). *Business behaviour, value and growth*. London: Macmillan.

Becker, M.C., & Lazaric, N. (Eds.). (2009). Organizational routines: Advancing empirical research. *Cheltenham*: Edward Elgar Publishing. doi. 10.4337/9781848447240

Bellone, F., Musso, P., Nesta, L., & Quéré, M. (2008). Market selection along the firm life cycle. *Industrial and Corporate Change*, 17(4), 753-777. doi. 10.1093/icc/dtn025

Boulding, K.E. (1991). What is evolutionary economics?. *Journal of Evolutionary economics*, 1(1), 9-17. doi. 10.1007/BF01202334

Boyer, R. & Durand, J.-P. (1993). *L'après-fordisme*. Paris: Syros.

Boyer, R. (2015). *Économie politique des capitalismes. Théorie de la régulation et des crises*. Paris: La Découverte.

Brandenburger, A.M., Nalebuff, B.J. (1997). *Co-opetion*. Currency Doubleday.

Brynjolfsson, E., & McAfee, A. (2015). *Le deuxième âge de la machine: Travail et prospérité à l'heure de la révolution technologique*. Paris: Odile Jacob.

Buenstorf, G. (2006). How useful is generalized Darwinism as a framework to study competition and industrial evolution?. *Journal of Evolutionary Economics*, 16(5), 511-527. doi. 10.1007/s00191-006-0035-3

Carlino, G., & Kerr, W.R. (2015). Agglomeration and innovation. *In Handbook of regional and urban economics* (Vol.5, pp.349-404). Elsevier. doi. 10.1016/B978-0-444-59517-1.00006-4

Chamberlin, E.H. (1933). *The theory of monopolistic competition*. Cambridge, MA: Harvard University Press.

Chandler, A.D. (1962). *Strategy and structure: Chapters in the history of the industrial enterprise*. Cambridge, MA: MIT press.

Chaney, T. (2016). Networks in international trade. In Bramoullé, Y., Galleoti, A., & Rogers, B. (eds.). *The Oxford Handbook of the Economics of Networks* (pp. 754-775).

Oxford: Oxford University Press.

Chassagnon, V. (2010). Jalons pour une théorie de la firme comme entité fondée sur le pouvoir: le gouvernement interne et externe des firmes modernes (Doctoral dissertation, Lyon 2).

Chassagnon, V. (2011a). The law and economics of the modern firm: A new governance structure of power relationships. *Revue d'économie industrielle*, (2), 25-50. doi. 10.4000/rei.4983

Chassagnon, V. (2011b). Organisation et institution: Vers une socioéconomie de la firme?. *International Review of Sociology*, 21(3), 447-468. doi. 10.1080/03906701.2011.625651

Chassagnon, V., & Hollandts, X. (2014). Who are the owners of the firm: shareholders, employees or no one?. *Journal of Institutional Economics*, 10(1), 47-69. doi. 10.1017/S1744137413000301

Chassagnon, V., & Vivel, C. (2013). Frank H. Knight and Ronald H. Coase on the nature of the capitalist firm: An analysis of their seminal contributions (1921-1937). *History of Economic Ideas*, 21(2), 29-52.

Coase, R.H. (1988). *The firm, the market and the law*. Chicago: Chicago University Press.

Coase, R.H., Gillis, X., & Thiébault, C. (1987). La nature de la firme. *Revue française d'économie*, 2(1), 133-163. doi. 10.3406/rfeco.1987.1132

Coddington, A. (1976). Keynesian economics: the search for first principles. *Journal of Economic Literature*, 14(4), 1258-1273.

Cohen, D., (2011). La mondialisation et ses ennemis. Paris: Pluriel.

Cohen, M.D. (2007). Reading Dewey: Reflections on the study of routine. *Organization Studies*, 28(5), 773-786. doi. 10.1177/0170840606077620

Cohendet, P., & Llerena, P. (1999). La conception de la firme comme processeur de connaissances. *Revue d'économie industrielle*, 88(1), 211-235. doi. 10.3406/rei.1999.1751

Colander, D. (2000). The death of neoclassical economics. *Journal of the history of Economic Thought*, 22(2), 127-143. doi. 10.1080/10427710050025330

Colander, D., Holt, R., & Rosser Jr,B. (2004). The changing face of mainstream economics. *Review of Political Economy*, 16(4), 485-499. doi. 10.1080/0953825042000256702

Coriat, B. (1995). Variety, routines and networks: The metamorphosis of Fordist firms. *Industrial and Corporate Change*, 4(1), 205-227. doi. 10.1093/icc/4.1.205

Coriat, B., & Weinstein, O. (2010). Les théories de la firme entre "contrats" et "compétences". Une revue critique des développements contemporains. *Revue d'économie industrielle*, (129-130), 57-86. doi. 10.4000/rei.4142

Corm, G., (2010). *Le nouveau gouvernement du monde*. Paris: La Découverte.

Covey, S.R. (1992). *Principle centered leadership*. New York: Simon and Schuster.

Cyert, R.M., & March, J.G. (1963). *A behavioural theory of the firm*. Englewood Cliffs: Prentice Hall.

D'Adderio, L. (2008). The performativity of routines: Theorising the influence of artefacts and distributed agencies on routines dynamics. *Research Policy*, 37(5), 769-789. doi. 10.1016/j.respol.2007.12.012

Deming, W.E. (2000). *The new economics: For industry, government, education*. MIT press.

Dosi, G. (1995). Hierarchies, markets and power: some foundational issues on the

nature of contemporary economic organizations. *Industrial and Corporate Change*, 4(1), 1-19. doi. 10.1093/icc/4.1.1

Dosi, G., &Winter, S.G. (2003). Interprétation évolutionniste du changement économique. *Revue économique*, 54(2), 385-406. doi. 10.3917/reco.542.0385

Duck, J.D. (1993). *Managing change: The art of balancing*. Harvard Business Review.

Elias, S.M. (2009). Employee commitment in times of change: Assessing the importance of attitudes toward organizational change. *Journal of Management*, 35(1), 37-55. doi. 10.1177/0149206307308910

Favereau, O. (2011). New institutional economics versus economics of conventions: the difference between bounded rationality and... bounded rationality. *Economic Sociology, the European Electronic Newsletter*, 13(1), 22-27.

Fehr, E., Hart, O., & Zehnder, C. (2011). Contracts as reference points: Experimental evidence. *American Economic Review*, 101(2), 493-525. doi. 10.1257/aer.101.2.493

Festré, A., & Garrouste, P. (2009). The economic analysis of social norms: A reappraisal of Hayek's legacy. *The Review of Austrian Economics*, 22(3), 259-279. doi. 10.1007/s11138-009-0083-7

Follett, M.P. (1977). *Dynamic administration: the collected papers of Mary Parker Follett*. Buccaneer Books.

Fontaine F., Goulard, S., Bodman, B. (2010). *La mondialisation*. Paris: First Éditions.

Forrester, J.W. (1980). *Principes des systèmes*. Paris: PUL/CERG.

Foss, N.J. (1999). The use of knowledge in firms. *Journal of Institutional and Theoretical Economics*, 155(3), 458-486.

Foss, N.J., & Ishikawa, I. (2007). Towards a dynamic resource-based view: Insights from Austrian capital and entrepreneurship theory. *Organization Studies*, 28(5), 749-772. doi. 10.1177/0170840607072546

Freeman, C., Soete, L., & Mothe, J.D.L. (1995). Work for all or mass unemployment: Computerized technical change into the 21st century. *Science and Public Policy*, 22(6), 421-422.

Galbraith, J.K. (1967). *The new industrial state*. Princeton University Press.

Garratt, B. (1987). *The learning organization*. London: Fontana.

Gest, A. (1986). *Grappes technologiques. Les nouvelles stratégies d'entreprise*. Paris: McGraw-Hill.

Gordon, R.J. (2017). *The rise and fall of American growth: The US standard of living since the civil war*. Princeton University Press.

Graz J.-C., (2013). *La gouvernance de la mondialisation*. Paris: La Découverte.

Gulick, D. (2012). *Encounters with chaos and fractals* (2nd edition). Chapman and Hall/CRC.

Hailey, J., & James, R. (2002). Learning leaders: The key to learning organisations. *Development in Practice*, 12(3-4), 398-408. doi. 10.1080/0961450220149753

Hall, B.H., Mairesse, J., & Mohnen, P. (2010). Measuring the Returns to R&D. In Hall, B., & Rosenberg, N. (eds.). *Handbook of the Economics of Innovation* (Vol. 2, pp. 1033-1082). North-Holland. doi. 10.1016/S0169-7218(10)02008-3

Hamel, G., & Prahalad, C.K. (1994). *Competing for the future*. Boston, MA: Harvard Business School Press.

Hamel, G. (2000). *Leading the revolution*. New York: Penguin Books.

Harle, E., Jouanneault. D. (1984). *L'entreprise en tant que système*. Paris: PUL.

Hart, O. (1989). An economist's perspective on the theory of the firm. *Columbia Law Review*, 89(7), 1757-1774. doi. 10.2307/1122818

(2) Innovation in Stra.Tech.Man terms

Hart, O., & Holmstrom, B. (2010). A theory of firm scope. *The Quarterly Journal of Economics*, 125(2), 483-513. doi. 10.1162/qjec.2010.125.2.483

Hawley, A. (1950). *Human ecology: A theory of community structure*. New York: Ronald Press.

Hayes, M. (2008). *The Economics of Keynes: A new guide to the General Theory*. Cheltenham UK and Northampton US: Edward Elgar Publishing.

Hodgson, G.M. (2002). The legal nature of the firm and the myth of the firm-market hybrid. *International Journal of the Economics of Business*, 9(1), 37-60. doi. 10.1080/13571510110102967

Hodgson, G.M. (2010). Darwinian coevolution of organizations and the environment. *Ecological Economics*, 69(4), 700-706. doi. 10.1016/j.ecolecon.2008.06.016

Hodgson, G.M. (2012). *From pleasure machines to moral communities: An evolutionary economics without homo economicus*. Chicago: University of Chicago Press. doi. 10.7208/chicago/9780226922737.001.0001

Hodgson, G.M., & Knudsen, T. (2007). Evolutionary theorizing beyond Lamarckism: a reply to Richard Nelson. *Journal of Evolutionary Economics*, 17(3), 353-359. doi. 10.1007/s00191-007-0062-8

Holmstrom, B. (1999). The firm as a subeconomy. *Journal of Law, Economics, and organization*, 15(1), 74-102. doi. 10.1093/jleo/15.1.74

Holmstrom, B., & Roberts, J. (1998). The boundaries of the firm revisited. *Journal of Economic perspectives*, 12(4), 73-94. doi. 10.1257/jep.12.4.73

Howson, S. (2001). Why didn't Hayek review Keynes's general theory? A partial answer. *History of Political Economy*, 33(2), 369-374. doi. 10.1215/00182702-33-2-369

Jaques, E. (2017). *Requisite organization: A total system for effective managerial organization and managerial leadership for the 21st century*. Routledge. doi. 10.4324/9781315088846

Juran, J. (1988*). Juran on planning for quality*. New York: The Free Press.

Katimertzopoulos, F., & Vlados, Ch.M. (2017). Local support mechanisms for entrepreneurship: The approach of local development and innovation institutions. *International Journal of Business and Economic Sciences Applied Research*, 10(1), 30-41. doi. 10.25103/ijbesar.101.04

Kautz, R. (2011). *Chaos: The science of predictable random motion*. Oxford: Oxford University Press.

Keynes, J.M. (1936). *The general theory of employment, interest and money*. London: Macmillan.

Kim, W.C., Mauborgne, R. (2005) *Blue ocean strategy: How to create uncontested market space and make competition irrelevant*. Boston, MA: Harvard Business Review Press.

Kotter, J. P. (1996). *Leading change*. Harvard Business School Press

Lawson, T. (2012). Ontology and the study of social reality: Emergence, organisation, community, power, social relations, corporations, artefacts and money. *Cambridge Journal of Economics*, 36(2), 345-385. doi. 10.1093/cje/ber050

Leibenstein, H. (1978). *General X-Efficiency theory and economic development*. Oxford: Oxford University Press.

Leromain, E., & Orefice, G. (2014). New revealed comparative advantage index: Dataset and empirical distribution. *International Economics*, 139, 48-70. doi.

10.1016/j.inteco.2014.03.003
Lesourne J. (1978). La théorie des systèmes et la théorie économique. *Economie Appliquée*, 31(3-4), 319-336.
Levitt, B., & March, J.G. (1988). Organizational learning. *Annual Review of Sociology*, 14(1), 319-338. doi. 10.1146/annurev.so.14.080188.001535
Lewin, P., & Phelan, S.E. (2000). An Austrian theory of the firm. *The Review of Austrian Economics*, 13(1), 59-79. doi. 10.1023/A:1007854129748
Loasby, B.J. (2007). A cognitive perspective on entrepreneurship and the firm. *Journal of Management Studies*, 44(7), 1078-1106. doi. 10.1111/j.1467-6486.2007.00729.x
Loasby, B.J. (2009). Knowledge, coordination and the firm: Historical perspectives. *The European Journal of the History of Economic Thought*, 16(4), 539-558. doi. 10.1080/09672560903201227
Machlup, F. (1959). Statics and dynamics: Kaleidoscopic words. *Southern Economic Journal*, 91-110. doi. 10.2307/1055009
Mäki, U. (2004). Theoretical isolation and explanatory progress: transaction cost economics and the dynamics of dispute. *Cambridge Journal of Economics*, 28(3), 319-346. doi. 10.1093/cje/28.3.319
Marshall, A. (1879). *The pure theory of domestic values*. London: London School of Economics and Political Science.
Marshall, A. (1890). *Principles of economics* (8th edition, 1920). London: Macmillan.
Marshall, A. (1919). *Industry and trade*. London: Macmillan.
Martin, L. (1993). *Changing the mind of the corporation*. Harvard Business Review.
Masaaki, I. (1986). *Kaizen: The key to Japan's competitive success*. New York: MacGraw-Hill.
Menard, C. (1994). *L'Economie des organisations*. Paris: La Decouverte.
Morgan, J. (Ed.). (2015). *What is neoclassical economics?: Debating the origins, meaning and significance*. London: Routledge.
Moss Kanter, R. (2009) *SuperCorp: How vanguard companies create innovation, profits, growth, and social good*. Crown Business.
Nelson, R.R. (2007). Comment on: Dismantling Lamarckism: why descriptions of socio-economic evolution as Lamarckian are misleading, by Hodgson and Knudsen. *Journal of Evolutionary Economics*, 17(3), 349-352. doi. 10.1007/s00191-007-0061-9
Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company*. New York: Oxford University Press.
Nonaka, I., & Konno, N. (1998). The concept of "ba": Building a foundation for knowledge creation. *California Management Review*, 40(3), 40-54. doi. 10.2307/41165942
Nooteboom, B. (2009). *A cognitive theory of the firm: Learning, governance and dynamic capabilities*. Cheltenham: Edward Elgar Publishing. doi. 10.4337/9781848447424
Nordstrom, K., & Ridderstrale, J. (2007) *Funky Business Forever: How to enjoy capitalism*. Pearson Education Canada.
North, D.C. (1990). *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press. doi. 10.1017/CBO9780511808678
North, D.C. (2005). *Understanding the process of economic change*. Princeton: Princeton University Press. doi. 10.1515/9781400829484
OECD (2014). *New sources of growth: Knowledge-based capital*. Paris.

(2) Innovation in Stra.Tech.Man terms

OECD (2015). *Manuel de Frascatti*. Paris.

OECD (2016). *Science, technology and innovation outlook*. Paris.

Oreg, S. (2003). Resistance to change: Developing an individual differences measure. *Journal of Applied Psychology*, 88(4), 680. doi. 10.1037/0021-9010.88.4.680

O'sullivan, A., & Sheffrin, S.M. (2003). *Economics: Principles in action*. New Jersey: Pearson Prentice Hall.

Paunov, C., & Guellec, D. (2017). Digital innovation and the distribution of income. In Corrado C., Miranda J., Haskel J. et Sichel D. (eds). *Measuring and accounting for innovation in the 21st century*. NBER, Book Series in Income and Wealth.

Penrose, E.T. (1952). Biological analogies in the theory of the firm. *The American Economic Review*, 42(5), 804-819.

Perez, C. (2003). *Technological revolutions and financial capital*. Cheltenham: Edward Elgar Publishing.

Porter, M.E. (1991). Towards a dynamic theory of strategy. *Strategic management journal*, 12(S2), 95-117. doi. 10.1002/smj.4250121008

Porter, M.E. (1996). *What is strategy?*. Harvard Business Review, pp.61-78.

Porter, M.E., & Heppelmann, J.E. (2015). How smart, connected products are transforming companies. *Harvard Business Review*, 93(10), 96-114.

Prahalad, C.K. (2004). *The future of competition: Co-creating unique value*. Harvard Business School Press

Prahalad, C.K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 3, 79-91.

Prigogine, I. (1976). Games of chance and necessity. *Nature*, 262(5571), 823-824. doi. 10.1038/262823a0

Roberts, J. (2010). Designing incentives in organizations. *Journal of Institutional Economics*, 6(1), 125-132. doi. 10.1017/S1744137409990221

Rowley, J., & Hartley, R. (2017). *Organizing knowledge: An introduction to managing access to information*. Routledge.

Rueff, J. (1947). The fallacies of lord Keynes' general theory. *The Quarterly Journal of Economics*, 61(3), 343-367. doi. 10.2307/1879560

Samuelson, P.A. (1951). *Economics-an introductory analysis*. New York, London and Toronto McGraw-Hill Book Company, Inc.

Sapir, J., (2010). *La démondialisation*. Paris: Seuil.

Scherer, F.M., Ross, D. (1990). *Industrial market structure and economic performance*. Houghton Mifflin Company.

Schreyögg, G., & Kliesch-Eberl, M. (2007). How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization. *Strategic Mmanagement Journal*, 28(9), 913-933. doi. 10.1002/smj.613

Schumpeter, J. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

Schumpeter, J. (1942). *Capitalism, socialism and democracy*. New York: Harper and Row.

Senge P. (1993). *The fifth discipline: The art & practice of the learning organization*. London: Century Business.

Shackle, G L.S. (1967). *The years of high theory*. Cambridge: Cambridge U.P

Silva, S.T., & Teixeira, A.A. (2009). On the divergence of evolutionary research paths in the past 50 years: a comprehensive bibliometric account. *Journal of Evolutionary Economics*, 19(5), 605. doi. 10.1007/s00191-008-0121-9

(2) Innovation in Stra.Tech.Man terms

Simon, H. (1982). *Models of bounded rationality*. Cambridge, MA: The MIT Press.

Sollow, R.M. (1957). Technical change and the aggregate production function. *The Review of Economics and Statistics*, 312-320. doi. 10.2307/1926047

Spilanis, I, & Vlados, Ch.M. (1994). *Development dynamics in Southern Europe*. Studies in Regional & Urban Planning, 3, 301-316.

Sraffa, P. (1926). The laws of returns under competitive conditions. *The Economic Journal*, 36(144), 535-550. doi. 10.2307/2959866

Sweezy, P.M. (1946). *John Maynard Keynes*. Science & Society, 398-405.

Tarondeau, J.C. (1999). *Le management des savoirs et le renouveau de la pensée stratégique*. Humanisme et Entreprise, (236), 97-115.

Veblen, T. (1898). Why is economics not an evolutionary science?. *The Quarterly Journal of Economics*, 12(4), 373-397. doi. 10.2307/1882952

Veblen, T. (1900). The preconceptions of economic science. *The Quarterly Journal of Economics*, 14(2), 240-269. doi. 10.2307/1883770

Vernengo, M. (2010). Conversation or monologue? On advising heterodox economists. *Journal of Post Keynesian Economics*, 32(3), 389-396. doi. 10.2753/PKE0160-3477320304

Vlados Ch.M. (1992a). Les dimensions technologiques dans la théorie de la régulation et la contribution de Coriat sur la conception analytique de la production de la technique et de la science. Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche mineur sous la direction de B.Madeuf. Université de Paris X-Nanterre.

Vlados, Ch.M. (1992b). Politiques industrielles et stratégies des groupes multinationaux dans les secteurs de base-industrie des matériaux en Europe. Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche majeure sous la direction de M. Delapierre (CEREM). Université de Paris X-Nanterre.

Vlados, Ch.M. (1996). International restructuring dynamics of competitive advantage. *Middle East Forum*, 1, 233-252.

Vlados, Ch.M. (2004). La dynamique du triangle stratégie, technologie et management: L'insertion des entreprises Grèques dans la globalisation. Thèse de doctorat de Sciences Économiques. Université de Paris X-Nanterre.

Vlados, Ch.M. (2005). The insertion of Greek firms into globalization: the dynamics of the triangle of strategy, technology and management. Tome of Proceedings of International Conference: Managing Global Trends and Challenges in a Turbulent Economy. University of the Aegean: Department of Business Administration.

Vlados, Ch.M. (2007). Development dynamics in South-Eastern Europe: The challenge of the new paradigm of cooperation, *Middle East Forum*, 6.

Vlados, Ch.M. (2012). The search of competitiveness and the entrepreneurial evolution in a global environment: Toward a new approach of development dynamics based on the case of Greek productive system. *Journal of Management Sciences and Regional Development*, 8.

Vlados, Ch.M., Deniozos, N., & Chatzinikolaou, D. (2018a). Towards a new approach of local development under crisis conditions: Empowering the local business ecosystems in Greece, by adopting a new local development policy. *International Journal of Regional Development*, 5(1). doi. 10.5296/ijrd.v5i1.11955

Vlados, Ch.M., Deniozos, N., & Chatzinikolaou, D. (2018b). The "evil globalization" & the central dialectic tug-of-war in the new globalization's shaping. *Civitas*

Gentum, 6(1), 89-134.

Vlados, Ch.M., Deniozos, N., Chatzinikolaou, D., & Demertzis, M. (2018a). Towards an evolutionary understanding of the current global socio-economic crisis and restructuring: From a conjunctural to a structural and evolutionary perspective. *Research in World Economy*, 9(1). doi. 10.5430/rwe.v9n1p15

Vlados, Ch.M., Deniozos, N., Chatzinikolaou, D., & Demertzis, M. (2018b). Perceiving competitiveness under the restructuring process of globalization. *International Journal of Business and Management*, 13(8). doi. 10.5539/ijbm.v13n8p135

Von Bertalanffy. L. (1973). *Theorie generale des systemes*. Paris: Ed Dunod.

Walras, L. (1874). *Eléments d'économie politique pure ou théorie de la richesse sociale* (Elements of Pure Economics, or the theory of social wealth). Lausanne, Paris.

Weinstein, O., & Azoulay, N. (2000). Les compétences de la firme. *Revue d'économie industrielle*, 93(1), 117-154. doi. 10.3406/rei.2000.3007

Weintraub, E.R. (2002). *Neoclassical economics*. In Henderson, D. R. (ed.). Concise Encyclopedia of Economics (1st ed.). Library of Economics and Liberty.

Wenting, R. (2009). 6. The inheritance of organizational routines and the emergence of a firm genealogy in the fashion design industry. In Becker, M., & Lazaric, N. (eds.). *Organizational Routines: Advancing Empirical Research* (pp. 103-128). Cheltenham: Edward Elgar. doi. 10.4337/9781848447240.00012

Wernerfelt, B. (1984). A resource-based view of the firm. Strategic *Management Journal*, 5(2), 171-180. doi. 10.1002/smj.4250050207

Wiener, N. (1948). *Cybernetics or control and communication in the animal and the machine*. John Wiley.

