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*For a New Capital Theory:  
A Hermeneutical Approach*

*Abstract*

La teoria del capitale è uno dei temi più controversi della

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scienza economica e oggetto di dibattito all'interno della Scuola Austriaca di economia. Anche se la teoria del capitale di Böhm-Bawerk, di solito identificata come teoria austriaca del capitale, ha lasciato insoddisfatti molti economisti austriaci, una chiara definizione di capitale, coerente con il soggettivismo mengeriano, non è ancora emersa all'interno della Scuola. Seguendo Lachmann e la sua applicazione dell'ermeneutica all'economia, questo saggio tenta di definire il capitale come il risultato di processi mentali soggettivi, determinati da intenzioni ed aspettative individuali, e non dal possesso di specifiche caratteristiche fisiche ed economiche. Il saggio non intende ridefinire totalmente la teoria del capitale ma, più specificatamente, intende raggiungere una definizione di capitale, beni di capitale e valore del capitale; tali definizioni tentano di completare il lavoro iniziato da Lachmann, e la speranza è di trovare un certo consenso tra gli studiosi non soddisfatti dallo stato presente della teoria del capitale, dominata da una prospettiva oggettivista post-ricardiana. Infatti, al momento di giungere ad una definizione di capitale, anche Lachmann sembra non essere in grado di mostrarsi coerente con la sua critica brillante alla prospettiva ricardiana. In particolare, nel distinguere tra beni di capitale e capitale 'potenziale' e 'attuale', tento di superare tale lacuna e di definire capitale e beni di capitale in termini radicalmente soggettivisti.

*Parole chiave:* capitale, aspettative, Lachmann, ermeneutica, soggettivismo

Capital theory is one of the most controversial topics in economics and a object of debate inside the Austrian School of Economics. If Böhm-Bawerk's capital theory, usually identified as the Austrian Capital Theory, left many Austrian economists unsatisfied, a clear definition of capital, consistent with Mengerian subjectivism, is still to be seen inside the School. Following Ludwig Lachmann's application of hermeneutics to economics, this paper tries to define capital as the outcome of

subjective mental processes, determined by individual intentions and expectations, and not by specific physical or economic features. The paper does not aim to redefine capital theory totally but, more specifically, to reach a definition for capital, capital goods, and capital value; such definitions try to complete the work initiated by Lachmann, and the hope is to find a certain consensus among scholars dissatisfied with the present state of capital theory, dominated by an objectivist post-Ricardian perspective. Indeed, at the moment of defining capital in itself, even Lachmann seems not able to be consistent with his brilliant criticism to the Ricardian perspective. In particular, in distinguishing between 'potential' and 'actual' capital goods and capital in general, I try to overcome such gap and to define capital and capital goods in radically subjectivist terms.

*Keywords:* capital, expectations, Lachmann, hermeneutics, subjectivism

SUMMARY. 1. Hermeneutical Processes in Time: The Framework - 2. Hermeneutics of Capital - 2.1. Lachmann's Critics to Böhm-Bawerk - 2.2. Austrian Definitions of Capital - 2.3. A Post-Austrian Definition for Capital and Capital Goods - 2.4. Capital Value - 2.5. Capital Structure and the Production Process - 3. Interest and Profit - 3.1. Neo-Austrians beyond Böhm-Bawerk: Intertemporal Preferences and Interest Rate - 3.2. Entrepreneurial Profit - 4. Conclusions

#### 1. Hermeneutical Processes in Time: The Framework

**L**udwig M. Lachmann (1906-1990) was a German economist who studied with Hayek at the London School of Economics during the 1930s<sup>1</sup>. A professor in economics

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<sup>1</sup>) For a biographical sketch see KARL MITTERMEIER, *Ludwig Lachmann (1906-1990): A Biographical Sketch*, in *Modern Austrian*

in South Africa and New York, he became, with Israel Kirzner and Murray N. Rothbard, one of the protagonists of the Austrian economics revival during the period 1974-1976<sup>2</sup>. Working on the importance of expectations and the impossibility for the economic system to reach an equilibrium position<sup>3</sup>, even if equilibrating forces are always at work, he gave birth to the 'radical subjectivist'<sup>4</sup> stream inside the Austrian school of economics, characterized by the shift from preferences to expectations and by the introduction of hermeneutics in economics<sup>5</sup>. As recalled by Prychitko

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*Economics. Archaeology of a Revival, 1: A multi-directional revival*, edited by Sandye Gloria-Palermo, Pickering & Chatto, London 2002 (1992), pp. 252-269; and *Ludwig M. Lachmann (1906-1990): Scholar, Teacher, and Austrian Critic of Late Classical Formalism in Economics*, edited by Laurence S. Moss, «American Journal of Economics and Sociology», vol. 59, 3, 2000, pp. 367-417.

<sup>2</sup>) See JOHN BLUNDELL, *IHS and the Rebirth of Austrian Economics: Some Reflections on 1974-1976*, «The Quarterly Journal of Austrian Economics», vol. 17, 1, 2014, pp. 92-107; and KAREN VAUGHN, *Austrian Economics in America. The Migration of a Tradition*, Cambridge University Press, New York and Cambridge 1998 (1994), pp. 92-111.

<sup>3</sup>) Garrison opposed Lachmann's 'equilibrium-never' position to Lucas's 'equilibrium-always' approach. See ROGER W. GARRISON, *From Lachmann to Lucas: On Institutions, Expectations, and Equilibrating Tendencies*, in *Subjectivism, Intelligibility, and Economic Understanding: Essays in Honor of Ludwig M. Lachmann on His Eightieth Birthday*, edited by Israel M. Kirzner, New York University Press and Macmillan and Co., New York and London 1986, pp. 87-101.

<sup>4</sup>) See *Subjectivism and Economic Analysis: Essays in Memory of Ludwig M. Lachmann*, edited by Roger Koppl and Gary Mongiovi, Routledge, London and New York 2003 (1998).

<sup>5</sup>) LUDWIG M. LACHMANN, *Austrian Economics: A Hermeneutic Approach*, in *Economics and Hermeneutics*, edited by Don Lavoie, Routledge, London and New York 1990, pp. 132-144. See also FRANCESCO DI IORIO, *Cognitive Autonomy and Methodological Individualism: The Interpretative Foundations of Social Life*, Springer Publishing, New York 2015, pp. 15-22.

«Lachmann attempted to reconstruct the individualist phenomenology of the Austrian School. He called for a hermeneutical-interpretative project that can study and understand the coordinating roles of social and economic institutions. Lachmann was the first economist that I am aware of to suggest that hermeneutics could be profitably applied to economics, particularly as practiced with the Austrian tradition»<sup>6</sup>.

Even if he found important followers<sup>7</sup>, Lachmann attracted a strong criticism by Rothbard<sup>8</sup>, which was mitigated by the so-called Kirznerian middle ground<sup>9</sup>.

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<sup>6</sup>) DAVID L. PRYCHITKO, *Introduction: Why Hermeneutics?*, in *Individuals, Institutions, Interpretations. Hermeneutics Applied to Economics*, edited by David L. Prychitko, Avebury, Aldershot, UK and Brookfield, US 1995, pp. 1-5.

<sup>7</sup>) See in particular *Economics and Hermeneutics*, edited by Don Lavoie, Routledge, London and New York 1990; *Individuals, Institutions, Interpretations. Hermeneutics Applied to Economics*, edited by David L. Prychitko, Avebury, Aldershot, UK and Brookfield, US 1995; and MARIO J. RIZZO, *Disequilibrium and All That: An Introductory Essay*, in *Time, Uncertainty, and Disequilibrium: Exploration of Austrian Themes*, edited by Mario J. Rizzo, Heath and Company, Lexington, D.C. 1979, pp. 1-18. See also GERALD O'DRISCOLL, MARIO J. RIZZO, *The Economics of Time and Ignorance*, Routledge, London and New York 2002 (1985).

<sup>8</sup>) See MURRAY N. ROTHBARD, *The Hermeneutical Invasion of Philosophy and Economics*, in IDEM, *Economic Controversies*, Ludwig von Mises Institute, Auburn 2011 (1989), pp. 119-136; and MURRAY N. ROTHBARD, *The Present state of Austrian Economics*, in *Modern Austrian Economics. Archaeology of a Revival, 2: The Age of Dispersal*, edited by Peter J. Boettke and Stephan Boehm, Pickering & Chatto, London 2002 (1992), pp. 1-59. For the debate Lachmann-Rothbard on hermeneutics and disequilibrium see also MARIO J. RIZZO, *Equilibrium Visions*, in *Modern Austrian Economics. Archaeology of a Revival, 2: The Age of Dispersal*, edited by Peter J. Boettke and Stephan Boehm, Pickering & Chatto, London 2002 (1992), pp. 175-190; PETER J. BOETTKE, STEVEN HORWITZ, DAVID L. PRYCHITKO, *Beyond Equilibrium*

This essays builds on the Lachmannian tradition and it is now necessary to clarify what I have in mind when I talk about the application of hermeneutics to economics in general and to capital theory in particular. Without a doubt, we owe to the Austrian School of Economics (ASE) the idea that human action is the core of economic analysis, a vision directly descending from the subjective revolution initiated by Menger<sup>10</sup> and culminated in Mises, who clearly stated that economics «is not about things and tangible material objects»; on the contrary, «it is about men, their meanings and actions. Good, commodities, and wealth and all the other notions of conduct are not elements of nature; they are elements of human meaning and conduct. He who wants to deal with them must not look at the external world; he must search for them in the meaning of acting men»<sup>11</sup>.

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*Economics: Reflections on the Uniqueness of the Austrian Tradition*, in *Modern Austrian Economics. Archaeology of a Revival, 2: The Age of Dispersal*, edited by Peter J. Boettke and Stephan Boehm, Pickering & Chatto, London 2002 (1986), pp. 121-132; GEORGE A. SELGIN, *Praxeology and Understanding: An Analysis of the Controversy in Austrian Economics*, Ludwig von Mises Institute, Auburn 1990 (1988); DAVID L. PRYCHITKO, *Ludwig Lachmann and the Interpretative Turn in Economics: A Critical Inquiry into the Hermeneutics of the Plan*, in *Advances in Austrian Economics*, 1, JAI Press, London 1994, pp. 303-319; DAVID L. PRYCHITKO, *Introduction*, cit., p. 4; and DARIO ANTISERI, *Contro Rothbard. Elogio dell'ermeneutica*, Rubbettino, Soviera Mannelli 2011.

<sup>9</sup>) See ISRAEL M. KIRZNER, *The Meaning of Market Process: Essays in the Development of Modern Austrian Economics*, Routledge, London and New York 1992, pp. 3-54; and ISRAEL M. KIRZNER, *The Driving Force of the Market: Essays in Austrian Economics*, Routledge, London and New York 2000, pp. 132-148. See also DAVID L. PRYCHITKO, *Ludwig Lachmann and the Interpretative Turn*, cit., p. 305.

<sup>10</sup>) CARL MENGER, *Principles of Economics*, Ludwig von Mises Institute, Auburn 2007 (1871).

