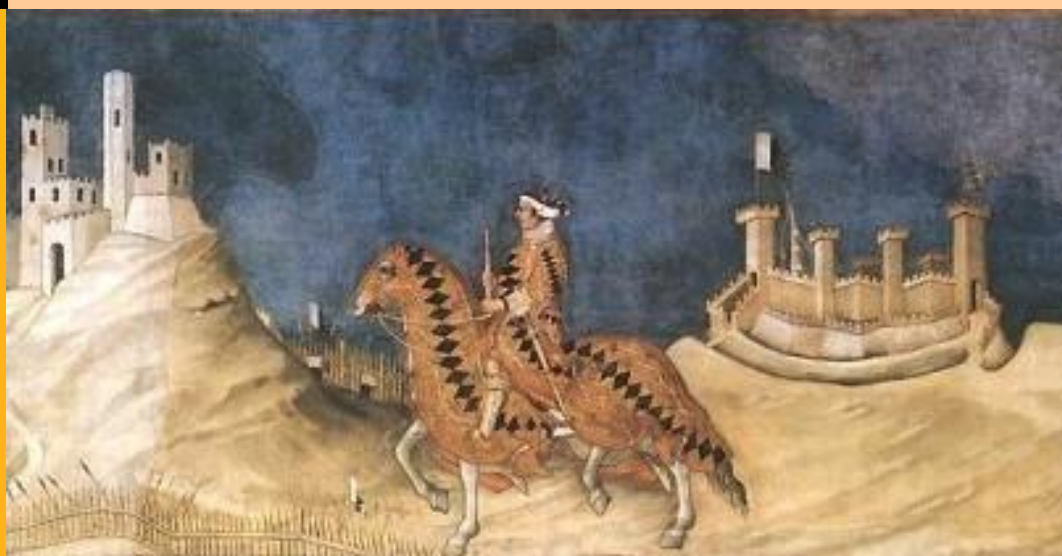# QUADERNI DEL DIPARTIMENTO
DI ECONOMIA POLITICA E STATISTICA

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Appearances do mislead: Marxist economic theory and
the demise of the labour theory of value.
Part two: *Das Kapital au contraire.*

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Appearances do mislead: Marxist economic theory and the demise of labour theory of value.
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Summary: Completely renouncing the labour theory of value, Marxist economic theory has in fact obliterated Marx's specific contribution to the same theory and more generally to the critique of political economy: the theory of surplus-value, that is the difference between the use-value and the exchange-value of labour power as a determinant of profit in perfectly competitive conditions and of the contradictory character of the capital accumulation process.

Starting from the observation that such a contribution is instead still relevant and timely, both in theoretical and practical terms, in this paper it is shown how it could be made independent from its original analytical formulation in terms of labour quantity. It is indeed such analytical formulation, which Marx largely borrowed from Ricardo, that today seems useless, again for both theoretical and practical reasons.

More specifically, then, in the first part of this paper the static part of such theory has been dealt with, verifying in particular the hypothesis that the role played by the Ricardian notion of production cost, which Marx, differently from Ricardo himself, significantly used to also determine wages, could be played by the general notion of transaction costs, in the Coasean meaning of the costs of using the price system.

This second part, instead, tackles the dynamic part of the same theory, verifying in particular the hypothesis that capital, in Marx's definition of money in motion in the Money → Commodity → More Money circuit, can be taken as unit of analysis in an evolutionary process substituting the so-called circular vision of the production process, which Marx also borrowed from Ricardo but actually goes back directly to Quesnay and, equally notably, has been thought with reference to an agricultural economy.

The end result is an institutional and evolutionary re-interpretation of Marx's version of the labour theory of value.

Key words: transaction costs; wealth effects; use-value; exchange-value; differential replication; methodological individualism.

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"I think most readers would be uncomfortable with the juxtaposition of surplus value and human capital investment: the mix of concepts from Marxian and neo-classical economics is not obvious and requires much more justification and explanation. At best, this mix can be seen as contrived and at worst illegitimate. For example, Marxian theory would not condone and indeed would actively resist the definition and classification of 'human capital' (as well as social capital, natural capital, intellectual capital, etc.) and instead would seek to understand capital in *social and class terms*." (anonymous referee, emphasis added).

1.Introduction

This paper introduces a qualitative interpretation of the Marxian theory of surplus value, that is, the difference between use-value and exchange-value of labour power as the determinant of profit in perfectly competitive conditions as well as the determining cause of the contradictory character of the capital accumulation process.

This interpretation is in turn based on the institutional and evolutionary recovery of the combination between cooperation and division of labour within the firm which Marx and his contemporaries identified as the determinant of surplus-value and thus long-term prices, against which short-term market prices, determined by changes in supply and demand on the basis of the scarcity principle, prove to be derived or exogenous phenomena - such as the increase in the price of black cloth in the event of a funeral (Smith, 1776, p.76).

Consequently, in the first part of this paper the static element of this theory was addressed, that is the issue of the existence of a type of profit deriving from the above-mentioned difference and that therefore, in order to be distinguished from that of monopoly, which derives instead from some form of price setting, should be called Marxian or industrial profit.

Indeed, the difference between these two types of profit consists of the fact that the latter does not result from imperfections in the exchange mechanisms, which, as should be known, is assumed to be "between equivalents", but from the advantage of group production over individual production or, more precisely, from the advantage of capitalist production, which in the Marx's definition belongs to the Money → Commodity → More Money circuit over the independent or medium-small size one which, again in Marx's definition, belongs to the Commodity → Money → Commodity circuit.[1]

The cost of production of this latter type of firms, i.e the amount that it would have cost to obtain a given commodity using the price system, has therefore been interpreted as the institutional opportunity cost of capitalist production and thus as a measure of profit in terms of transaction costs (in their turn distinguished between standard transaction costs, or incentive and coordination costs, and transaction costs arising from the presence of wealth effects) of this type of - Marxian or industrial - profit.

In other words, this amount has been interpreted as the exchange-value of goods. Applying the same rule for the determination of wages, the latter is therefore equal to the amount that can be earned by independently participating in the production process, without any specific means of production in the common place meaning of the term.

Since the passage in terms of surplus labour is then skipped as a result of the transition from a quantitative measure of labour in terms of working hours to a qualitative one in monetary terms, the exchange-value of goods coincides with the use-value of labour. Hence, as in Marx, from here it follows the existence of this kind of profit deriving from the difference between the exchange-value of labour power and its use-value.

Remarkably, not being due to a temporary or permanent lack of substitutes but to the combination of cooperation and division of labour just mentioned, this type of profit is not eliminated by competition. On the contrary, the latter determines its conditions of production and realization and is in its turn determined by it because of the relationship of interdependence between the sphere of production and the sphere of circulation.

In light of these considerations, addressed in this second part of the paper is the dynamic element of the Marxian theory of surplus-value, i.e. the role of the profit maximization principle in determining the contradictory dynamics of the capital accumulation process. Thus the results obtained in the first part are extended to the more general and dynamic context of this second part.

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[1] See footnote 1, Part One

Accordingly, in this case the hypothesis to be verified is whether an evolutionary conceptual framework can provide a basis on which to build an alternative to the circular view of the productive process that Marx had in fact borrowed from Ricardo and that, among other things, also characterizes the dynamic interpretation of the general equilibrium proposed by Schumpeter (1911).

As well known, moreover, the idea of a possible analogy between the self-expansive nature of capital in the economic domain and that of the gene in the biological domain is not new. However, as must have been apparent to Nelson and Winter (1968), who were the first to propose such an analogy, in the absence of a non-Schumpeterian notion of profit one finds oneself in the uncomfortable position of having to state the proposition – at least counter-intuitive - according to which what evolves is what cannot be imitated.

Of course, the body of literature which pertains to the evolutionary theory of the firm has provided remarkable in-depth analysis in regard to the Marxian notion of mode of production and Simon's notion of bounded rationality, on which the approach presented here is also partly based. The very fact, however, that inimitability is the distinguishing feature of artwork, means that it is unlikely to play a central role in the economic domain, as also explicitly ruled out by Schumpeter himself and, particularly, by what he called the theory of imputation (see section 3 and footnotes 17 and 24, Part One).

The proposition just cited is in fact in clear contradiction with the notion of differential replication since, as the word itself states, not only does imitation not eliminate profits, i.e., reproductive success, but it is even what the latter consists of. And, as has just been pointed out, this is not the case for the notion of profit of the Marxian or industrial type to which reference has just been made.