Williamson, O. (1991). Comparative economic organization: The analysis of discrete alternative. *Administrative Science Quarterly*, 36, 269-296. doi. 10.2307/2393356

Williamson, O. (1999). Strategy research: Governance and competence perspectives. Strategic *Management Journal*, 20, 1087-1108. doi. 10.1002/(SICI)1097-0266(199912)20:12%3C1087::AID-SMJ71%3E3.0.CO;2-Z

Williamson, O. (2000). The new institutional economics: Taking stock, looking ahead, *Journal of Economic Literature*, XXXVIII, 595-613.

Winter, S.G. (2006). Toward a neo-Schumpeterian theory of the firm. *Industrial and Corporate Change*, 15(1), 125-141. doi. 10.1093/icc/dtj006

Witt, U. (2008). What is specific about evolutionary economics?. *Journal of Evolutionary Economics*, 18(5), 547-575. doi. 10.1007/s00191-008-0107-7

In Greek

Βλάδος, Χ. Μ. (2006). Η δυναμική της παγκοσμιοποίησης και οι επιχειρήσεις στην Ελλάδα. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2007). Η δυναμική της παγκοσμιοποίησης και η νέα προβληματική της τοπικής ανάπτυξης: Στοιχεία για την σύσταση μηχανισμών ενίσχυσης του καινοτομικού δυναμικού των τοπικών παραγωγικών συστημάτων. Στο Συλλογικό Έργο Ειδικά Θέματα Ανάπτυξης σε Λιγότερο Ευνοημένες Περιοχές (ΛΕΠ). Αθήνα: Gutenberg.

Βλάδος, Χ.Μ. (2014). Τομές στην ελληνική κρίση. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2016). Στρατηγική μικρομεσαίων επιχειρήσεων σε συνθήκες κρίσης: Η προσέγγιση Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2017). Παγκόσμια κρίση, καινοτομία και διαχείριση αλλαγής: Η οπτική Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.

(2) Innovation in Stra.Tech.Man terms

3 Innovation in economics and management: The Stra.Tech.Man synthesis*

Introduction

The interest regarding the problematic of innovation was not born recently. Sir Francis Bacon first presented the work of New Atlantis, where he describes a technological paradise, to which honours are attributed to the inventors, honours which would, of course, be classified in this "utopia" depending on the importance of the invention (Weinberger, 1976).

In recent years, the topic of innovation is becoming the most essential and decisive—directly or indirectly—in any attempt to interpret and predict the common socio-economic future (Aghion & Howitt, 1997; Boyer & Didier, 1998; Fagerberg, Fosaas, & Sapprasert, 2012; OECD, 2014a; OECD, 2014b; Cerne, Jaklic, & Skerlavaj, 2016). The structural foundations of socio-economic reality, technological evolution as well as all associated changes and transformations into the contained and evolving socio-economic affairs can only take place, constantly, through the implementation of innovations, of every kind, level and range (Acemoglu & Robinson, 2012; Brynjolfsson & Mc Afee, 2015; Gordon, 2016). The ability of a society to innovate constitutes the fundamental mechanism for its renewal and overall evolution, and ultimately it involves every aspect of the economic and social development process in which the society participates (Aghion *et al.*, 2005; OCDE, 2016).

(3) Innovation in economics and management: The Stra.Tech.Man synthesis

Undoubtedly, innovation never enters the world unimpeded and in a "peaceful" way: It always requires multiple incisions and rupture in its implementation and assimilation. Its core lies in the sustained interplay between creativity, dynamic adaptability and the synthesis of strategic, technological and managerial skills, people, groups and organizations (Carlino & Kerr, 2015; Vlados & Katimertzopoulos, 2018).

And yet, in overall terms, the concept of innovation continues to be covered by an atmosphere of "mystery": Ambiguity, equivocation, relative conceptual fluidity and fragmentation. The purpose of this article is to attempt to elucidate this issue striving to introduce a synthetic conceptual counterproposal, which will bridge a first conditional expression of economic and business thinking on the dynamics of innovation.

Methodology and organization of the present problematic

The discussion that follows a brief and comprehensive review of the literature with the following succession:

- The presentation of the main conceptual outline in modern understanding of innovation, focusing on the observed multiplicity in the examination of the innovation phenomenon and attempting to formulate an introductory functional definition of innovation.
- The critical examination of the central different viewpoints of innovation and the related conceptual transformation within the Economic Science.
- The critical examination of the central different viewpoints of innovation and the related conceptual evolution within the Business and Organizational Science.

The attempt to synthesize a unified concept of innovation, through the creation of an analytical bridge between Economic and Business science, in combination and through the evolutionary terms of Strategy-Technology-Management (Stra.Tech.Man) (Vlados & Katimertzopoulos, 2018).

The main conceptual framework of innovation

The multiplicity in the approach of the innovative phenomenon

As it has been rightly pointed out by Wolfe (1994), the most obvious element that can be found in the literature of innovation is that its research results are very vague. Even in terms of providing a simple definition or thematic "retrenchment" of the subject of innovation, things are far from being clear. In practice, there is a multiplicity of different, largely convergent and complementary definitions and viewpoints to innovation, being at the same time, however, opposing and mutually exclusive to each other. In reality, there are many perspectives, different interpretative priorities and multiple focal points (Dasgupta & David, 1994; Freeman & Soete, 1997; Guillaume, 1998; Clément & Lelarge, 2006; Wolfe, Wright, & Smart, 2006; Damanpour, 2016).

A large number of theorists have tried to capture and attribute, in recent decades, the content of the "mystery" of innovation, each one in its own way. Among the most fruitful definition efforts, Porter (1990) considers innovation as the determining factor in defining industrial structures, as the absolute strategic priority of all businesses, and as a one-way street to gain the competitive advantage (Porter & Heppelmann, 2014; Porter & Heppelmann, 2015). For Narayanan (2000), innovation must be perceived primarily as a production process, since innovation refers to both output and process through which a technologically feasible solution to a problem can be achieved, that has arisen either because of a technological opportunity or a consumer need (Narayanan & O'Connor, 2010).

According to Deakins & Freel (2007), in an entrepreneurship approach, the concept of innovation refers to substantial changes in the technological background of products or production processes. According of Crossan & Apaydin (2009) innovation is the production or adoption, assimilation and exploitation of a value-added innovation in the social and economic spheres; the expansion and renewal of services, products and markets; the development of new production methods; and the establishment of

new management systems: Here innovation is perceived, simultaneously, both as a process and as a result.

Thus, it seems that a very broad pluralism of definitions of innovation and a constant multiperspectivity exists among researchers and analysts. Theorists seem to understand the concept of innovation either from the strategic viewpoint or from the technological point of view, and sometimes even from the general administrative approach.

Towards a functional definition of innovation

Attempting a first open synthesis with simple functional terms, innovation can be seen, ultimately, as the application of new ways of solutions on older or new problems: that is, more efficient, more effective and more "profitable" ways in a broader sense of these terms. Naturally, this definition is also incapable of claiming the meaningful integration—and let alone exclusivity—of the innovation reality.

In this open orientation it could be said that innovation is a new applied concept, a new—construction‖ (in a broader sense) or a new method that manages to improve the performance of any "mechanism" in anything. The minimum requirement for an innovation is either the product or the process or method to be able to be classified as new (or significantly improved), increasing ultimately the performance of the carried organization.

In overall terms, however, there seems to be a remarkable distance in the way in which innovation is perceived on the one hand by Economic science and on the other by the theoretical tradition of Entrepreneurship and Organizational theory. Each overall perspective, within the dominant paradigm that governs each period (but also on the fringes of the dominant approaches in the context of "heterodox" approaches that emerge) seems to hold on to the concept of innovation a different handling and a different interpretive architecture (Kuhn, 2012; Godin, 2015). This conceptual distance, indeed, seems to be useful in trying to be resynthesized conceptually by liberating the overall explanatory potential of the concept of innovation.

The economic thinking in the study of the innovation dynamics

Fertility of classical political economy and the "myopia" of neoclassical tradition and conventional Keynesianism

Certainly, the foundation of the entire building of economic science lays on the Classic Political Economy (CPE). In fact, the first roots of the Economic Development Theory can be found in the work of classical economists of the 18th and 19th centuries (Screpanti & Zamagni, 2005; Blaug, 2008; Skousen, 2008).

Overall, in the work of A. Smith (The Wealth of Nations in 2000), the concept of innovation—even without an explicit reference—emerges as the deepest explanatory foundation of the entire development process. It is not interpreted strictly on the mechanical-technological basis of innovation (new machines), but is opened directly—and with great overlap—to its fully interconnected management content (expanded division of labor) and its necessary broader strategic horizon (international trade and conquest new markets).

The thought process of Smith (2000) is, undoubtedly, the birth mother of the Economics of Innovation as it realizes the expansive dynamics of the "new" at all levels as the fundamental mechanism of capitalist development itself (Figure 1).

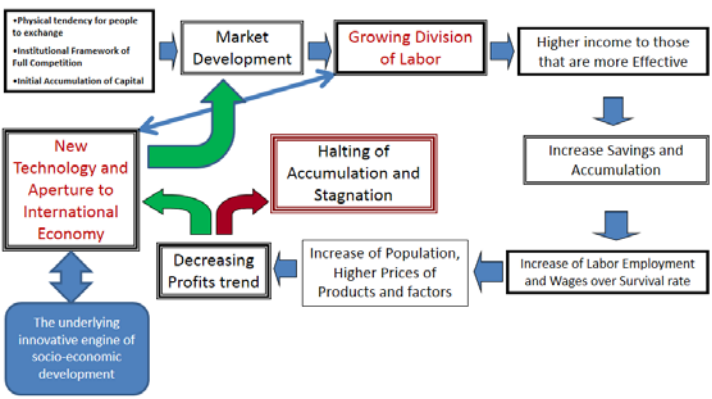

Figure 1. *The underlying engine of innovation and the overall model of capitalist development in accordance with the thought of A. Smith.*

(3) Innovation in economics and management: The Stra.Tech.Man synthesis

The first decades between the publication of The Wealth of the Nations of Adam Smith (2000) and the Principles of David Ricardo (2002) were undoubtedly a period of excitement and euphoria for the bourgeoisie of the time, in the context of the emerging and constantly empowering industrial revolution (Mark, 1993).

In general, however, the classical political economy over the years seems to have turned towards less optimistic projections (Dienstag, 2006). But particularly Thomas Robert Malthus, through his work and the "Essay on the Principle of Population", argued that reality was more conducive to the necessity of assimilating the principles of moral self-restraint and puritanism than to the optimistic prospect of an unimpeded innovation towards future improvements of human societies (Slaboch, 2018).

Obviously, in the forefront of criticism against capitalist optimism in the 19th century is the contribution of Marx. Marx, principally in Capital, but also throughout his rich work, fully accepts, deepens and reinforces, on a theoretical level, the pre-existing classical position that expansive internationalization is an absolutely necessary condition for the existence of capitalism itself. At the same time, Marx together with Engels in the Manifesto of the Communist Party, did not hesitate to recognize the revolutionary developmental role of the bourgeois / capitalist class itself and of the technological progress that mobilizes and expresses in "deterministic" terms. In Marx's theoretical perspective, in particular, the production conditions are the main determinants of the overall and surrounding social structure, which in turn creates values, lifestyles, cultures and institutions (superstructure), which ultimately set the limits of development of the economic base. These forms of production and the accompanied social constructs have their own co-evolutionary logic. According to Marx's perspective, the deeper center of the developmental motor of capitalism—in other words, the identification of the historical specific productive forces—recognizes the dynamic evolution of the means of production and the tools of each place and time. In this way, the overall technological development becomes, ultimately, in his view, the ultimate protagonist of the socio-economic development (Marx, 1955; Marx, 1976; Castoriades, 1987; Hobsbawn, 2017) (Figure 2).

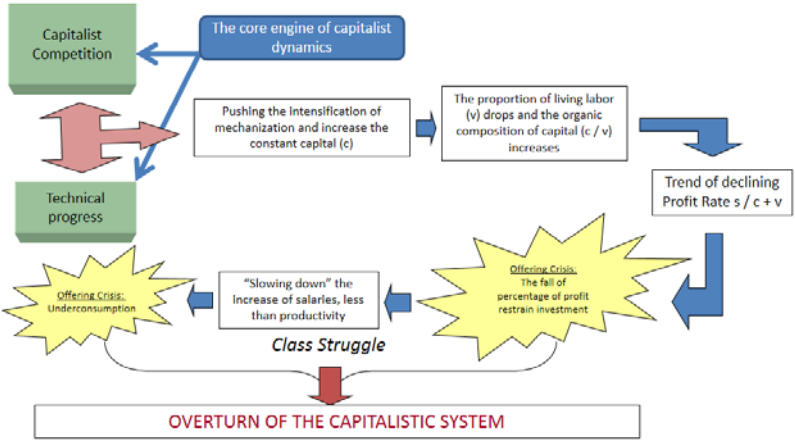

Figure 2. *The "relentless" dynamics of technical progress and competition and the inevitable collapse of capitalism.*

Later on, the arrival and prevalence of the Paradigm of Neoclassical Theory seemed to throw an interpretative shadow upon the subject of innovation dynamics in the socio-economic terms. The traditional "conventional" economic theory, the neoclassical as well as the theories inspired and directed by orthodox Keynsianism, were never really—charmed‖ with the overall innovation problem (Weintraub, 2007).

To start with, the conventional neoclassical theory of growth, in particular, considers the operation of the market as a simple—and in essence disconnected from any wider socioeconomic system—resource allocation mechanism, in which the demand interacts with the supply, in order to determine the prices, achieve and maintain market balance (Parkin, 1997). The capitalist business is therefore considered here in the vast majority of the theoretical operations to be a "hollow cover", a static "black box" which exists to solely perform an automatic transformation of economic inputs into outflows. In neoclassical theory, in particular, the pace of technological change affects—mysteriously the rate of economic growth without being however affected by it. As such, the reverse is not applied: The relationship appears strictly as to be as a one-way direction. According to this theory, innovation is always caused by a variety of independent exogenous variables and mechanisms, and as such, actors operating with consistent logical

action criteria can control it to some extent but cannot influence the rhythm and its direction (Fonseca, 2002; Geels, 2005; Cerne, *et al.*, 2016).

Paradoxically, even in its deeper sense, traditional economic theory finds it difficult to see clearly and to "assimilate" the dimensions new knowledge and innovation of this interpretation. According to Marshall (1890) the Capital consists largely of knowledge and organization, is the most powerful production mechanism and the organization helps knowledge. However, for neo-classical economists, the key issue was the use of the existing knowledge, which is concentrated only on price information. They did not concern how this knowledge is created and neglected to examine the position of the business as a creator of knowledge. On the contrary, the Austrian School of Economics, represented mainly by Friedrich von Hagen and Joseph A. Schumpeter, gave more importance to the role played by knowledge in economic affairs (Hayek, 1941; Schumpeter, 1949).

However, the fundamental Keynesian tradition does not appear to be more open-minded in interpreting terms regarding the study of the innovation dynamics. Despite the very clear deviation from the neoclassical perspective—especially regarding the possibility of achieving automatically full employment balance—it also seems unable to welcome the problematic of innovation in a fuller and structurally more fundamental way (Keynes, 2001).

In his General Theory, Keynes (2001) under a different approach neglected the issue of investments which aim to introduce faster and more efficient new technologies. As Freeman & Soete (1994) quite rightly point out, in fact, in General Theory, Keys was retreated to positions that ignore the overall term of technology by introducing the largely artificial concept of a temporary fall in the marginal profitability of capital, without correlating with the real changes in technology and capital stocks. For the Keynesians, therefore, the importance to determine the nature of new technologies and fast-growing industries was structurally insignificant.

The drastic reintegration of innovation dynamics into modern economic theory

Undoubtedly, J.A. Schumpeter (1883-1950) provided the most fundamental contribution to the exploration of the nature and dynamics of innovation, opening a whole new way of interpreting the scholarly economic science. In comparison, for J.A. Schumpeter's innovation process was, by its very nature, a structural cause of imbalance and development in the system, and not the manifestation of a calm and smooth transformation into a new market balance (Schumpeter, 1949; Schumpeter, 1951; Scherer, 1984).

In this context, indeed, the fundamental concept of "creative destruction" emerges: The creative destruction that is taking place according to its perspective, namely the progressive destruction and demolition of outdated technologies, the decadent sectors of economic activity, and the receding and dying reassured enterprises, and at the same time, new technologies of new branches of economic activity and innovative enterprises emergence through an evolutionary mimetic process aimed at monopoly returns on innovation (Schumpeter, 1942).

Therefore, these theoretical bases articulate an attempt to understand the concept of innovation in an evolutionary and structural way and the process by which it develops and diffuses into the individual socio-economic systems and the global system. What seems to be of increasing importance is the role of institutional dimensions and the way they interact in creating new knowledge (Brynjolfsson & Mc Afee, 2015; Gordon, 2016). The systematization of this overall institutional dynamics that causes—and its being provoked—from innovation has been developed within the thematic national innovation systems (OECD 1997; Bassis & Armellini, 2018).

There are a variety of definitions that attempt to approach the issue in a convergent and complementary way. According to them, a national innovation system can be characterized as:

- The national institutions, the incentive structures and the competitive advantages that govern them and which determine the degree and direction of technological learning within a country (Patel & Pavitt, 1994).

- That distinct sum of institutions that jointly and personally contribute to the development and diffusion of new technologies and provide the framework within which governments shape and implement policies to influence the innovation process. It is, therefore, a system of interconnected institutions for the creation, storage and transfer of knowledge, skills and artifacts that define new technologies (Metcalfe & Georghiou, 1997).

Most of the above dimensions have been studied, analyzed and synthesized within the framework of the French "School of Regulation" since the 1970s (Aglietta & Orléan, 1982; Billaudot, 1996; Billaudot, 2001; Boyer, 2004; Amable, 2005). In a parallel conceptual direction, already since the late 1980s, the approaches of "micro-competitiveness" were also emerged. In this stream of discussion during the late 1980s, the "micro-orientation" in the MIT approach was also recorded (Dertouzos, Lester, & Solow, 1989). In this, a "bottom-up" approach is usually chosen instead of the usual "top-down" of competitiveness including, indirectly but absolutely decisively, the innovation process. In these approaches, a point of convergence is the finding that knowledge and organization of relationships, both inside the enterprise and between enterprises, in a comparable historical and spatial socio-economic context, is always of great importance.

On this conceptual basis, the concept of "innovation environment" (milieu innovateur) is also built (Aydalot, 1984; Aydalot, 1986a). Specifically, an innovation environment can be defined as a set of multi-dimensional diverse business activities and diffusion of knowledge which is open to the exterior and incorporates, in a gradual process, expertise, rules and "relational capital» (capital relationnel). Particularly, under this approach, spatial development is perceived as a synthetic product of both innovative processes and socio-economic synergies, which fan out into specific spatial contexts, of local range.

By this reasoning, local innovation system is defined and localized at a lower level of spatial perception of the innovative environment; the structural components of which can be grouped into three main categories: a) the running skill, b) the operational

rules, c) the relational capital, namely: capital in terms of the value of the generated, maintained and reproduced relationships.

In a converging direction, Carlota Perez's "Neo-Schumpeterian" work is also being driven. The most interesting point in Carlota Perez's reasoning in relation to the "change of techno-economic paradigm " is the view that the periods of high growth explosions occur only when there is a "good combination", an active agreement between the new techno-economical " paradigm " of a long wave of economic development and the social and institutional climate that surrounds it (Perez, 1983; Perez, 2013; Marin, Navas-Aleman, & Perez, 2015).

Innovative dynamics, socio-economic systems and globalization

In this context, however, a series of very important issues are still open: Can the logic of globalization be combined with this historically and institutionally determined innovation momentum, which is always perceived as the childbirth of specific spatial socioeconomic systems? The innovational dynamic globalization will not, in the end, surpass the differences of socio-economic systems? Is not equating and ultimately "flattening" the differences between different socio-economic spaces? What significance can anymore find in any local or national particularity in terms of innovation (Amable, Barre, & Boyer, 1997; OECD, 2014b; OECD, 2016; Katimertzopoulos & Vlados, 2017).

Christopher Freeman explains in particular that: In contrast to the recent work on "globalization", this research argues that national and regional innovation systems remain a necessary field of economic analysis. Their importance is drawn from the networks of relationships that are essential for a business to innovate. Although external international connections are becoming, of course, increasingly important, the influence of the national education system, industrial relations, technical and scientific institutes, government policies, cultural traditions and many other national institutions are fundamental to understanding innovation. And he concludes that differences in national socio-economic structures continue to make a decisive contribution to competitive success even at the era of globalization (Freeman,

1995; Freeman, 2002; Edquist & Hommen, 2008; Kuhn, 2012; Paunov, 2012; Bremmer, 2014) (Figure 3).

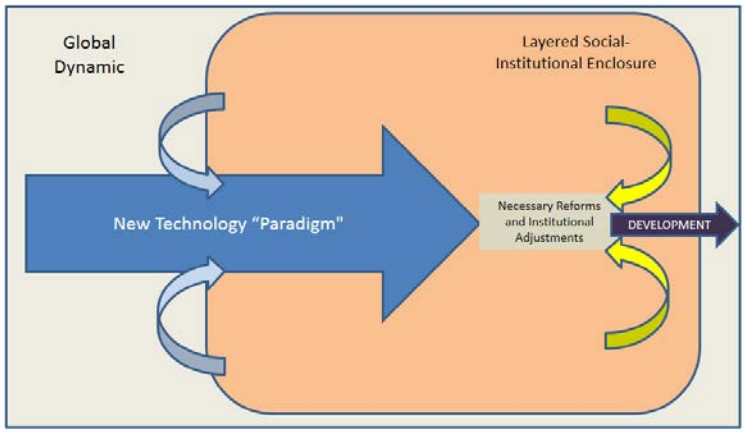

Figure 3. *Changing the techno-economic paradigm and the necessary institutional adjustments*

And indeed Freeman's point seems to bring his ideas closer to the conclusions of Michael Porter, who starts from a clearly different theoretical starting point. In particular, Porter (1990), in his many contributions to economic and strategic theory, has also introduced an analysis of the so-called national "diamond" of competitiveness. The analysis of M. Porter's "diamond" attempts, in particular, to interpret the national advantage enjoyed by some national industries and businesses within them (Porter, 1990). In the depth of his analysis, the dimension of the inner innovation dynamic of the national system emerges indirectly.

The focus of Porter's analysis is therefore on the comprehensive exploration of the construction of sectoral competitiveness, approached by its national contexts. This analysis leads to the conclusion that the competitive advantages are not static, not "inherited forever" and do not arise automatically, never and nowhere. Instead, they are created and recreated, always, through peculiarities that vary from country to country and from sector to sector (Porter, 1990).

However, in subsequent years, M. Porter has repeatedly stressed the importance of locality- the "home advantage" that

acquires great importance in the globalization (Gibson, 1998). In his reasoning, "innovation advantages" are always subject to an inevitable process in progress, in which the technology eliminates the traditional advantages of location. But by doing so, it can create new advantages for the location, possibly at a higher level.