<sup>11</sup>) LUDWIG VON MISES, *Human Action: A Treatise on Economics*, Ludwig von Mises Institute, Auburn 1998 (1949), p. 92.

Introducing the category of *meaning* we enter the world of interpretations, *verstehen* (understanding)<sup>12</sup>, which is central to the analysis of human action<sup>13</sup> and which is the most important novelty introduced by Lachmann and his followers<sup>14</sup>. Indeed, *interpretation* processes have to be seen as the necessary and subjective link between different objective facts and events. Human actions are objective facts; they are answers to other objective facts, constituting the elements of reality. However, the way in which such answers are defined is totally subjective, the outcome of interpretation processes, which we can define as

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<sup>12</sup>) «Verstehen, i.e., the idea that the ultimate causes of social phenomena must be sought in the meanings individuals attach to their actions and which result from mental interpretative processes» (FRANCESCO DI IORIO, *Hayek and the Hermeneutics of Mind*, «Social Science Information», vol. 54, 2, 2015, p. 178).

<sup>13</sup>) DARIO ANTISERI, *Contro Rothbard*, cit., p. 7.

<sup>14</sup>) According to DAVID L. PRYCHITKO, *Ludwig Lachmann and the Interpretative Turn*, cit., Lachmann introduced a sort of objectivistic hermeneutics, rooted in the Weberian concept of *verstehen* and focused on the analysis of individual plans in the context of evolving institutions (see, in particular, LUDWIG M. LACHMANN, *The Legacy of Max Weber*, The Glendessary Press, Berkeley 1971). Prychitko (ivi) argued that such vision is not as radical as Gadamer's and Ricoeur's phenomenological hermeneutics; Prychitko (ivi) explained the differences between the two approaches at length. However, DARIO ANTISERI, *Contro Rothbard*, cit., and FRANCESCO DI IORIO, *Cognitive Autonomy*, cit., do not agree with this categorization. According to FRANCESCO DI IORIO, *Cognitive Autonomy*, cit., paragraphs 2.3 and 2.4, Gadamer defended an objective conception of truth (similar to the Weberian one), stressing that an interpretation validity is never arbitrary nor subjective, and during the last years of his life he pointed out several common features between his vision and the Popper's one. Following Popper, Dario Antiseri (ivi) explained that fallibility and hermeneutics are different words to describe the same kind of knowledge theory. See also ENZO DI NUOSCIO, *Ermeneutica ed economia. Spiegazione ed interpretazione dei fatti economici*, Rubbettino, Soveria Mannelli 2014.

hermeneutical actions. As explained by Bellet and Durieu, «the relationship between objective economic variables or ‘business situations’ and expectations depends on the interpretation which the agents give to the former»<sup>15</sup>. This is what Lachmann called the subjectivism of active minds. Such a perspective does not deny the objective nature of reality; however, the nature of the response to objective elements is exquisitely subjective, ontologically hermeneutical. An example will help in clarifying my point of view. An earthquake is an objective fact. However, can we say that, economically speaking, the consequences of an earthquake are defined by the earthquake *per se*? If the answer is ‘yes’ we must conclude, as modern econometricians try to do, that every earthquake will bring out a certain set of economic consequences, independently from the conditions of time and space, and, above all, independently from the perception generated in the people affected by the natural disaster. I believe, instead, that the answer must be ‘no’. The objectification (mechanization) of reality does not take in account the action of real human beings, which takes place as consequence of hermeneutical processes in a specific context of space and time. In fact, a natural disaster can bring out different outcomes. People living in the affected area could react thinking that, even if earthquakes cannot be avoided, it is time to rebuild the town with better engineering techniques, so as to leave future generations a better heritage and to suffer less damages in case of future disasters; in this case, the earthquake would bring out research, investment, general development. But if the disaster is interpreted as a sign that world end is imminent and nothing can be done in order to appease God’s anger, then the affected human community would simply stands still, waiting for the unavoidable outcome of an unchangeable destiny. It is

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<sup>15</sup>) MICHEL BELLET, JACQUES DURIEU, *Lundberg and Lachmann on Expectations*, in *Evolution of the Market Process: Austrian and Swedish Economics*, edited by Michel Bellet, Sandye Gloria-Palermo, Abdallah Zouache, Routledge, London and New York 2004, p. 236.



clear that the economic consequences of the same event can be radically different, according to the hermeneutical process following the objective fact. The difference lies in processes happening into human minds; of course, such processes are affected by environmental and space-time conditions; however, to be affected does not mean to be objectively determined. The objective outcome is always the result of subjective processes of evaluation and interpretation.

It is now clear how subjective hermeneutical processes constitute the necessary link between objective facts. Without the interpretative moment, reality could not take shape because no action would be decided. Such a vision explains also the weakness of modern day economics and its focus on economizing and maximizing functions (as described in Robbins's *Essay on the Nature and Significance of Economic Science*)<sup>16</sup>. Economizing men (*homo oeconomicus*) make decisions with respect to *given* series of ends and means<sup>17</sup>: their action is reduced to reaction. Pareto's agent does not choose his tastes and preferences<sup>18</sup>. The important point raised up by Kirzner is that, in an analytical framework in which ends and means are given, there is no room to study *how* ends and means are decided. Instead, being «[...] broader than the notion of economizing, the concept of human action does not restrict analysis of the decision to the allocation problem posed by the juxtaposition of scarce means and multiple ends. The decision, in the framework of the human-action approach, is not arrived at merely by mechanical computation of the solution to the

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<sup>16</sup>) For an earlier and detailed contraposition of Robbinsian economizing agent and Misesian *homo agens* see ISRAEL M. KIRZNER, *The Economic Point of View*, Sheed and Ward, Kansas City 1976 (1960), pp. 108-185.

<sup>17</sup>) ISRAEL M. KIRZNER, *Competition and Entrepreneurship*, University of Chicago Press, Chicago, 1973, pp. 32-33.

<sup>18</sup>) DAVID L. PRYCHITKO, *Ludwig Lachmann and the Interpretative Turn*, cit., p. 304.

maximization problem implicit in the configuration of the given ends and means. It reflects not merely the manipulation of given means to correspond faithfully with the hierarchy of given ends, but also *the very perception of the ends-mean framework within which allocation and economizing is to take place*<sup>19</sup>.

While Robbins's economizing man can only react, in a given way, to a strictly defined set of ends and means, the Misesian *homo agens* can also identify which ends to strive for and which means are available. This is possible because we actually «can *imagine* the future, even a nonexistent, unknowable future»<sup>20</sup>. Instead, economizing behavior does not take into account the process to identify ends and means. At this point the hermeneutical processes described above come into play. How are ends and means actually defined? As Lachmann pointed out, one of the most important achievements of modern subjectivism is the shift from preferences to expectations. An analysis of human action unable to deal with expectations would be maimed. Individual action takes place in a context which generates, via hermeneutical processes, expectations about the future. It is according to such expectations that human minds define their set of ends and corresponding means, thought to be adequate to achieve ends. Human action consists of actual implementation of plans, the utilization of means to reach goals defined by the expectations generated by interpretative processes, in turn sprouting from the impact between human beings and surrounding reality<sup>21</sup>. To

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<sup>19</sup>) ISRAEL M. KIRZNER, *Competition and Entrepreneurship*, cit., p. 33.

<sup>20</sup>) ISRAEL M. KIRZNER, *The Meaning of Market Process*, cit., p. 25.

<sup>21</sup>) This is what is usually labelled as the purposefulness of human action. See RONIN COWAN - MARIO J. RIZZO, *The Genetic-Causal tradition and Modern Economic Theory*, in *Modern Austrian Economics: Archaeology of a Revival, 1: A multi-directional revival*, edited by Sandye Gloria-Palermo, Pickering & Chatto, London, 2002 (1996), pp. 333-335; and EMILE PHANEUF - CARMELO FERLITO, *On Human Rationality and Government Control*, «Procesos de Mercado: Revista Europea de Economía Política», vol. 11, 2, 2014, pp. 159-176.

understand the actions of individuals, it is necessary to reduce action to plan<sup>22</sup>.

Such plans implementation happens *in time*. As already clearly pointed out by Menger, the «idea of (originary) causality [...] is inseparable from the idea of time. A process of change involves a beginning and a becoming, and these are only conceivable as processes in time»<sup>23</sup>. A suitable concept of time, which will be crucial for my analysis of capital, needs to be introduced. There are indeed two ways of looking at the phenomenon of time, belonging to what Hicks called *economics of time* as distinct from *economics in time*<sup>24</sup>. Those two ways of implementing the role of time in economics may be summarized by saying that time plays in the first case the role of an *ingredient* of the economic process while in Hicks's it rather plays the role of a *container* in which the unwinding of that process is set. Modern Austrian economists built mostly on a Hicksian path, centered on the development of an *economics in time*, linked with the concepts of human actions, expectations, and uncertainty.

As very well explained by Meacci<sup>25</sup>, different conceptions of time gave birth, in economics, to different paradigms: the General Equilibrium Theory (GET paradigm) and the

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<sup>22</sup>) See ROGER KOPPL, *Lachmann on the Subjectivism of Active Minds*, in *Subjectivism and Economic Analysis: Essays in Memory of Ludwig M. Lachmann*, edited by Roger Koppl, Gary Mongiovi, Routledge, London and New York 2003 (1998), p. 63.

<sup>23</sup>) CARL MENGER, *Principles of Economics*, cit., quoted in RONIN COWAN - MARIO J. RIZZO, *The Genetic-Causal Tradition*, cit., p. 329.

<sup>24</sup>) See FERDINANDO MEACCI - CARMELO FERLITO, *The Classical Roots of the Austrian Theory of Capital*, paper presented at the SIBR-UniKL Conference on Interdisciplinary Business and Economics Research, Kuala Lumpur, February 12-13.

<sup>25</sup>) See FERDINANDO MEACCI, *Uncertainty and Expectations in Shackle's Theory of Capital and Interest*, MPRA paper 11700. Munich: Munich Personal RePEc Archive, 2006.

Economics of Uncertainty and Expectations (EUE paradigm)<sup>26</sup>. Such a distinction is built on Shackle's<sup>27</sup> and Robinson's<sup>28</sup> attempts to go beyond a spatialized concept of time in economics, used by neoclassic economists, and move back to a more realistic use of the concept of time. O'Driscoll and Rizzo distinguished *real time* from *Newtonian time* and linked the first

<sup>26</sup>) The following table, from FERDINANDO MEACCI, *Uncertainty and Expectations*, cit., pp. 3-4, clarifies the Robinson's distinction between logical and historical time, as summarized in DONALD J. HARRIS, *Robinson on 'History versus Equilibrium'*, in *Joan Robinson's Economics. A Centennial Celebration*, edited by Bill Gibson, Edward Elgar, Cheltenham and Northampton 2005, pp. 81-108.