Consequently, the rest of this second part is organized as follows. In the next section the original Marxian theory of the crisis is presented, both with reference to its link with the theory of surplus-value, and with reference to the differences that ensue from the qualitative interpretation proposed here. In this regard, the uniqueness of Marx is that the tendency to crisis does not originate from finance, as has been argued especially recently in the wake of the latest crises, or from exogenous shocks as is necessarily the case in the dynamic versions of the general economic equilibrium. Rather, it originates endogenously by what is commonly called the real economy.

In the following two sections the Marxian analysis of the contradictions and the interdependence between the phase of production and the phase of circulation is developed further using contemporary analytical tools such as institutional complementarity, a notion connected with but distinct from that of strategic complementarity introduced in Part One, and the more explicitly evolutionary ones such as 'replicator dynamics' and 'evolutionary stable strategies'.

More specifically, section 3 introduces the first extension of the static and partial analysis of the division of labour within the firm presented in section 3 of part one, by relating the asymmetric coordination game shown in Figure 1 of that section with a symmetrical coordination game which represents the division of labour among firms. Of the two pairs of equilibria which support each other because of the relationship of interdependence between these two aspects of the division of labour, one corresponds to the Marxian maxim according to which "anarchy in the social division of labour and despotism in the division of labour in factory are conditions one of other"[2]; the other corresponds

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[2] Since it is the only passage in Capital where Marx seems to envisage the possibility of the first phase of single firm Socialism, morevoer in a way which could be more precisely characterized as 'ante-Keynesian' rather than 'old-fashioned communist', and in this sense justifying the distinction between Marx's role as a critical economist and his role as a political-ideologue on which this paper is based, it is apposite to quote the entire sentence about the difference between the *ex ante* coordination typically provided by the firm and the *ex post* coordination typically provided by the market (note 11, first part): "The same bourgeois mind which praises division of labor in the workshop, (…), as being an organization of labor that increases its productiveness –that same bourgeois mind denounces with equal vigor every conscious attempt to socially control and regulate the process of production, as an inroad upon such sacred things as the rights of property,

instead to what could be characterized as 'collaboration within the firm and cooperation in relations among firms' and that, as already mentioned, could be associated with the virtuous circle between the division of labour and the size of the market identified by Smith, extended to take into account the collective character of production and the material living conditions.

In this regard to be pointed out from the outset that if the first part of this paper could be interpreted as being guided by the re-discovery of Marx's contribution as a critical economist, completely hidden up by the demise of the labour theory of value by Marxist economic theory, this second part could at least as easily be interpreted as driven by the re-discovery of those parts of Smith's thought that the neo-classical theory has likewise obscured or even reversed.

The most significant of the latter undoubtedly concerns the causal link between the division of labour, and hence the creation of value, and the differences in talents. Whilst for Smith, "The difference of natural talents in different men is in reality much less than we are aware of; and the very different genius which appears to distinguish men of different professions, when grown up to maturity, is not upon many occasions so much the cause, as the effect of the division of labour." (Smith, 1776, p. 28), in the neo-classical theory, fundamentally based on the model of pure exchange of already produced goods and therefore on the idea that value stems from differences in tastes and endowments, the opposite direction of causality operates, i.e. the division of labour is caused and made mutually beneficial by the existence of given differences.

This naturally has important implications for the theory of growth and its relationship with that of distribution. As noted in a quite surprising article by Buchanan and Yoon (2000), while in Smith gains from exchange are possible also in a world of equals, a feature from which derives the possibility of increasing returns in the size of the market, in the neo-classical approach, which the two American economists see as originating from the Ricardian theory of comparative advantage, gains from exchange are only possible in a world where there are given differences, from which instead derives the assumption of decreasing returns on the various production factors considered individually and therefore the compatibility with the zero profit condition typical of general equilibrium analysis.

In fact, the point is that in Smith, as in Marx, the phase of value-creation and the phase of value-realization are not coincident as in the pure-exchange model and its a-critical extension to the phenomenon of production. On the contrary, they are interdependent, a feature from which derives the possibility of cumulative mechanisms either positive or negative; or in other words the possibility of the virtuous or vicious circles that can be respectively associated to the phases of expansion or crisis.

Consequently, Section 4 presents the extension in dynamic terms, embedding these two games in what is called the replicator dynamics and evaluating the conditions of evolutionary stability of the strategies that correspond to these pairs of equilibria, considered both jointly and individually. Significantly for the purposes of this second part, such an extension of the conditions of evolutionary stability to the pairs of equilibria that respectively prevail in the game within the firm and in the game among firms –which basically rules out the possibility that an individual strategy in the game within the firm evolves because it is profitable from the point of view of the group, and similarly that a group strategy in the game of the division of labour among firms evolves because it is profitable from the point of view of a specific individual within the group – is a formalization of a situation in which the axioms of the neo-classical theory do not apply, i.e. the situation already mentioned in the first part where, although there is free entry and product homogeneity, and therefore the price-taking condition applies, profits are not only positive but also increasing or decreasing.

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freedom and unrestricted play for the bent of the individual capitalist. It is very characteristic that the enthusiastic apologists of the factory system having nothing more damning to urge against a general organization of the labour of society, than that it would turn all society into one immense factory." (Marx, 1867, p. 246-247). The choice of the term "anarchy" to characterize a competitive situation, however, seems to reveal some form of upset that the word itself –competition- probably provoked in him. See also footnote 6, first part and Coase (1936, p. 98, quoted in section 3, Part One).

This in turn makes it possible to demonstrate the compatibility of an evolutionary approach with the Marxian one, so to speak, '*ad absurdum*': an interpretation of Marx's approach compatible with what he himself, in his typical jargon, sometimes contemptuous and almost always colourful, did not tire of calling "vulgar" political economy, and of which the neo-classical theory can be interpreted as the much more sophisticated –but basically similar in the essence- heir, would in itself be a contradiction.

Finally, the last section contains some general conclusions concerning the paper's analysis as a whole.

2. The Marxian theory of crisis: quantitative version and qualitative version.

To start from the beginning, however, given the variety of ways in which Marx's thought has been adapted to the objectives of those who interpreted it, the Marxian theory of the crisis, or at least the way in which it is understood in this paper, should be briefly summarized.

Like the rest of its scientific production, even that theory is based on the theory of surplus-value and therefore on the identification of the link between value creation and the use of labour-power within the production process: "The consumption of labour-power is completed, as in the case of every other commodity, outside the limits of the market or of the sphere of circulation. Accompanied by Mr Moneybags and by the possessor of labour-power, we therefore take leave for a time of this noisy sphere, where everything takes place on the surface and in view of all men, and follow them both in the abode of production, on whose threshold there stares us in the face: "No admittance except business". *Here, we shall see, not only how capital produces, but how capital is produced. We shall at last force the secret of profit making*." (Marx, 1867, p. 123, emphasis added).[3]

And it is of course this feature that distinguishes it from others, particularly because the tendency to the crisis that derives from it is real in nature rather than due to the excesses of finance as it has been argued especially recently, and therefore to the monetary aspects which would distinguish modern and barter economies.[4]

The starting point is what might be called the fundamental contradiction of capitalism in the phase of production, that is, the fact that, on the one hand, profit - which however capitalists contribute to extract- is basically unpaid labour; but on the other hand the same profit has an inverse relation with wages. This contradiction is therefore a consequence of the class divide between those who make the decisions, i.e. the owners of the means of production, and those who are subjected to them, i.e. subordinate labour, and the conflict that derives from this distinction (see section 3, first part).

From this contradiction it follows that, once an economic activity has been incorporated into the circuit of capitalist production, its subsequent development takes place through the substitution of variable capital, or labour power, with constant capital, or capital provided by the capitalist. Given the class divide just mentioned, while the increase in constant capital is an investment, an increase in variable capital corresponds to an increase in costs. It is no coincidence that it seems possible to argue that, while unit labour costs are minimised, 'unit capital costs', or the value of shares, are being maximised.

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[3] To the extent that Marx's approach is compatible with an evolutionary one, this somewhat hidden feature of the process of production of capital should relate its contribution not only to that of Darwin but also, and maybe most of all, to that of Mendell, who explained how genes pass from one generation to the other. In this respect it should at least be noted that the combination between cooperation and the division of labour analysed in this paper has its archetype in sexual reproduction.