All in all, approaches that attach specific interest to the spatial—institutional and historical—background of the innovation process seem extremely useful in understanding the modern global dynamics of innovation. The nation-states and the socio-economic systems that they are formed within them, at every level (local, regional, national and international) are still instrumental in shaping the overall innovation dynamics (Hanson, Lind, & Muendler, 2015; Chaney, 2016; Katimertzopoulos & Vlados, 2017; Arkolakis *et al.*, 2018).

The critical points of business thinking in studying innovation dynamics

The foundations and contemporary transformation in the perception of innovation in business and organizational thinking

Beyond economic thinking and science, the innovative and cognitive phenomenon has, certainly, been intensively studied by the wider Organizational and Business Science (Nonaka & Konno, 1998; Prax, 2007; Walker, Chen, & Aravind, 2015). In this context, interpretive efforts usually have been focused on individual "game players", businesses and organizations by studying them at all their activity levels. Some of them are focused on the overall organizational level, some others on the segmental, the departmental or the team; others even on the individual-psychological. Few others attach great importance to their strategic priorities, to the technological parameters, or finally to the management requirements of the innovation process. We see here, no doubt, a rich variety of multiple interpretations.

First of all, for Peter Drucker, the pioneer in examining innovation in management science, innovation is simply the response to change in a creative way: It is the process of producing new ideas, the improvement of processes or the redesign of

products and services—and at another level, more abstract, innovation is the new way of thinking in a business (Edersheim, 2007).

In addition to fundamental approaches, in the last two decades, in particular, a new stream of thought in organizational science has been remarkably enhanced, calling for a radically new perspective. Apart from the fundamental approaches, in the past two decades in particular, a new current of thought in organizational science that calls for a radically new optic has strengthened noticeably: The perception and study of social organizations in terms of living organisms and ecosystems (Kashan & Mohannak, 2017; Bassis & Armellini, 2018). This approach calls for a definitive transition from "engineering" to "biology" of businesses, providing a vital opening for bridging the gap with the perspective of modern economic science, as we will see later (Kauffman, 1993).

Beyond this significant trend—with a deeper character of a paradigm transition—in the last decades there is also a remarkable—even if relatively subtle—analytical tripolism regarding to the understanding of innovation dynamics in the international business literature, which will be briefly examine here (Clarke & Clegg, 2000; Dogan, 2001; Antonelli, 2003).

Approaches of innovation that grand strategy its analytical priority

First, Michael E. Porter in this particular analytical orientation—in an indirect but remarkably compliance with the views of Hammel and Prahalland—distinguishes the failure of management to tell the difference between strategic and operational-managerial efficiency as the main aspect of the problem: While both dimensions are essential for leading performance of an organization, their significance may vary (Porter, 1996; Eisenhardt & Martin, 2000; Grant & Baden-Fuller, 2004; Hamel, 2006; Zhou & Sun, 2016).

Porter notes, in particular, that the only valid and lasting way to achieve a competitive advantage is through innovations and substantial strategic repositioning (Porter, 1996). Naturally, these innovations and reorientations in their perspectives must always be consistent with a consequent and original strategic direction.

That is why there must be an inaugural and fundamental strategic vision within which the innovations that are underway will operate[6].

In turn, Prahalad promotes the modern strategic innovation challenge to the world of co-creation, through the direct and continuous cooperation between producer and user, underlining that while the strategic orientation (or strategic intent) of an business may be obvious, strategy is always a process of continuous experimentation, risk reduction, time compression and investment minimization and, at the same time, maximization of the market impact. As such, strategy must be primarily and always a process of innovation and discovery (Prahalad, 2004).

In the same direction there are many other newer approaches that bring forward the motion of searching the best strategic ideas outside the traditional boundaries of an organization. Whether reference is made to open invitation to raise external resources (crowd sourcing) of Howe (2009), either in cooperative economy (wikinomics) of Tapscott & Williams (2010), or collaborative thinking (we-think) of Leadbeater (2009), in all these converging perspectives, it is now clear that the modern innovative game requires the generous abolition of the watertight boundaries of business and its drastic opening to their strategic external environment.

In the same direction, already since the 1990s, Norman Augustine, when referring to change, sectoral reconstruction and survival, he began by pointing out that all modern businesses are finding themselves in a highly uncertain and fluid competitive environment. His conclusion was that in an increasingly fluid environment of continuous restructuring of sectors, only two types

[6] What is, for Michael Porter, the role of technology in this increasingly fast global innovation race? In simple terms, purely scientific innovations are not particularly important: on the contrary, an important source of advantage is the ability to apply technology. And for technology to be applied it should be able to be connected with a variety things. Ultimately, in the markets those who can understand how to integrate technology into the wider system of the company can be successful (Porter, 1996).

of companies are traced: a) those who change and survive and b) those that end up ceasing its operations (Augustine, 1997).

In this line of thought, Kim & Mauborgne (2005) gave a quite original answer to whether and how a business can escape from the direct competitive confrontation, and survival beyond the painful and "bloody" path between hammer and the anvil. They argued in particular that the most dynamic businesses of the future would not climb "fighting" with their competitors in already existing and incumbent industries, but they will do that by creating new "blue oceans", e.g. new, unspoiled areas, new sectoral fields, which are offered for rapid and "bloodless" growth.

The strategy of these pioneering analysts is based on what they call 'value innovations', e.g. the creation of a completely new, distinct proposal-value for their customers, thus leaving behind their traditional sectoral rivals and creating a whole new demand (Markides & Geroski, 2004; Crainer & Dearlove, 2005; Markides, 2008)[7][8].

The innovation approaches that attribute analytical prominence to technology

At the same time, a large number of analytical contributions to the problem of innovation, in our days, attribute a prominent and overwhelming importance to the technological dimension of

[7] Obviously, it is clear that the "blue ocean" approach comes in significant contrast to the conventional theory of sectoral strategy: Both the "traditional" model of Porter's five forces which helps businesses determine how they can compete with in the best possible way in an existing market-sector, and the logic of re-designing Hammer's business operations.

[8] Of course things are never so simple. According to Constantinos Markides, for example, very often, a "fast second" business lets the "leading" companies innovate and experiment, creating new markets in their first steps. Leaving them to bear the burden of the great uncertainty of "start-up", "first customers training" costs and the huge operability costs of the idea, the "fast second" enter the markets, as soon as the "dominant model" in the new market tends to emerge, to clear, to consolidate and to prevail, utilizing its largest size, greater awareness, wider networks and great overall business experience.

innovation (Boonstra & Vink, 1996; Uchupalanan, 2000; Schilling, 2008; Guellec & Paunov, 2017).

In this direction, particularly important is Christensen's approach with his research Disruptive Technologies: Catching the Wave (Christensen & Boyer, 1995). In his perspective, disruptive innovation—subversive and even divisive innovation—establishes a theoretical model of explanation of the rapid technological changes that develop, diffuse and interfere with business activity on a global level (Christensen & Boyer, 1995). Specifically, Christensen argues that the disruptive technologies follow performance trajectories, and in particular during in their first steps, they are considered marginal and "heretical." Disruptive innovation is defined as a product or service designed for a new customer group characterized by uncertainty and instability in its early stages (Christensen, Dillon, & Hall, 2016).

Christensen's approach, over the time, has received a variety of criticism. First of all to it is worth highlighting that the act of change, which inevitably introduces an innovation, always refers more to the sphere of overall socio-economic dynamics than to narrowly meant technology. Something that seems to be underestimated by some technologists like Christensen is the fact that there is always a necessary structural period for the understanding and socio-economic assimilation of change. Moreover, the theory of subversive innovation has often received criticism as, in addition to being seen several times as a supposed "lifesaver" or as the sole pursuit of a business, is an approach that is based on selected case studies perceived as the main proof of element and therefore it cannot be interpreted as a theory that can explain all aspects of modern economic life (Krugman, 2014; Lepore, 2014; Weeks, 2015; Guellec & Paunov, 2017)[9].

Deeper than Christensen's approach, it is becoming clear that only when people, and the groups in which they are involved, feel

[9] Namely with the Solution of innovation, Christensen & Raynor (2003) are demonstrating, in fact, to companies how to create inversions instead of destroying them, without giving however any concrete solution or a clear strategic path towards innovation.

more confident and certainty in experimenting, then they pursue more new ideas and practices.

Innovation approaches that attribute analytical priority to management

Appearing as a third pole to the study of innovation dynamics within organizational and operational theory, the one that attributes the interpretive primary to the dimension of management emerges. Inside this perspective, there are a number of individual management approaches to the innovation process: from inspired leadership to systematic human resource management and from the proposal of total ―reengineering‖ to the priority of effective management of intellectual capital of organizations (Birkinshaw, Hamel, & Mol, 2008; Damanpour, 2010; Walker, Damanpour, & Devece, 2011; Volberda, Van Den Bosch, & Mihalache, 2014).

Naturally, this analytical line is not late. For example, since the 90s, Belasco & Stayer (1994) concluded that what is important for the innovative performance of an organization is primarily the actions of its leader, having the principal responsibility to oversee that the people to whom has delegated responsibilities focus on the "right" objectives: The hard strategic question of "what am I doing?", they conclude, is meaningless if the nature of what the customer values remains unclear; consequently, it will be impossible to offer it consistently. Ultimately, the innovative efforts of a business must, according to this approach, always focus on solving the specific needs of the customer, which clearly implies a necessary opening of the organization's management logic to the requirements of their socio-economic environment.

Certainly, the approach that has excelled the previous in this particular problematic is the one of Business Process Reengineering (without of course avoiding criticism). Specifically, based on Hammer and Champy's perspective, redesigning business processes eventually changes almost everything within an organization, as all aspects (employees, jobs, managers and values) are linked to each other. The authors note in particular that the characteristics required by the post-industrial era are, on the one hand, orientation towards innovation, change and personal

responsibility, and on the other hand, the cooperation of the groups, a degree of unselfishness under which the client becomes the center of the processes and actual capacities, especially learning, so that complex work tasks can be carried out (Hammer & Champy, 1993).

On the other hand, Kanter (2009) focuses on the leadership's innovative capability and estimates that the best leaders have some, almost universal features: They are much more effective when they can build coalitions, develop and use a support system, to encourage, to listen, elements that strengthen the innovation capacity of each organization.

In a similar direction, Warren Bennis believes the biggest challenge for leaders in the 21st century will be how to unleash the mental power of their organizations. He concludes that the problem that almost all leaders will face in the future will be on how to develop the social architecture of their organizations so that it actually produces intellectual capital (Bennis, 2009; Bennis & Goldsmith, 2010).

Comprehensively, the analytic focus to the human factor appears to be of particular interest in the study of the innovation phenomenon, in the context of modern organizational theory. In this direction, Sumantra Ghoshal also emphasizes in his work that financial capital is no longer a scarce resource. It therefore distinguishes the emergence of a different leadership philosophy that will dominate in the future, focusing on purpose, process, human philosophy and which will determine the innovativeness of organizations (Ghoshal & Bartlett, 1999; Bartlett & Ghoshal, 2002).

And what supplies are needed for a company to succeed tomorrow? At the same time, Ridderstråle & Wilcox (2009) underline the need for modern innovative companies to come into contact with the feelings of their people[10].

[10] In a converging perspective, Daniel Goleman (1998; 2005) analysis of "emotional intelligence" is based on the idea that the ability of managers to understand and control their own feelings and relationships is the key to a better innovation performance.

Constructing the bridge between economic and business thinking on innovation

Observing the unfolding of the scientific literature of the last decades in the study of innovative dynamics, this paper arrives to the following three main constatation:

(1) In its evolution, modern economic science seems to be progressively turning towards an increasingly integrated systemic, evolutionary and institutional perspective on the concept of innovation (Arena & Lazaric, 2003). Conceptual and interpretative constraints and analytical myopia of "traditional" economics—of mainstream neoclassical and Keynesian direction—appear to be phasing out, to the extent that a fuller and more credible perception of the dynamics of innovation that drives contemporary socio-economic systems is becoming increasingly global (Veltz, 2000; White, 2002). Thus, it can be assumed that modern economic thinking seems to understand in an increasingly spherical way the importance of the socio-economic substratum of innovation and attribute to its study an increasing importance (Maurice & Sorge, 2000). Nevertheless, economic science still seems, to a large extent today, hesitant to deepen its studies in profound business terms. In fact, seeing the problem in depth, "what is the capitalist business" is not—and never was—a question with unique and self-explanatory answers; something which does not seem to be fully perceived by a large portion of modern economists to whom traditional mechanical and simplistic perspective continues to dominate, although considerable theoretical progress has been achieved (Boyer & Freyssenet, 2000; Durand, 2000).

(2) The progress in modern exploration of the innovation phenomenon in the organizational and business literature shows the gradual deepening of the study in all individual intra-organizational dimensions of the phenomenon, in a progressively more complete and penetrating way (Ahlstrom, 2010; Li, Y *et al.*, 2010). Nevertheless, to a large extent, the necessary dynamic and cohesive perception of the socioeconomic environment of innovation continues to be perceived in a relatively partial and restrictive way (Lebas,

2003; Perez, 2003). At the same time, the preservation and reproduction of a specific "interpretive tripolism" is observed, with the rendering of the analytic primacy to either strategy or technology or management, while in contrast, it becomes progressively clear that the innovative phenomenon can only, always and necessarily, have a mixed and complex content, both in terms of strategy and in terms of technology and management (Βλάδος, 2016; Vlados & Katimertzopoulos, 2018).

(3) The need for a more efficient articulation and synergy between the economic and business perspective on the innovation phenomenon seems progressively clearer, with the aim of a synergistic combination of the virtues of individual research traditions and methods, the mitigation of individualistic analytical "myopia", and ultimately the more complete and detailed perception of the subject of innovation itself, as it will be examined further in the study (Figure 4).

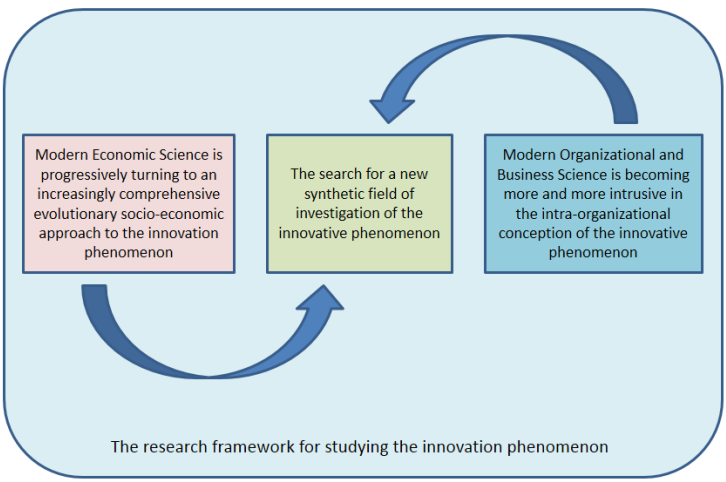

Figure 4. *The attempt to bridge economic and business thinking on the study of the innovation phenomenon*

In reality, innovation is always the birth of a complex synthesis of operational and socio-economic dynamics, which are always manifested in an indivisible co-evolutionary way (Figure 5).

(3) Innovation in economics and management: The Stra.Tech.Man synthesis

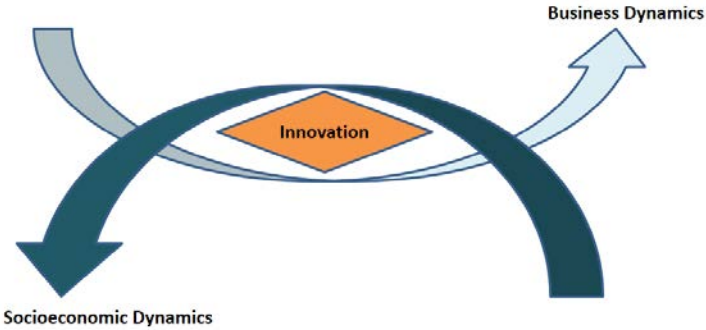

Figure 5. *Innovation as a synthesis of operational and socio-economic dynamics*

Therefore, this study supports the notion that ultimately, modern economic and business thinking and science would have much to gain from a theoretical focus on this co-evolutionary basis, centered on the "evolutionary heart" of the capitalist business which, in return, could bridge an analytical fertility in economic and business thinking in the study of the multiphase innovative phenomenon (Rinkinen & Harmaakorpi, 2018). In particular, this can be achieved by focusing on the physiological structure and organic evolution of the Stra.Tech.Man synthesis of the business (Βλάδος, 2016; Vlados & Katimertzopoulos, 2018).

In this evolutionary approach, the Firm ceases to be considered merely as a passive acceptor of some exogenous changes and is, at last, perceived as one of the most critical—indeed, the most critical—producer of the profound changes that invade the socio-economic reality, at all levels, through the—incessant and imperative for its survival—innovative action.

In this orientation, the Firm is ultimately perceived as an active actor and even as a major structural co-creator of the sectors of industries and the socio-economic systems that is hosted in, in "living" ecosystem conditions (Rinkinen & Harmaakorpi, 2018; Sako, 2018).

In this context of analysis, at least five critical questions pertaining to the evolutionary existence of the business are now at the center of exploring its innovative action:

(1) Who and how draws the path to the future (Strategy)?

(2) Who and how implements the function of acquiring, exploiting and using of information, knowledge and tools (Technology)?
(3) Who and how assumes the management of its activities, organization and coordination of production (Management)?
(4) Who and how conducts the composition of the above dimensions and the creation of innovation within (Synthesis of Strategy, Technology and Management— Stra.Tech.Man)?
(5) Who and how guarantee the management of change and the assimilation of innovative actions within?

On this new analytical basis, ultimately, the innovative phenomenon can be approached as an indivisible and continuous synthesis of operational and socio-economic dynamics (Figure 6).

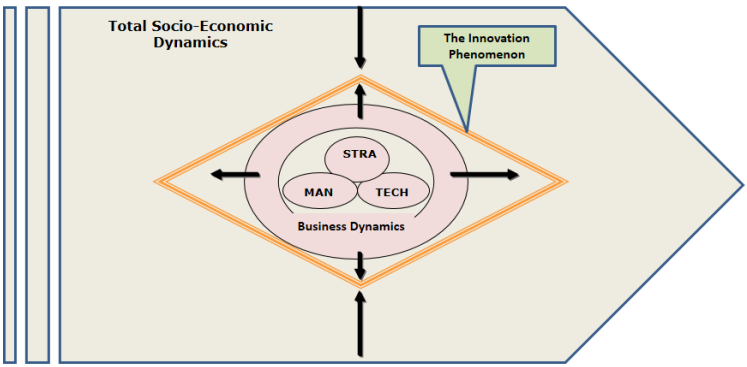

Figure 6. *The innovation phenomenon as a synthesis between operational and socio-economic dynamics*

Central conclusion

According to the previous analysis, the present study concludes that the Stra.Tech.Man approach you propose has the potential to bilaterally overcome the conceptual barriers between the conceptual tradition of economic and business thinking: Since it perceives innovation as a dialectical product between the internal dynamics of enterprises/organizations and, at the same time, the external dynamics of the socio-economic environment in which they operate and develop.

In this sense, the Stra.Tech.Man approach simultaneously enables a deepening of the economic perspective of innovation in

terms of the political economy of the firm (Maurice & Sorge, 2000; White, 2002) and the business vision of innovation into a direction of evolutionary approach to business development dynamics in fruitful combinational terms (Dosi & Nelson, 1994; Boyer & Freyssenet, 2000).

References

Acemoglu, D., & Robinson, J. (2012). *Why Nations Fail. The Origins of Power, Prosperity, and Poverty*. New York: Crown.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., & Howitt, P. (2005). Competition and innovation: an inverted-u relationship. Quarterly Journal of Economics, 120(2), 701-728. doi. 10.1093/qje/120.2.701

Aghion, P., & Howitt, P. (1997). *Endogenous Growth Theory*. Cambridge, MA: The MIT Press.

Aglietta, M., & Orléan, A. (1982). *La violence de la monnaie*. Paris : PUF.

Ahlstrom, D. (2010). Innovation and growth: How business contributes to society. *Academy of Management Perspective*, 24(3), 10-23. doi. 10.5465/amp.24.3.11

Amable, B., Barré, R., & Boyer, R. (1997). *Les Systèmes nationaux d'innovation à l'ère de la globalisation*. Paris: Economica.

Amable, B. (2005*). Les cinq capitalismes*. Paris: Seuil.

Antonelli, C. (2003). *The Economics of Innovation, New Technologies, and Structural Change*. London: Routledge.

Aréna, R., & Lazaric, N. (2003). La théorie évolutionniste du changement économique de Nelson et Winter. *Revue économique*, 54 (2), 329-354. doi. 10.2307/3503006

Arkolakis, C., Ramondo, N., Clare, A.R., & Yeaple, S.R. (2018). Innovation and production in the global economy. *American Economic Review*, 108(8), 2128-2173. doi. 10.1257/aer.20141743

Aydalot, P. (1984). *Crise et Espace*. Paris: Economica.

Aydalot, P. (1986a). *Milieux Innovateurs en Europe*. Paris: Gremi.

Augustine, R.N. (1997). Reshaping an Industry: Lockheed Martin's Survival Story. *Harvard Business Review*, 75(3), 83-94.

Bartlett, A.C., & Ghoshal, S. (2002). *Managing Across Borders: The Transnational Solution*. (2nd ed.). Boston: Harvard Business Review Press.

Bassis, F.N., & Armellini, F. (2018). System of innovation and innovation ecosystem: a literature review in search of complementaries. Journal of Evolutionary Economics, 28(5), 1053-1080. doi. 10.1007/s00191-018-0600-6

Belasco, A.J., & Stayer, C.R. (1994). *Flight of the Buffalo: Soaring to Excellence, Learning to Let Employees Lead*. New York: Warner Books.

Bennis, W. (2009). *On Becoming a Leader*. New York: Basic Books.

Bennis, W., & Goldsmith, J. (2010). *Learning to Lead: A Workbook on Becoming a Leader*. New York: Basic Books.

Billaudot, B. (1996). *L'ordre économique de la société moderne*. Paris: L'Harmattan.

Billaudot, B. (2001). *Régulation et croissance. Une macroéconomie historique et institutionnelle*. Paris: L'Harmattan.

Birkinshaw, J., Hamel, G., & Mol, M. (2008). Management innovation. *Academy of Management Review*, 33(4), 825-845. doi. 10.5465/amr.2008.34421969

Blaug, M. (2008). *"British classical economics," The New Palgrave Dictionary of Economics*. (2nd ed.). Cheltenham, UK/ Northampton, USA: Edward Elgar Publishing. doi. 10.1057/978-1-349-95121-5_99-2

Boonstra, J.J., & Vink, M.J. (1996). Technological and organizational innovation: A dilemma of fundamental change and participation. *European Journal of Work and Organizational Psychology*, 5(3), 351-376. doi. 10.1080/13594329608414865

Boyer, R., & Didier, M. (1998). *Relancer une dynamique de la croissance durable par l'innovation, rapport pour le Conseil d'analyse économique*. Paris: La Documentation française.

Boyer, R., & Freyssenet, M. (2000). *Les Modèles productifs.* Paris: La Découverte, collection Repères.

Boyer, R. (2004). *Théorie de la régulation, 1. Les fondamentaux*. Paris: La Découverte, collection Repères.

Bremmer, I. (2014). The New Rules of Globalization. *Harvard Business Review*, 92(1), 103-107.

Brynjolfsson, E., & Mc Afee, A. (2015). *Le Deuxième Âge de la machine: travail et prospérité à l'heure de la révolution technologique*. Paris: Odile Jacob.