	Logical Time	Historical Time
Directionality of time	Reversibility	Irreversibility
Time intensity of action	Instantaneous	Discreteness, lags; inertia
Expectations	Self-realizing, correct foresight	Falsifiable, future unknowable
Information/Knowledge	Complete, free, symmetric	Imperfect, costly, local learning
Capital goods	Substitutability	Specificity, lumpiness
Investment	Elastic	Inertia, driven by animal spirits
Technical change	Disembodied	Embodied, path-dependent
Money/finance	Barter, passive money, complete futures markets	Active money, liquidity preference, incomplete markets

<sup>27</sup>) Time of mechanism versus time of uncertainty, or expectational time. See GEORGE L.S. SHACKLE, *A Scheme of Economic Theory*, Cambridge University Press, New York and Cambridge UK 1965.

<sup>28</sup>) Logical time versus historical time. See JOAN ROBINSON, *History versus Equilibrium*, in IDEM, *Collected Economic Papers*, Basil Blackwell, Oxford 1979 (1974), pp. 48-58.

one to the inevitable ignorance that characterizes the process of human action. From Hayek onward Austrians clearly moved into the *historical time* ground, which is vehicle of novelty and source of uncertainty. What O'Driscoll and Rizzo called *real time* is a further evolution of the Robinsonian historical time and of Shackleian *expectational time*. Mainstream economics, on the contrary, unfolds its theory in a logical time context, what O'Driscoll and Rizzo defined as *Newtonian time*, a spatialized time, in which «its passage is represented or symbolized by 'movements' along a line. Different dates are then portrayed as a succession of line segments (*discrete time*) or points (*continuous time*). In either case, time is fully analogized to space, and what is true of the latter becomes true of the former»<sup>29</sup>. O'Driscoll and Rizzo<sup>30</sup> emphasized that time conceived in this way has three main characteristics: homogeneity, mathematical continuity, and causal inertia. Homogeneity means that different temporal moments are simply points in space, a temporal position; nothing may happen between one moment and another. This means that homogeneous time is fundamentally static. Mathematical continuity, on the other hand, implies that time is simply a sequence of moments, which may even be different, but no change can take place endogenously. Since time is a sequence of static situations, each change must be exogenous. Causal inertia, lastly, means that nothing happens with the flow of time. There is no learning, there is no change in knowledge or adjustment of expectations. The system itself must already contain all the elements needed for it to function. It is evident that while such a concept may fit the description of physical phenomena, where actions are always met by the same reactions, it lends itself poorly to representing unpredictable and dynamic human actions.

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<sup>29</sup>) GERALD O'DRISCOLL - MARIO J. RIZZO, *The Economics of Time*, cit., p. 82.

<sup>30</sup>) *Ibidem*, pp. 82-85.

What interests us, on the other hand, is real time, a «dynamically continuous flow of novel experiences. [...] We cannot experience the passage of time except as a flow: something new must happen, or real time will cease to be»<sup>31</sup>. As described by O'Driscoll and Rizzo<sup>32</sup>, the characteristics of real time are precisely opposite to those of Newtonian time. They are, dynamic continuity, heterogeneity, and causal efficacy. If we consider dynamic continuity, time must consist of *memory* and *expectations*; i.e., it is *structurally* related moments, past and future, through the perceptions of the individual; one cannot imagine a present without memory of the past and expectations for the future; consequently, all the moments in the flow of time are intimately linked and reciprocally influenced. Heterogeneity, on the other hand, means that in each successive moment the individual's perception has of the facts may be, and in fact is, different: the past, once it has occurred, becomes memory, enhancing the present and thereby also changing perception of the future; therefore, the perception of things changes from moment to moment, thereby making the characteristics of a given moment in time radically different from those of the previous moment. The direct consequence of heterogeneity is causal efficacy; the flow of time modifies knowledge, awareness, and information, thereby expanding the creative potential of human action. Yet this is possible precisely because of acquisitions made 'beforehand' in time.

It is therefore clear that in a context of logical/Newtonian time nothing happens between the moment in which expectations are formed and the moment in which plans are accomplished. Time is just a fiction to distinguish between two different situations, but no obstacles enter the scene to deviate the course of action. However, reality works in a different way. When we allow real/historical time to be part of the analytical framework, then the picture radically changes; we move from a

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<sup>31</sup>) *Ibidem*, p. 89.

<sup>32</sup>) *Ibidem*, pp. 89-91.

scenario in which *nothing* happens between two objective events to a new situation in which *everything* can happen *continuously*. We have seen how the impact between human beings and reality generates hermeneutical processes through which individuals form their expectations. In turn, expectations define ends and corresponding means; human action, then, consists in the implementation of plans thought to be suitable to achieve ends with the chosen means. At the very first moment in which plans are implemented, however, individuals embark on a process of mutual interaction and further contact with the surrounding reality. Such interaction is a discovery process, revealing to economic actors fundamental information about each other, expectations, ends/means frameworks, and plans. Synthetically, information is transmitted.

Information transmission is another fundamental element for our analytical scheme. Mainstream economics usually moves into a perfect knowledge, a perfect foresight context: information is given once and forever. Introducing human action and historical time, instead, we must move on a ground characterized by imperfect and ever changing knowledge. If information is continuously transmitted and knowledge content therefore correspondently changes, hermeneutical processes need to always be in motion. Novelty and uncertainty brought out by information through the flow of historical time continuously trigger interpretative analyses, with consequent revisions of expectations, ends, means, and plans. What emerges is Shackle's<sup>33</sup> *kaleidic society*, «a society in which sooner or later unexpected change is bound to upset existing patterns, a society “interspersing its moments or intervals of order, assurance and beauty with sudden disintegration and a cascade

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<sup>33</sup>) GEORGE L.S. SHACKLE, *Epistemics and Economics: A Critique of Economic Doctrines*, Transaction Publishers, New Brunswick and London 2009 (1972), pp. 76-79.

into a new pattern"»<sup>34</sup>. At the root of such disintegration we find the endless stream of hermeneutical processes through which individuals deal with the continuous flow of novelty due to human action unfolding in a context of *real time*.

## 2. Hermeneutics of Capital

### 2.1. Lachmann's Critics to Böhm-Bawerk

This is not the place where to summarize the Austrian Capital Theory (ACT), as developed in particular by Böhm-Bawerk<sup>35</sup>. However, in order to reach our *hermeneutical* definition of capital, it is necessary to explain the general feeling of uneasiness raised by Böhm-Bawerk's perspective inside the new generation of Austrian economists, who noticed how such capital theory seemed to part the original Mengerian subjectivist approach and to remain entangled inside neo-Ricardians fences.

In Frank Fetter<sup>36</sup>, at the beginning of the twentieth century, several critics to Böhm-Bawerk's capital theory can already be found. However, it is with Schumpeter that an 'attack' on Böhm-Bawerk's approach clearly started, faulting it as not consistent with the Austrian subjectivist paradigm. Elegant as

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<sup>34</sup>) LUDWIG M. LACHMANN, *From Mises to Shackle: An Essay on Austrian Economics and the Kaleidic Society*, «Journal of Economic Literature», vol. 14, 1, 1976, pp. 54.

<sup>35</sup>) EUGEN VON BÖHM-BAWERK, *Capital and Interest. A Critical History of Economical Theory*, Macmillan and Co., London and New York 1890 (1884); EUGEN VON BÖHM-BAWERK, *The Positive Theory of Capital*, G.E. Stechert, New York 1930 (1889). On this see in particular KLAUS H. HENNINGS, *The Austrian Theory of Value and Capital. Studies in the Life and Work of Eugen von Böhm-Bawerk*, Edward Elgar, Cheltenham and Brookfields 1997.

<sup>36</sup>) See in particular the collection of papers in FRANK FETTER, *Capital, Interest, and Rent*, Sheed Andrews and McMeel, Inc., Kansas City 1977.



usual, Schumpeter did not directly accuse his former teacher, but he reported what Menger supposedly told him once<sup>37</sup>. «[...] Menger, far from welcoming that theory [Böhm-Bawerk's one] as a development of suggestions of his, severely condemned it from the first. In his somewhat grandiloquent style he told me once: 'The time will come when people will realize that Böhm-Bawerk's theory is one of the greatest errors ever committed.' He deleted those hints in his 2nd edition»<sup>38</sup>.

Ludwig Lachmann explicitly referred to Schumpeter's lines in judging the Austrian Capital Theory inadequate for

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<sup>37</sup>) Also Hayek referred to the Mengerian negative position about Böhm-Bawerk's capital theory: «It is pretty certain that we owe this article [Zur Theorie des Kapitals, 1888] to the fact that Menger did not quite agree with the definition of the term capital which was implied in the first, historical part of Böhm-Bawerk's *Capital and Interest*. The discussion is not polemical. Böhm-Bawerk's book is mentioned only to comment it. But its main aim is clearly to rehabilitate the abstract concept of capital as the money value of the property devoted to acquisitive purposes against the Smithian concept of the "produced means of production". His main argument that the distinction of the historical origin of a commodity is irrelevant from an economic point of view, as well as his emphasis on the necessity of clearly distinguishing between the rent obtained from already existing instruments of production and interest proper, refer to points which, even to-day, have not yet received quite the attention they deserve»; FRIEDRICH A. VON HAYEK, *Carl Menger*, in CARL MENGER, *Principles of Economics*, cit., pp. 27-28.

<sup>38</sup>) JOSEPH A. SCHUMPETER, *History of Economic Analysis*, Routledge, London and New York 2006 (1954), p. 814fn. See also SANDYE GLORIA-PALERMO - GIULIO PALERMO, *To What Extent is the Austrian Theory of Capital Austrian? Böhm-Bawerk and Hicks Reconsidered*, in *Evolution of the Market Process: Austrian and Swedish Economics*, edited by Michel Bellet, Sandye Gloria-Palermo, Abdallah Zouache, Routledge, London and New York 2004, pp. 197-210; and FERDINANDO MEACCI - CARMELO FERLITO, *The Classical Roots*, cit.

inclusion in the Austrian paradigm<sup>39</sup>. As pointed out by Schumpeter<sup>40</sup> too, Lachmann stressed that Böhm-Bawerk's analysis was unable to disengage itself completely from the influence of Ricardo<sup>41</sup>. Lachmann's '*j'accuse*' focused in including Böhm-Bawerk's approach into what he called the neo-Ricardian perspective, characterized by *macro-economic formalism*, an analysis conducted «within the context of *macro-economic equilibrium*»<sup>42</sup>, in which the origins of the motion of the forces of the economic system are systematically ignored.

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<sup>39</sup>) LUDWIG M. LACHMANN, *Austrian Economics in the Present Crisis of Economic Thought*, in IDEM, *Capital, Expectations, and the Market Process*, edited by Walter E. Grinder, Sheed Andrews And McMeel Inc., Kansas City 1977 (1976), p. 27. See also LUDWIG M. LACHMANN, *Sir John Hicks as a Neo-Austrian*, in IDEM, *Capital, Expectations, and the Market Process*, edited by Walter E. Grinder, Sheed Andrews and McMeel, Inc., Kansas City 1977 (1973), p. 253: «Certainly Böhm-Bawerk was a Ricardian capital theorist who asked questions about the causes and magnitude of interest Ricardo had been unable to answer».

<sup>40</sup>) «The Böhm-Bawerkian theory of interest and, incidentally, the Böhm-Bawerkian period of production are only two elements in a comprehensive model of the economic process, the roots of which may be discerned in Ricardo and which parallels that of Marx. [...] There is thus a Ricardian root to Böhm-Bawerk's achievement though he was entirely unaware of it»; JOSEPH A. SCHUMPETER, *History*, cit., p. 813.