[4] These monetary aspects of the functioning of an economic system at present are not directly tackled in this paper, although this does not mean that finance should be considered as a chapter disconnected from the rest of economic theory. Indeed, a deeper understanding of the nature of profit should be considered as propaedeutic for any theory of the demand and supply of capital. Intuitively, one of the main beneficiaries of such a more articulated understanding of the nature of profit could be the notion of Central Banks' 'independence' which, as for now, is –at a minimum- one-sided.

This a process, which takes the form of technical progress and makes goods less and less expensive, thus stems from the unavoidable need for capital to self-expand but has the ultimate effect of undermining the foundations on which the process of value creation itself is based. Physical or constant capital, indeed, does not create value but merely transfers its exchange-value to that of the product according to its share, thus representing an unambiguous example of how, under competitive conditions, the exchange of goods is an exchange of equivalents and any profits can only result from the failure to satisfy such conditions; situations –monopoly rents or arbitrage mechanisms- that Marx tellingly summarized with the term "cheating". In the extreme case where only constant capital is present and therefore the production function is additively separable, for example, there would be neither surplus-value nor industrial or Marxian profit and therefore not even relative growth, neither at a rising nor at a decreasing rate. Besides, the use-value of capital goods considered individually not only does not increases during the production process but even decreases due to obsolescence. [5]

This conclusion is reinforced by the recognition that this fundamental contradiction in the sphere of production generates two more in the sphere of circulation, i.e., in the phase of profit realization on the goods market. On the one hand, that of supply, because the increase in constant capital in itself decreases the rate of profit, even its mere maintenance requires an increase in the volume of profit; however, since this substitution does not create new value but appropriates what is already there, decreasing the use-value of labour-power and the exchange-value of goods, such an increase can only happen at the expense of other capitalists. Whence derives the circumstance whereby competition among capitalists takes the form of an attempt to increase their own market share with constant market size and ultimately results in a situation characterized by high concentration and profit rates – Marxian or industrial - declining[6].

On the other hand, that of demand, since technical progress reduces the number of hours socially needed to produce the goods necessary for subsistence, this process of reducing the cost of commodities also involves the exchange-value of labour by determining what Marx called the "tendency towards the impoverishment of workers", in its turn at the basis of the prediction about the inevitable superseding of capitalism and the characterization of the crisis in terms of under-consumption.

These three contradictions, finally, combine into what might be called the general contradiction of capitalism: the fact that, from the separation between decision-makers and those subjected to them and from the inevitable conflict that ensues, the increase of productive forces, or technical progress, is functional only to the self-expansion of capital rather than to the society as a whole or at least to the economic system.

The original quotation of this contradiction is useful. Although it is actually from Engels, it does not really seem written so long ago and this circumstance is one of the reasons for the substantial importance, in our times, of Marx's contribution from the point of view of praxis: "The *real barrier* of capitalistic production is *capital itself*. It is that capital and its self-expansion appear as the starting and the closing point, the motive and the purpose of production; that production is production for capital and not vice-versa, the means of production are not mere means for a constant expansion of the

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[5] For the argument of this paper it is important to point out that neither Smith nor Schumpeter thought that capital creates value, although this of course does not mean that it is not necessary: "Wealth, as Mr. Hobbes says, is power. (…). The power which that possession immediately and directly conveys to him, is the power of purchasing; a certain command over all the labour, or over all the produce of labour which is then in the market" (Smith, 1976, p. 48). See also footnote 25, first part. In regard to Schumpeter, the problem is even more serious since with his theory of profit and development, as he liked to call it, he intended to replace the existing theories of interest, meant as a *permanent* flow of income. Not surprisingly, but not less guilty, this element has been largely neglected by his many followers and, as far as we can tell, cost him the relationship with his mentor, the imposing figure of Boom-Bawerk. Section 4.1.

[6] The fact that this tendency to decrease Marxian or industrial profits may be accompanied by a tendency to increase monopoly profits should lead, among other things, to a reconsideration of the notion of 'natural monopoly'.

living process of the society of producers. (….) The means –unconditional development of the productive forces of society- comes continually into conflict with the limited purpose, the self-expansion of the existing capital. The capitalist mode of production is, for this reason, a historical means of developing the material forces and creating an appropriate world market and is, at the same time, a continual conflict between this historical task and its own corresponding relations of social production. "(Marx, 1867, vol. III, p. 171, emphasis in the text).

Before discussing the consequences stemming from the qualitative interpretation of the theory of surplus-value proposed in this paper compared to what has just been recalled about Marx, also in relation to what follows, to be stressed first are the differences from the neo-classical approach, which Marx criticized in the additive version contemporary to him.

First, the substitution between production factors does not take place on the basis of relative prices; rather, it is the latter that are determined by the process of substitution between capital and labour, in its turn determined by the requirements of the capital accumulation process. In short, "it is not the exchange that determines the magnitude of the value but the magnitude of the value, [or the process of its production], that determines the exchange".

Secondly, in accordance with what Marx considered to be his own contribution to economic analysis, i.e. inclusion of the production process in the analysis, the interdependencies between markets are not regulated by the price system alone and not even principally. Consequently, propositions such as the one called the 'Walras' law' lose much of their validity outside the context of the model of pure exchange within which they were presumably originally conceived. In addition, in so far as production in the general equilibrium model is treated in terms of the well-known 'technological black box', i.e. in terms of an a-critical transposition of the theory of consumption, the very serious doubts about the validity of such a law for demonstration of the existence of the general equilibrium are more than confirmed and actually even more exacerbated by the even more doubtful realism of the assumptions that should guarantee its uniqueness and stability, i.e., that of gross substitutability (Gravelle and Rees,1981, Ch. 16).

Finally, the third and most important difference, at the basis of the other two, consists precisely in the substitution of exchange with production as the primary economic phenomenon. On the one hand, while in the case of the additive theory and the general equilibrium the creation and realization of value coincide and consequently also the theory of value, i.e. the theory of the prices of goods, coincides with the theory of distribution, i.e. the theory of the prices of productive factors, in the Marxian system, the creation and realization of value are interdependent, so that the theory of value and the theory of distribution are also interdependent, in the manner just described. And, as anticipated in the Introduction, from this interdependence between the process of creating value in the sphere of production and its realization in the sphere of circulation, which in part also applies to Smith, by far first among the classical economists to introduce the notion of natural price as a price around which market prices as determined by supply and demand gravitate is to be attributed, as well as the related view by which markets' dynamics are endogenous to the value creation process, ensue the mechanisms of cumulative causation at the level of the economic system that characterize in the negative the analysis of the first and in the positive that of the second.[7]

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[7] As noted earlier, much of the ambivalence surrounding the contribution of Smith, who is indeed considered to be the founder of both the classical and the neo-classical approaches, stems from the fact that, in the case of individual production, the respective theories of value and distribution coincide in a trivial manner (see Conclusion, Part One). The interpretation put forward in this paper, which sees him as a 'classical economist who tended to think in individual terms', preserves instead the dynamic part of his contribution and is in line with the interpretation of Smith by Marx and his contemporaries, none of whom ever dreamt of considering the Scottish economist an exponent of the additive school.
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On the other hand, and this also applies partially to Ricardo -to whom, as we have seen in the Part One, should be attributed the first conflictual theory of distribution, based on the residual nature of profit and the consequent inverse relationship with wages, confirming among other things the possibility of a remarkable variety of interpretations as far as the three main classical economists discussed in the paper are concerned- with the introduction of production into economic analysis Marx intended to correct the harmonious and common interest, or 'win-win', view which emerged from the representation of economic reality as if it were constituted only by markets and exchange relationships.

Immediately after the sentence quoted at the beginning of this section, indeed, Marx continues with the even more famous one that follows: "This sphere we are deserting, within whose boundaries the sale and purchase of labour-power goes on, is in fact a very Eden of the innate rights of man. There alone rule Freedom, Equality, Property and Bentham. Freedom because both buyer and seller of a commodity, say of labour-power, are constrained only by free-will. They contract as free-agents, and the agreement they come to, is but the form in which they give legal expression to their common will. Equality, because each enters into relation with the other, as with a simple owner of a commodity. And they exchange equivalent for equivalent. Property, because each disposes only of what is his own. And Bentham, because each looks only to himself. The only force that brings them together and put them in relation to each other is selfishness, the gain and private interests of each. Each look to himself only, and no one troubles about the rest, and just because they do so, in accordance with the pre-established harmony of things, or under the auspices of an all-shrewd providence, work together to their mutual advantage, for the common weal and in the interest of all." (Marx, 1967, p. 123).