Carlino, G., & Kerr, W. (2015). Agglomeration and innovation. In Duranton, G., Henderson, J. V., & Strange, W (Eds.), Handbook of Regional and Urban Economics, 5A, (pp.349-404). Amsterdam: Elsevier. doi. 10.1016/B978-0-444-59517-1.00006-4

Castoriades, C. (1987). *The Imaginary Institution of Society*. Campridge, UK/Massachusetts, USA: Polity Press.

Cerne, M., Jaklic, M., & Skerlavaj, M. (2016). Management innovation enters the game: Re-considering the link between technological innovation and financial performance. *Innovation: Organization & Management*, 17(4), 429-449. doi. 10.1080/14479338.2015.1126530

Chandler, A.D. (1990). *Scale and Scope. The Dynamics of Industrial Capitalism*. Cambridge, Massachusetts: Belknap Press (Harvard University Press).

Chaney, T. (2016). Networks in international trade. In Bramoullé, Y., Galeotti, A., & Rogers, B. (Eds.), *Oxford Handbook of the Economics of Networks* (pp.754-775). Oxford: Oxford University Press.

Christensen, M.C., & Boyer, L.J. (1995). Disruptive Technologies: Catching the Wave. *Harvard Business Review*, 73(1), 43-53.

Christensen, M.C., & Raynor, E.M. (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*. Boston: Harvard Business Review Press.

Christensen, M.C., Dillon, K., & Hall, T. (2016). *Competing Against Luck: The Story of Innovation and Customer Choice*. New York: Harper Business School Press.

Clarke, T., & Clegg, S. (2000). *Changing Paradigms*. London: Harper Collins.

Clément, C.L., & Lelarge, C. (2006). *L'innovation dans l'industrie: une contribution forte à la croissance de la productivité globale*. Le 4-pages, SESSI, n◦ 224.

Coriat, B., & Weinstein, O. (1995). *Les nouvelles théories de l'entreprise*. Paris: LeLivredePoche.

Crainer, S., &Dearlove, D. (2005). Η Επιχείρηση στη Νέα Εποχή: Μιλούν οι κορυφαίοι του Μάνατζμεντ. Αθήνα: Εκδόσεις Κριτική.

Crossan, M., & Apaydin, M. (2009). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154-1191. doi. 10.1111/j.1467-6486.2009.00880.x

Damanpour, F. (2010). An integration of research findings of effects of firm size and market competition on product and process innovations. *British Journal of Management*, 21(4), 996-1010. doi. 10.1111/j.1467-8551.2009.00628.x

Damanpour, F. (2016). *Organizational Innovation. Oxford Research Encyclopedia of Business and Management*. USA: Oxford University Press.

Dasgupta, P., & David, P. (1994). Towards a new economics of science. *Research*

(3) Innovation in economics and management: The Stra.Tech.Man synthesis *Policy*, 23(5), 487-521. doi. 10.1016/0048-7333(94)01002-1

Deakins, D., & Freel, M. (2007). Επιτειρημανικόηηηα. Αθήνα: Εκδόζεις Κριηική.

Dertouzos, L.M., Lester, K.R., & Solow, M.R. (1989). *Made In America: Regaining the Productive Edge*. Cambridge: MIT Press.

Dienstag, F.J. (2006). *Pessimism: Philosophy, Ethic, Spirit*. New Jersey: Princeton University Press.

Dogan, M. (2001). Paradigms in the Social Sciences. In Smeltser, J.N., & Baltes, P.B. (Eds.), *International Encyclopedia of the Social and Behavioral Sciences*, 16 (New-Per), (pp.11023-11027). Amsterdam: Elsevier. doi. 10.1016/B0-08-043076-7/00782-8

Dosi, G., & Nelson, R. (1994). An Introduction to Evolutionary Theories in Economics. *Journal of Evolutionary Economics*, 4(3), 153-172. doi. 10.1007/BF01236366 Durand, R. (2000). *Entreprise et évolution économique* . Paris: Belin.

Edersheim, H.E. (2007). *The Definitive Drucker*. New York: McGraw-Hill.

Edquist, C., & Hommen, L. (2008). *Small Country Innovation System: Globalization, Change and Policy in Asia and Europe*. U.K.: Edward Elgar. doi. 10.4337/9781847209993

Eisenhardt, K., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21, 1105-1121. doi. 10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E

Fagerberg, J., Fosaas, M., & Sapprasert, K. (2012). Innovation: Exploring the knowledge base. *Research Policy*, 41(7), 1132-1153. doi. 10.1016/j.respol.2012.03.008

Fonseca, J. (2002). Complexity and Innovation in Organizations: Complexity and Emergence in Organizations. London: Routledge. doi. 10.4324/9780203279267

Freeman, C., & Soete, S. (1994). *Work for All or Mass Unemployment? Computerized Technical change into 21st Century*. London/New York: Pinter Publishers.

Freeman, C. (1995). The 'National System of Innovation' in historical perspective. *Cambridge Journal of Economics*, 19(1), 5-24.

Freeman, C., & Soete, L. (1997). *The Economics of Industrial Innovation*. Cambridge: MIT Press.

Freeman, C. (2002). Continental, national and sub-national innovation system-complementarity and economic growth. *Research Policy*, 31(2), 191-211. doi. 10.1016/S0048-7333(01)00136-6

Gabrié, H., & Jacquier, J.L. (1994). *La Théorie moderne de l'en*treprise. Paris: Economica.

Geels, F. (2005). *Technological Transitions and System Innovations: A Co-Evolutionary and Socio-Technical Analysis*. UK: Edward Elgar. doi. 10.4337/9781845424596

Ghoshal, S., & Bartlett, A.C. (1999). *The Individualized Corporation: A Fundamentally New Approach to Management*. New York: Harper Business.

Gibson, R. (1998). *Rethinking the Future: Rethinking Business Principles, Competition, Control and Complexity, Leadership, Markets and the World*. London: Nicholas Brealey Publishing.

Godin, B. (2015). Innovation contested: The idea of innovation over the centuries. London: Routledge. doi. 10.4324/9781315855608

Goleman, D. (1998). The emotional intelligence of leaders. *Leader to Leader Institute*, 10, 20-26. doi. 10.1002/ltl.40619981008

Goleman, D. (2005). *Emotional intelligence: Why it Can Matter More Than IQ*. (10th ed.). New York: Batman Dell.
Gordon, R. (2016). *The Rise and Fall of American Growth*. New Jersey: Princeton University Press. doi. 10.1515/9781400873302
Guellec D., & Paunov, C. (2017). Digital innovation and the distribution of income. *NBER Working Paper* No.23987. doi. 10.3386/w23987
Guillaume. H. (1998). *Technologie et innovation, rapport pour le gouvernement*. Paris: La Documentation Française.
Grant, R.M., & Baden-Fuller, C. (2004). A knowledge accessing theory of strategic alliances. *Journal of Management Studies*, 41(1), 61-84. doi. 10.1111/j.1467-6486.2004.00421.x
Hamel, G. (2000). *Leading the Revolution*. USA: PenguinBooks.
Hamel, G. (2003). Οδηγώντας την Επανάσταση. Αθήνα: Εκδόσεις Κλειδάριθμος.
Hamel, G. (2006). The why, what and how of management innovation. *Harvard Business Review*, 84(2), 72-84.
Hammer, M., & Champy, J.A. (1993). *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: Harper Business Books. doi. 10.1016/S0007-6813(05)80064-3
Hanson, G., Lind, N., & Muendler, M. (2015). The dynamics of comparative advantage. *NBER Working Paper* No. 21753. doi. 10.3386/w21753
Hayek, A.F. (1941). *The Pure Theory of Capital*. Chicago: University of Chicago Press.
Hobsbawn., J.E. (2017). Εισαγωγή στο Κομμουνιστικό Μανιφέστο. Αθήνα: Εκδόσεις Πλέθρον.
Howe, J. (2009). *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business*. U.S: Crown Business.
Kanter, M.S. (2006). *Confidence: How Winning Streaks and Losing Streaks Begin and End*. U.S: Crown Business.
Kanter, M.S. (2009). *SuperCorp: How Vanguard Companies Create Innovation, Profits, Growth, and Social Good*. U.S: Crown Business.
Kashan, J.A., & Mohannak, K. (2017). The Role of Knowledge Integration in Capability Development and Emergence of Innovation Ecosystem. International *Journal of Innovation and Technology Management*, 14(5). doi. 10.1142/S0219877017500274
Katimertzopoulos, F., & Vlados, C.M. (2017). Local support mechanisms for entrepreneurship: The approach of local development and innovation institutions. International Journal of Business and Economic Sciences Applied Research, 10(1), 30-41. doi. 10.25103/ijbesar.101.04
Kauffman, A.S. (1993). *The Origins of Order: Self-Organization and Selection in Evolution*. NewYork: OxfordUniversityPress.
Keynes, J.M. (2001). Η γενική θεωρία της απασχόλησης, του τόκου και του χρήματος. Αθήνα: Εκδόσεις Παπαζήση.
Kim, C.W., & Mauborgne, R. (2005). *Blue Ocean Strategy: How to Create Uncontested Market Space and Make Competition Irrelevant*. Boston: Harvard Business Review Press.
Krugman, P. (1990). *Rethinking International Trade*. Cambridge: MIT Press. doi. 10.7551/mitpress/5933.001.0001
Krugman, P. (2014, June 16). Creative Destruction Yada Yada. The New York Times.
Kuhn, S.T. (2012). *The Structure of Scientific Revolutions. 50th anniversary*. (4th ed.).

(3) Innovation in economics and management: The Stra.Tech.Man synthesis Chicago: University of Chicago Press. doi. 10.7208/chicago/9780226458144.001.0001

Leadbeater, C. (2009). *We-Think: Mass innovation, not mass production*. UK: Profile Books.

Lebas, C. (2003). *La théorie évolutionniste de la firme; état des lieux raisonné et implications pour l'analyse stratégique*. WP, centre Walras, université Lyon 2. Cambridge: Cambridge University Press.

Lepore, J. (2014, June 23). *Annals of enterprise: The disruption machine: What the gospel of innovation gets wrong*. The New Yorker.

Li, Y., Lee, S., Li, X., & Liu, Y. (2010). Knowledge codification, exploitation, and innovation: The moderating influence of organizational controls in Chinese firms. *Management and Organization Review*, 6(2), 219-241. doi. 10.1111/j.1740-8784.2010.00179.x

Marin, A., Navas-Aleman, L., & Perez, C. (2015). Natural Resource Industries as a Platform for the Development of Knowledge Intensive Industries, Tijdschrift voor economische en sociale geografie. *Journal of Economic and Social Geography*, 106(2), 154-168.

Markides, C.C., & Geroski, A.P. (2004). *Fast Second: How Smart Companies Bypass Radical Innovation to Enter and Dominate New Markets*. USA: Jossey-Bass.

Markides, C.C. (2008). *Game-Changing Strategies: How to Create New Market Space in Established Industries by Breaking the Rules*. USA: Jossey-Bass.

Marshall, A. (1890*). Principles of Economics*. (1st ed.). London: Macmillan. Marx, K. (1955). *The Poverty of Philosophy*. Moscow: Progress Publishers. Marx, K. (1976). *Das Kapital*, Harmondsworth. USA: Penguin Books.

Maurice, M., & Sorge, M. (2000). *Embedding Organizations*. Amsterdam/Philadelphie: John Benjamin's Publishing Company. doi. 10.1075/aios.4

Menard, C. (1994). *L'Economie des Organisations*. Paris, La Decouverte.

Metcalfe, S., & Georghiou, L. (1997). Equilibrium and Evolutionary Foundations of Technology Policy. CRIC Discussion Paper No.3. Centre for Research on Innovation and Competition. Manchester: University of Manchester.

Narayanan, V.K. (2000). *Managing Technology and Innovation for Competitive Advantage*. London: Pearson.

Narayanan, V. K., & O'Connor, C. G. (2010). *Encyclopedia of Technology and Innovation Management*. New Jersey: Wiley-Blackwell.

Nonaka, I., & Konno, N. (1998). The concept of Ba: Building for knowledge creation. *California Management Review*, 40(3), 40-54. doi. 10.2307/41165942

OECD, (1997). *National Innovation Systems*. Paris: OECD Publications.

OCDE, (2014a). *Examens des politiques d'innovation*. Paris: OECD Publications.

OCDE, (2014b). *New sources of growth: knowledge-based capital*. Paris: OECD Publications.

OCDE, (2016). *Science, technology and innovation outlook*. Paris: OECD Publications. doi. 10.1787/sti_in_outlook-2016-en

Parkin, M. (1997). *Microeconomics*. (4th ed.). Boston: Addison Wesley.

Patel, P., & Pavitt, K. (1994). The Nature and Economic Importance of National Innovation Systems. *STI Review*, OECD, 14, 9-32.

Paunov, C. (2012). The global crisis and firms' investments in innovation. *Directorate for Science, Technology and Industry*, OECD, 41(1), 24-35. doi. 10.1016/j.respol.2011.07.007

Perez, C. (1983). Structural change and assimilation of new technologies in the economic and social systems. *Futures*, 15(5), 357-375. doi. 10.1016/0016-3287(83)90050-2

Perez, C. (2013). Unleashing a golden age after the financial collapse: Drawing lessons from history. *Environmental Innovations and Societal Transitions*, 80(1), 11-23. doi. 10.1016/j.eist.2012.12.004

Pérez, R. (2003). *La Gouvernance de l'entreprise, La Découverte*. Paris: Collection Repères.

Porter, M.E. (1990). The Competitive Advantage of Nations. *Harvard Business Review*, 68(2), 73-93. doi. 10.1007/978-1-349-11336-1

Porter, M.E. (1996). What is a strategy?. *Harvard Business Re*view, 74(6), 61-78.

Porter, M.E., & Heppelmann, J.E. (2014). How Smart, Connected Products are Transforming Competition. *Harvard Business Review*, 92(11), 64-88.

Porter, M.E., & Heppelmann, J.E. (2015) How Smart, Connected Products are Transforming Companies. *Harvard Business Review*, 93(10), 96-112.

Prahalad, C.K. (2004). *The Future of Competition: Co-Creating Unique Value*. Boston: Harvard Business School Press.

Prax, J.Y. (2007). *Le manuel du knowledge management*. (2e éd.). Paris: Dunod.

Robbins, P.S., &Judge, A.T. (2011). Οργανωσιακή συμπεριφορά: Βασικές έννοιες και σύγχρονες προσεγγίσεις. Αθήνα: Εκδόσεις Κριτική.

Ricardo. D. (2002). Αρχές πολιτικής οικονομίας και φορολογίας. Επιμέλεια-Μετάφραση: Νικηφόρος Σταματάκης. Αθήνα: Εκδόσεις Παπαζήση.

Ridderstråle, J., & Wilcox, M. (2009). *Re-energizing the Corporation: How Leaders Make Change Happen*. New Jersey: John Wiley & Sons.

Rinkinen, S., & Harmaakorpi, V. (2018). The business ecosystem concept in innovation policy context: building a conceptual framework. *Innovation: The European Journal of Social Science Research*, 31(3), 333-349. doi. 10.1080/13511610.2017.1300089

Sako, M. (2018). Business ecosystem: how do they matter for innovation?. *Communications of the ACM*, 61(4), 20-22. doi. 10.1145/3185780

Scherer, F.M. (1984). *Innovation and Growth. Schumpeterian Perspectives*. Cambridge, MA: MIT Press.

Schilling, M.A. (2008). *Strategic management of technological innovation*. New York: McGraw-Hill Irwin.

Screpanti, E., & Zamagni, S. (2005). *An Outline of the History of Economic Thought*. New York: Oxford University Press. doi. 10.1093/0199279144.001.0001

Shacle, G.L.S. (1967). The Years of High Theory. London: Cambridge University Press. Simon, H. (1982). *Models of Bounded Rationality*. Cambridge, MA: The M.I.T Press.

Skousen, M.A. (2008). Classical Economics. In Hamowy, Ronald. (Eds.), The Encyclopedia of Libertarianism (pp.71-73). *Thousand Oaks*, CA: SAGE. doi. 10.4135/9781412965811.n47

Slaboch, W.M. (2018). *A Road to Nowhere: The Idea of Progress and Its Critics*. USA: The University of Pennsylvania.

Smith, A. (2000). *The Wealth of Nations / Adam Smith; introduction by Robert Reich; edited, with notes, marginal summary, and enlarged index by Edwin Cannan*. New York: Modern Library.

Schumpeter, A.J. (1942). *Capitalism, socialism and democracy*. United States: Harper &

(3) Innovation in economics and management: The Stra.Tech.Man synthesis Brothers.
Schumpeter, A.J. (1949). Historical Approach to the Analysis of Business Cycles. In National Bureau of Economic Research (NBER). Proceedings of the Conference on Business Cycle Research. US: NBER.
Schumpeter, A.J. (1951). *Ten great economists: from Marx to Keynes*. New York: Oxford University Press.
Tapscott, D., & Williams, D.A. (2010). *Wikinomics: How Mass Collaboration Changes Everything*. USA: Portfolio.
Uchupalanan, K. (2000). Competition and information technology-based innovation in banking services. *International Journal of Innovation Management*, 4(4), 455-489. doi. 10.1142/S1363919600000238
Veltz, P. (2000). *Le Nouveau Monde industriel*. Paris: Gallimard.
Vlados, Ch., & Katimertzopoulos, F. (2018). Assessing Meso and Micro-Competitiveness Boosting Policies, in Stra.Tech.Man Terms. *International Journal of Business and Social Research*, 8(9), 1-15.
Volberda, H.W., Van Den Bosch, F.A., & Mihalache, O.R. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies*, 35(9), 1245-1264. doi. 10.1177/0170840614546155
Walker, R.M., Damanpour, F., & Devece, C.A. (2011). Management innovation and organizational performance: Mediating role of planning and control. *Journal of Public Administration Research and Theory*, 21(2), 367-386. doi. 10.1093/jopart/muq043
Walker, R., Chen, J., & Aravind, D. (2015). Management innovation and firm performance: An integration of research findings. *European Management Journal*, 33(5), 407-422. doi. 10.1016/j.emj.2015.07.001
Walras, L. (2010). *Elements of Pure Economics*. (Paperback 1st ed.). London: Routledge.
Weeks, M. (2015). Is disruption theory wearing new clothes or just naked? Analyzing recent critiques of disruptive innovation theory. *Innovation*, 17(4), 417-428. doi. 10.1080/14479338.2015.1061896
White, H.C. (2002). *Markets from Networks: Socioeconomic Models of Production*. New Jersey: Princeton.
Williamson, O.E., & Winter, G.S. (1991). *The Nature of the Firm: Origins Evolution and Development*. New York: Oxford University Press.
Weinberger, J. (1976). Science and Rule in Bacon's Utopia: An Introduction to the Reading of the New Atlantis. *The American Political Science Review*, 70(3), 865-885. doi. 10.2307/1959872
Weintraub, R.E. (2007). *Neoclassical Economics. The Concise Encyclopedia of Economics*. Indiana, USA: Library of Economics and Liberty.
Wolfe, R. (1994). Organizational Innovation: Review, Critique, and Suggested Research Directions. *Journal of Management Studies*, 31(26), 405-431. doi. 10.1111/j.1467-6486.1994.tb00624.x
Wolfe, R., Wright, P., & Smart, D. (2006). Radical HRM Innovation and Competitive Advantage: The Moneyball Story. *Human Resource Management Journal*, 45(1), 111-145. doi. 10.1002/hrm.20100
Wooldridge, A., & Micklethwait, J. (2011). *The Right Nation: Why America is Different*. U.K: Penguin.
Zhou, M., & Sun, Y. (2016). Editorial — Strategy and Execution of Innovation and

(3) Innovation in economics and management: The Stra.Tech.Man synthesis Entrepreneurship. *International Journal of Innovation and Technology Management*, 13(3). doi. 10.1142/S0219877016020016

Βλάδος, Χ.Μ. (2006). Η δυναμική της παγκοσμιοποίησης και οι επιχειρήσεις στην Ελλάδα. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2016). Στρατηγική μικρομεσαίων επιχειρήσεων σε συνθήκες κρίσης: Η προσέγγιση Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2017). Παγκόσμια κρίση, καινοτομία και διαχείριση αλλαγής: Η οπτική Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.

4 Change management and innovation in Stra.Tech.Man terms*

Introduction

Capitalism has never been characterized by stability or absolute certainty. Nowadays, however, it is obvious that the "status quo" is significantly different than that of the past. This "state of things" has deeply and irreversibly changed.

This state of affairs we call the current restructuring phase of globalization (Bhattacharya, Khanna, Schweizer, & Bijapurkar, 2017; Bremmer, 2014; Laudicina & Peterson, 2016; Rodrik, 2011) has overturned everything we used to consider as given, at every level. There is nothing constantly secured, nothing absolutely prescribed, nothing by definition certain. And this applies everywhere: in businesses, in sectors of economic activity, in national policies, in the life of firms, in our individual courses, everywhere.

It seems that to overcome the present crisis and the restructuring of the global system, an innovative leap forward is absolutely necessary, a leap arrayed and implemented at all levels in order for our world to manage to enter a trajectory of a new stable overall model of global development. Behind this drastic innovative leap, the problem of how to establish the required change management mechanisms that can make this innovation possible inevitably emerges.

But, in a deeper sense, what does change mean?

(4) Change management and innovation in Stra.Tech.Man terms

Change is every transformation process of the way a person, a group or an organization or an ecosystem of organizations act, moving from one set of ways of action and behavior to another (Battilana & Casciaro, 2012; Choi & Ruona, 2011; Jaros, 2010; Robert, Yoguel, & Lerena, 2017; Scazzieri, 2018; Valentinov, 2015; van Witteloostuijn, Jacobs, & Christe-Zeyse, 2013).

The change and the overall change process (Ates & Bititci, 2011; Brenner & Holten, 2015; Dahl, 2014; Whelan-Berry & Somerville, 2010) that is being triggered gives birth and reproduces, inevitably, resistance and conflicts. Every change creates in a multiplying way, to a greater or lesser extent, waves of deriving changes and at the same time carries in the background thoughts and actions that incubated this change in the past.

The change management processes (Ashkenas, 2013; By, Burnes, & Oswick, 2011, 2012; Hechanova & Cementina-Olpoc, 2013; Küçüközkan, 2015; Kuipers *et al.*, 2014; Raineri, 2011; Steigenberger, 2015; Stensaker & Langley, 2010; Suddaby & Foster, 2017; Tsai, Huang, & Tai, 2017; Vora, 2013; Worley & Mohrman, 2014) are the sum of the forms and ways utilized for the design, implementation, control and as simulation of changes. More specifically, a change process can be imposed by a higher hierarchical level or can come from the bottom, be centralized or participatory, be superficial or structural, according always to the particular physiology of the organization (Geus, 1997; Hodgson, 2013; Meyer & Davis, 2003; Moore, 1993; Penrose, 1952) that receives and faces this change.

By tracking the roots of the theoretical approach of change management (Beckhard, 1969; Bridges, 1980; Conner, 1993; Gennep, 1909; Jick, 1993; Kotter, 1996; LaMarsh, 1995; Lewin, 1948; Phillips, 1983; Rogers, 2003) we distinguish, specifically, three basic perspectives / schools of thought:

I. The school of individual approach (Arthur, Inkson, & Pringle, 1999; Brower & Nurius, 1993; Lifton & Zimpfer, 1972; Sanford, 1969; Sundel, 1985).