<sup>41</sup>) On the so called 'greatest error' see ANTHONY M. ENDRES, *The Origins of Böhm-Bawerk's 'Greatest Error': Theoretical Points of Separation from Menger*, «Journal of Institutional and Theoretical Economics», vol. 143, 2, 1987, pp. 291-309; ANTHONY M. ENDRES, *Neoclassical Microeconomic Theory. The Founding Austrian Version*, Routledge, London and New York, 2015 (1997), chapter 9.

<sup>42</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking and the Market Economy: An Essay on the Neglect of the Micro-Foundations and its Consequences*, The Institute of Economic Affairs, London 1973, p. 14.

The German economist included Böhm-Bawerk's approach in what he called a *macro-economic formalism* attitude<sup>43</sup>: working exclusively with macro aggregates<sup>44</sup> and ignoring the microfoundations<sup>45</sup>. As Lachmann stated in referring to the neo-Ricardian revolution started with Sraffa and Joan Robinson<sup>46</sup>, for them there is no room for subjectivist analysis. They did not focus on the analysis of human action, but of human reaction. According to the Ricardian perspective, individuals are divided into social classes, and real human beings are confined into stereotyped behavior, so that imaginary «beings take the place of real people»<sup>47</sup>.

## 2.2. Austrian Definitions of Capital

Following Lachmann's insights and trying to link themselves back with Menger, next generations of Austrian economists tried to overcome Böhm-Bawerk's contradictions and to develop a subjectivist view on capital. However, what I believe to be still missing in the context of the Austrian Capital Theory is a clear definition of what capital is in physical terms and in value.

Surely, some attempts to reach a definition were done, but they seem to remain uncompleted. Menger simply distinguished between first- (or lower-) order goods, which can directly be used to satisfy needs, and higher- order goods, which needs to be transformed in order to produce lower-order

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<sup>43</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit., p. 16.

<sup>44</sup>) LUDWIG M. LACHMANN, *On the Central Concept of Austrian Economics: Market Process*, in *The Foundations of Modern Austrian Economics*, edited by Edwin G. Dolan, Sheed & Ward, Kansas City 1976, pp. 126-132.

<sup>45</sup>) LUDWIG M. LACHMANN, *Toward a Critique of Macroeconomics*, in *The Foundations of Modern Austrian Economics*, edited by Edwin G. Dolan, Sheed & Ward, Kansas City 1976, pp. 152-158.

<sup>46</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit.

<sup>47</sup>) *Ibidem*, p. 18.

goods and therefore participate only indirectly in the needs satisfaction process<sup>48</sup>; lower- and higher-order goods are related through production processes implemented in time<sup>49</sup>. Rothbard<sup>50</sup> and Huerta de Soto<sup>51</sup> worked on such distinction, pointing out that the combination of natural resources, work (human action) and time generates capital goods<sup>52</sup>, which then can be defined as «the intermediate stages of each action process»<sup>53</sup>. They are the Mengerian higher-order goods<sup>54</sup>, distinguished by the fact of not having immediate consumption as their purpose<sup>55</sup>.

As pointed out by Menger, in order to obtain higher-order goods it is necessary to initiate time-consuming production processes, which, in turn, require *saving* to be implemented<sup>56</sup>.

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<sup>48</sup>) CARL MENGER, *Principles of Economics*, cit.

<sup>49</sup>) On the Mengerian perspective on capital theory and his followers inside the Austrian School see in particular ANTHONY M. ENDRES - DAVID H. HARPER, *Carl Menger and His Followers in the Austrian Tradition on the Nature of Capital and Its Structure*, «Journal of the History of Economic Thought», vol. 33, 3, 2011, pp. 357-384; ANTHONY M. ENDRES - DAVID H. HARPER, *Menger on the Nature of Capital and Its Structure: A Reply*, «Journal of the History of Economic Thought», vol. 36, 1, 2014, pp. 103-109.

<sup>50</sup>) MURRAY N. ROTHBARD, *Man, Economy, and State: A Treatise on Economic Principles*, in IDEM, *Man, Economy, and State: A Treatise on Economic Principles with Power and Market. Government and the Economy*, Ludwig von Mises Institute, Auburn 2004 (1962), pp. 1-1046.

<sup>51</sup>) JESÚS HUERTA DE SOTO, *The Austrian School: Market Order and Entrepreneurial Creativity*, Edward Elgar, Cheltenham and Northampton 2010 (2000).

<sup>52</sup>) MURRAY N. ROTHBARD, *Man, Economy, and State*, cit., p. 47; JESÚS HUERTA DE SOTO, *The Austrian School*, cit., p. 46.

<sup>53</sup>) JESÚS HUERTA DE SOTO, *The Austrian School*, cit., p. 46.

<sup>54</sup>) CARL MENGER, *Principles of Economics*, cit., pp. 58-67.

<sup>55</sup>) MURRAY N. ROTHBARD, *Man, Economy, and State*, cit., p. 47.

<sup>56</sup>) STEVEN HORWITZ, *Microfoundations and Macroeconomics: An Austrian Perspective*, Routledge, New York 2000, p. 44; JESÚS HUERTA

Specifically, in order to obtain capital goods, which require time and resources, immediate consumption of certain resources has to be renounced so that they can be used in a process which will bring about a result over a given period of time. Consequently, without saving (foregoing immediate consumption of certain resources) and without the flow of time (saving must have a certain duration in order to complete the production process) capital cannot exist (i.e., it is not possible to start and finish the process that transforms resources).

Having so described capital goods and capital formation, Huerta de Soto defined capital as «the market value of capital goods»<sup>57</sup>. It seems to me that such descriptions and definitions cannot go in the direction indicated by Menger. I would expect to find a better insight in Lachmann's seminal work on capital theory<sup>58</sup>, but the definition presented there also looks disappointing: «As yet we have left the concept of Capital undefined. We now define it as the (heterogeneous) *stock of material resources*. [...] When capital is defined, with Boehm-Bawerk, as the 'produced means of production' land is, of course, excluded. But to us the question which matters is not which resources are man-made but which are man-used. Historical origin is no concern of ours. Our interest lies in the uses to which a resource is put. In this respect land is no different from other resources. Every capital combination is in fact a combination of land and other resources»<sup>59</sup>.

While Lachmann was able to develop a meaningful critique of capital theories developed inside and outside the Austrian School, introducing the hermeneutical approach as interpretative key for a new way to do economics, he failed to

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DE SOTO, *The Austrian School*, cit., p. 47; MURRAY N. ROTHBARD, *Man, Economy, and State*, cit., p. 53.

<sup>57</sup>) JESÚS HUERTA DE SOTO, *The Austrian School*, cit., p. 50.

<sup>58</sup>) LUDWIG M. LACHMANN, *Capital and Its Structure*, Sheed Andrews and McMeel, Kansas City 1978 (1956).

<sup>59</sup>) LUDWIG M. LACHMANN, *Capital and Its Structure*, cit., p. 11.

develop a definition of capital consistent with his own insights. It is true that, reading between the lines, we can see the direction Lachmann wanted to follow on capital theory, but a clear alternative statement, able to go beyond Böhm-Bawerk and building on Menger, is still to be found. Similarly, the two Austrians who worked more from a Lachmannian position regarding capital theory failed to give clear definitions: Garrison<sup>60</sup> focused on the analysis of capital as structure, while Lewin<sup>61</sup> preferred to stress the role of capital in a context of disequilibrium. Similarly, Kirzner<sup>62</sup> confined himself into methodological borders, explicitly refusing to give capital a definition. Therefore, a clear definition of capital is still waiting to emerge.

### 2.3. A Post-Austrian Definition for Capital and Capital Goods

My aim here is to fill that gap, defining *capital* both in physical terms and in terms of value. Following Menger, we can define *useful* those things «that can be placed in a causal connection with the satisfaction of human needs»<sup>63</sup>; if «we both recognize this causal connection, and have the power actually to direct the useful things to the satisfaction of our needs, we call them *goods*». Menger clearly identified four prerequisites that need to be present simultaneously in order for a thing to acquire the status of a *good*:

- 1) A human need;

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<sup>60</sup>) ROGER W. GARRISON, *Time and Money: The Macroeconomics of Capital Structure*, Routledge, London and New York 2001.

<sup>61</sup>) PETER LEWIN, *Capital in Disequilibrium: The Role of Capital in a Changing World*, Ludwig von Mises Institute, Auburn 2011.

<sup>62</sup>) ISRAEL M. KIRZNER, *An Essay on Capital*, in Idem, *Essays on Capital and Interest: An Austrian Perspective*, Edward Elgar, Cheltenham 1996 (1966), pp. 13-122.

<sup>63</sup>) CARL MENGER, *Principles of Economics*, cit., p. 53.

- 2) Such properties as render the thing capable of being brought into a causal connection with the satisfaction of this need;
- 3) Human knowledge of this causal connection; and
- 4) Command of the thing sufficient to direct it to the satisfaction of the need<sup>64</sup>.

The four points stress the subjective and hermeneutical nature of goods. In fact, if a thing does not respond to a *subjective* need, it cannot be classified as a *good*, it simply remains a thing. Prerequisite 1, therefore, can be identified with expectations. It should be followed by prerequisite 3, which can be seen as the choice of the ends/means framework defined by expectations. From my perspective, moreover, prerequisite 3 is a hermeneutical one: the possibility for a thing to satisfy a need is not primarily an objective one; initially, the thing is *thought* to be suitable for a need satisfaction. Human mind subjectively *interprets* the object, imagining it able to meet the need under examination. Only now prerequisite 2 can be taken into account: Things reveal their attitude (characteristics) to satisfy needs through a discovery process, the result of the testing procedure over the previous hermeneutical decision. Prerequisite 4 is the implementation of a plan and cannot be separated from prerequisite 2. Once expectations are formed and a certain ends/means framework is thought to be consistent with them, the choice of the framework is tested through implementation processes revealing, in time, the correctness of our hermeneutical intuitions or the necessity for a revision. In order for a thing to become a 'good', therefore, it is necessary primarily to be thought as suitable for a need satisfaction, and afterward such suitability needs to be tested in reality. The initial hermeneutical process can find confirmation or denial: subjective processes need always to find confirmation in the factual reality. I am free to think of a watch as suitable to cut a steak; but the practical test of my hypothesis would

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<sup>64</sup>) *Ibidem*.

frustrate my expectations. Subjective and objective sides of reality complete each other.

It must be noted that this testing process is never at rest. In fact, a thing could lose, or acquire, good status if circumstances change. The important elements remain unchanged: expectations, interpreting some means as suitable to achieve ends, testing the intuition through a plan implementation, and revising plans as a consequence of information acquired during plan implementation. Now, how to distinguish between goods and capital goods? I believe that Mengerian distinction between higher- and lower-order goods is not enough. Similarly, Lachmann's heterogeneous stock of material resources does not help, it seems to be recursive: what are material resources, then? Lachmann added confusion in arguing that certain *goods* «are capital not by virtue of their physical properties but by virtue of their economic functions. Something is capital because the market, the consensus of entrepreneurial minds, regards it as capable of yielding an income»<sup>65</sup>. While I can agree with the first part of the statement, the second part, linking capital and income, sees Lachmann dangerously sliding onto a Böhm-Bawerkian or neo-Ricardian trap.