From this point of view, if in Marx's times the problem was the absence of production from the analysis, not much seems to be changed with its analysis in terms of exchange of property rights and group production by Alchian and Demsetz (1972), a study which, as argued in the first part of this paper, can in all respects be considered a reverse interpretation of Marxism if it is true, and it is so, that this exchange of property rights is understood as the reality that would lie behind the appearance of the power relations within the firm and if it is true, and it is so, that the result -even if more desired that actually obtained - is always the disappearance of profit and conflict.

As also already pointed out, this is actually a general feature of standard economic theory, which, by equating the notion of objectivity with a principle of unanimity in the –dubious- attempt to transfer into the economic domain the separation between the external observer and the subject matter typical of the natural sciences, in fact unduly restricts the analysis to common interest situations, i.e. to Pareto-improvements framed in additively separable contexts as mandated by the postulate of methodological individualism.

Without questioning, of course, the fact that every human phenomenon has its end and, even more so, every phase in which these phenomena occur, the first of the consequences that ensue from the substitution of the quantitative measure of the exchange value of labour power in terms of working hours by the qualitative measure in terms of the amount that can be earned from an independent participation to the production process, or in other words from participating in the pre-capitalist or non-capitalist economic Commodity → Money → Commodity circuit, is that the implication concerning the progressive impoverishment of workers collapses and so does too the one concerning the inevitability of the superseding of capitalism, at least capitalism understood in the general sense defined by private property, inclusive of the means of production, markets and firms.

As already noted in the first section of Part One of this paper, in Marx's original analysis, technical progress also entails a reduction in the exchange value of labour power, the latter being determined by amount of labour socially necessary to produce subsistence goods. This does not happen by skipping the passage in terms of surplus-labour as required by the qualitative interpretation of the exchange value of labour power: interpretation that, as noted in section 4 of part one, would still be desirable, given the recent re-emergence of the piece rate system, even if the quantitative version had

not given rise to the logical problems, primarily those concerning the transformation problem, which led to its total demise.

Consequently, given that the exchange-value of labour power has a lower limit which is not decreased by the reduction in the exchange-value of commodities, the law relating to the workers' impoverishment and the consequent inevitability of the end of capitalism, at least in the general sense just recalled, becomes more simply but not necessarily less importantly an inevitable tendency to real crisis.

Moreover, again as a consequence of the limited reduction in the exchange-value of labour-power, also the characterization of the crisis in terms of under-consumption is not necessary to the logic of the argument, which can be carried out also by assuming that the relevant markets are always in equilibrium, an approach that by treating the opposing theory in its ideal conditions, as already mentioned in part one, appears to be the one preferred by Marx and is also preferable in terms of exposition since it reduces the distance from the general equilibrium model which, as just pointed out, not only is shown to exist but is almost always considered as unique and stable as well.

The second consequence, which follows from the first and equally benefits at least in part from discussing such predictions after they should have occurred, is that the Marxian notion of mode of production, in turn composed of "productive forces" or technology, and "relations of production", or property rights, should not be referred to entire economic systems such as capitalism, feudalism, slavery etc. but to the spatial/temporal variety of forms that capitalism itself has assumed in the international global system from the First Industrial Revolution to the present day.

This in turn requires replacing the unilinear view of history typical of Marx and his contemporaries to the more properly cyclical one of contemporary evolutionary analyses of our time, which associates with every Industrial Revolution a given economic paradigm, understood as the combination of technological, organizational and more generally institutional arrangements characterizing each of the phases in which it is possible to subdivide that evolution of the capitalist system (Perez, 2002; see also Maddison, 1982).

While running the risk of identifying a succession of events that would repeat substantially the same throughout history, thus denying in some way at least a potential for uniqueness, and also avoiding to clarify that a cyclical vision of history has no necessary relationship with a progressive vision, however, this literature has the merit of identifying some regularities in the process of introducing, developing and exhausting these different techno-economic paradigms. In its turn, this feature averts the danger of mistaking these various stages for the rotating confirmation of the validity of the axiomatic models, which instead are independent of such material and historical conditions, and above all emphasizes the characteristics of complementarity among the various aspects - technological, organizational and institutional in a more general sense - which define them at the level of the overall economic system.

However, rather than to the incremental innovations meant in a Schumpeterian way which, as said in the Introduction, owing their profitability to restrictions in their adoption cannot form the basis of an evolutionary approach, it seems appropriate to refer to the radical or general-purpose innovations, whose benefits, on the other hand, not only do not necessarily diminish as the number of economic agents adopting them increases but may even increase.

Moreover, such radical innovations are nothing more than what Marx, in the already mentioned *incipit* of the Introduction to the Critique of Political Economy, called "productive forces" or technology, with respect to which the "production relations", or property rights, are initially "development forms" but rapidly transform "into their fetters", giving rise to the tendency to crisis, which can therefore also be interpreted as a tendency to fail to fully exploit a given techno-economic paradigm or, to use the expression of Perez, a tendency to fail to reach the 'turning point' at which the benefits of the new paradigm spread through the entire structure of the economic system.

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While Perez links this turning point to a period of crisis leading to the resolution of the conflict between the old and the new system and the spread of the benefits of the new paradigm from the financial sector to that of the real economy, Marx links it to the effect of the aforementioned real contradictions on the formation of a "social consciousness" that can be interpreted as a sort of emphasis of the action, uniquely human, whereby change in the interpretation of reality can determine on reality itself, in this case again, because of the relationship of interdependence between praxis and theory (or structure and super-structure) and, in this case again, laying the foundations for an original theory of institutional change, of which a first treatment in quite the same analytical context of the present paper can be found in Battistini (2011; see also Denzau and North, 2004).

For what matters here, however, the point is as follows: since the conflict between old and new and the class conflict will not coincide but neither can they be understood as separate, if only as a consequence of the different degree of liquidity of labour and capital, the two observations are complementary rather than pertaining to different patterns of reasoning, as illustrated by the frequent references made by the evolutionary approaches to the Marxist theory of the long waves (Freeman and Sousa, 2001).

Finally, the third and most important consequence, also at least in part arising or in any case confirmed by the privileged position of discussing these matters almost two centuries afterwards, but in any case based on that theoretical perspective mentioned in Part One, different from that of Marx and already at his times, not without contradictions, working on a qualitative and inter-subjective labour theory of value, is the following: while the quantitative formulation used to suggest a centralised solution to the fundamental contradiction of capitalism, that associated with the notion of 'single firm Socialism', at least in theory, designed to incorporate and resolving by elimination the other two present in the phase of circulation, the qualitative formulation outlined in this paper suggests instead a decentralised solution to this contradiction, which in turn can be at the basis of the positive solution of the other two secondary contradictions characterizing the phase of profit realization on the goods market, rather than simply eliminating them.

Whence derives the opportunity and also the meaning of extending the already recalled dynamic part of Smith's approach to take account of the collective character of production and of material living conditions, or in other words of adding to it a theory of the firm. In this respect, tough at this point probably obvious to the majority of readers, it is nevertheless apposite to point out that while Smith cannot be reasonably held accountable for failing to appreciate the role of cross-derivatives (indeed, the derivation rule for the product of functions), or the operations of multi-national corporations employing millions of workers around the world (clearly a totally different phenomenon from international trade, as Marx and Engels were already able to grasp, but a century late), that sort of complacency should not be considered an affordable luxury for a scientific community of this century, whatever the meaning may be attributed to such expression.

Showing the limits of an informal approach to economic problems, mixed with an explicitly normative approach rather than just the implicit one of neo-classical economics –philosophising "in the air" from a Marxian perspective-, in the article just referred to Buchanan and Yoon (2010, p. 44) let us to know that: "The advantages of specialization at the within-firm level of team production are, of course, universally acknowledged. Issues arise only beyond these familiar limits. And it is the possible presence of increasing returns to the scale of operations for a firm that has generated issues of analytical interest and import.".

As already noted in section 4, Part One, to the extent that the difference between standard economic theory and the varied world of the 'constitutional' approaches, somewhat hidden in the periphery of the Anglo-Saxon mainstream, lies in shifting –or, more precisely, in returning- the margin of analysis from the cost function to the individual, it is a difference that in the context just outlined, speaks for itself.