II. The school of group dynamics (Forsyth, 2019; Friedkin & Johnsen, 2014; Levi, 2017; Reichert, 1970).

III. The school of open systems (Freeman, 2014; Scott & Davis, 2017; Wagner, 2007; Warmington, Lupton, & Gribbin, 2014).

By studying these three main schools of thought that establish analytically the change management theory, the following main observations can be made:

- These three approaches to change focus on different aspects of organizational life (person – group – organization) and, therefore, they have different impact on the type of change and the way of managing the change.
- All the emerging contemporary organizational models and approaches are directly related to the aforementioned approaches that focus, respectively, on the persons, the groups and the organizations, while being directly opposed to the mechanistic perception of the Classical School.
- Although every perspective / school of thought "believes" it is the most comprehensive and effective approach to change, these are in reality neither mutually exclusive nor are in conflict conceptually. In our view they are rather complementary instead of contradictory.

Eventually, whatever route an organization might follow to manage its change, what definitely is going to change is also the behaviors.

With these introductory clarifications in mind, we can now articulate the particular research question of this article: we explore, precisely, whether the process and management of change can be perceived as an outcome of synthesis between the organizational strategy, technology and management, by combining the internal and external organizational dynamics and through the production/reproduction of the organization's innovative potential.

Methodology and structure of the chapter

In order to understand how this synthesis in terms of change management can be achieved, the article is structured as follows:

(i) It investigates the basic dimensions of change management in the relevant contemporary literature;

(ii) It proposes the integrated Stra.Tech.Man methodology to change management (synthesis of Strategy-Technology-Management);

(iii) It reaches to specific conclusions and implications.

The fundamental dimensions under study in contemporary change management literature

In the related literature, there are two basic forms of change that are usually mentioned within an organization: the incremental and the radical change (Brown & Eisenhardt, 1997; Carter, Armenakis, Feild, & Mossholder, 2013; Collins & Hill, 1998; Edelman & Benning, 1999; Jain, 2013; McAdam, 2003; Romanelli & Tushman, 1994). The incremental change expresses a series of constant changes and developments within the organization that manage to preserve the organization's general structural equilibrium and appear to influence directly and drastically only a portion of the organization every time. On the contrary, when the radical change occurs, this seems that it manages to disrupt and rearrange fundamentally the overall organizational frame of reference, transforming completely the organization, to all its dimensions.

In a similar analytic orientation, the changes can be distinguished in three discrete models:

a) In the incremental model of change

b) In the punctuated equilibrium model of organizational transformation

c) In the continuous transformation model of change

Not all organizations are to the same degree ready to welcome change and proceed successfully to the organizational change.

Based on the empirical data, on a global scale, there is no doubt that there are times when organizations have increased chances to change effectively and successfully and other times when it is generally considered less possible for this to happen (Burnes, 2009). In general, the main trend of change realization is when the people involved believe that the projected benefits will outweigh the costs. In this process, when a new idea is developed, the "idea champions" promote this change actively and, therefore, create the

necessary organizational support, overcome the resistance and secure the implementation of change. Eventually, however, an organizational change is going to happen—successfully or not—within an organization. The way the organizational change is perceived by the people involved in terms of expected benefits and costs is also critical.

The resistance to change (Georgalis, Samaratunge, Kimberley, & Lu, 2015; Matos & Esposito, 2014; Thomas, Sargent, & Hardy, 2010) is the power of individuals, groups or organizations that tends to deny, prevent, restrict or cancel completely the extent of the necessary changes.

The resistance to change is not, of course, a painless procedure—it is exactly the opposite, for any organization. In practice, very often, the inability to monitor, to respond or to assimilate change causes and deepens the organizational crisis, while this worsening crisis—in every organization, of every size and reach—manifests itself through chain reactions, since each successive problem creates conditions for relating problems to occur.

An interesting approach to why human resources resist change is offered by Paul Streber (1996), who investigates the causes of employees resisting to change. He assumes that all failures have a single root, since the business executives perceive change differently than the business personnel. He proposes to substitute the conservative culture of avoiding risk with a culture where all employees are fully devoted to pursuit change.

In practice, conflicts always bear a particular content in terms of personal, group, departmental, cross-departmental and overall organizational and cross-organizational dimensions (see Figure 1).

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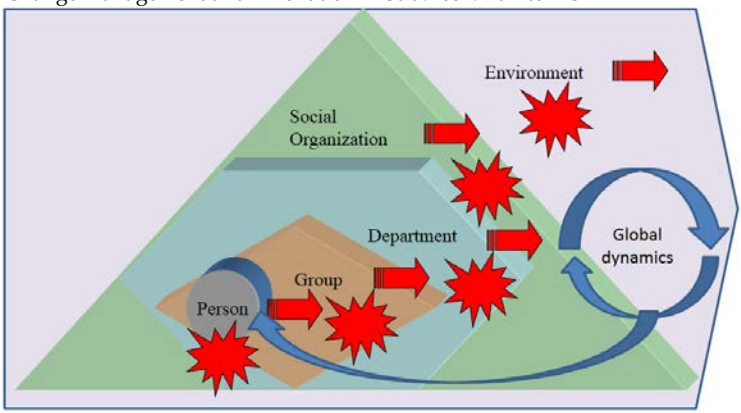

Figure 1. *The necessity of handling conflicts, at all organizational levels*

The changes that global dynamics cause are diffused in all organizational levels, thus creating conditions for the emergence of new conflicts and new ways of overcoming them. In this sense, the organizational crisis (Alvintzi & Eder, 2010; Brockner & James, 2008; Kash & Darling, 1998; Mitroff, 2001; Ponis & Koronis, 2012) is perceived as a phase of persistent insufficiency in implementing change, something which increases conflicts, while the only long-term exit from this crisis is the effective overall organizational innovation (Aghion, Van Reenen, & Zingales, 2013; Drucker, 1986; Schumpeter, 1942; Wolfe, 1994). However, the only way to effectively and for a long time innovate is to achieve to manage efficiently the change; therefore the organization should unceasingly care for organizational development and evolution.

The Stra.Tech.Man approach to change management

Overall, we think that if change management theory gets enriched with a "biological" type of perception of the social organizations under study, then more clear answers can be given.

The Stra.Tech.Man approach is moving to this direction. This approach assimilates an evolutionary and "biological" perception to business dynamics analysis: more specifically, the main basis for this research orientation was built according to multiple perspectives from the field of evolutionary economics (Boulding,

1981; Boyer & Saillard, 2002; Coriat & Dosi, 2002; Coriat & Weinstein, 1995; Euroconsult, 1984; Lordon, 1993; Nelson & Winter, 1982; Zeleny, 1980).

The main findings of the Stra.Tech.Man approach, which derives from multiannual field research (Vlados, Katimertzopoulos, & Blatsos, 2019; Vlados, 2004, 2005; Βλάδος, 2006) can be summarized as follows:

A. All firms, even those with even those with similar size and sectorial focus, as living organisms (Ben Letaifa, Gratacap, Isckia, & Pesqueux, 2013; Wolfe, 2012), belong to different physiological species; they are different "animals".

B. Every firm has its own "DNA"; We can argue that this biological identity (Kennedy, Miller, & Niewiarowski, 2018; Reeves, Levin, & Ueda, 2016) contains all the genetic information that determine the potential of its biological development. In particular, the biological core of every living firm is located and determined evolutionarily always within three fundamental and interconnected analytical spheres: within strategy, technology and management. Every organization produces and reproduces its innovative evolutionary Stra.Tech.Man potential (Ahrweiler, 2010; Anderson, Potočnik, & Zhou, 2014), aiming to its competitive survival and development, within the constantly evolving environment (see Figure 2).

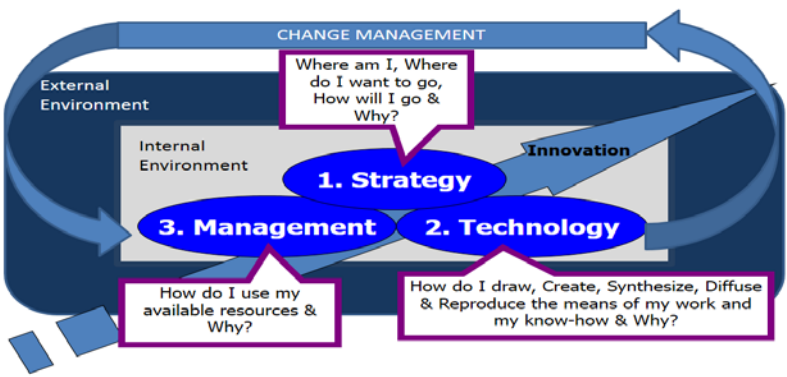

Figure 2. *The evolutionary Stra.Tech.Man core and the change management of the organization. Adapted from Βλάδος (2006)*

(4) Change management and innovation in Stra.Tech.Man terms

C. Within every organization, the emerging innovations are "organically relevant" to each other. Whether they are born from the same combination of functions, or applied to the same functional firm segments. Organizational innovations are usually aggregated in groups (bunches) of innovation. In practice, one innovation lays the ground for the birth of related innovations, within the overall change management framework of the organization (see Figure 3).

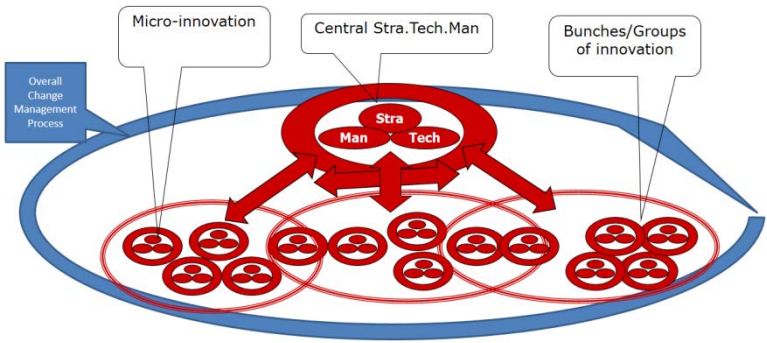

Figure 3. *Organizational structure of innovation and the overall change management process. Adapted from Vlados et al., (2019)*

D. Firm strategy, technology and management, even though are independent spheres in analytical terms, they are combined and co-determined in practice. Firm success never results from a single sphere; it is the result of all three spheres together and the particular way their synthesis manages to give effective answers to the changing environment they are facing. In this way, in order to survive and develop, within a constantly changing environment, every organization has to synthesize effectively—with a unique way and according to its particular physiology—the strategic, technological and managerial dynamics, aiming to the effective innovation that would allow the competitive advantage of the organization and sustain its profitability. Otherwise, if this cannot be achieved, then sooner or later the firm collapses, dies and dissolves. In reality, the answer to one Stra.Tech.Man triangle sphere (namely on the level of strategy, technology, or management) prescribes to a great extent the other two answers. One answer, to a significant extent, gives birth to the other: this

happens because at the inner organizational level there is a deeper physiological unity (Vlados, 2012; Vlados, Deniozos, Chatzinikolaou, & Demertzis, 2018).

E. The organization's specific potential defines its species, and not its pure desire. According to its potential, the organization:

- Builds and develops its particular physiology as synthesis of entrepreneurial philosophy and entrepreneurial processes that implements
- Constructs the mechanisms of understanding the surrounding environments
- Synthesizes its actions and initiatives (see Figure 4).

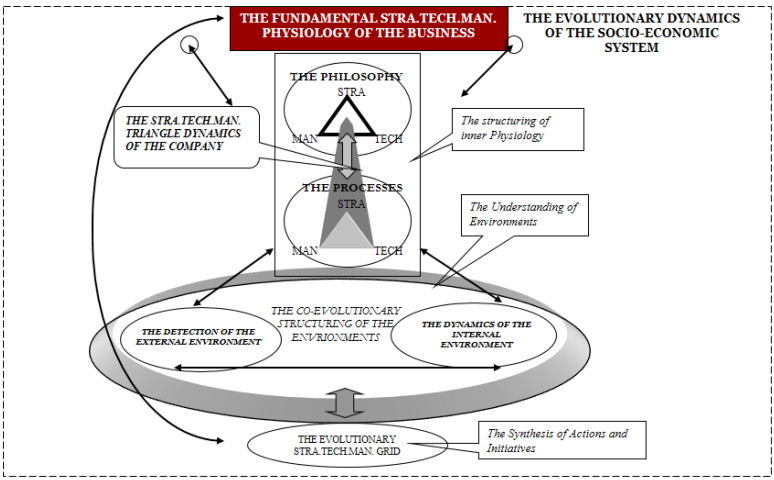

Figure 4. *The evolutionary socioeconomic gameplay and the Stra.Tech.Man perception of the organization. Adapted from Βλάδος (2016)*

F. The evolutionary physiology drives a firm to successful Stra.Tech.Man syntheses and re-syntheses. Therefore, it implements its particular and idiosyncratic business rationality and, in this way, reproduces evolutionarily its unique heterogeneity. In the background, every successful firm does not cease to get reshaped over its evolutionary trajectory (Andreoni & Scazzieri, 2014; Dosi, 1982); and, in fact, the organization does not cease to adaptively reshape its trajectory within the

environments (socioeconomic and industrial) in which it operates, as long as it reshapes its Stra.Tech.Man triangle (see Figure 5).

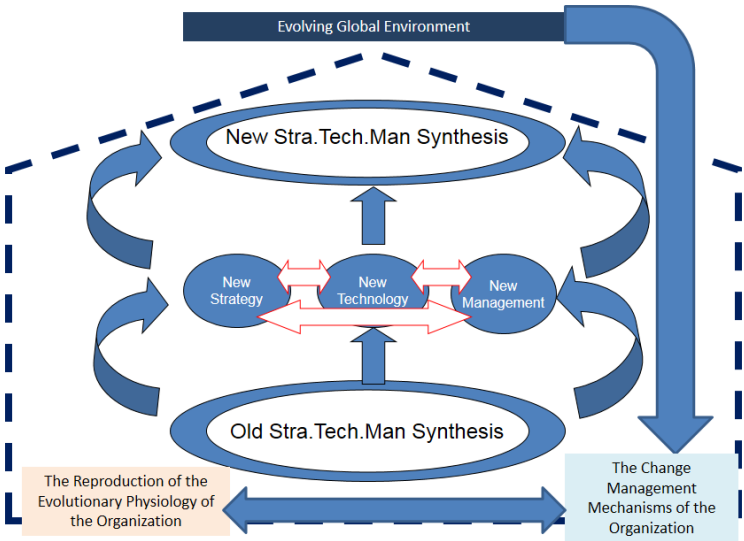

Figure 5. *The reproduction of the evolutionary physiology of the organization in Stra.Tech.Man terms. Adapted from Βλάδος (2006)*

In the background, the evolution of every organization in Stra.Tech.Man terms is path dependent (Jakobsen *et al.*, 2012; Thrane, Blaabjerg, & Møller, 2010) and therefore we should always recognize that its particular physiological history is important; also, the organizational strategy, the technological and managerial choices for the future are determined to a great extent from past decisions.

Based on empirical data from the field (Vlados, 2004), we find that the most critical organizational problems that also prevent the effective management of change are located, eventually, to the organization's physiological core. That is, they are born and reproduced within the organization's evolutionary dimensions:

- From its overall strategy
- From its overall technology
- From its overall management

(4) Change management and innovation in Stra.Tech.Man terms

Specifically, we propose five steps of managing change in the Stra.Tech.Man perspective, as a continuous cycle with five perpetually repeating steps.

This approach to managing change is composed by five consecutive steps, with eight points each, defining a continuous evolutionary process for the successful action of the organization, which must never stop.

I. The successful strategic evolution

1. Crystallize and deepen the vision and mission of your firm: First of all, understand yourself better
2. Question your strategic certainties and ring the warning bell: Come closer to your allies and partners
3. Build mechanisms for a timely and comprehensive perception of the changes of your external environment: Come closer to your customer, supplier and competitor
4. Develop the understanding of your internal business environment: Come closer to your employee and give him or her voice and participation to the strategic process
5. Build a truly comparative and evolutionary SWOT analysis
6. Build carefully your alternatives and evaluate them open-mindedly: Ask questions also to the people surrounding you and understand that you are not always right
7. Choose the strategy that suits you, not only with ambition but also with realism
8. Analyze comprehensively your tactics and policies

II. The successful technological evolution

1. Understand more deeply the technological nature of your firm
2. Get a full comparative image of your technological capabilities
3. Develop even more your mechanisms of technological alertness and collection of new technical data / information
4. Cultivate your internal potential for creating new technical capabilities
5. Stimulate mechanisms for new technology diffusion within your organization

6. Strengthen your mechanisms of assimilating new technological data

7. Support in practice the integration of new technology. Do not be afraid of experimentation; mistakes are also allowed as long as they give substantial lessons

8. Reward the successful implementation of new technology

III. The successful managerial evolution

1. Experiment in new programming methods

2. Make your organization chart lighter

3. Build a really meritocratic way to place the right person in the right position, in the right time

4. Give your people the leaders who fit with them and can inspire them

5. Make your business a school

6. Give extra motives, more flexible and more specialized

7. Measure and evaluate with a fair enough and comparative spirit

8. Open new communication channels and build new ways of coordinating the action

IV. The successful innovative synthesis

1. Crystallize the successful transformations in terms of strategy, technology and management and prepare, with caution, the new Stra.Tech.Man synthesis

2. Weigh, balance and adjust the innovative Stra.Tech.Man triangle to all sides

3. Spread the revolutionary message and build a dynamic guiding group

4. Remove the obstacles, assign roles and give courage with your example

5. Maintain the balance during the operation

6. Try having fast wins and celebrate them in moderation

7. Define control and evaluation points of your overall effort

8. In the end, do not forget to reward those who fought for this change

V. The successful assimilation of change and the continuous change

1. Protect the actions that brought results and unify them into a cohesive logic: Deepen and develop your business physiology

2. Do not punish those that experimented honestly but failed, but those that proved faint-hearted during the change
3. Refresh the hierarchy with new faces
4. Make yesterday's success a goal to overcome and not a conservation monument
5. Place external reviewers within your firm and tolerate them
6. Build a firm that can be loved
7. Chase down complacency and do not rest on your laurels
8. Start over, always, from the beginning

Conclusions and implications

We suggest that the Stra.Tech.Man approach gives a useful and explanatory analytical framework. This can combine effectively the analytical dimensions of organizational strategy, technology and management, in the effort of generating innovation and managing more effectively the change. We think that this approach gives the possibility for a unified perception of the organizational physiological evolution, within the contemporary highly-demanding and fluid global environment.

In terms of research limitations, we suggest that this approach can be strengthened in the future, to a direction of greater systematization and operational enrichment. With the required implementation and operationalization it can acquire more practical usefulness in order to be applied within different organizations.

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References

Aghion, P., Van Reenen, J., & Zingales, L. (2013). Innovation and institutional ownership. *American Economic Review*, 103(1), 277–304. doi. 10.1257/aer.103.1.277

Ahrweiler, P. (2010). *Innovation in Complex Social Systems*. New York: Routledge.

Alvintzi, P., & Eder, H. (2010). *Crisis Management*. New York: Nova Science Publishers.

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297–1333. doi. 10.1177/0149206314527128

Andreoni, A., & Scazzieri, R. (2014). Triggers of change: Structural trajectories and production dynamics. *Cambridge Journal of Economics*, 38(6), 1391–1408. doi. 10.1093/cje/bet034

Arthur, M.B., Inkson, K., & Pringle, J.K. (1999). *The New Careers: Individual Action and Economic Change*. Thousand Oaks, Ca: Sage.

Ashkenas, R. (2013). Change management needs to change. *Harvard Business Review*, 3.

Ates, A., & Bititci, U. (2011). Change process: A key enabler for building resilient SMEs. *International Journal of Production Research*, 49(18), 5601–5618. doi. 10.1080/00207543.2011.563825

Battilana, J., & Casciaro, T. (2012). Change agents, networks, and institutions: A contingency theory of organizational change. *Academy of Management Journal*, 55(2), 381–398. doi. 10.5465/amj.2009.0891

Beckhard, R. (1969). *Organization Development: Strategies and Models*. Reading, MA: Addison-Wesley.

Ben Letaifa, S., Gratacap, A., Isckia, T., & Pesqueux, Y. (2013). *Understanding Business Ecosystems: How Firms Succeed in the New World of Convergence?* Bruxelles: De Boeck.

Bhattacharya, A., Khanna, D., Schweizer, C., & Bijapurkar, A. (2017). The New Globalization: Going Beyond the Rhetoric. Access: September 26, 2018, from BCG Henderson Insitute. [Retrieved from].

Boulding, K.E. (1981). *Evolutionary Economics*. London: Sage Publications.

Boyer, R., & Saillard, Y. (2002). *Théorie de la Régulation: L'état des Savoirs*. Paris: Découverte.

Bremmer, I. (2014). The new rules of globalization. *Harvard Business Review: International Business*, (January-February Issue).

Brenner, S.O., & Holten, A.-L. (2015). Leadership style and the process of organizational change. *Leadership & Organization Development Journal*, 36(1), 2–16. doi. 10.1108/LODJ-11-2012-0155

Bridges, W. (1980). *Transitions: Making Sense of Life's Changes*. Reading, Mass.; Don Mills, Ont.: Addison-Wesley.

Brockner, J., & James, E.H. (2008). Toward an understanding of when executives see crisis as opportunity. *The Journal of Applied Behavioral Science*, 44(1), 94–115. doi. 10.1177/0021886307313824

Brower, A.M., & Nurius, P. (1993). *Social Cognition and Individual Change: Current Theory and Counseling Guidelines*. Newbury Park, Calif.: Sage Publications.

Brown, S.L., & Eisenhardt, K.M. (1997). The art of continuous change: Linking

complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1), 1–34. doi. 10.2307/2393807

Burnes, B. (2009). *Managing Change: A Strategic Approach to Organisationaldynamics*. Harlow, England; New York: Prentice Hall/Financial Times.

By, R.T., Burnes, B., & Oswick, C. (2011). Change management: The road ahead. *Journal of Change Management*, 11(1), 1–6. doi. 10.1080/14697017.2011.548936

By, R.T., Burnes, B., & Oswick, C. (2012). Change management: Leadership, values and ethics. *Journal of Change Management*, 12(1), 1–5. doi. 10.1080/14697017.2011.652371

Carter, M.Z., Armenakis, A.A., Feild, H.S., & Mossholder, K.W. (2013). Transformational leadership, relationship quality, and employee performance during continuous incremental organizational change. *Journal of Organizational Behavior*, 34(7), 942–958. doi. 10.1002/job.1824

Choi, M., & Ruona, W.E.A. (2011). Individual readiness for organizational change and its implications for human resource and organization development. *Human Resource Development Review*, 10(1), 46–73. doi. 10.1177/1534484310384957

Collins, L.K., & Hill, F.M. (1998). Leveraging organizational transformation through incremental and radical approaches to change: Three case studies. *Total Quality Management*, 9(4–5), 30–34. doi. 10.1080/0954412988505

Conner, D. (1993). *Managing at the Speed of Change: Guidelines for Resilience in Turbulent Times*. New York: Villard Books.

Coriat, B., & Dosi, G. (2002). The institutional embeddedness of economic change: An appraisal of the "evolutionary" and "regulationist" research programmes. *In* G. Hodgson, *A Modern Reader in Institutional and Evolutionary Economics*. Cheltenham: Edward Elgar. doi. 10.4337/9781843765554.00015

Coriat, B., & Weinstein, O. (1995). *Les Nouvelles Théories de l'entreprise*. Paris: LGF - Livre de Poche.