As mentioned, the Mengerian distinction between higher- and lower-order goods also seems to be inadequate. In fact, is it really possible to distinguish when a good is directly serving a need and when it is only participating in a process to get a lower order good? Look at a machine, for example. Common sense would judge it as at a capital good and Menger would be on the same page, imagining the machine to contribute to producing something that would satisfy more direct needs. But, at the same time, the very same machine is also serving a direct need, that is the entrepreneurial need to produce things. It could be argued that first-order goods are directly consumed and cannot be used a second time, while higher-order goods can serve their purposes several times—their consumption is

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<sup>65</sup>) LUDWIG M. LACHMANN, *Capital and Its Structure*, cit., p. xv.



spread over time. However, the possibility of a one-time use juxtaposed with a multiple-time usage seems not able to grasp the ontological essence of capital goods.

My distinction uses Menger as a starting point and tries to move beyond him. The basic distinction between consumption goods and capital goods is that the latter enter production processes. As I shall clarify later, from this perspective labor must also be considered as a capital good. The second characteristics of capital goods, deriving from the first, is that they cannot serve their mission by themselves but only in combination with other capital goods. It is true, however, as pointed out by Lachmann, that such goods are *capital goods* by virtue of an economic function and not because of certain physical characteristics. It means that they need to be *thought* as suitable to enter a production process in combination with other goods, and generate a certain result. My definition for *capital goods*, therefore, is as follows: *capital goods are goods that, in a specific moment in time, are thought to be suitable to generate a certain output when combined with other goods in a production process unfolding in time.* It will be the unfolding of the production process which will confirm their suitability as capital goods.

More specifically, I distinguish two categories of capital goods:

- 1) *Potential capital goods*: They are what I defined above, *stricto sensu*. Potential capital goods are goods that, in a specific moment in time, are thought to be suitable for generating a certain output when combined with other goods in a production process unfolding in time.
- 2) *Actual capital goods*: Goods that, in a specific moment in time, after being thought as suitable for generating a certain output when combined with other goods in a production process unfolding in time, are actually implemented in such a production process.

The physical definition of capital shall reflect the above distinction. Physically speaking, then, we might say that, in any given moment, potential capital is the set of potential capital goods, which means the set of goods that will be combined into production processes because they are thought, in a specific moment, to be suitable for implementing plans imagined to achieve ends dictated by expectations. Actual capital consists, on the other hand, of the set of goods that, in a specific moment, are actual capital goods, goods combined into production processes in order to achieve desired ends. In both cases, capital is therefore not simply a set of goods. And, at the same time, it is not simply a set of productive combinations of goods. We are talking about a set of productive combinations of goods consciously implemented because they are *thought* to be the logical outcome of plans set in motion by the intention of fulfilling expectations.

It might seem that there is no difference between potential and actual capital. However, the first difference lies in the distinct moments in time at which the two entities come into being; potential capital refer to the moment at which the ends/means framework, following expectation formation, is generated into the economic actor mind (hermeneutical moment); actual capital, on the other hand, appears when plans thought to be consistent with the ends/means framework are implemented (operational/implementation moment). But potential and actual capital can be distinguished also for another reason: the hermeneutical moment could identify as capital goods some things which are not actually at the disposal of the individual for several reasons. Therefore, a second hermeneutical process would be needed, at a separate moment, in order to identify an alternative. The formation of the actual capital (implementation moment), thus, could happen, theoretically speaking, only after several hermeneutical moments take place.

It is now clear what I have in mind when I talk about *hermeneutics of capital*. The identification of capital goods is, first

of all, a hermeneutical process in which active minds operate on objects after expectation formation has already happened. Capital without expectations cannot exist, therefore, precisely because capital is a characteristic attributed to objects by the subjective interpretation process operated by individuals who try to fulfill expectations. Plan implementation is the link between potential and actual capital.

Given such clarification, then, all the typical features of capital identified by Austrian economics apply to both the ideas of potential and actual capital. First of all capital is a heterogeneous set of goods, which acquire their capital characteristics only by virtue of being used together (combined) in a production process. To look at capital as a stock or as a sort of aggregate is impossible, and this gives rise to a lot of problems when we have to define capital in monetary terms.

The preferential position for observing capital, consequently, is not the abstract macroeconomic vision typical of neo-classics and Keynesians. The appropriate place, as pointed out by Lachmann, is the company, if we mean it as the context in which subjective entrepreneurial interpretative processes happen<sup>66</sup>.

One of the fundamental features of capital goods is that they are not perpetual: They are consumed in the course of a subsequent production process or become obsolete<sup>67</sup>. This means that after several implementation moments, capital goods can lose their attributes and therefore new hermeneutical processes are necessary in order to identify new capital formation paths.

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<sup>66</sup>) LUDWIG M. LACHMANN, *On Austrian Capital Theory*, in *Modern Austrian Economics: Archaeology of a Revival*, 1: *A multi-directional revival*, edited by Sandye Gloria-Palermo, Pickering & Chatto, London 2002 (1976), p. 310.

<sup>67</sup>) JESÚS HUERTA DE SOTO, *The Austrian School*, cit., p. 49; MURRAY N. ROTHBARD, *Man, Economy, and State*, cit., p. 53.

Another characteristic of capital goods is that they become progressively more difficult to retransform the closer they come to the final stage of consumption<sup>68</sup>. This means that as we move closer to final consumption stages and alternative solutions are more difficult to imagine, hermeneutical processes of capital goods will become more complicated.

## 2.4. Capital Value

It is now moment to try to understand if and how capital can be measured, that is, if it is possible to find a quantitative measure for capital and capital goods. As acknowledged in Lachmann<sup>69</sup> and Lewin<sup>70</sup>, in fact, the heterogeneous nature of capital goods create several problems in order to reach a meaningful measurement for the value of capital goods. Several options are also presented and analyzed by Kirzner<sup>71</sup>.

Another question to be answered is whether capital measurement has a meaning at all. Why should we be interested in knowing the value of capital goods? In the end, what matters is the value of the output generated by capital goods intended as described above. An actual measure of capital can be interesting only to scholars conceiving rate of profit as the return rate on capital and therefore interpreting the profitability of investment as related to the employment of capital goods which can be aggregated and objectively measured. Instead I look at profit as the difference between the price at which a good is sold and the sum of costs necessary to

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<sup>68</sup>) JESÚS HUERTA DE SOTO, *The Austrian School*, cit., pp. 49-50.

<sup>69</sup>) LUDWIG M. LACHMANN, *On the Measurement of Capital*, in IDEM, *Expectations and the Meaning of Institutions: Essays in Economics by Ludwig Lachmann*, edited by Don Lavoie, Routledge, London and New York 1994 (1941), pp. 87-101.

<sup>70</sup>) PETER LEWIN, *Capital in Disequilibrium*, cit.

<sup>71</sup>) ISRAEL M. KIRZNER, *An Essay on Capital*, cit., pp. 94-122.

produce it. Profit, therefore, has a microeconomic nature, ignored by the aggregative approach.

However, some attempt of definition can be done. What cannot be measured is the value of single capital goods. Of course, individual capital goods have a market value, a price, intended as the objective synthesis of subjective evaluation processes. But to identify the value of a single capital good with its market value is meaningless, according to the definition of capital I brought out here. In fact, as we have seen, certain things acquire capital good status only in the moment in which they are thought to be suitable to achieve an end when combined with other goods into an intertemporal production process. What has meaning, thus, is the value of capital (potential or actual) intended as the productive combination of certain goods.

It is now useful to recall our definition of capital (potential and actual). At any given moment, potential capital is the set of potential capital goods, which means the set of goods that will be combined into production processes because they are thought, in a specific moment, to be suitable to implement plans imagined to achieve ends dictated by expectations. Actual capital consists, on the other hand, of the set of goods that, in a specific moment, are actual capital goods, goods combined into production processes in order to achieve desired ends. In both cases, capital is a set of productive combinations of goods consciously implemented because *thought* to be the logical outcome of plans set in motion by the intention of fulfilling expectations.

What we are looking for, thus, is the value of each productive combination at different moments in time. I believe that, for a certain output at the hermeneutical moment of time, the value of potential capital is the expected value (expected market price) of the desired output, discounted for the realization time ( $d$ ) at an interest rate intended as the measure

of the temporal preference. It is therefore clear that a measure of capital is completely subjective<sup>72</sup>.

Given:

$PC$  = Potential Capital;

$EO$  = Expected Output meant to be obtained with  $PC$ ;

$V_{EO}$  = Expected Value (market price) of  $EO$  at the realization moment ( $x$ );

$T_n$  = Time at which  $PC$  is thought (hermeneutical moment,  $n$ );

$T_x$  = Time at which  $EO$  is expected to be sold, where  $x > n$ ;

$d = x - n$  (distance between the realization moment  $x$  and the hermeneutical moment  $n$ );

$i$  = interest rate (intertemporal preference measure) at time  $n$ ;

$V_{PC}$  = Value of  $PC$  at time  $n$ ;

Then:

$$V_{PC} = V_{EO} - [(V_{EO} * i * d) / 100] \quad (1)$$

Things become slightly more complicated when we want to define the value of actual capital, because of the different moment of time involved in the plan implementation process. For a certain output at any given moment in time, the value of actual capital is the expected value (expected market price) of the desired output, discounted for the realization time at an interest rate intended as the measure of the temporal preference. Therefore, the value of actual capital changes according to the different moments at which we are looking at it.

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<sup>72</sup>) PETER LEWIN, *A Short Course in Capital Theory*, in *Modern Austrian Economics. Archaeology of a Revival, 1: A multi-directional revival*, edited by Sandye Gloria-Palermo, Pickering & Chatto, London, 2002 (1996), p. 283.

Given:

$AC_{n(1...x-\varepsilon)}$  = Actual Capital at different moments, where  $(x-\varepsilon)$  is the instant before  $EO$  is sold;

$EO$  = Expected Output meant to be obtained with  $AC$ ;

$V_{EO}$  = Expected Value (market price) of  $EO$  at the realization moment  $(x)$ ;

$T_{n[1...x-\varepsilon]}$  = Time at which  $AC$  is observed (different implementation moments);

$T_x$  = Time at which  $EO$  is expected to be sold, where  $x > n$ ;

$d_{n(1...x-\varepsilon)}$  =  $x - n(1...x-\varepsilon)$  (distances between the realization moment and the different implementation moments);

$i_{n(1...x-\varepsilon)}$  = interest rates (intertemporal preference measure) at different implementation moments;

$V_{ACn(1...x-\varepsilon)}$  = Value of  $AC$  at different implementation moments;

Then:

$$V_{ACn(1...x-\varepsilon)} = V_{EO} - [(V_{EO} * i_{n(1...x-\varepsilon)} * d_{n(1...x-\varepsilon)})/100] \quad (2)$$

It is therefore clear that, regarding  $AC$ , we have to define its value according to the moment at which it is observed and evaluated. What makes the difference in the evaluation at different times is not only the discount period, which becomes gradually longer but also the interest rate, which, measuring the intertemporal preferences, presents an unpredictable path. Therefore we cannot conclude, as we move from  $n$  to  $x$ , that the value of the actual capital increases because of the unpredictability of the measure of the interest rate, which is subject to all the modifications that can happen in the flow of the real/historical time.