Returning to more technical aspects, in regard to the following argument, finally to be noted is that explicit analysis of the phenomenon of the production of surplus-value and its relationship of interdependence with the mechanisms that guarantee its realization on the goods market is based on the recognition that between the market and the firm there is not only a relationship of substitution with respect to the production or the purchase of intermediate goods, but also one of complementarity, which links a particular type of firm to a particular type of competition between firms and vice versa.

The contemporary analytical device with which it is possible to treat the relationship of mutual causality that Marx and Smith, as they are interpreted here, identified between the division of labour within the firm and the division of labour between firms is related but distinct from that of strategic complementarity. It is introduced in the following section.

3. Institutional complementarity between the sphere of production and the sphere of circulation.

The analysis of the previous section comprised two implicit extensions to the static and partial analysis of the division of labour within the firm carried out in the first part of this paper. The first extension was of a dynamic type, in the sense that more than on the determinants of the creation of surplus-value, the analysis concentrated on its temporal evolution. The second extension was of a general nature, in the sense that the analysis of the division of labour within the firm was linked to that of the division of labour among firms. Put otherwise, the analysis of what happens in the sphere of production was linked to the analysis of what happens in the sphere of circulation.

As anticipated, this section first addresses this last extension, combining the game within the firm presented in section 3 of the part one (γ_w) with another game that takes place among firms (γ_b) as in the figure below.

K \ L	Comp	coop
Comp	3, 1	0, 0
Coop	0, 0	2,5, 2,5

A \ B	COMP	COOP
COMP	4,4	4,3
COOP	3, 4	5,5

Fig.1a γ $(_w)$ **Fig. 1b** (γ_b)

As discussed on that occasion, in Figure 1a. is represented the game of the division of labour within the firm. There are two players, a capitalist (K) and a worker (L) or two partners as will soon be clearer; strategies are a hierarchical or vertical division of labour (comp) or a more egalitarian and horizontal division of labour (coop). In other words, following Pagano (1991), the former strategy represents a division of labour based on the principle of minimising learning before doing, which in turn can be attributed to Gioa-Babbage, while the latter represents a division of labour based on the principle of maximising learning by doing, that could in turn be significantly associated precisely with Smith and the advantages of the specialization that he identified in the famous example of the pin factory; lastly, the pay-offs amount to an asymmetric coordination game due to the combination of non-additive separability and wealth effects and therefore to the existence of *two* Pareto-efficient equilibria, of which one maximizes the total value of the relationship being considered whilst the other does not.

Hence, expressing the condition of super-modularity in terms of the dependence of optimal strategies on a parameter (Milgrom and Roberts, 1990, Theorem 5)[8], the prediction according to which, given that when wealth effects decrease the class divide between capital and labour fades in a relationships among equals as in the case of partnerships and the professional labour markets, profit sharing, in its turn a consequence of the exchange of property rights over the goods produced rather than of labour-power, comes as the solution to the appropriability problem posed by the presence of strategic complementarities, and therefore the equilibrium that maximizes the total value of the group will prevail (coop, coop).

Conversely, as these wealth effects increase, and therefore as the class divide between capital and labour characterizing the case of the classical firm and subordinated labour market deepens, the equilibrium which maximizes the individual profit of the capital owners will prevail; that is the one in which the capitalist pays to the worker the exchange-value of labour-power and keeps the residual, i.e. the profit arising from the difference between the exchange-value of the product and the exchange value of the labour-power (comp; comp).

Associated to this latter situation, as already highlighted in part one, are both a class conflict that especially in present times is quite important to distinguish from common interest situations such as those of pure exchange as well as from those of pure conflict such as those of zero-sum games, and a notion of abuse of power in part analogous to that resulting from monopoly markets, with the difference that whilst in the latter case it is due to price setting and therefore competition eliminates it, in the present case it depends on the ownership of the means of production, so that competition has the opposite effect of making it systemic and in some respects independent of the will of the individual capital owners themselves.

Figure 1b., which is the innovation of this article's second part, devoted to verifying this proposition, depicts instead the game of the division of labour between firms. Consequently, the two players are two firms (A and B), each consisting of two players of the type participating in the game in Figure 1a. (and in its twin, not shown).

However, since firms do not have a life of their own, independent of the individuals interacting within them, such players are actually the decision makers, a function also more or less centralized depending on the fundamental parameter of the initial distribution of property rights. In this respect a subtle point, so to speak, is that, to the extent that the game within the firm is non-cooperative, players are individuals interacting in that domain and taking their decisions independently. However, since from the point of view of the workers the (comp) strategy amounts to accepting the authority of the capitalist within the limits of the contract whereas the (coop) strategy presupposes a consensus-based form of decision-making, those who make decisions concerning the division of labour between firms –capital owners or partners, respectively- are also decision-makers as far the division of labour within the firm is concerned, while workers are only left with the alternative between accepting or not accepting such a decision -a point that, being about the difference between optimal choice and satisfying choice, in the sense that the latter is associated with just an improvement, will be discussed again in the next section.

Strategies consist instead of realizing the surplus-value appropriated in the sphere of production by increasing the market share for a given size of the market, and therefore at the expense of the other firm (COMP), or of realizing the surplus-value created in the sphere of production as a result of the

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[8] From the general definition given in footnote 19, first part, it follows that when they are defined it is possible to describe the condition being considered in a perhaps more transparent way in terms of cross derivatives. In this way it is consequently possible to distinguish between complementarity between the strategies of a single player ($\sigma_{ik} > 0$, with i and k indicating the generic components of the player's strategy i), complementarity between the strategies of two players within the same game ($\sigma_{ij} > 0$, with i and j indicating the generic strategies of the two players), and just complementarity between the strategies of a player and a parameter ($\sigma_{i\mu} > 0$, with μ indicating a relevant parameter).

increase in the size of the market, and thus at a given market share (COOP). And, of course, in this case too, reference can be made to the principles just mentioned concerning the division of labour within the firm, with the difference that the principle of the minimization of learning by doing, as mentioned, can also be attributed to Ricardo and his theory of comparative advantage; finally, the pay-offs represent a coordination game, this time symmetrical, with the usual two equilibria whereby the one that maximizes the total value of the two groups, or of the 'super-group' (COOP, COOP) Pareto-dominates the one that does not maximize it (COMP, COMP).

In this case too, therefore, where there are strategic complementarities which can be expressed in terms of the dependence of optimal strategies on a parameter such as the increase in the size of the market, the equilibrium (COMP, COMP) will prevail in situations where such market size decreases or remains constant, and vice-versa for equilibrium (COOP, COOP).

Unfortunately, however, the problem of achieving this more desirable equilibrium is more complex than in the typical symmetrical framework where, given the absence of conflict, the emergence of the Pareto-dominant equilibrium can be easily justified in terms of group selection (Boyd and Richerson, 1982). The reason for this difference is the interdependence between this game between firms and the game within the firm and in particular the conflict between Pareto-efficiency and total value maximisation of the relationship being considered which characterises the latter.

In other words, as will become clearer from the analysis of the conditions of evolutionary stability in the next paragraph, since in $\gamma\,(_w)$ the equilibria cannot be Pareto-ranked, it can happen that the transition from the low to the high equilibrium in $\gamma\,(_b)$ is blocked by the fact that this low equilibrium is preferred by capitalists because it corresponds to their preferred equilibrium in $\gamma\,(_w)$. This, in turn, is due to the fact that pay-offs in $\gamma\,(_w)$ represent the way in which pay-offs realised in $\gamma\,(_b)$ are distributed, pay-offs which in turn were previously created - and possibly advanced - by the capital owners to the workers- in $\gamma\,(_w)$.

From this situation, representing the interdependence between the theories of value and distribution in Marx's approach, it also appears evident how, wearing the lenses of methodological individualism, it is possible to suffer from the optical illusion - already discussed in regard to the approach of Alchian and Demsetz - whereby, since the surplus-value resolves itself in the distributional shares, one may have the impression that it is instead determined by them in an additive way, or by the sum of the individual contributions, in this context at least determined by the equilibrium between supply and demand in their respective markets. From Figures 1a and 1b, in effect, it follows that 4=3+1, 5= 2,5+2,5, and 3=1,5+1,5 or, in more general and formal terms (see also fig. 2):

(1) $\Pi^g(\Sigma_g, \Sigma_h | \delta(\hat{\sigma})) = \Pi^i(\sigma_i^*, \sigma_j^* | \eta(\hat{\Sigma})) + \Pi^j(\sigma_i^*, \sigma_j^* | \eta(\hat{\Sigma}))$, where i, j= 1,…n, e g, h= 1,…,m, represent the generic players of the two games, with n=2m, whilst $\delta(\hat{\sigma}) \epsilon [0,1]$ and $\eta(\hat{\Sigma}) \in [0,1]$ are respectively the parameter that measures the extent of the market and depends on the strategy profile in $\gamma\,(_w)$, and the parameter that measures the intensity of wealth effects and depends on the strategy profile in $\gamma\,(_b)$, that is the parameters that in turn determine the relationship between strategies and pay-offs in their respective games. Finally, the reason why in eq. (1) the strategies in $\gamma\,(_b)$ are not expressed as equilibria, unlike those in $\gamma\,(_w)$, depends on the fact that, if there is no equilibrium in this latter game within the firm not even the other is played between the firms.