Dahl, J. (2014). Conceptualizing coopetition as a process: An outline of change in cooperative and competitive interactions. *Industrial Marketing Management*, 43(2), 272–279. doi. 10.1016/j.indmarman.2013.12.002

Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, 11(3), 147–162. doi. 10.1016/0048-7333(82)90016-6

Drucker, P.F. (1986). *Innovation and Entrepreneurship*. New York, NY: Harper & Row.

Edelman, L.F., & Benning, A.L. (1999). Incremental revolution: Organizational change in highly turbulent environments. *Organization Development Journal; Chesterland*, 17(4), 79.

Euroconsult. (1984). *Les bonzaide l'industrie Japonaise: Éléments de réflexion sur l'intégration de la technologie dans la fonction stratégique des entreprises Japonaises: Étude réalisée*. Paris: Ministère de l'industrie et de la recherche.

Forsyth, D.R. (2019). *Group Dynamics* (7th Edition). Australia ; Boston, MA: Cengage.

Freeman, R. (2014). *Managing Open Systems*. London ; New York: Routledge.

Friedkin, N.E., & Johnsen, E.C. (2014). *Social Influence Network Theory: A Sociological Examination of Small Group Dynamics*. Cambridge: Cambridge UniversityPress.

Gennep, A. van. (1909). *Les Rites de Passage. Étude Systématique des Rites*.Paris.

Georgalis, J., Samaratunge, R., Kimberley, N., & Lu, Y. (2015). Change process characteristics and resistance to organisationalchange: The role of employee perceptions of justice. *Australian Journal of Management*, 40(1), 89–113. doi. 10.1177/0312896214526212

(4) Change management and innovation in Stra.Tech.Man terms
Geus, A. de. (1997). The living company. *Harvard Business Review*, March–April 1997.
Hechanova, R.M., & Cementina-Olpoc, R. (2013). Transformational leadership, change management, and commitment to change: A comparison of academic and business organizations. *The Asia-Pacific Education Researcher*, 22(1), 11–19. doi. 10.1007/s40299-012-0019-z
Hodgson, G.M. (2013). Understanding organizational evolution: Toward a research agenda using generalized Darwinism. *Organization Studies*, 34(7), 973–992. doi. 10.1177/0170840613485855
Jain, A. (2013). Radical change to organizational knowledge Through the accumulation of incremental changes. *Academy of Management Proceedings*, 2013(1), 12144. doi. 10.5465/ambpp.2013.12144abstract
Jakobsen, S.-E., Byrkjeland, M., Båtevik, F.O., Pettersen, I.B., Skogseid, I., & Yttredal, E.R. (2012). Continuity and change in path-dependent regional policy development: The regional implementation of the Norwegian VRI programme. *NorskGeografiskTidsskrift - Norwegian Journal of Geography*, 66(3), 133–143. doi. 10.1080/00291951.2012.681686
Jaros, S. (2010). Commitment to organizational change: A critical review. *Journal of Change Management*, 10(1), 79–108. doi. 10.1080/14697010903549457
Jick, T. (1993). *Managing Change: Cases and Concepts*. Homewood: Irwin.
Kash, T.J., & Darling, J.R. (1998). Crisis management: Prevention, diagnosis and intervention. *Leadership & Organization Development Journal*, 19(4), 179-186. doi. 10.1108/01437739810217151
Kennedy, E.B., Miller, D.J., & Niewiarowski, P.H. (2018). Industrial and biological analogies used creatively by business professionals. *Creativity Research Journal*, 30(1), 54–66. doi. 10.1080/10400419.2017.1411631
Kotter, J.P. (1996). *Leading Change*. Boston, Mass: Harvard Business School Press.
Küçüközkan, Y. (2015). Change management: A theoretical framework. *Journal of Social and Administrative Sciences*, 2(2), 83–92. doi. 10.1453/jsas.v2i2.257
Kuipers, B.S., Higgs, M., Kickert, W., Tummers, L., Grandia, J., & Voet, J.V.D. (2014). The management of change in public organizations: A literature review. *Public Administration*, 92(1), 1–20. doi. 10.1111/padm.12040
LaMarsh, J. (1995). *Changing the Way we Change: Gaining Control of Major Operational Change*. Reading, Mass.: Addison-Wesley.
Laudicina, P.A., & Peterson, E.R. (2016). From Globalization to Islandization (p.26). ATKearney. [Retrieved from].
Levi, D. (2017). *GroupDdynamics for Teams* (5th Edition). Los Angeles: Sage.
Lewin, K. (1948). *Resolving Social Conflicts: Selected Papers on Group Dynamics*. New York: Harper and Row.
Lifton, W.M., & Zimpfer, D.G. (1972). *Groups: Facilitating Individual Growth and Societal Change*. New York; Chichester: Wiley.
Lordon, F. (1993). *Irrégularités des Trajectoires de Croissance Evolutions et Dynamique Non-linéaire: Vers une Schématisation de l'endométabolisme*. EHESS, Paris.
Matos, M.S.P., & Esposito, M. (2014). Improvingchange management: How communication nature influences resistance to change. *Journal of Management Development*, 33(4), 324–341. doi. 10.1108/JMD-05-2012-0058
McAdam, R. (2003). Radical change: A conceptual model for research agendas. *Leadership & Organization Development Journal*, 24(4), 226–235. doi. 10.1108/01437730310478093

Meyer, C., & Davis, S.M. (2003). *It's Alive: The Coming Convergence of Information, Biology, and Business*. New York: Crown Business.

Mitroff, I.I. (2001). *Managing Crises before they Happen: What Every Executive and Manager Needs to Know about Crisis Management*. New York: AMACOM.

Moore, J. (1993). Predators and prey: A new ecology of competition. *Harvard Business Review*, 71(3), 75–86.

Nelson, R.R., & Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge; London: The Belknap Press of Harvard University Press.

Penrose, E.T. (1952). Biological analogies in the theory of the firm. *The American Economic Review*, 42(5), 804–819.

Phillips, J.R. (1983). Enhancing the effectiveness of organizational change management. *Human Resource Management*, 22(1–2), 183–199. doi. 10.1002/hrm.3930220125

Ponis, S.T., & Koronis, E. (2012). A knowledge management process-based approach to support corporate crisis management. *Knowledge and Process Management*, 19(3), 148–159. doi. 10.1002/kpm.1390

Raineri, A.B. (2011). Change management practices: Impact on perceived change results. *Journal of Business Research*, 64(3), 266–272. doi. 10.1016/j.jbusres.2009.11.011

Reeves, M., Levin, S., & Ueda, D. (2016). The biology of corporate survival. *Harvard Business Review*, 94(1), 2.

Reichert, R. (1970). *Self-awareness Through Group Dynamics*. Fairfield, N.J.: Cebco Standard Pub.

Robert, V., Yoguel, G., & Lerena, O. (2017). The ontology of complexity and the neo-Schumpeterian evolutionary theory of economic change. *Journal of Evolutionary Economics*, 27(4), 761–793. doi. 10.1007/s00191-017-0512-x

Rodrik, D. (2011). *The Globalization Paradox: Democracy and the Future of the World Economy*. New York: W.W Norton & Company.

Rogers, E.M. (2003). *Diffusion of Innovations* (5th edition). New York: Free Press.

Romanelli, E., & Tushman, M.L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *The Academy of Management Journal*, 37(5), 1141–1166. doi. 10.2307/256669

Sanford, N. (1969). *Self [and] Society: Social Change and Individual Development*. New York: Atherton Press.

Scazzieri, R. (2018). Structural dynamics and evolutionary change. *Structural Change and Economic Dynamics*, 46, 52–58. doi. 10.1016/j.strueco.2018.03.007

Schumpeter, J. (1942). *Capitalism, Socialism, and Democracy*. New York ; London: Harper & Brothers.

Scott, W.R., & Davis, G.F. (2017). *Organizations and Organizing: Rational, Natural and Open Systems Perspectives*. New York ; London: Routledge.

Steigenberger, N. (2015). Emotions in sensemaking: A change management perspective. *Journal of Organizational Change Management*, 28(3), 432–451. doi. 10.1108/JOCM-05-2014-0095

Stensaker, I.G., & Langley, A. (2010). Change management choices and trajectories in a multidivisional firm. *British Journal of Management*, 21(1), 7–27. doi. 10.1111/j.1467-8551.2009.00657.x

Strebel, P. (1996). Why do employees resist change? *Harvard Business Review*, May–June 1996.

(4) Change management and innovation in Stra.Tech.Man terms
Suddaby, R., & Foster, W.M. (2017). History and organizational change. *Journal of Management*, 43(1), 19–38. doi. 10.1177/0149206316675031
Sundel, M. (1985). *Individual Change Through Small Groups*. New York; London: Free Press ; Collier Macmillan.
Thomas, R., Sargent, L.D., & Hardy, C. (2010). Managing organizational change: Negotiating meaning and power-resistance relations. *Organization Science*, 22(1), 22–41. doi. 10.1287/orsc.1090.0520
Thrane, S., Blaabjerg, S., & Møller, R.H. (2010). Innovative path dependence: Making sense of product and service innovation in path dependent innovation processes. *Research Policy*, 39(7), 932–944. doi. 10.1016/j.respol.2010.04.003
Tsai, F.-S., Huang, W., & Tai, C.-T. (2017). Change pressure on organizational commitment and identification: Knowledge and decision-making competencies in government units. *Journal of Social and Administrative Sciences*, 4(1), 38–47. doi. 10.1453/jsas.v4i1.1244
Valentinov, V. (2015). Kenneth Boulding'stheories of evolutionary economics and organizational change: A reconstruction. *Journal of Economic Issues*, 49(1), 71–88. doi. 10.1080/00213624.2015.1013880
van Witteloostuijn, A., Jacobs, G., & Christe-Zeyse, J. (2013). A theoretical framework of organizational change. *Journal of Organizational Change Management*, 26(5), 772–792. doi. 10.1108/JOCM-09-2012-0137
Vlados, Ch. (2012). The search of competitiveness and the entrepreneurial evolution in a global environment: Toward a new approach of development dynamics based on the case of Greek productive system. *Journal of Management Sciences and Regional Development*, 8, 91–116.
Vlados, Ch., Deniozos, N., Chatzinikolaou, D., & Demertzis, M. (2018). Perceiving competitiveness under the restructuring process of globalization. *International Journal of Business and Management*, 13(8), 135–153. doi. 10.5539/ijbm.v13n8p135
Vlados, Ch., Katimertzopoulos, F., & Blatsos, I. (2019). Innovation in Stra.Tech.Man (Strategy-Technology-Management) terms. *Journal of Entrepreneurship and Business Innovation*, 5(2), 1-26. doi. 10.5296/jebi.v5i2.13477
Vlados, Ch. (2004). *La Dynamique du Triangle Stratégie, Technologie et Management: l'insertion des Entreprises Grecques dans la Globalisation.* Thèse de doctorat, Paris 10. [Retrieved from].
Vlados, Ch. (2005). The insertion of Greek firms into globalization: The dynamics of the triangle of strategy, technology and management. Presented at the *Managing Global Trends and Challenges in a Turbulent Economy*, University of the Aegean, Department of Business Administration.
Vora, M. (2013). Business excellence through sustainable change management. *The TQM Journal*, 25(6), 625–640. doi. 10.1108/TQM-07-2013-0080
Wagner, A. (2007). *Robustness and Evolvability in Living Systems*. Princeton: Princeton University Press.
Warmington, A., Lupton, T., & Gribbin, C. (2014). *Organizational Behaviour and Performance: An Open Systems Approach to Change*. London: Palgrave Macmillan. doi. 10.1007/978-1-349-03088-0
Whelan-Berry, K.S., & Somerville, K.A. (2010). Linking change drivers and the organizational change process: A review and synthesis. *Journal of Change Management*, 10(2), 175–193. doi. 10.1080/14697011003795651
Wolfe, N.S. (2012). The evolving corporate model—From machine to living

(4) Change management and innovation in Stra.Tech.Man terms organization. *Employment Relations Today*, 39(1), 23–30. doi. 10.1002/ert.21351

Wolfe, R.A. (1994). Organizational innovation: Review, critique and suggested research directions. *Journal of Management Studies*, 31(3), 405–431. doi. 10.1111/j.1467-6486.1994.tb00624.x

Worley, C.G., & Mohrman, S.A. (2014). Is change management obsolete? *Organizational Dynamics*, 43(3), 214–224. doi. 10.1016/j.orgdyn.2014.08.008

Zeleny, M. (1980). *Autopoiesis: A Theory of Living Organizations*. New York, N.Y: Elsevier Science Ltd.

Βλάδος, Χ.Μ. (2006a). *Η δυναμική της παγκοσμιοποίησης και οι επιχειρήσεις στην Ελλάδα*. Αθήνα: Εκδόσεις Κριτική.

Βλάδος, Χ.Μ. (2016b). *Στρατηγική μικρομεσαίων επιχειρήσεων σε συνθήκες κρίσης: Η προσέγγιση STRA.TECH.MAN*. Αθήνα: Εκδόσεις Κριτική.

5 Fostering micro and meso competitiveness in Stra.Tech.Man terms*

Introduction

Nowadays, the global economy is in a phase of seeking a comprehensive restructuring and reconstitution towards the creation of a new, long-lasting development model, following the manifestation of a structural socioeconomic crisis and the respective efforts to escape it (Abélès, 2008; Adda, 2012; Gadrey, & Jany-Catrice, 2012; Lin, 2011).

It seems that one of the most sustainable ways to get out of the current global restructuring crisis is to systematically assimilate a new organic way of perceiving innovation across all the different socio-economic organizations and systems of the planet and at all their operational levels (Arkolakis, Ramondo, Rodriguez-Clare, & Yeaple, 2013; Bozio, Irac, & Py, 2014; Peri, 2005). And, in a more general sense, this restructuring will require a consolidation of a new way of perceiving and managing change, that is caused and reproduced in all aspects of socioeconomic reality (Bloom, Sadun, & Van Reenen, 2012; Chaney, 2016).

According to the central axis of this article, all the previous restructuring steps require drastic redeployments in the way the socioeconomic organisms perceive and synthesize their strategy (STRA-tegy), their technology (TECH-nology) and their management (MAN-agement) at all level of action (STRA.TECH.MAN) (Vlados, 1992a; Vlados, 1992b; Vlados, 1996;

Vlados, 2004; Vlados, 2005; Vlados, 2007; Vlados, 2012; Katimertzopoulos, & Vlados, 2017; Vlados, Deniozos, & Chatzinikolaou, 2018a; Vlados, Deniozos, & Chatzinikolaou, 2018b; Vlados, Deniozos, & Chatzinikolaou, 2018c; Vlados, Deniozos, Chatzinikolaou, & Demertzis, 2018a, 2018b; Βλάδος, 2006; Βλάδος, 2007; Βλάδος, 2014; Βλάδος, 2016;Βλάδος, 2017).

In this critical phase of transition, the challenge of stimulating competitiveness in holistic terms seems to acquire new dialectics. This new approach of competitiveness leads to multiple conceptual and theoretical repositionings (Acemoglu, Gancia, & Zilibotti, 2015; Acemoglu, *et al.,* 2016; Altomonte, *et al,* 2016; Alfaro, & Charlton, 2013).

National, regional and local socio-economic systems in organic restructuring

This phase of crisis in globalization and the current search for a way out of it, inevitably leads all national and local socio-economic systems of the planet, in a process of deep structural restructuring. It is almost impossible for any socioeconomic organism to escape the imperative need for effective adaptation to the new emerging data.

And the attempt of the national and local systems to exit their crises is necessarily attempted within a particularly complex and constantly evolving global environment, where the individual, spatially established, socio-economic systems try to manage and assimilate internally the new external challenges (Moreau, 2015a, 2015b; Graz, 2013; Picketty, 2013; Norel, 2009) (see Figure 1).

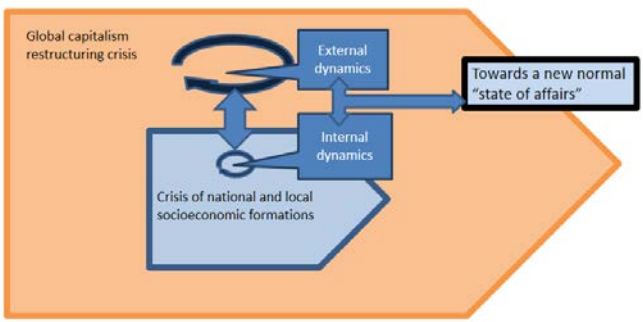

Figure 1. *The restructuring crisis of global capitalism*

Ultimately, all the partial phenomena of development/crisis, on a global scale, prove that every socioeconomic formation constructs its own evolutionary path of development and crisis, which is based on ideological, political, institutional and structural specifications and options. And, in the end, you always become 'what you produce'. Therefore, the benefits of globalization are always for those who invest in their competitive production (Rodrik, 2011).

Every region in our planet is characterized by specific developmental perspectives. And it is fundamental nowadays that no socioeconomic system, of every kind and size, can expect substantial economic development in the absence of a productive grid that is competitive. And this competitiveness will always result from the specific innovative entrepreneurship that the socioeconomic environment is able to host and nourish (Aghion *et al.*, 2015; Brynjolfsson, & McAfee, 2015; Carlino, & Kerr, 2015; Hall, Mairesse, & and Mohnen, 2010).

In the pursuit of a new logic of developmental economic policy

Most of the effective economic policies on the planet seem to converge in a new understanding. This new logic is able to surpass all the simplifications and 'myopia' of the past industrial policy, which was characterized by a Keynesian approach, mainly of ethnocentric interpretation (Guellec, 1999; Jones, 2001; Maddison, 1995; Saint-Paul, 1997). In this new developmental perspective, there is a dialectical continuity in all spatial levels of development (global, regional, national and local). On this basis, we can imagine a 'developmental triangle' that, first, aims to stimulate the competitiveness of the locally operating business entities, second, to strengthen the local productive socioeconomic grid and, third, to increase the attractiveness of the socioeconomic space for new investments (see Figure 2).

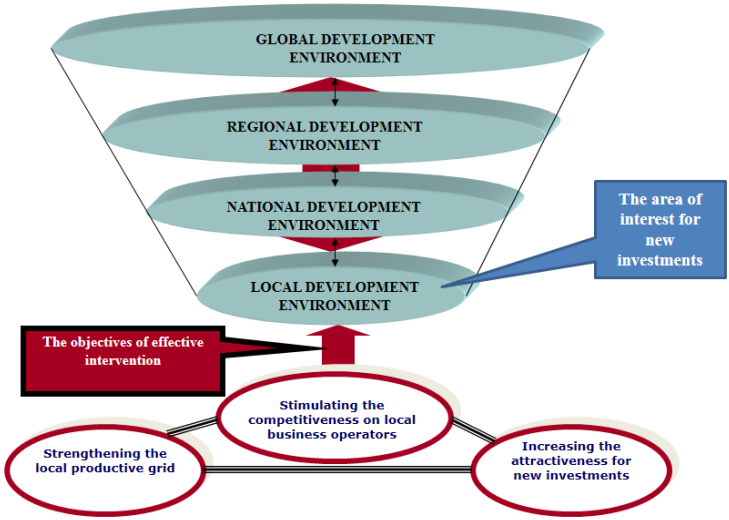

Figure 2. *The tight interaction of different territorial levels of development and the effective developmental intervention in the globalization phase*

In this approach also, it seems that the most important aspect is now attributed to the structuring of an innovative institutional framework that reproduces and is fueled by the continuous strengthening of the established innovation potential. Therefore, the local innovation system—the clusters and ecosystems that includes and mobilizes—seems to be of crucial importance (Balland, Boschma, & Frenken, 2015; Breschi, & Lenzi, 2015; Brossard, & Moussa, 2014; Ravix, 2014).

In practice, the established entrepreneurship, the locally-operating business and the co-evolving ecosystem seem to become the structural center, the 'cell' of the developmental process itself (in sectoral, cross-sectoral and sub-sectoral terms). And the most dominant developmental component in this ecosystemic perspective is the innovative potential that it being composed, diffused and reproduced.

Development, competitiveness and institutional dynamics in the contemporary literature

In this kind of evolutionary approach, economic development is always a combination of moral and social changes that enables a population of socioeconomic organisms to cumulatively increase their real total product (Perroux, 1969): This definition of Francois Perroux gives an insight about the different natures of economic development and economic growth. Surprisingly enough, the traditional and conventional 'economic paradigm' in economic analysis confuses these two different economic processes (Aoki, 2001; Bosworth, & Triplet, 2001; Latouche, 1989; Ward, 2004).

This over-simplistic interpretation is unable to observe that economic growth refers only to the sustainability, over a period of time, of a nation-state's index (or indices) of a specific economic size or flow. Economic growth, therefore, is mostly observed with the real gross domestic product (GDP), usually divided by the country's population (per capita GDP). On the contrary, the concept of economic development can only be linked to the economic evolution and progress; that is, the change of events and structures, tied to each other, as opposed to a random succession, within the irreversible historical time. Ultimately, the process of economic development always carries a potential structural and qualitative transformation and upgrade of the socioeconomic system (Ruttan, 1998).

Although, in the long run, there is no economic development without a parallel economic growth, the two concepts must be analyzed distinctly. The conventional discipline of economic growth seems traditionally to be depleted in the study of the accumulation of quantities. However, economic development refers to much deeper qualitative and structural socioeconomic transformations and imposes policies that go beyond some simple quantitative interventions, implementing institutional changes in an integrated reform framework that structurally rearranges the development model (Amsden, 2001; Bardhan, & Udry, 1999; Rodrik, 1999).

Why, then, is this analytical level of reproduction being reproduced in the myopic and unproductive equation of the concepts of economic development and growth? This is usually the

case for the followers of the "conventional", traditional neoclassical vision as:

- They consider that many critical issues in developmental dynamics, such as distribution, poverty, technology, political power, crisis, innovation, and so many other socio-economic dimensions, are – and must be – "outside the interpretative field" of "pure" Economics.
- They assume, usually silently, that the development process is a non-historical, uniform, continuous and mechanistic process of simple quantitative accumulation, carried out within a static framework of unchanged social forms and political priorities.
- They argue that the exclusive study of market flows—and not the study of the complex socio-economic structures underlying these flows—is sufficient to capture the economic progress of a society.
- They believe that economic growth is simply "a matter of time" for an enlarged economy: the wealth provided by economic growth "will necessarily and automatically be diffused" at all levels. Any deviations from the "rule" and any heterogeneities "will be assimilated and disappear in the future".
- In final analysis, for most of them, developmental economics are shaped as a "discount" of Economics to politics and ideology.

This confusion should be avoided – and it will be avoided – in the current theoretical approach of the development process.

What does the holistic theoretical approach to the development process mean?

In particular, the scientific view of the development process must be the field of study that is interested at the same time in the interpretation of resource allocation processes and economic change in the least developed countries and in the production of sustainable development strategies and policies (Assidon, 1992; Hunt, 1989; Sen, 1983). It is not only the increase in wealth and income per capita a sufficient condition for developing a sustainable spiral of economic development in the poorest societies

of the planet. Deeper structural changes are also needed in less developed socio-economic systems to systematically increase their potential in the fight against poverty and deprivation (Gillis, *et al.*, 1992). And, above all, to their ability to effectively innovate and manage change successfully.