Actual capital can also be evaluated at the moment  $x$ , when the output is actually sold.

$$V_{ACx} = V_{EOx} - [(V_{EOx} * i_x * d)/100] \quad (3)$$

This is a privileged moment of observation, for the realization value is actually known and not simply expected. Moreover, such evaluation keeps in account the temporal preference at the realization moment  $x$ .  $V_{ACx}$  can then be compared with  $V_{PC}$  assuming that the potential capital become actual capital (the thought goods are actually implemented into combinations). Then we can encounter the following scenarios.

Table 1.  $V_{ACx}$  and  $V_{PC}$  relationship according to  $V_{EOx}$  and  $V_{EOn}$  and  $i_x$  and  $i_n$  relationships.

$V_{EOx}$ and $V_{EOn}$	$i_x$ and $i_n$	Result
$V_{EOx} = V_{EOn}$	$i_x = i_n$	$V_{ACx} = V_{PCn}$
$V_{EOx} > V_{EOn}$	$i_x = i_n$	$V_{ACx} > V_{PCn}$
$V_{EOx} < V_{EOn}$	$i_x = i_n$	$V_{ACx} < V_{PCn}$
$V_{EOx} > V_{EOn}$	$i_x > i_n$	$V_{ACx} > V_{PCn}$
$V_{EOx} < V_{EOn}$	$i_x > i_n$	$V_{ACx} < V_{PCn}$
$V_{EOx} > V_{EOn}$	$i_x < i_n$	$V_{ACx} > V_{PCn}$
$V_{EOx} < V_{EOn}$	$i_x < i_n$	$V_{ACx} < V_{PCn}$
$V_{EOx} = V_{EOn}$	$i_x > i_n$	$V_{ACx} < V_{PCn}$
$V_{EOx} = V_{EOn}$	$i_x < i_n$	$V_{ACx} > V_{PCn}$

Table 1 tells us that, if the interest rate at the realization moment and at the hermeneutical moments does not change, then the sign of the difference between  $V_{ACx}$  and  $V_{PCn}$  is given by the sign of the difference between  $V_{EOx}$  and  $V_{EOn}$ . When, on the other hand, the realization value is exactly the same as expected at the hermeneutical moment, then  $V_{ACx}$  will be higher than  $V_{PCn}$  if the interest rate decreased between  $n$  and  $x$ , while  $V_{ACx}$  will be lower than  $V_{PCn}$  if during the production process the interest rate increased. If both  $V_{EO}$  and  $i$  are higher at moment  $x$  when compared with moment  $n$ , then  $V_{ACx}$  will be also higher than  $V_{PCn}$ . Conversely,  $V_{ACx}$  will be lower than  $V_{PCn}$  when both  $V_{EO}$  and  $i$  are lower at moment  $x$  when compared with moment  $n$ . Instead, in case of opposite directions taken by  $V_{EO}$  and  $i$



between  $x$  and  $n$ , the relationship between  $V_{ACx}$  and  $V_{PCn}$  will follow the direction of the difference between  $V_{EOx}$  and  $V_{EOn}$ . In synthesis, Table 1 shows us how the value of the actual capital at the realization moment can differ from the value of the actual capital at the beginning of the plan implementation process (supposing that the potential capital becomes actual capital), according to the different movement that we can experience in the interest rate and in the difference between the realized value of the output and the expected value of it.

Finally, we can define the average value of the actual capital as the average between the different evaluations done at distinct moments in time, between  $x$  and  $n$ .

$$AV_{AC} = (\sum_1^{x-\varepsilon} ACn) / d \quad (4)$$

Formula (4) does not give us an *objective* measure of capital value, but simply an average value of the different evaluations done at distinct moments in time. Capital value exists only with reference to a specific moment in time and it is determined by the expected realization value, by the flow of time and by the temporal preference (via interest rate). (4) can only be interpreted as a synthetic expression, without any pretense of being the actual value of capital, which instead changes during the flow of time.

It is necessary to re-stress that, as capital in physical terms, I defined the value of capital *only* with reference to expectations and plans implemented in order to achieve the ends dictated by said expectations. It is only in such sense that we can meaningfully talk about capital goods and capital value. With reference to capital value in particular, it can be noted I radically ignored any relation to the market value of the goods combined into production processes: the value of capital, intended as a combination, can be meaningfully interpreted only using the expected output as reference point. It is the output, as a human desire, which gives meaning to capital; therefore the value of the latter can be interpreted by active

minds only with reference to the expected realization value of the former.

To summarize: capital, in physical and monetary terms, exists only in relationship with some expected output. Such expected output allows us define and evaluate capital. Therefore, I never talked of capital in general terms, but always in connection with a specific ends/means framework, strictly related to individual expectations.

Also in measuring the value of capital, so far I have limited my analysis to the evaluation of single combinations and referred to the implementation of plans related to specific expectations. Again, I have confined my analysis at the micro level, without considering, as much as possible, capital as a whole with reference to the economic system.

## 2.5. Capital Structure and the Production Process

After focusing in analyzing capital goods and capital value with exclusive reference to individual expectations, can we move from the micro to the macro level in the attempt to find a suitable definition for capital as referred to the economy as a whole? Some effort in this direction was done by Austrian economists.

As we have seen before, one of the most important elements in Austrian theory of capital lies in not referring to it as a macroeconomic aggregate. Instead, the Austrians, in resuming the Mengerian tradition, preferred a reference to various capital goods by acknowledging the heterogeneous nature<sup>73</sup> of a set of goods that cannot be constituted as an aggregate<sup>74</sup>.

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<sup>73</sup>) See LUDWIG M. LACHMANN, *Capital and Its Structure*, cit., p. 2; STEVEN HORWITZ, *Microfoundations and Macroeconomics*, cit., p. 47.

<sup>74</sup>) See NICOLAI J. FOSS, *The Continuing Relevance of Austrian Capital Theory*, «The Quarterly Journal of Austrian Economics», vol. 15, 2, 2012, pp. 151-171.

As is well known, to overcome such obstacles and to develop a structural perspective on capital, some Austrian economists built on the concept of production period or length of the production process<sup>75</sup>. In truth, as Hayek admitted, it is difficult to think about the production period or the length of the production process in aggregate terms<sup>76</sup>. This is precisely because of the inhomogeneous nature of capital. Hayek tried to overcome the difficulty introducing the so-called Hayek's *triangle*<sup>77</sup>. The base of the right-angled triangle is the production period. The height measures the value of the final consumption goods produced during the production process. The various vertical distances between the hypotenuse and the axis of time are the values of the goods in production. Consequently, the hypotenuse is the value added by time and additional input. The intention is to illustrate the intertemporal structure of capital using certain basic concepts of Austrian theory, such as 'production period' and 'roundabout' production. However, it seems that such an instrument does not render justice to capital as I have defined it.

Before trying to define capital for an economic system, and following the traditional Austrian approach, I will refer to the *capital structure*. First of all we can define the *potential capital structure* as the set of all the combinations that are, at a specific moment, thought to be suitable to fulfill expectations when implemented into production processes. Similarly, the *actual capital structure* is the set of all the combinations of actual capital

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<sup>75</sup>) See FRIEDRICH A. VON HAYEK, *The Pure Theory of Capital*, The University of Chicago Press, Chicago 1952 (1941), p. 70.

<sup>76</sup>) See *ibidem*. Rothbard: «Again, it must be observed that, in considering the length of a process of production, the actor is not interested in past history as such. The length of a process of production for an actor is the waiting-time from the point at which his action begins» (MURRAY N. ROTHBARD, *Man, Economy, and State*, cit., p. 52).

<sup>77</sup>) FRIEDRICH A. VON HAYEK, *Prices and Production*, Augustus M. Kelley, New York 1967 (1931), p. 39.

goods which are implemented, following plans designed to fulfill expectations. Such definitions directly derive from the previous ones but probably fail to deepen the understanding of the shape taken by the structure itself.

This structure, which is determined by expectations and production plans, can hardly be viewed as stable over time. It is therefore evident that the neoclassical function of production, in which there is no process but simply the relationship between output and the combination of capital and labor, is unable to grasp the essence of the production process as the combination, over time, of capital goods. «[T]he neoclassical constant-returns production function [...] does not describe production as a process, i.e., as an ordered sequence of operations. It is more like a recipe for bouillabaisse where all the ingredients are dumped in a pot, (K, L), heated up,  $f(\cdot)$ , and the output, X, is ready. This abstraction from the sequencing of tasks, it will be suggested, is largely responsible for the well-known fact that neoclassical production theory gives us no clue to how production is actually organized»<sup>78</sup>.

The neoclassical production function, moreover, marks the contrast between capital and labor, as two distinct and often conflicting factors of production. Such a distinction penetrated economic theory so deeply that it is widely accepted as describing the 'capitalistic mode of production' through the so-called aggregate production function<sup>79</sup>:

$$q = F(K,L) \tag{5}$$

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<sup>78</sup>) AXEL LEIJONHUFVUD, *Capitalism and the Factory System*, in *Economic as a Process: Essays in the New Institutional Economics*, edited by Richard N. Langlois, Cambridge University Press, New York 1986, pp. 203-204.

<sup>79</sup>) ROBERT M. SOLOW, *A Contribution to the Theory of Economic Growth*, «Quarterly Journal of Economics», vol. 70, 1, 1956, p. 66; ROBERT M. SOLOW, *Technical change and the aggregate production function*, «Review of Economics and Statistics», vol. 39, 3, p. 312.

Formula (5) is probably one of the most famous formulas studied in microeconomics and all students are familiar with it. Of course, it is true that a certain output is generated by the combination of capital goods as described above, and human intervention, which here is generally labelled as  $L$ . Apart from considerations regarding the measurability of  $K$  and  $L$ , and recalling my definition of actual capital, I simply conclude that  $L$  is not opposed or even complementary to  $K$ ; quite the contrary:  $L$  is included in  $K$ . When I defined actual capital as the set of goods that are implemented together in production processes in real time in order to generate an output dictated by expectations, I naturally included labor in the goods which can be chosen to enter the capital combination. It must therefore be clear that labor has to be organically intended as a part of both the potential and the actual capital. In this way, the labor category has to be considered widely; labor includes tasks performed by workers in a factory, administrative roles covered by white collar workers, and also organizational and directional duties accomplished by managers and directors. Formula (5) can be rewritten as follows:

$$O_x = F(O_n; AC; tf) \quad (6)$$

Where  $O_x$  is the output at the end of the production process,  $O_n$  is the desired output (thought at the hermeneutical/expectational moment  $x$ ),  $AC$  is the actual capital and  $tf$  is the time flow. This means that the output is not simply a function of labor and capital, but, more generally, is a function of expectations ( $O_n$ ), of the actual capital (including different human functions usually labelled as labor) and of the time flow. It must be taken into account, moreover, that the shape of  $AC$ , between  $x$  and  $n$ , is not necessarily stable; it will have to readapt according to the novelty brought in by the implementation of the plan over time. It has to be added that, in defining  $O_x$  as function of  $O_n$  (expectations), I do not intend this

in a deterministic way; expectations do not univocally define the actual output, but of course they play the major role in defining the capital formation thought to be suitable for fulfilling them, and therefore they must be considered a non-deterministic determinant of the final outcome.