Consequently, it follows from this relationship that, as anticipated in the title of this section, the key notion here is that of institutional complementarity, a concept linked but distinct from that of strategic complementarity. While the latter refers to the relationship between the players' strategies in

a single game, the former refers to the relationship between the players' strategies in two games simultaneously played in different domains.[9]

Formally, the definition is therefore similar to the one defining strategic complementarities; that is, the super-modularity of the pay-offs functions. In both cases, increasing differences are present, but in the case of strategic complementarities, reference is made to the difference between payoffs associated with alternative strategies as the level at which a given strategy, treated as a parameter by the player in question, increases; in the case of institutional complementarities, instead, it means that the difference between the pay-offs associated with one strategy rather than the other in a given domain, increases as the number of players who choose the complementary strategy in the other domain increases, which in this case, too, to the extent that what happens in one of the two domains is taken as a given by players in the other domain, may be interpreted in parametric terms.[10]

Following in particular Aoki (2007, p. 261), and omitting for simplicity the parameters $\delta\ (\hat{\sigma})$ e $\eta\ (\hat{\Sigma})$ representing the relationships of interdependence between strategic complementarities in the game considered separately and institutional complementarities between the two games considered together, it is then possible to write:

$$(2a)\ \Pi^i(comp|COMP) - \Pi^i(coop|COMP) \geq \Pi^i(comp|COOP) - \Pi^i(coop|COOP)$$
$$(2b)\ \Pi^i(coop|COOP) - \Pi^i(comp|COOP) \geq \Pi^i(coop|COMP) - \Pi^i(coop|COMP),$$
and
$$(3a)\ \Pi^g(COMP|comp) - \Pi^g(COMP|comp) \geq \Pi^g(COMP|coop) - \Pi^g(COOP|coop)$$
$$(3b)\ \Pi^g(COOP|coop) - \Pi^g(COMP|coop) \geq \Pi^g(COOP|comp) - \Pi^g(COMP|comp).$$

In words, the more the competitive strategy prevails in $\gamma\ (_b)$ the greater the concentration of capital and consequently the importance of the wealth effects, thus making the competitive strategy in $\gamma\ (_w)$ relatively more attractive than the cooperative one. On the other hand, the more the competitive strategy prevails in $\gamma\ (_w)$ the smaller the increase of the extent of the market and the more the competitive strategy in $\gamma\ (_b)$ is attractive compared to the cooperative alternative.

Analogously, the more the cooperative strategy prevails in $\gamma\ (_b)$, the lower the degree of concentration of capital and thus the significance of wealth effects, which in turn makes the cooperative strategy relatively more attractive than the competitive strategy in $\gamma\ (_w)$. On the other hand, the more the cooperative strategy prevails in $\gamma\ (_w)$ the greater the increase in the extent of the market and consequently the greater will be the advantage of the cooperative strategy compared to the competitive strategy in $\gamma\ (_b)$.

Accordingly, game theory and in particular the theory of super-modular games can be understood as one of the contemporary technical tools that enable the representation and analysis of the cumulative causation mechanisms present in the Marxian principle according to which "anarchy in the social division of labour and despotism in the division of labour in the factory are one another conditions" as well as in the one, inspired by the Smithian theory of growth extended to take into

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[9] For example, as pointed out in particular by Aoki (2007) with reference to the Anglo-Saxon model compared to the Japanese one, the more flexible and without guarantees for workers is the labour market, the more a financial system based on the stock market, with its short-term perspective and a potentially high turnover rate among managers, is attractive compared to a financial system based on fiduciary and lasting relationships between banks and firms. On the other hand, the more the labour market provides protection and property rights for workers, at the level of the firm as was the case for Japan at least until the end of the 1980s, or at the level of the industry as was the case for example for Germany, the more a financial system based on fiduciary and lasting relationships between banks and enterprises is attractive compared to one based on the most immediate and impersonal relationships of the stock market. See also Pagano (1991).

[10] With respect to the definitions in terms of cross-derivatives given in footnote 9, in this case we have $\sigma_{i\mu(\Sigma)} > 0$, where Σ represents the generic strategy profile in the game among firms on which the relevant parameter for the strategies in the game within the firm depends, and vice-versa.

account the collective nature of production and the material living conditions, according to which also 'collaboration in the division of labour within the firm and cooperation in the division of labour between firms' may be conditions for each other.

Moreover, recalling that the pay-offs in both games are functions of the relevant parameters and that therefore the representation in normal form of figures 1a and 1b, and 2a and 2b, is only approximately correct, as otherwise implied in the definition in terms of increasing differences, it is possible to confirm that the two pairs of equilibria just discussed and respectively associated with the Marxian and the Smithian cases may actually be characterised in dynamic terms and associated with the two situations mentioned in the Introduction, or, respectively, to a situation where overall profits and growth are decreasing and another one where both are increasing.

Therefore, these two situations correspond to the re-discovery of the two types of competition, already mentioned in Part One as also present in the biological literature, distinguished by the fact that in one - 'bad'- profits increase through an increase in market share at fixed market size, while in the other - 'good'- profits increase through an increase in market size at given individual market share.[11]

In this regard to be noted is that the difference between these two types of competition is not the usual difference between perfect competition and monopolistic competition, that is, between price or quality competition, the latter through some form of vertical or horizontal differentiation.

Since in the equilibrium (comp; comp) in $\gamma\left(_{w}\right)$ no surplus-value is created but rather it is appropriated what is already there, decreasing the use-value of labour and the exchange-value of the good produced, so that the extent of the market or the demand are left at best unchanged, its realization in $\gamma\left(_{b}\right)$ cannot be other than a zero-sum game where every firm tries to appropriate market shares at the expense of the other firms. Accordingly, the point is not intercepting an unsatisfied demand deriving from an artificially high price but to grab market shares in the attempt to compensate the decrease in the rate of profit with an increase in its volume for a given level of the size of the market.

Conversely, since in the equilibrium (coop, coop) in $\gamma\left(_{w}\right)$ surplus-value is created, increasing the use-value of labour and the exchange-value of the good produced, and consequently increasing also the extent of the market or the demand, its realization in $\gamma\left(_{b}\right)$ is a common interest game where the increase in the profits of one firm is not in conflict with that of the others because it derives from an increase in the rate of profit for given market shares and increasing market size. This type of competition therefore does not amount to differentiating the product to create a niche taking refuge from competitors and exhausting profit opportunities – a situation that from an evolutionary point of view is actually the same as the one just discussed-, but to create profit opportunities by realizing the increased exchange-value of the product, which in turn determines an increase in the demand for a good which, consequently, can also be assumed to be homogeneous (though not necessarily produced in a single unit as implicitly assumed so far).

Remarkably, indeed, as repeatedly noted because of the relevance of the issue, in this situation where profit does not derive from scarcity but from the combination between cooperation and the

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[11] In Ghiselin (1995, p. 1034) these two forms of competition are respectively called 'competition push' and 'opportunity pull', where the difference is that the former refers to saturated environments with "one species 'wedging' another out of its place" while the latter refers to unsaturated environments where "New places are created, and occupied". Similarly, in Simon (1983, pp. 42-44) these two types of competition are respectively called 'niche competition' and 'niche elaboration', where the difference is that in the second type in addition to explaining how genes are reproduced, how the environment in which such reproduction takes place is itself reproduced must also be explained. Finally, is of interest that both associate Darwin with only the former type because of the influence exerted on him by the Malthusian theory of the population and the decreasing returns of land, and that Ghiselin, probably due to the fact that he did not receive an economics education in the first place and was therefore accustomed to thinking in terms of organisms, has no problem in understanding the division of labour not only in terms of an ever greater parcelling out of tasks but also in relation to the need to coordinate them, which is Marx's own step forward compared to Smith (see section 2.2., first part).

division of labour, competing by reducing the exchange-value of the good so as to increase the market share has the paradoxical effect of diminishing the rate of – Marxian or industrial - profit.