The classic relative approach of Nathan Rosenberg and L.E. Birdzell. Jr. (Rosenberg, & Birdzell, 1986) is highly enlightening, as it reminds us that economic growth is a form of change, and since change is never limited to the economic sphere of life, it is inevitably expanding into social and political aspects. Naturally, and in a parallel conceptual direction, development economics cannot and should not be reliably perceived as a "purely technical" field. Instead, growth inherently has an indelible value as it stems from the specific social realities to which it refers (Stiglitz, 1989).

In the light of the previous observations, the developmental importance of the institutional foundation of development (Acemoglu, & Robinson, 2005; Acemoglu, & Robinson, 2012; Crouch, 2005; Lordon, 1994; Petit, 2006; Rodrik, Subramanian, & Trebbi, 2004; Rutherford, 1996; Rutherford, 2011) becomes clear, and in this sense, development intervention should primarily aim at removing institutional barriers and deficiencies, when they are detected in a socio-economic formation, and at all its operational levels. Thus, the confirmation of the most important developmental importance of structural policy as opposed to simple conjuncture.

Ultimately, looking for competitiveness in a new institutional perspective and as the critical backbone of the development process with a holistic perspective, emerges as a matter of fundamental importance in the articulation of growth dynamics at a global level.

What does competitiveness mean in particular?

Competitiveness can be defined, in overall terms, as the ability of an economic unit, enterprise, socio-economic organism, region or nation, to be superior, to being more efficient than other similar units, in terms of a commonly agreed target indicator (Algan, Cahuc, & Shleifer, 2013; Amador, & Cabral, 2016; Cheptea,

Fontagné, & Zignago, 2014; Costinot, & Rodriguez-Clare, 2014; Hanson, Lind, & Muendler, 2015; Leromain, & Orefice, 2014).

More specific, the major goal of enterprises is profitability, while nations' a high per capita income. In a broad context of perception, it can therefore be said that the competitiveness of each socio-economic formation, and at every level of analysis, is linked to its ability to survive, reproduce and develop, within the evolving conditions of its external socio-economic environment. And, of course, it is always about an external socio-economic environment where production capacities remain limited, survival opportunities are not abundant, and there is a conflict for the acquisition and distribution of available goods in terms of remaining scarcity.

In this way, there could be a first approach to the "competitiveness" of a socio-economic formation by examining the degree of coverage of the dynamically evolving needs of its members and participants. This depends on the size of its production capacities and, by extension, on its innovative potential. In this sense, the problematic of competitiveness is clearly emerging as one of the most prominent development issues.

More specific, according to several converging approaches, the competitiveness of a nation is the extent to which it can, under free and fair market conditions, produce goods and services that respond to international markets, and at the same time, increases the real income of its citizens[11]. Competitiveness at national level is therefore based on higher productivity performance and the ability of the economy to shift production into high productivity activities, which in turn can generate high levels of real wages. Under this approach, competitiveness is not just a measure of a nation's ability to sell abroad and maintain its trade balance: By contrast, competitiveness is matched with rising standards of living, increasing employment opportunities and the ability of a nation-state to serve its international obligations. In this direction,

[11] Review of findings of the President's Commission on Industrial Competitiveness (1985). Available at: [Retrieved from].

for the most part, all modern "macro-economic" developmental definitions of competitiveness are being structured.

Nevertheless, many modern analysts now have legitimate criticism of the "close" macroeconomic view of competitiveness. They call for a fuller approach to the problematic of competitiveness in deepening the study in terms of enterprise (micro-level) and sector or/and regional level (meso-level) (Hamel, & Prahalad, 1993; Morvan, 1991). In this respect, competitiveness at the enterprise level is approached as the ability of the firm to perform better than its competitors (higher productivity and / or greater efficiency in the use of its capital and / or greater market share and / or higher sales & profits, etc.) based on its competitive advantages and its available innovative potential. Of course, the spatial level of articulation of micro-competitiveness varies and can be approached at national, regional and international and global levels (Adelstein, 2005; Dosi, & Winter, 2003).

At the same time, competitiveness can also be approached at sectorial and local level (what, in general, is called Meso level). In its "classical" version, this direction of study contributes to traditional industrial politics. It selects, proposes and strengthens some sectors of economic activity that are of strategic importance for future national economic development (Balland, 2012; Broekel, 2012; Pisani-Ferry, 2016). More specific, according to several converging approaches, the competitiveness of a nation is the extent to which it can, under free and fair market conditions, produce goods and services that respond to international markets, and at the same time, increases the real income of its citizens3. Competitiveness at national level is therefore based on higher productivity performance and the ability of the economy to shift production into high productivity activities, which in turn can generate high levels of real wages. Under this approach, competitiveness is not just a measure of a nation's ability to sell abroad and maintain its trade balance: By contrast, competitiveness is matched with rising standards of living, increasing employment opportunities and the ability of a nation-state to serve its international obligations. In this direction, for the most part, all modern "macro-economic" developmental definitions of competitiveness are being structured.

Competitiveness as an analytical category is of significant importance?

No matter how "paradoxical" such a question sounds, for most people these days, there are clear disagreements in the relevant international bibliography, over the last several years.

Looking at the theoretical development in its conceptual foundations, Michael Porter (Porter, 1990) initially criticized the concept of competitiveness. In his critique, he concludes that if the main economic objective of a country is to create a high and growing living standard for its citizens, then the ability to achieve it, is not dependent on the amorphous perception of competitiveness but on the productivity with which, its resources (labor and capital) are being employed. Ultimately, according to Porter, productivity is simply the main determinant of a country's standard of living for a long time.

In parallel to Porter's criticism, Paul. Krugman (Krugman, 1991; Krugman, 1994; Krugman, 2008) argued that the definition of a country's competitiveness is problematic, as opposed to its approach in terms of business. According to Paul Krugman's view, in particular, the concept of competitiveness itself is unnecessary, since for the economy, the important things are productivity, income distribution and unemployment: If these go well then there is not much more to stumble. If these do not go well, nothing is possible to do well. In his view, productivity is not everything, but in the long run it ends up being almost everything.

Therefore, Krugman's argument leads to the conclusion that competitiveness is a "dangerous obsessive idea" and the working hypothesis that supports, it is wrong. Finally, in his earlier approaches, Krugman focuses on the importance of internal-domestic factors, arguing that, ultimately, the world is not as "interdependent" as we believe, and that international trade between countries is not a zero-sum game, as a growing national economy assists the development of its neighboring economy and vice versa.

The "other side", on the other perspective, does not lack essential arguments. In particular, "critical critique" of the concept of competitiveness has several supporters. According to Burton (Burton, 1994), the difference between Krugman and supporters of

the concept of competitiveness, is simply a difference of degree. He argues that Krugman, with an emphasis on domestic productivity, detracts from the importance of international trade in the US economy. On the contrary, supporters of the concept of competitiveness, emphasize both dimensions, internal and external. In turn, Burton considers that the concept of competitiveness is particularly useful for several reasons:

- It allows very different people (researchers, business executives, public officers...) to think about their performance, in an international competitive environment and to try to follow world-class standards.
- Broaden the attention beyond trade, in issues related to technology, education and the quality of investment.
- Although its benchmark is international, it does not stop focusing on domestic dimensions (productivity, investment).

In the same direction, Preeg (Preeg, 1994) strongly criticizes Krugman's views on competitiveness. In principle, he questions the quantitative justification of Krugman's position on the small importance of US foreign trade in relation to its GDP. He denies Krugman's qualitative assessment that there is no causal link between international trade and national productivity. Preeg argues that the use of a measure of national purchasing power reflecting standard of living and a measure of national output such as productivity, does not adequately capture the effect of international competition on national productivity.

Yoffie (Yoffie, 1993a; Yoffie, 1993b), in the same logic, considers that global competition and competitiveness, stem from the combined interaction between business strategy, state policies and industrial structures. In this way, it opposes the theories of competitiveness that are "rigid" focusing on the factors of production. Yoffie therefore proposes under this orientation, a framework for the analysis of international competition, which includes five dimensions:

- Country's advantages
- Structure of industry sector
- Organizational and strategic business features
- State policies

- The "inertia" (historical heritage, "physiology" in our approach) of the business.

In turn, Best (Best, 1990) in the "New Competition Approach", starts from the study of the modern American economy, and considers that its most important problem is the relative deterioration of its production capacity and not the insufficient savings in the interior or external debt. His approach focuses on the sphere of production and on the role of the internal organization of the business: So, its analysis has a clear micro and strategic orientation. The dominant contemporary phenomenon, according to Best, is the emergence of "New Competition", distinguished by the old one in four points: the organization of the enterprise, the forms of coordination at the various phases of the production chain, the organization of the sector and the types of industrial policy.

In more detail, he finds the overthrow of the "old competition" axioms. "New Competition", in its perspective, proposes strategic interventions at all four levels and is characterized by market-shaping actions, as opposed to simply responding to market developments. At the same time, it calls on businesses, to try to change the "rules of the game", instead of following them "passively". In this way, Best's approach conflicts with the three "axioms" of traditional competitiveness analysis:

- Technological development is linear
- Technological diffusion follows a cycle of 25 to 50 years
- Organizational skills are not important to understand the competitive advantage.

Best thus highlights, the complex evolutionary nature of the contemporary phenomenon of competition and cohesive competitiveness.

It is therefore sufficiently clear from previous approaches, that the narrow view of macro- competitiveness of a country, for years and from multiple sources in the international literature, has been the subject of substantial criticism and overcoming. On the contrary, the microeconomic competitiveness perspective, with a clear institutional and evolutionary orientation, appears to have gained a growing interest over time.

Towards a new methodology macro, meso and micro dimension in the articulation of a "new logic's" economic policy

Of the most important aspects in the study of economic science, in total, is the distinction of its basic analytical levels. In principle, the macroeconomic approach concerns this specific approach to economic phenomena in their overall, cumulative economic dimension: It refers to the study of the factors that determine the aggregate flows and sizes of the economic system under consideration, such as employment and inflation, total savings the economy, total consumption & investment, etc.

The boundaries of macroeconomic policy and the roads of its essential enrichment

It is difficult to deny that achieving the economic equilibrium of the system is of enormous importance, in the structural and long-term development of the business of one place. In principle, it is the main pillar for the creation of a strong socio-economic development model, where economic balance meets, produces and reproduces social cohesion, political stability and continuous technological improvement of the system, as a strictly necessary term in the long-term cross-sectoral development, and thereby safeguard and enhance business profitability. Should not be forgotten that macroeconomic policy undoubtedly, directly and in the short term, influences the world of business: through monetary policy, through interest rates (Shane, 1996), through taxation (Schuetze, & Bruce, 2004) and through the consolidation of climate stability or not (Parker, 1996; Stiglitz, 2002). But in any case, the macroeconomic approach cannot exhaust the problematic of a modern economic policy in the era of globalization.

In practice, it is very important that the articulation of micro-economic and meso-economic policy gradually emerges, which is based, in turn, on the micro- and meso-term view of economic dynamics. The microeconomic approach is, in principle, a specific approach to economic problems, which focuses on the analysis of the behavior / action of the units operating within the economy (individual and enterprise). It refers to the study of factors that

determine the relative prices of goods and inputs, focusing on the relevant markets: Microeconomics focuses on the specific rather than on the general.

The main differences of the macroeconomic and microeconomic approach, are therefore that macroeconomics deals with the study of economic phenomena on a global scale as a set of flows and processes at the level of a national economy, while microeconomics deals with economic phenomena, not from the point of the overall data, but focusing on the units of economic activity, on the "cells" of the economy, i.e. on how it works, with what logic it chooses and how the individual household or individual enterprise acts. The fact that micro-economy is interested in the unit of economic activity, gives it the character "micro". Whereas, because we are interested in macroeconomics for the large measures and processes of the whole economy, we are talking about a "macro" view.

In this dichotomy, meso-economic approach can be said that refers to this specific approach to economic phenomena, in their intermediate, dynamic & evolutionary socio-economic dimension (Mann, 2011; Yew-Kwang, 1986). It refers to the study of the factors that traditionally define the structural dimensions and the "intermediate" sizes of the economic system under consideration, such as the sectors of economic activity, their concentration, the localities in which they accumulate and penetrate, as well as the evolving forms of competition and innovation in their interior (Angelier, 2002; Stead, Curwen, & Lawler, 1996).

According to the rationale chosen in this paper, we support that modern economic policy for business should use all three approaches in a synthetic way. In particular, modern economic policies, claiming higher efficiency, seem to be comprehensively compiling their intervention at all three levels, in a combined and coherent way, in the context of the current dynamics of globalization (see Figure 3).

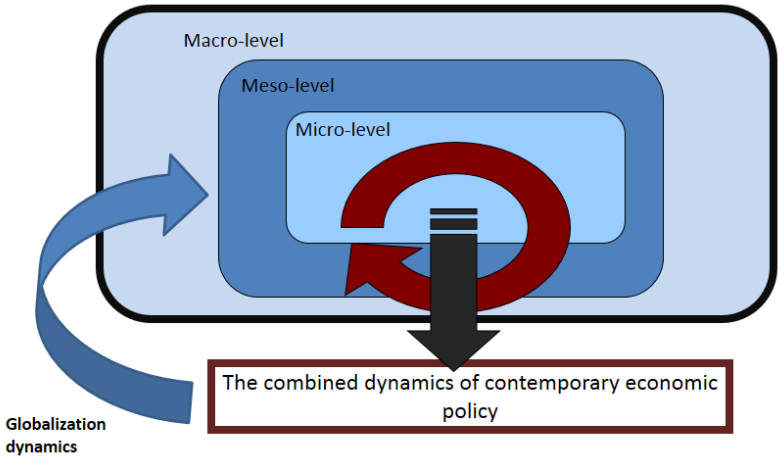

Figure 3. *The necessary composition of all the analytical levels in the structuring of modern economic policy*

Overall, the process of choosing modern solutions of economic policy, in the modern phase of globalization restructuring, seems to require an enriched systemic thinking that will include the assessment of the potential impact of each intervention on the organic whole of the socio-economic grid and not only on a narrow area of the specific economic problem. In this way, resolving development problems through economic policy, is always emerging as a dynamic-evolutionary process (Boulding, 1991; Friedman, 1998; Hodgson, 1993; Toulmin, 1982).

In practice, fragmented and tightly embedded economic policies, do not seem to be able to provide long-term development solutions. They must be re-positioned on a new perspective. Ultimately, it is not enough to try to analyze the "partial", within certain "autonomous" analytical scientific views of modern socio-economic science. Furthermore, someone must try to interpret the constituent parts of the socio-economic subject in question in a consistent, dialectical way.

The analytical penetrance of micro-competitiveness

For several decades, since the late 1980s, micro-competitiveness approaches seem to be of particular interest, for a minority but particularly fruitful part of the relevant research community.

(5) Fostering micro and meso competitiveness in Stra.Tech.Man terms

Under this stream, the "micro-orientation" of the MIT approach has been recorded in "Made in America" (Dertouzos, Richard, Lester, & Solow, 1989), in the late 80's. Specifically, the relevant research committee of the US MIT University, researching the industrial competitiveness, is redirected and focuses now on a micro-economic approach to the competitiveness problem. The committee accepts that improving the macroeconomic climate is important and necessary but not in itself sufficient to solve the problem of a country's productive performance. Thus, attempts to examine the variety of factors, whose combined action leads to the conception, design, development, production and marketing of products and services that, in practice, realize the competitive potential of the economy. The interest directly touches the theme of the articulation of the business strategy.

In parallel, there is also the, timely near-by approach of F. Chesnais (Chesnais, 1986). The researcher argues that international competitiveness of national economies is shaped by the competitiveness of the companies operating within them and exporting. In the long run, he considers that a country's competitiveness is the accumulation of the competitiveness of the businesses operating within it and, ultimately, the expression of their dynamism in terms of administrative practices, investment and innovation capabilities. He does not, however, neglect the importance of structural factors, in establishing a country's international competitiveness, where long-term investment trends, pace and composition of investment, technical infrastructure and the flexibility and sufficiency of productive structures, are of great importance too. Finally, he considers that external factors (broad economic and social framework) of a country define the concept of its structural competitiveness.

At the same wavelength is the micro-approach of Reve & Mathiesen (Reve, & Mathiese, 1994) a few years later. According to Reve & Mathiesen, the industrial competitiveness of a country or a wider economic area, is simply a matter of how competitive its own businesses are. For them, macro-approaches to competitiveness are characterized as "traditional" and outdated, as they are depleted in the analysis of the "macro-conditions" of competitiveness, mainly in the relative prices of productive factors

and, in particular, labor, capital and energy; neglecting to look deeply at what is happening within sectors and businesses. Reve & Mathiesen therefore propose a policy that starts from the micro-level of competitiveness at the operational and sectoral level, in other words at the micro- and meso-level, according to the perspective developed in this research.

Similarly, the interesting "functional" approach to competitiveness, according to Lall (2001), concludes with a convergent conclusion. According to this approach, industrial competitiveness means, developing relative efficiency along with sustainable growth. In this sense, competitiveness is more defined as a process and can be evaluated in terms of the relative path it deters rather than its outcome.

Overall, as you can see, a large number of valuable research contributions, more than forty years old duration, are at the heart of this proposal, which seeks to articulate an economic policy to strengthen the competitiveness of our small and medium-sized enterprises, focusing on micro- and meso-level actions, interested in the 'qualitative', cognitive and structural reinforcement of their productive grid and by directly enhancing their strategic, technological and managerial potential, deeper than the traditionally "monarchy's assumption" of conventional macroeconomic policy optic.

It is estimated that the main issue now becomes framed, within the framework of a modern effective economic policy, systematic assistance in structuring and reproduction of competitive business advantages. In this direction, the coexistence of clusters and business networks, appropriate institutional redeployments by the state and appropriate private investment from abroad and within the country, are the key vehicles/instruments for creating value and wealth in a country.

The best achievement of the goal, is when the socio-economic system builds competitive advantages that already has, and also when it creates/recreates new suitable bases for building new ones. This creation of advantages, requires systematic, long-lasting and coordinated strategy and action in systematic co-operation, between the private and public sectors (Delapierre, & Milelli, 1995; Michalet, 1999; Spilanis, & Vlados, 1994; Storper, 1997).

The prospect of developing a new synthetic approach to competitiveness in the globalization restructuring process

There are many "modern approaches" to economic policy, which continue to follow the path of a superficial and mechanistic approach, both theoretical and analytical, proving in practice that they are dichotomous and not enough sufficient. In these, competitiveness is either perceived only as a closed property of the socio-economic area (see most of the "national space"), or competitiveness is only perceived as a closed property of the enterprise (see more often the "national enterprise"). In the background, both of these two-dimensional approaches to competitiveness, are analytically inadequate and, by extension, can only remain extremely ineffective and in any attempt to consistently conceive developmental phenomenon within globalization.

It can be perceived that within the same socio-economic area, nationally or locally, there are always, and at the same time, companies that are more and more competitive and successful. In fact, there is never a single, homogeneous competitiveness, in the whole of a socio-economic area, regardless of the specific enterprises operating within it. Nor is there a single, competitive and homogeneous competitiveness for an enterprise, regardless of the particular socio-economic countries in which it is established and operating. Competitiveness does not arise only from one or the other, in an isolated and separate way. The creation of competitiveness requires a dialectical synthesis of all its individual dynamic components. Competitiveness, should be a dialectical synthesis between an enterprise/socio-economic area of action and specific sectorial/industrial dynamics, integrating it as an evolutionary set within the global dynamics.

All these three evolutionary dimensions (business, socioeconomic area, branch of activity), in their dialectical synthesis, are those that generate and reproduce competitiveness. Therefore, they should be considered in the context of any substantial developmental vision, within globalization: Socioeconomic area / Business / Branch of productive activity, always integrated as a dynamic/evolutionary ensemble.

Conclusions and analytical perspectives: The STRA.TECH.MAN approach and the Institutes of Local Development and Innovation (ILDI)

According to the above, it becomes understandable why the problematic of competitiveness in globalization today, redefines and restructures—directly and indirectly—the theoretical and practical challenges of modern economic science. The stake here is so important, because someone in a truly evolutionary way of understanding the process of creating competitiveness, now has in his/her hands, a credible holistic "compass" to understand coherently the overall developmental dynamics in the context of globalization restructuring and to manage to articulate a high efficiency developmental economic policy.

According to the overall view of the present research, therefore, an integrated approach to competitiveness and production of the global development phenomenon in the globalization restructuring phase—including and reproducing it—must have a character (Βλάδος, 2006):

- Multilevel and synthetic: Since its articulation requires reconciliation and structural co-ordination between macro, meso and micro vision of the developmental phenomenon
- Holistic: As it always arises and is being reproduced by the overall socio-economic system, dialectically involving its symbolic, moral, legislative and institutional dimensions and not just "narrow economic" ones.
- Organic: Since it is always concerned about evolutionary socio-economic entities, based on their constant adaptation to uncompromised systemic conditions, which are increasingly articulating globally.
- Strategic, Technological and Managerial, in terms of managing change that causes and reproduces: Since it can never be perceived as automatic, exogenous and mechanistically predetermined, it is always produced under the influence of specific choices and behaviors of the individual actors of action / space-producing sectors and which reproduce unceasingly its heterogeneous character.

(5) Fostering micro and meso competitiveness in Stra.Tech.Man terms

In this direction, modern economic policy with focus the support of enterprises at "source", in the "cell", could be said to have a multiform and long-lasting past as a necessary component of global economic policy in many countries around the globe (Acemoglu, Aghion, & Zilibotti, 2006; Aghion, & Howitt, 1990; Aghion, Boulanger, & Cohen, 2011; Hannon, 1997; Iansiti, & Levien, 2004; Moore, 1993; Moore, 1998; Power, & Jerjian, 2001) (see Figure 4).

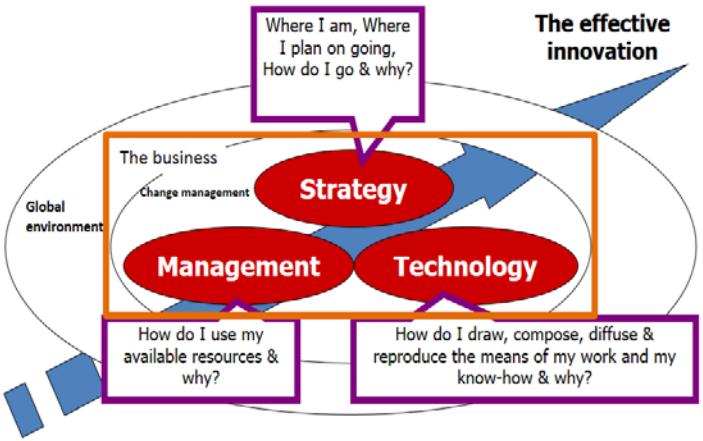

Figure 4. *The stra.tech.man core of the firm*

This is because, ultimately, it seems that at the innermost level of each organization, at the level that it creates its strategy (STRAtegic component), its technology component (TECHnological component) and management (MANagerial component), and to the point where (STRA.TECH.MAN synthesis) identifies the matrix of its innovative potential and its adaptive capacity. To this kernel the articulation policy has to focus, creating a framework of meso-environment enhancing mechanisms, capable of directly boosting the core of micro-competitiveness of the locally based enterprise, in terms of STRA.TECH.MAN, according to the logic shown in the following figure.