When relating the production function with time and expectations, we cannot look at the capital structure as something stable. The amount of goods combinations implemented over time is so high that something is always changing somewhere. Moreover, the various combinations are interlinked since they are complementary or replaceable. There are also combinations that become unsuitable, and therefore such goods can no longer be considered as capital. «The capital structure of society is an aggregate of capital combinations, but only in a state of general equilibrium can the capital goods belonging to different firms be regarded as additive, when the stand to each other in a relationship of *complementarity*. It is, however, a type of complementarity different from that governing capital goods within the same capital combination. We have to distinguish between the planned complementarity of the latter, the result of entrepreneurial choice and decision, and the unplanned complementarity of capital resources at various stages of production, which is an outcome of the operation of the market process»<sup>80</sup>.

The shape that the structure of capital takes is thereby defined by none other than production plans, which use different combinations of capital goods. The relative extents to which these factors become part of the combinations (production coefficients) identify the extent to which these factors are complementary to each other. «[T]he proportions in which the various capital resources enter [a combination] express the mode of capital complementarity in it, what we shall call the *capital coefficients*. The capital coefficients in each

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<sup>80</sup>) LUDWIG M. LACHMANN, *On Austrian Capital Theory*, cit., p. 311, my italics.

combination are thus the ultimate determinants of the capital structure, at least in equilibrium. In disequilibrium the degree of consistency between plans is a modifying factor»<sup>81</sup>.

However, as hinted by Lachmann himself<sup>82</sup>, the real world is constantly in disequilibrium, and therefore entrepreneurs will have to continually seek new ways to group capital goods together in order to adapt to the changes taking place.

A certain capital structure, as defined above (potential or actual), can be observed only in a well-defined instant. The kaleidoscope metaphor used by Lachmann and Shackle is appropriate: in the very moment at which our eyes are grasping the shape of such a structure, it is already changing, or, better, it is evolving in order to adapt itself to the evolution of the hermeneutical process of expectation formation. We may say that, at any moment, capital goods are combined into processes in order to achieve results: capital structure exists but has no shape. Or, better, at any moment it reshapes in order to adapt itself to mind processes never at rest. A *kaleidiscopic blob* is probably the best image to think about capital structure: contractions and expansion continuously happen in all directions.

### 3. Interest and Profit

#### 3.1. Neo-Austrians beyond Böhm-Bawerk: Intertemporal Preferences and Interest Rate

Lachmann's criticism of Böhm-Bawerk is only the initial point of a general attempt, inside the Austrian School, to build a new capital theory able to go beyond the neo-Ricardian

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<sup>81</sup>) LUDWIG M. LACHMANN, *Complementarity and Substitution in the Theory of Capital*, in IDEM, *Capital, Expectations, and the Market Process*, edited by Walter E. Grinder, Sheed Andrews and McMeel Inc., Kansas City 1977 (1947), p. 204.

<sup>82</sup>) LUDWIG M. LACHMANN, *On Austrian Capital Theory*, cit., p. 312.

formalism, without, at the same time, wasting the positive insights contained inside the traditional version of the Austrian Capital Theory. Such attempts brought out the so-called *pure-time preference theory of interest*, which I consider consistent with my approach to capital theory.

The first attempts to redirect the Austrian Capital Theory along Mengerian lines was done by Frank Fetter and Ludwig von Mises, with the development of the pure-time preference theory of interest (PTPT), in which the vision of time as ingredient (which leaves the door open to productivistic views on interest) is rejected in favor of an approach based on time as the general container for economic processes. As explained by Lewin, «[...] interest does not depend in any way on the productivity of capital. [...] The *rental return* to capital is conceptually quite distinct from interest. Interest is not the return on capital. [...] A positive time preference is a necessary and sufficient condition for the existence of interest. [...] Interest is thus “explained” by the propensity of individuals to discount the future»<sup>83</sup>.

In order to define the PTPT properly, it is necessary to embrace the concept of time I described at the beginning of the present essay. The definition of time developed by post-Böhm-Bawerk Austrians marks an intergenerational change inside the School. As described above, O’Driscoll and Rizzo distinguished real time from Newtonian time and linked the first one to the inevitable ignorance that characterizes the process of human action<sup>84</sup>. While Böhm-Bawerk elaborated on his theory to include a logical time framework (which allowed him to unfold the concepts of time preference and interest), from Hayek onward Austrians shifted into the historical time ground, which is a vehicle of novelty and source of uncertainty.

It is only a concept of time such as this that allows Austrians to include in the schema two other fundamental

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<sup>83</sup>) PETER LEWIN, *Capital in Disequilibrium*, cit., pp. 111-112.

<sup>84</sup>) GERALD O’DRISCOLL - MARIO J. RIZZO, *The Economics of Time*, cit.



elements: time preferences and the inter-temporal structure of production. Thanks to the combination of such factors, a completely different definition of interest rate arises.

According to the law of time preference, other things being equal, humans always place present goods higher than future goods on their scale of values; on this assumption, we can define the interest rate as the market price of present goods in terms of future goods. Neo-Austrians, then, depart from the traditional vision of interest rates as the cost of money or marginal productivity of capital. Such a vision, at the root of the pure temporal preference theory of interest, can arise only in the context of historical time, because time preference is not conceivable outside a world of uncertainty.

Therefore, neo-Austrians define an interest rate for the economic system that measures the more general structure of time preferences. In a future-oriented system, consumers are more savings-oriented, thereby encouraging the accumulation of loanable funds that can be used by entrepreneurs in long-term projects. A present-oriented society, in contrast, has a greater propensity toward consumption on the consumer side, while investors do not lengthen the production process. The level of equilibrium for a combination of time preferences and measured by the so-called natural interest rate corresponds to a defined structure of the production process. Intertemporal preferences, therefore, via the interest rate, determine the pace of capital investment and the extent of capital accumulation. As anticipated by Mises, and developed by Hayek, it is necessary to sacrifice the production of consumer goods in order to divert resource for investment projects (via saving).

Time preference can be described simply by arguing that the value of a certain object, or a certain amount of money, today is not the same as the value of that object of amount of money two years from now. As Rothbard clearly stated, time preference: «[...] is the insight that people prefer “present goods” (goods available for use at present) to “future goods” (present expectations of goods becoming available at some date

in the future), and that the social rate of time preference, the result of the interactions of individual time-preference schedules, will determine and be equal to the pure rate of interest in a society»<sup>85</sup>.

Therefore the interest rate finds its own justification only in the passage of time. As explained by Lewin, «[c]omparing the purchase of (a) a prospect that is ranked 1 today with (b) a prospect that would be ranked 1 today if it were available today but is only available tomorrow; since (as indicated by the ranking) (a) is preferred to (b), time preference exists»<sup>86</sup>.

It is implicit in such a definition that time preference exists because the flow of time implies *uncertainty*. Therefore, the interest rate cannot be seen as the yield gained on the usage of some capital goods<sup>87</sup>. On the contrary, uncertainty ontological to the flow of historical time generates a natural tendency in human beings to prefer present goods to future goods. The intensity of such preference, called *time preference*, constitutes the natural interest rate.

Such a concept of interest rate, even if not measuring the return on capital, is closely related to hermeneutical processes of capital formation, centered on the concept of human action. Human action is the process of plan implementation set in motion in order to define the ends/means framework, which in turn is defined consistently with expectations. However, as the implementation of plans is a process which unfolds over (historical/real) time, expectations revision drives toward a continuous change in the ends/means framework and therefore in the implemented plans. Expectations are defined consistently

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<sup>85</sup>) MURRAY N. ROTHBARD, *Time Preference*, in *The Pure-Time Preference Theory of Interest*, edited by Jeffrey M. Herbener, Ludwig von Mises Institute, Auburn 2011 (1987), p. 59.

<sup>86</sup>) PETER LEWIN, *Capital in Disequilibrium*, cit., p. 115.

<sup>87</sup>) LUDWIG VON MISES, *Human Action: The Rate of Interest*, in *The Pure-Time Preference Theory of Interest*, edited by Jeffrey M. Herbener, Ludwig von Mises Institute, Auburn 2011 (1949), p. 67.

with time preferences, which are the key element in the definition of production processes consistent with such preferences. A shift in time preferences can drive toward capital destruction, capital creation, or, in general, capital re-shaping; the central signal guiding these processes of capital formation is given by the interest rate intended as the synthesis measure of the intertemporal structure of preferences, mirrored by a defined intertemporal structure of production. Interest rate is no more linked with a necessary measurement of capital. On the contrary, variations in the interest rate (as a measure of the intertemporal structure of preferences) potentially generate a modification in the intertemporal structure of production and therefore in the structural composition of capital and not the reverse. A capital, in turn, that can be viewed only in its ever-changing, intertemporal, structural composition, avoids any possibility of being defined as an aggregate (social or individual).

### 3.2. Entrepreneurial Profit

As in the previous section I completely disconnected interest rate from the concept of return on capital, a similar process needs to be done in defining *profit*. As it should be clear from our discussion so far, it is only in the realm of expectational (historical) time that profit can be generated<sup>88</sup>. In fact, historical time, as the framework into which novelty and uncertainty are generated, allows profit opportunities to appear and to be exploited by entrepreneurial alertness. If there were no uncertainty, «there would be no profit. All production plans in such a world would be successful»<sup>89</sup>. While in a context of logical time the concept of *waiting* is a sufficient element in bringing out Böhm-Bawerk's idea of interest intended as

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<sup>88</sup>) GEORGE L.S. SHACKLE, *Epistemics and Economics*, cit., chapter 35.

<sup>89</sup>) PETER LEWIN, *Capital in Disequilibrium*, cit., p. 117.

«marginal productivity of waiting»<sup>90</sup>, only the *uncertainty* ontological to the concept of historical time can bring out profit as necessary outcome of a context of limited knowledge (about the present conditions of other actors and about the future status of the economic system).

Ignoring the microfoundations of macroaggregates, Ricardo, Marx, neo-Ricardians, Keynes, and even Böhm-Bawerk, according to Lachmann, assumed capital to be homogeneous; this allowed them to define unequivocally a uniform rate of profit linked with the return on capital<sup>91</sup>. Therefore, while Böhm-Bawerk and Hayek<sup>92</sup> remained connected with the classics in linking capital and the rate of profit, successive generations of Austrians parted this view, associating profit with entrepreneurial activity. Lachmann argued that, first of all, profit needs to be considered simply as the difference between the price at which a commodity is sold and its cost to the seller<sup>93</sup>. To find a way to sell goods at prices above the production costs is the essence of entrepreneurial activity; as such, profit can sprout only from a disequilibrium situation, because in equilibrium all profit opportunities are already exploited.