As will be made clearer in the next section, this in turn shows how another consequence of freeing Smith from the neo-classical interpretation, and in particular from scarcity as the defining principle of what is economic and what is not, as well as from the notion of competition as an assumption, which by the way is at least out of place in an evolutionary context, allows to interpret growth not in terms of *an imperfection* with respect to the general equilibrium but, as would seem more logical also from a terminological point of view, in terms of the *perfection* of these market mechanisms and in particular of their relation with the value creation process which may take place within the firm.[12]

In other words, understanding how profit generally derives from the exploitation of labour also makes it possible to identify the ideal case where profit may derive instead from the appreciation of labour and whose maximization consequently amounts to total value maximization.

Finally, these considerations show that the difference between the neo-classical approach and the one presented here is not only due to a difference in points of view, as it could be if such a difference depended only on the presence or not of wealth effects, but rather to the extension of the phenomena that it is possible to treat from an economic standpoint and which ensues from the already discussed attempt to relativize the postulate of methodological individualism (see footnote 3, Part One). In its turn, this relativization is the reason why, as underlined by Hayek's quotation provided in the conclusions at the end of Part One, taking seriously the contradiction between methodological individualism and non-additively separable production functions means having to take account of the explanatory character of the relationships within the group, discovering as a consequence that it is necessary to analyse them together with the relationships between groups, as is done again in the next section.

3.1. Discussion

Of course, however, the identification of this last theoretical or ideal possibility does not say much about the possibilities of its practical realization, since the latter depends on the rare case where there are no wealth effects and the even more uncommon formation of a "social consciousness" of the kind referred to in the previous section.

Moreover, the fact that it can be associated with the real functioning of professional labour markets and partnerships, and that, therefore, the two pairs of equilibria just analysed may be seen as referring to two sectors of the same economic system rather than to two overall equilibria of the same system, in itself is not sufficient to guarantee the viability of its generalisation.

This is particularly true in the simplified context of this paper, where there are only two types of labour, subordinated or professional-managerial, because the managerial functions in the sector employing subordinated labour and the more strictly professional functions in the sector employing only professional labour are so permeable as to leave open the possibility that the profit realized in this latter sector could have actually been produced in the former or that it is anyway calculated taking as a point of reference the profit realized in the capitalist sector in a strict sense -where, after all, partnerships usually sell their services.

Approaching reality from the 'model', though, it is worth noting that the reason why the role of class distinctions has lately disappeared from the debate is not so much the already noted theoretical rarefaction which followed the total abandonment of the labour theory of value by the Marxist theory

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[12] As noted quite unequivocally by Romer (1986, p. 1005, emphasis added): "Following Smith, Marshall, and Young, most authors justified the existence of increasing returns on the basis of increasing specialization and division of labor. It is now clear that these *changes in the organization of production* cannot be rigorously treated as technological externalities. Formally, increased specialization opens new markets and introduces new goods. All producers may benefit from the introduction of these goods, but they are goods, not technological externalities.". See also footnote 24, Part One.

- and which if nothing else at least at the cultural level helped to keep a critical perspective alive - as the fact that in the so-called Golden Age of Capitalism in Western societies, which ran approximately from the end of World War II – or, more in line with the perspective of the paper, from the Great Crisis of the 30s- to the end of the 1980s -, they were actually less relevant.

As noted by many observers, this was in turn due to the deterrence effect exerted by the communist systems prevailing in the Eastern hemisphere, which suggested significant corrections to the spontaneous functioning of markets and firms, particularly as regards what in Part One was characterised as economic democracy, i.e. an expansion of workers' rights in the workplace and over the joint product.

Paradoxically, it is precisely the end of this deterrence effect that, together with the new wave of globalisation that followed, has determined the conditions for the enormous increase in capital concentration and the consequent renewed centrality of class relationships which, from a practical point of view, are in turn the main reason for the relevance and modernity of Marx's contribution, summarized by Engels' quotation in section 2.

In this regard, but in more theoretical terms, it is worth noting that the perspective outlined so far, and which could at this point be called *à la* Marx-&-Smith, or at least an institutional and evolutionary re-interpretation of the classical perspective, unsurprisingly offers a different point of view also with respect to what emerges from 'macroeconomic' analysis.

Value and growth, indeed, arise neither from aggregate supply, as suggested by the pre-Keynesian or non-Keynesian approaches, nor from the aggregate demand, as instead supported by the Keynesian one, in turn subdivided into neo-Keynesian and post-Keynesian depending on whether this role of the demand is considered valid only in the short term or in the long run as well. On the contrary, as just described at the end of the previous section, they depend on the way in which the fundamental contradiction of capitalism in the sphere of production is resolved, which in turn determines the type of interactions between firms and workers whereby aggregate supply and demand emerge. It is in this sense, therefore, that they could be usefully understood as 'micro-founded'.

In other words, aggregate supply and demand, as well as the resulting equilibria in the respective markets, are endogenous to this solution and thus to the same value-creation process that, as already pointed out in the conclusions of the Part One, also determines the other economic institutions like the – complementary - type of the prevailing firm.

Consequently, in this case too we have to invoke the principle of unintended consequences to accommodate the fact that the policies to which reference has just been made regarding the Golden Age of Capitalism did actually work despite being at most approximatively justified. As shown by the fact that their suggested removal by the international economic institutions is indicated by the term 'structural reforms', the welfare policies of those years - the public supply, direct or indirect, of private goods such as healthcare and education, the substantial guarantee, always public and direct or indirect, of employment and welfare, and even decisive support with regard to housing - did not work because they were demand policies, which is actually like claiming that wages and profits determine growth, or that the same role was played by the demand for pencils and syringes.

On the contrary, such policies consisted of a sort of distribution of a basic individual capital endowment which made the adherence of such an economic model to the strict definition of capitalism by Marx (that in terms of wage-labour, which as already noted in Part One requires the upstream presence of the class divide between capital owners and workers and consequently identifies capitalism with the combined operation of its two most important institutional innovations, the classical firm and the unskilled labour market) substantially merely nominal.[13]

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[13] Indeed, the democratic principle of 'one head, one vote', in the economic domain is made preferable both from an etymological point of view ('one head, one capital') and from a conceptual point of view, since it does not give rise to problems of mandate.

More precisely, the success of such policies may be understood as a sort of compromise between those that in section 2 were called the 'decentralized' and the 'centralised' solutions to the fundamental contradiction of capitalism in the sphere of production. Indeed, such a midway nature can also be found in the idea that national income is *determined* by the sum of the contributions of the capital owners (investments, as tellingly posited first by financial markets' regular Ricardo) and of the workers (consumption, to add insult to injury the same role attributed to land owners by –their-reverend Malthus).

Not surprisingly, therefore, at least in the perspective of this work, such an idea can only be understood as a sort of 'full-screen projection' of the optical illusion referred to above in relation to the neo-classical theory of value and distribution, obtained through a relaxed use of the notion of representative individual.

Incidentally, Marx himself (1959, p.2, emphasis added), much more 'Smithian' as a critical economist than as a political-ideologue, when thinking about those forms of "social consciousness" originating from the contradictions between technology and property rights which in turn determine the tendency to real crises, was not convinced that they were so precisely informed: "With the change of the economic foundation the entire immense superstructure is more or less rapidly transformed. In considering such transformations, a distinction should always be made between the material transformation of the economic conditions of production, which can be determined with the precision of natural science, and the legal, political, (…) – in short, ideological forms in which men become conscious of this conflict and fight it out. *Just as our opinion of an individual is not based on what he thinks of himself, so can we not judge of such a period of transformation by its own consciousness*; on the contrary, this consciousness must be explained rather from the contradictions of material life, from the existing conflict between the social productive forces and the relations of production.".

Consequently, the main beneficiary of this unlikely convergence between standard economic theory and Marxist theory in eliminating any possible link between labour and value creation can be identified in Keynes himself. Both the possibility of over-production and the role of the effective demand (literally, 'effectual demand', in the sense of demand that corresponds to an income actually produced, as opposed to the potential one that is obviously infinite), had already been highlighted by Marx and Smith, respectively, and in a much more general and coherent context in my opinion.