Stra.Tech.Man and the Mechanism of the Institutes of Local Development and Innovation (LDI) have been founded in this direction (Katimertzopoulos, & Vlados, 2017; Vlados, Deniozos, & Chatiznikolaou, 2018a). More specifically, the Institutes of Local

(5) Fostering micro and meso competitiveness in Stra.Tech.Man terms

Development and Innovation (LDI) are sustainable mechanisms of developmental co-ordination, boosting and diffusion of information and modern operational knowledge, with an innovative entrepreneurship focus and locally-installed businesses extraversion.

Furthermore, LDI is a mechanism with a regional and local focus, provides a "point of contact" of coordination of all actors, organizations and services (similar to "Citizens Service Centers") related to the innovative and developmental characteristics of various regions of a country (see above Figure 5).

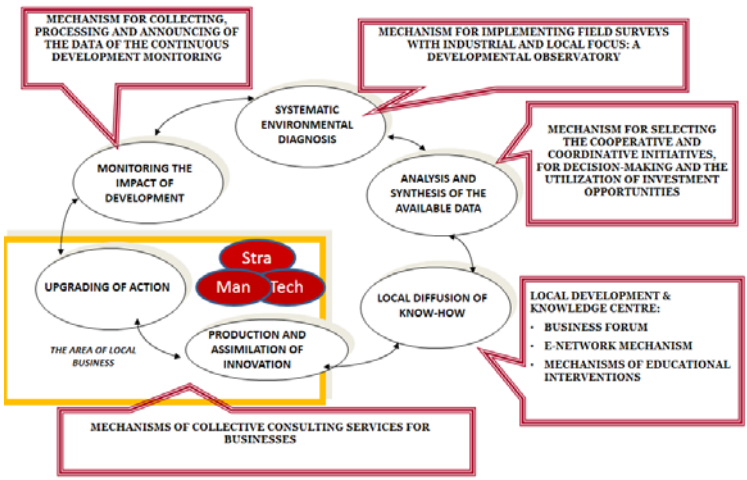

Figure 5. *The 6-link chain of the local institutes of development and innovation mechanism*

References

Abélès, M. (2008). *Anthropologie de la Globalisation*, Payot, Paris.

Acemoglu, D., & Robinson, J.A. (2005). Economic origins of dictatorship and democracy. Cambridge: Cambridge University Press. doi. 10.1017/CBO9780511510809

Acemoglu, D., & Robinson, J.A. (2012). *Why nations fail: The origins of power, prosperity and poverty*. New York: Crown Business.

Acemoglu, D., Aghion, P., & Zilibotti, F. (2006). Distance to frontier, selection, and economic growth. *Journal of the European Economic association*, 4(1), 37-74. doi. 10.1162/jeea.2006.4.1.37

Acemoglu, D., Autor, D., Dorn, D., Hanson, G.H., & Price, B. (2016). Import competition and the great US employment sag of the 2000s. *Journal of Labor Economics*, 34(S1), S141-S198. doi. 10.1086/682384

Acemoglu, D., Gancia, G., & Zilibotti, F. (2015). Offshoring and directed technical change. *American Economic Journal: Macroeconomics*, 7(3), 84-122. doi. 10.1257/mac.20130302

Adda, J. (2012). *La Mondialisation de l'économie*. Paris: La Découverte.

Adelstein, R. (2005). Knowledge and power in the mechanical firm: Planning for profit in Austrian perpsective. *The Review of Austrian Economics*, 18(1), 55-82. doi. 10.1007/s11138-005-5593-3

Aghion, P., & Howitt, P. (1990). A model of growth through creative destruction No. w3223. *National Bureau of Economic Research*. doi. 10.3386/w3223

Aghion, P., Akcigit, U., Bergeaud, A., Blundell, R., & Hémous, D. (2015). Innovation and Top Income Inequality. *NBER Working Paper* No.21247. doi. 10.3386/w21247

Aghion, P., Boulanger, J., & Cohen, E. (2011). *Rethinking industrial policy*. No.2011/04. Brussels: Bruegel.

Alfaro, L., & Charlton, A. (2013). Growth and the quality of foreign direct investment. In Stiglitz, J.E., & Lin, J.L. (eds.). *The Industrial Policy Revolution I* (pp. 162-204). London: Palgrave Macmillan.

Algan, Y., Cahuc, P., & Shleifer, A. (2013). Teaching practices and social capital. *American Economic Journal: Applied Economics*, 5(3), 189-210. doi. 10.1257/app.5.3.189

Altomonte, C., Bas, M., Bugamelli, M., Colantone, I., Fontagné, L., Forlani, E., ... & Ottaviano, G.I. (2016). *Measuring competitiveness in Europe: resource allocation, granularity and trade*. Bruegel Blueprint Series Volume XVIV.

Amador, J., & Cabral, S. (2016). Global value chains: A survey of drivers and measures. *Journal of Economic Surveys*, 30(2), 278-301. doi. 10.1111/joes.12097

Amsden, A.H. (2001). *The rise of "the rest": challenges to the west from late-industrializing economies*. Oxford: Oxford University Press. doi. 10.1093/0195139690.001.0001

Angelier, J.P. (2002). *Economie industrielle, une méthode d'analyse sectorielle*. Grenoble: P.U.G.

Aoki, M. (2001). *Toward a comparative institutional analysis*. Cambridge, Massachusetts: MIT Press.

Arkolakis, C., Ramondo, N., Rodríguez-Clare, A., & Yeaple, S. (2013). Innovation and production in the global economy. No. w18972. *National Bureau of Economic Research*. doi. 10.3386/w18972

Assidon, E. (1992). *Les théories économiques du développement*. Paris: La Découverte.

Balland, P.A. (2012). Proximity and the evolution of collaboration networks: evidence from research and development projects within the global navigation satellite system (GNSS) industry. *Regional Studies*, 46(6), 741-756. doi. 10.1080/00343404.2010.529121

Balland, P.A., Boschma, R., & Frenken, K. (2015). Proximity and innovation: From statics to dynamics. Regional Studies, 49(6), 907-920. doi. 10.1080/00343404.2014.883598

Bardhan, P., & Udry, C. (1999). *Development microeconomics*. Oxford: Oxford University Press. doi. 10.1093/0198773714.001.0001

Best, M. (1990). *The new competition: Institutions of industrial restructuring*. Cambridge, MA: Harvard University Press.

Bloom, N., Sadun, R., & Van Reenen, J. (2012). The organization of firms across countries. *The Quarterly Journal of Economics*, 127(4), 1663-1705. doi. 10.1093/qje/qje029

Bosworth, B., & Triplett, J.E. (2001). What's New About the New Economy? IT, Economic Growth and Productivity. *International Productivity Monitor*, 2, 19-30.

Boulding, K. E. (1991). What is evolutionary economics?. *Journal of Evolutionary economics*, 1(1), 9-17. doi. 10.1007/BF01202334

Bozio, A., Irac, D., & Py, L. (2014), Impact of research tax credit on R&D and innovation: Evidence from the 2008 French reform. *Working Paper*, no 532, Banque de France.

Breschi, S., & Lenzi, C. (2015). The role of external linkages and gatekeepers for the renewal and expansion of US cities' knowledge base, 1990–2004. *Regional Studies*, 49(5), 782-797. doi. 10.1080/00343404.2014.954534

Broekel, T. (2012). Collaboration intensity and regional innovation efficiency in Germany—a conditional efficiency approach. *Industry and Innovation*, 19(2), 155-179. doi. 10.1080/13662716.2012.650884

Brossard, O., & Moussa, I. (2014). The French cluster policy put to the test with differences-in-differences estimates. *Economics Bulletin*, 34(1), 520-529.

Brynjolfsson, E., & McAfee, A. (2015). *Le deuxième âge de la machine: travail et prospérité à l'heure de la révolution technologique*. Paris: Odile Jacob.

Burton, D.F. (1994). Competitiveness: Here to stay. *The Washington Quarterly*, 17 (4). doi. 10.1080/01636609409443752

Carlino, G., Kerr, W.R. (2015). Agglomeration and innovation, *Handbook of Regional and Urban economics*, 5, pp. 349-404. doi. 10.1016/B978-0-444-59517-1.00006-4

Chaney, T. (2016). Networks in international trade. In Bramoullé, Y., Galleoti, A., & Rogers, B. (eds.). *The Oxford Handbook of the Economics of Networks* (pp. 754-775). Oxford: Oxford University Press.

Cheptea, A., Fontagné, L., & Zignago, S. (2014). European export performance. *Review of World Economics*, 150(1), 25-58. doi. 10.1007/s10290-013-0176-z

Chesnais, F. (1986). *Innovation, competitiveness and Agro-industrial Development*. OECD.

Costinot, A., & Rodríguez-Clare, A. (2014). Trade theory with numbers: Quantifying the consequences of globalization. In Gopinath, G., Helpman, E., & Rogoff, K. (eds.). *Handbook of international economics* (Vol. 4, pp. 197-261). Amsterdam: Elsevier. doi. 10.1016/B978-0-444-54314-1.00004-5

Crouch, C. (2005). *Capitalist diversity and change: Recombinant governance and*

institutional entrepreneurs. Oxford: Oxford University Press. doi. 10.1093/acprof:oso/9780199286652-.001.0001

Delapierre, M., & Milelli, C. (1995). Les Firmes multinationales. Paris: Vuibert.

Dertouzos, L., Richard, M., Lester. K., & Solow, R.M. (1989). *Made in America: Regaining the productive edge*. MIT Press.

Dosi, G., & Winter, S.G. (2003). Interprétation évolutionniste du changement économique. *Revue économique*, 54(2), 385-406. doi. 10.3917/reco.542.0385

Friedman, D. (1998). Evolutionary economics goes mainstream: a review of the theory of learning in games. *Journal of Evolutionary Economics*, 8(4), 423-432. doi. 10.1007/s001910050071

Gadrey, J., & Jany-Catrice, F. (2012), *Les nouveaux indicateurs de richesse*. Paris: La Découverte.

Gillis, M., Perkins, D.H., Roemer, M., & Snodgrass, D.R. (1992). *Economics of development* (No.Ed.3). New York: W. W. Norton & Company, Inc.

Guellec, D. (1999). *Économie de l'innovation*. Paris: La Découverte.

Hall, B. H., Mairesse, J., & Mohnen, P. (2010). Measuring the returns to R&D. In Hall, B., & Rosenberg, N. (eds.). *Handbook of the Economics of Innovation* (Vol. 2, pp. 1033-1082). North-Holland. doi. 10.1016/S0169-7218(10)02008-3

Hamel, G., & Prahalad, C.K. (1994). Competing for the future. *Harvard Business Review*, 72(4), 122-128.

Hannon, B. (1997). The use of analogy in biology and economics: From biology to economics, and back. *Structural Change and Economic Dynamics*, 8(4), 471-488. doi. 10.1016/S0954-349X(97)00019-2

Hanson, G.H., Lind, N., & Muendler, M.A. (2015). The dynamics of comparative advantage. *NBER Working Paper*, No.w21753. doi. 10.3386/w21753

Hodgson, G. M. (1993). *Economics and evolution: Bringing life back into economics*. Michigan: University of Michigan Press. doi. 10.3998/mpub.14010

Hunt, D. (1989). *Economic theories of develo*pment. Rowman & Littlefield Publishers.

Iansiti, M., & Levien, R. (2004). *The keystone advantage: What the new dynamics of business ecosystems mean for strategy, innovation, and sustainability*. Boston, MA: Harvard Business Press.

Jones, C.I. (2001). Was an industrial revolution inevitable? Economic growth over the very long run. *Advances in Macroeconomics*, 1(2). doi. 10.2202/1534-6013.1028

Katimertzopoulos, F., & Vlados, Ch.M. (2017). Local support mechanisms for entrepreneurship: The approach of local development and innovation institutions. *International Journal of Business and Economic Sciences Applied Research*, 10(1), 30-41. doi. 10.25103/ijbesar.101.04

Krugman, P. (1991). Increasing returns and economic geography. *Journal of Political Economy*, 99(3), 483-499. doi. 10.1086/261763

Krugman, P. (1994). Competitiveness: a dangerous obsession. *Foreign Affairs*, 28-44. doi. 10.2307/20045917

Krugman, P. (2008). Trade and wages, reconsidered. *Brookings Papers on Economic Activity*, 2008(1), 103-154. doi. 10.1353/eca.0.0006

Lall, S. (2001). *Competitiveness, technology and skills*. Edward Elgar Publishing. doi. 10.4337/9781781950555

Latouche, S. (1989). *L'occidentalisation du monde*. Paris: La Découverte

Leromain, E., & Orefice, G. (2014). New revealed comparative advantage index: dataset and empirical distribution. *International Economics*, 139, 48-70. doi.

(5) Fostering micro and meso competitiveness in Stra.Tech.Man terms 10.1016/j.inteco.2014.03.003

Lin, J.Y. (2011). New structural economics: A framework for rethinking development. *The World Bank Research Observer*, 26(2), 193-221. doi. 10.1093/wbro/lkr007

Lordon, F. (1994). Modéliser les fluctuations, le changement structurel, et les crises: Formalizing fluctuations, structural change and crisis. *Revue d'économie politique*, 219-257.

Maddison, A. (1995). *L'économie mondiale, 1820-1992*: Analyse et statistiques. OECD.

Mann, S. (2011). *Sectors Matter!: Exploring mesoeconomics*. New York: Springer. doi. 10.1007/978-3-642-18126-9

Michalet, C. A. (1999). *La Séduction des nations ou comment attirer les investissements*, Paris: Economica.

Moore, J.F. (1993). Predators and prey: a new ecology of competition. *Harvard business review*, 71(3), 75-86.

Moore, J.F. (1998). The rise of a new corporate form. *Washington Quarterly*, 21(1), 167-181. doi. 10.1080/01636609809550301

Morvan, Y. (1991). *Fondements d'économie industrielle, qu'est-ce que c'est l'économie industrielle?*. Paris: Economica.

Parker, S. C. (1996). A time series model of self-employment under uncertainty. *Economica*, 459-475. doi. 10.2307/2555017

Peri, G. (2005). Determinants of knowledge flows and their effect on innovation. *Review of Economics and Statistics*, 87(2), 308-322. doi. 10.1162/0034653053970258

Perroux, F. (1969). *L'Économie du XXe siècle*. Paris: PUF.

Petit, P. (2006). Socio-institutional changes in the post-Fordist era. In Coriat, B., Petit, P., & Schmeder, G. (eds.). *The Hardship of Nations: Exploring the Paths of Modern Capitalism* (pp. 103-20). Cheltenham: Edward Elgar.

Pisani-Ferry, J. (2016). *Quinze Ans de politiques d'innovation en France, rapport de la Commission nationale d'évaluation des politiques d'innovation*. Paris: France Stratégies.

Porter, M. (1990). *The Competitive Advantage of Nations*. New York: Free Press. doi. 10.1007/978-1-349-11336-1

Power, T., & Jerjian, G. (2001). *Ecosystem: Living the 12 principles of networked business*. Financial Times Management.

Preeg, E.H. (1994). Krugmanian competitiveness: a dangerous obfuscation. *Washington Quarterly*, 17(4), 111-122. doi. 10.1080/01636609409443753

Ravix, J.L. (2014). Localization, innovation and entrepreneurship: an appraisal of the analytical impact of Marshall's notion of industrial atmosphere. *Journal of Innovation Economics & Management*, (2), 63-81.

Reve, T., & Mathiesen, L. (1994). *European industrial competitiveness. Stiftelsen for samfunns-og næringslivsforskning* (SNF).

Rodrik, D. (1999). *The new global economy and developing countries: making openness work* (Vol. 24). Washington, DC: Overseas Development Council.

Rodrik, D. (2011). *The Globalization Paradox: Democracy and the Future of the World Economy*. W. W. Norton & Company. doi. 10.1355/ae28-3k

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of economic growth*, 9(2), 131-165. doi. 10.1023/B:JOEG.0000031425.72248.85

Rosenberg, N., & Birdzell. L.E. (1986). *How the West Grew Rich: The Economic*

Transformation Of The Industrial World. New York: Basic Books.

Rutherford, M. (1996). *Institutions in economics: The old and the new institutionalism*. Cambridge: Cambridge University Press.

Rutherford, M. (2011). *The institutionalist movement in American economics, 1918–1947: Science and social control*. New York: Cambridge University Press. doi. 10.1017/CBO9780511977046

Ruttan, V.W. (1998). The new growth theory and development economics: A survey. *The Journal of Development Studies*, 35(2), 1-26. doi. 10.1080/00220389808422562

Saint-Paul, G. (1997). The role of rents to human capital in economic development. *Journal of Development Economics*, 53(2), 229-249. doi. 10.1016/S0304-3878(97)00053-9

Schuetze, H.J., & Bruce, D. (2004). Tax policy and entrepreneurship. *Swedish Economic Policy Review*, 11(2), 233-265.

Sen, A. (1983). Development: Which way now?. *The Economic Journal*, 93(372), 745-762. doi. 10.2307/2232744

Shane, S. (1996). Explaining variation in rates of entrepreneurship in the United States: 1899-1988. *Journal of Manage*ment, 22(5), 747-781.

Spilanis, I, & Vlados, Ch.M. (1994). Development dynamics in Southern Europe. *Studies in Regional & Urban Planning*, 3, 301-316.

Stead, R., Curwen, P., & Lawler, K. (1996), *Industrial economics*. New York: Mc Graw-Hill.

Stiglitz, J.E. (1989). Markets, market failures, and development. *The American Economic Review*, 79(2), 197-203.

Stiglitz, J.E. (2002). *Globalization and its Discontents*. Norton: New York.

Storper, M. (1997). *The regional world: territorial development in a global economy*. Guilford press.

Toulmin, S.E. (1982). *The return to cosmology: Postmodern science and the theology of nature*. CA: University of California Press.

Vlados Ch.M. (1992a). Les dimensions technologiques dans la théorie de la régulation et la contribution de Coriat sur la conception analytique de la production de la technique et de la science, Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche mineur sous la direction de B.Madeuf, Université de Paris X-Nanterre.

Vlados, Ch.M. (1992b). Politiques industrielles et stratégies des groupes multinationaux dans les secteurs de base-industrie des matériaux en Europe. Diplôme d'Etudes Approfondies (D.E.A.). Séminaire de Recherche majeure sous la direction de M. Delapierre (CEREM), Université de Paris X-Nanterre.

Vlados, Ch.M. (1996). International restructuring dynamics of competitive advantage. *Middle East Forum*, 1, 233-252.

Vlados, Ch.M. (2004). La dynamique du triangle stratégie, technologie et management: L' insertion des entreprises Grèques dans la globalisation. Thèse de doctorat de Sciences Économiques. Université de Paris X-Nanterre.

Vlados, Ch.M. (2005). The insertion of Greek firms into globalization: the dynamics of the triangle of strategy, technology and management. Tome of Proceedings of International Conference: Managing Global Trends and Challenges in a Turbulent Economy, University of the Aegean: Department of Business Administration.

(5) Fostering micro and meso competitiveness in Stra.Tech.Man terms
Vlados, C.M. (2007). Development dynamics in South-Eastern Europe: The challenge of the new paradigm of cooperation, *Middle East Forum*, 6.
Vlados, Ch.M. (2012). The search of competitiveness and the entrepreneurial evolution in a global environment: Toward a new approach of development dynamics based on the case of Greek productive system. *Journal of Management Sciences and Regional Development*, 8.
Vlados, Ch.M., Deniozos, N., & Chatzinikolaou, D. (2018a). Towards a new approach of local development under crisis conditions: Empowering the local business ecosystems in Greece, by adopting a new local development policy. *International Journal of Regional Development*, 5(1). doi. 10.5296/ijrd.v5i1.11955
Vlados, Ch.M., Deniozos, N., & Chatzinikolaou, D. (2018b). The "evil globalization" & the central dialectic tug-of-war in the new globalization's shaping. *Civitas Gentium*, 6(1), 89-134.
Vlados, C.M., Deniozos, N., & Chatzinikolaou, D. (2018c). Global Crisis, Innovation and Change Management: Towards a New Systemic Perception of the Current Globalization Restructuring. *International Business Research*, 11(8), 9-29. doi. 10.5539/ibr.v11n8p9
Vlados, Ch. M., Deniozos, N., Chatzinikolaou, D., & Demertzis, M. (2018a). Towards an evolutionary understanding of the current global socio-economic crisis and restructuring: From a conjunctural to a structural and evolutionary perspective. *Research in World Economy*, 9(1). doi. 10.5430/rwe.v9n1p15
Vlados, Ch. M., Deniozos, N., Chatzinikolaou, D., & Demertzis, M. (2018b). Perceiving competitiveness under the restructuring process of globalization. *International Journal of Business and Management*, 13(8). doi. 10.5539/ijbm.v13n8p135
Ward, M. (2004). *Quantifying the world: UN ideas and statistics* (Vol. 3). Indiana University Press.
Yew-Kwang, N. (1986). *Mesoeconomics: A micro-macro analysis*. New York: St. Martin's Press.
Yoffie, D.B. (1993a). Foreign direct investment in semiconductors. In Froot, K. A. *Foreign direct investment* (pp. 197-230). Chicago, IL: University of Chicago Press.
Yoffie, D.B. (1993b). *The International Political Economy of Direct Foreign Investment* (Vol. I & Vol. II). London: Edward Elgar Publishing Limited.
Βλάδος, Χ.Μ. (2006). Η δυναμική της παγκοσμιοποίησης και οι επιχειρήσεις στην Ελλάδα. Αθήνα: Εκδόσεις Κριτική.
Βλάδος, Χ.Μ. (2007). Η δυναμική της παγκοσμιοποίησης και η νέα προβληματική της τοπικής ανάπτυξης: Στοιχεία για την σύσταση μηχανισμών ενίσχυσης του καινοτομικού δυναμικού των τοπικών παραγωγικών συστημάτων. Στο Συλλογικό Έργο Ειδικά Θέματα Ανάπτυξης σε Λιγότερο Ευνοημένες Περιοχές (ΛΕΠ). Gutenberg.
Βλάδος, Χ.Μ. (2014). Τομές στην ελληνική κρίση. Αθήνα: Εκδόσεις Κριτική.
Βλάδος, Χ.Μ. (2016). Στρατηγική μικρομεσαίων επιχειρήσεων σε συνθήκες κρίσης: Η προσέγγιση Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.
Βλάδος, Χ.Μ. (2017). Παγκόσμια κρίση, καινοτομία και διαχείριση αλλαγής: Η οπτική Stra.Tech.Man. Αθήνα: Εκδόσεις Κριτική.

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Dr. Charis Vlados holds a Ph.D. degreewith a “Very Honorable Distinction” for his thesis on the types/forms of evolutionary integration of the enterprises operating in Greece into globalization that took place within the framework of the Research and Studies Center on Multinational Enterprises (C.E.R.E.M) of the “Paris X-Nanterre” University. The author’s primary focus is on the fields of corporate strategy, competitiveness, entrepreneurship, economic policy, and globalization, while he has established and developed the “Stra.Tech.Man approach” in the field of business dynamics. Charis Vlados has been workingwith various research institutes and as a business consultant, both in Greece and abroad, for approximately twenty years. He is now a lecturer (academic tenure) with the Department of Economics of the Democritus University of Thrace, while has also taught in the past at the Universities of the Aegean and Peloponnese, and at various Public and Private Centres of Studies. Charis Vlados has authored until now seven scientific textbooks and monographs (in Greek) and more than 50 scientific publications.

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