The vision of profit as the result of entrepreneurial activity is at best described by Kirzner<sup>94</sup>. Also Schumpeter simply defined *profit* as a surplus over costs, a difference between receipts and outlay generated by entrepreneurial action<sup>95</sup>,

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<sup>90</sup>) KNUT WICKSELL, *Value, Capital and Rent*, George Allen & Unwin, London 1954 (1893), pp. 21-22.

<sup>91</sup>) To define the concept of uniform rate of profit (intended as the situation in which return on various capital investments are equal), Ricardo initiated a tradition of referring to a situation of long-run equilibrium as a *constant state of affairs*.

<sup>92</sup>) See, i.e., FRIEDRICH A. VON HAYEK, *The Pure Theory*, cit., p. 354.

<sup>93</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit., p. 26.

<sup>94</sup>) ISRAEL M. KIRZNER, *Competition and Entrepreneurship*, cit., p. 48.

<sup>95</sup>) JOSEPH A. SCHUMPETER, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*,

adding that interest on capital is a remuneration that has to be kept out from profit *stricto sensu*<sup>96</sup>.

Profit, therefore, does not have anything to do with the supposed productivity of capital. In fact, such productivity could be defined only if it would be possible to define *capital* as an aggregate. At the same time, all the classic and neoclassic discussions about the rate of return lose their meaning; in fact, as to the concept of productivity, they are strictly concerned with the possibility of reaching an aggregate definition of *capital*. As explained in Lewin, for these economists the «rate of profit [...] is a flow of incomes received by the owners of wealth divided by the stock of capital. Hence with the rate of profit being the prime focus of interest, the size of the capital stock had to be considered by implication»<sup>97</sup>.

As we have seen, instead, we can only define the value of capital in a specific moment and as related to specific combinations implemented to obtain an output. According to my vision, moreover, capital value is changing with the flow of time, being determined by the expected value of the output, by the interest rate, and by time itself. Profit, therefore, can be analyzed only from a micro perspective, as the result of entrepreneurial activity.

With the neo-Austrian definition (linking profit to entrepreneurial activity), which I share, profit can have also a negative magnitude. In the market economy, each company or entrepreneur acts in order to maximize profit; however, *motivation* toward a positive profit and *success* in achieving the target are different things. The very nature of the market

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Transaction Publishers, New Brunswick and London 1983 (1934), p. 128.

<sup>96</sup>) JOSEPH A. SCHUMPETER, *The Entrepreneur in Today's Economy*, in Idem, *The Entrepreneur: Classic Texts by Joseph Schumpeter*, edited by Marcus C. Becker, Thorbjørn Knudsen, Richard Swedberg, Stanford University Press, Stanford 2011 (1928), pp. 266-271.

<sup>97</sup>) PETER LEWIN, *A Short Course*, cit., p. 280.

economy renders the success of all plans impossible<sup>98</sup>. Equilibrium exists only *ex ante*: plans are consistent with expectations and the limited available content of information. But, *ex post*, it is possible to discover that one plan was inadequate to reach the target. Malinvestment can actually happen. Therefore, there is «no such thing [...] as a rate of profit, there are only rates of profit which may differ widely»<sup>99</sup>. Each rate of profit is related, as capital, to a specific output and the specific combination of goods implemented in order to obtain it. Therefore, it is not possible to define a rate of profit for the economic system. Instead, we can define profit and rate of profit for each specific output, starting from the actual capital used in the production process. Remember formula (3):

$$V_{ACx} = V_{EOx} - [(V_{EOx} * i_x * d)/100] \quad (3)$$

Profit for a certain output ( $P_{EOx}$ ) would be thus defined:

$$P_{EOx} = V_{EOx} - \Sigma C_{EOx} \quad (7)$$

Where  $\Sigma C_{EOx}$  is the sum of all the costs encountered in order to get  $EO_x$ . The rate of profit for the same output ( $RP_{EOx}$ ) will be:

$$RP_{EOx} = (P_{EOx}/V_{EOx})*100 \quad (8)$$

Ricardians could not accept the fact that we cannot define a rate of profit for the whole economic system because of the micro nature of entrepreneurial action and the heterogeneity of capital. Even two identical machines can bring out different results if used in different ways or under different conditions of time and space. Profit is not simply related to the physical features of capital but above all to capital *combinations*: capital

<sup>98</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit., p. 26.

<sup>99</sup>) *Ibidem*.

can produce a profit if used in *a certain way*<sup>100</sup>: entrepreneurial function needs to be at work in continuously rearranging the capital structure<sup>101</sup>. This makes it impossible to talk about a *uniform rate of profit*<sup>102</sup> or *marginal productivity of capital*.

As mentioned earlier, following Shackle and his accent on expectational time as the context for uncertainty to generate profit, Lachmann<sup>103</sup> and the neo-Austrians in general define *profit* as *essentially* and *ontologically* a disequilibrium phenomenon. Being generated by the difference between selling prices and purchasing costs, profits cannot arise in an equilibrium context. In the struggle for profit, entrepreneurial function will wake up equilibrating forces, but profit will be present to the extent that such equilibrium does not prevail; and in a kaleidic world (historical time) this is the case: coordination tendencies are at work but they never prevail as the equilibrium itself is continuously changing.

Entrepreneurial function, seeking for profits, moves the market from a disequilibrium status on a coordination path toward equilibrium<sup>104</sup>. The starting point of human action, in fact, is always a state of disequilibrium, characterized by market ignorance. It is through interaction in the market that knowledge can be transmitted and acquired, bringing out plan revisions. Entrepreneurial alertness allows such changes to happen and, therefore, by reducing market ignorance and driving plans toward mutual compatibility, it is an *equilibrating* force. The equilibrating process consists exactly in the acquisition of better mutual information concerning the plans

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<sup>100</sup>) LUDWIG M. LACHMANN, *Capital and Its Structure*, cit., pp. 3-12.

<sup>101</sup>) *Ibidem*, p. 13.

<sup>102</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit., p. 27.

<sup>103</sup>) *Idem*, p. 31.

<sup>104</sup>) ISRAEL M. KIRZNER, *Competition and Entrepreneurship*, cit., pp. 69-75.

made by the different market actors<sup>105</sup>. It is only in disequilibrium that profit opportunities actually exist and can be discovered by entrepreneurial alertness<sup>106</sup>. In this sense, alertness allows discovery, and discovery plays an equilibrating role, reducing market ignorance. However, in opposition to Kirzner, Lachmann stated that such equilibrating forces, in the market economy, cannot prevail, and this fact gives meaning to the competitive process: Profit persists in the market because disequilibrium is always present in some sector of economic system<sup>107</sup>.

Lachmann drew two conclusions from his analysis on the nature of profit: «First, the ever-elusive and fugitive price-cost differences which are the source of all profits can have no place in the long-term equilibrium world to which the two rival schools [Cambridge and neo-classical schools] are both committed. *An equilibrium rate of profit is thus a contradiction in terms*. Secondly, profits are pre-eminently a micro-economic phenomenon. Their basis is to be found primarily in the ever-changing pattern of price-cost differences in a thousand different markets. Without understanding this micro-foundation of the phenomenon we cannot understand its essence. We certainly should not be able to formulate a general theory of profits without it. A macro-economic theory of profit can therefore make little sense»<sup>108</sup>.

According to Lachmann, from the Ricardian perspective which is implicit in Böhm-Bawerk's capital theory, we miss the opportunity to understand the true nature of profit, lying in the micro forces of the market competition process<sup>109</sup>. We can say that Böhm-Bawerk, in his analysis of profit and capital, started

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<sup>105</sup>) ISRAEL M. KIRZNER, *Market Theory and the Price System*, D. van Nostrand, Princeton - Toronto - New York - London 1963, p. 38.

<sup>106</sup>) ISRAEL M. KIRZNER, *The Meaning of Market Process*, cit., p. 5.

<sup>107</sup>) LUDWIG M. LACHMANN, *Macro-Economic Thinking*, cit., p. 32.

<sup>108</sup>) *Ibidem*, p. 32.

<sup>109</sup>) *Ibidem*, pp. 33-35.



to develop new ideas but remained linked with the aggregative approach of the classical economists, an approach from which neo-Austrians parted completely, developing a micro perspective of profit as the result of entrepreneurial action. When we talk about wealth and capital, we might say that Böhm-Bawerk, like Marx, developed, although in different directions, Smith's hints.

Post-Böhm-Bawerk Austrians followed a complete different path and clearly identified profit as the result of entrepreneurial activity. We should then talk about profit generated by different economic initiatives, a magnitude that can be negative. The time dimension, producing endless changes in the economic scenario, can be considered as the key to understanding the perpetual nature of profit, according to the neo-Austrians. Time changes information content and therefore the tendency toward equilibrium operate in a context in which such equilibrium is always changing. The kaleidoscopic nature of economic activity makes profit opportunities always present to be discovered by entrepreneurial alertness.

In conclusion, neo-Austrians, through an analysis developed in the historical time framework, stress the importance of entrepreneurial action *in time* as perpetual source of profit. This perspective, however, skipped past Böhm-Bawerk's focus on the justification of interest rate in the context of logical time.

#### 4. Conclusions

Ludwig Lachmann moved a brilliant critics to the present state of capital theory<sup>110</sup>, and did not hesitate in pointing the finger against Böhm-Bawerk too, widely recognized as the

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<sup>110</sup>) CARMELO FERLITO, *Ludwig M. Lachmann Against the Cambridge School*, «Journal of Reviews on Global Economics», vol. 4, 2015, pp. 251-267.

father of the so called Austrian capital theory. In fact, Böhm-Bawerk's approach seems not completely consistent with the subjectivist revolution initiated by Menger. Lachmann himself tried to overcome the traditional Austrian capital theory, in order to move closer to the original Mengerian approach; however, I am convinced that his final definition of capital is not consistent with his own criticism to Böhm-Bawerk and the Ricardian approach.

The present paper tried to demonstrate that, in order to build a radically subjectivist theory of capital, it is necessary to follow Lachmann in his application of hermeneutics to economics. In this way it is possible to reach completely new formal definitions of capital goods, capital and capital value. All such definitions stress the idea that capital is primarily and ontologically the result of subjectivist mental processes, the creative response of active minds to the state of reality and the expectations sprouting from it.

The identification of capital goods is therefore a subjective process of interpretation happening in time. The crucial dimension of time forces us to distinguish between potential capital and actual capital, in order to look at capital goods at different moments in time, moments that we called hermeneutical moment and implementation moment. The structure of capital, therefore, cannot be seen as stable over time, and it radically depends on the time flow and on the never ending hermeneutical processes happening inside individual minds during the time flow. Consistently with such perspective, a new production function was brought out and defined as depending on the desired output (thought at the hermeneutical/expectational moment), the actual capital and the time flow. This means that the output is not simply a function of labor and capital, but, more generally, is a function of expectations of the actual capital (including different human functions usually labelled as labor) and of the time flow.

Finally, it became necessary to redefine, on the footsteps of contemporary Austrian economists, profit and interest, making them independent from any aggregative vision of capital.