These considerations therefore seem to suggest that the contribution of the English economist might be identified in the rationalization of a role for economic policy in the event of short-term and exogenous shocks. However, while on the one hand it is certainly an intuitive and important contribution, on the other hand the fact that it is not particularly satisfactory at the theoretical or even logical level, has left the burdensome legacy of the extremely misleading alternative between the 'State' and the 'market', summarised by the well-chosen expression by Stiglitz about the 'privatization of profits and socialization of losses' - and which could also be reframed in terms of 'Sate-sponsored profit-making'.

As for the presumed 'revolution' that would consist in the transition from savings to investments as the engine of growth, the story is the same as that of the 'revolution' that would consist in the transition from aggregate supply to aggregate demand: both of these 'revolutions' are in fact based on the non-acceptance of the so-called Say's 'law', whose problem, as for the vast majority of the other economic 'laws', is not whether they are true in one sense or the other, but rather that they simply do not exist.

One last observation, finally, concerns the appropriateness not to 'idealise' this 'golden age of capitalism'. At best it is in fact a period of about thirty years that has affected a minority of the world population and therefore is not particularly representative when considered within the sequence of the

generally predatory forms of economic and political organization that have characterized human history from the advent of agriculture, that occurred about 10,000 years ago and, implying the transition to a sedentary way of life, gave rise to the State.

In addition, many of the forms of welfare that have just been referred to have not yet been paid for and appear in the form of public debt, at the same time a source of risk-free capital accumulation and a constraint to the continuation of those policies themselves. While for the standard economist, who does not see the fundamental contradiction of capitalism from the point of view of production, this debt shows the existence of an inter-generational conflict it is important to stress that in reality both this conflict and the more recent ones 'between nations' are in fact a consequence of the failure to fully resolve the fundamental one between capital and labour and its consequent displacement forward (in the case of the former) or outward (in the case of latter). And it is precisely this failure to provide a full solution to that fundamental conflict that prevents the transition from the general case to the ideal one and therefore determines the increasing severity and potential danger of the secondary ones (in addition of course to explain their essentially mystifying character).

In any case, if the notion of institutional complementarity provides a first insight into how markets and firms interact in the institutional and evolutionary interpretation of Marx's theory of surplus-value advanced in this paper, a more in-depth analysis would require going into more detail on the timing of choices and the assumptions that have to be made about the knowledge of the game attributed to players.

Since classical game theory, apart from word games, performs these operations in a way that is as questionable as the neo-classical theory, sharing, so to speak, its philosophy of science, and in particular the very suspicious idea that reality is self-evident, the second extension of the static and partial analysis of the division of labour within the firm - the dynamic one that is introduced in the next section - is presented explicitly in evolutionary terms, immersing the two games in figure 1a and 1b in what is called the replicator dynamics and evaluating the evolutionary stability of the pairs of equilibria that characterize them. [14]

4. Substantive rationality and evolutionary rationality.

This section therefore presents an explicitly evolutionary approach to solution of the two games just discussed. To this end, they are treated in a slightly more abstract way in the figure below.

1 \\ 2	comp	coop
Comp	$V - \overline{w}, \overline{w}$	$0, 0$
Coop	$0, 0$	$\frac{V}{2}, \frac{V}{2}$

A \\ B	COMP	COOP
COMP	$\overline{V}, \overline{V}$	$\overline{V}, \tilde{V}$
COOP	$\tilde{V}, \overline{V}$	$\overline{\overline{V}}, \overline{\overline{V}}$

Fig. 2a   **Fig. 2b**

In this new figure, the players and the strategies are the same ones introduced regarding the previous formulation. The same applies the pay-offs, for which the following relationships apply: $\overline{\overline{V}} > \overline{V} > \tilde{V}$ indicates the relationship between the exchange-value of the product realized in the commodity market to be distributed within the firm, with $\tilde{V} = 2\overline{\overline{w}} > 2\overline{w}$ which is the crucial condition

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[14] However, to be noted is the dynamic extension of the super-modular games carried out by Milgrom, Roberts and Choi (1991) through formulation of the so-called ''Momentum theorem'', which should yield results substantially similar to those that follow in the next paragraph.

that ensures that group production is always preferable to individual production; finally, $\overline{w} < \overline{\overline{w}}$ indicates the relationship between the exchange value of the subordinated labour and the professional labour, respectively.

As said, unlike the axiomatic models where individuals or, more precisely, their theories represent the beginning and the end of the analysis, so that from this point of view they could also be understood as 'creationists', in an evolutionary model players are in the middle of a process in regard to which they have limited control and knowledge[15].

To be sure, this is also the meaning of the above-mentioned famous *incipit* of the Introduction to the Critique of Political Economy, in which Marx states that, "in the social production of their life" individuals find themselves in production relations that precede them and that therefore are "indispensable and independent of their will" o, to use another well-known expression of Marx, operate "behind their backs".

Within the liberal theory itself, moreover, two different schools of thought can be identified: the one which refers to the tradition of the 'social contract' or the 'constitutional design' on the one hand, and the one that instead refers to the notion of 'spontaneous order' or 'self-organizing systems themselves' on the other, which no doubt includes both Smith and Schumpeter and probably Hayek as well.

More specifically, this feature of being in the middle of a process in regard to which agents only have limited control and knowledge is formalized by assuming that they are engaged in what is called a 'best reply learning process', i.e. a feedback mechanism that goes from precedents to expectations and therefore to the optimal strategies, and thence back again to the precedents, as in the figure below (Young, 1998, p.6).

Precedents ⟶ Expectations
        ↙ Strategies ↙

Fig. 3

Rather than maximizing an expected utility function from the state of nature, therefore, agents make their decisions on the basis of adaptive expectations, that is, on the reasonable assumption that the rest of the population will not suddenly and in unison change its strategy, so that in their turn they will change their strategy if the expected pay-off from that change is sufficiently higher than the expected pay-off of the strategy they are currently playing.

According to Young, the differences between the neo-classical approach and the evolutionary approach concern the notion of equilibrium as well as the notion of rationality: "In neo-classical economics equilibrium is the reigning paradigm. Individual strategies are assumed to be optimal given the expectations, and expectations are assumed to justified given the evidence. We too are interested in equilibrium but we insist that equilibrium can only be understood in a dynamic framework that explains how it comes about (if in fact it does). Neo-classical economics describes the way the world looks like once the dust has settled; we are interested on how the dust goes about settling. *This is not an idle issue, since the business of settling has considerable bearing on how things look afterwards.*

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[15] Clearly, the concept of evolution has problems with those of beginning and end, so much so that today it is not considered necessarily in contradiction with views of a religious character, provided that the principle of the division of labor apply in this case too. Precisely this consideration, however, also highlights the risks mentioned above about the inevitable tendency of axiomatic approaches to present themselves as unique and true. Simon himself (1983, p. 34), who calls the substantive rationality of the axiomatic approach "Olympian rationality", characterize it as the "rationality of God" (ibid). On the contrary, 'The evolutionary model is a *de facto* model of rationality' (ibid, p. 35) even if '(…) an evolutionary model of rationality does not commit us to a particular mechanism for the rational process (ibid, p.72)'.

(…). The second feature that differentiates our approach from standard ones is the degree of rationality attributed to economic agents. In neo-classical economic theory –especially game theory- agents are assumed to be hyper-rational. They know the utility functions of other agents (or the probability that agents have these utility functions), they are fully aware of the process they are embedded in, they make long-run plans on the assumption that everyone else is making long-run plans, and so forth. This is a rather extravagant and implausible model of human behaviour, especially in the complex, dynamic environments that economic agents typically face. *Moreover, it represents a peculiar aberration from traditional thinking in economics*. One of the central messages of the pure theory of exchange, for example, is the ability of price and markets to coordinate economic activity without assuming that agents are anything more than naïve optimizers acting on limited information. (ibid, pp. 4-5, emphasis added).

Consequently, the main solution concept in evolutionary game theory is the notion of evolutionary stable strategies (Maynard-Smith, 1973). Basically, the question which this notion of equilibrium answers is in what conditions an asymptotically stable equilibrium in the replicator dynamics is protected from a potential invasion by mutants introducing a new strategy. More formally, the point is to determine what constitutes the barrier against invasion by these strategies, or rather the fraction $\tilde{p}$ such that if mutants appear to a lesser extent than $\tilde{p}$ the existing strategy obtains a payoff greater than the entrant so that the invasion will be rejected - a definition calling for an equally immediate and transparent economic interpretation in terms of free-entry, because the only barriers are those of profitability.

In practice, therefore, indicating with y (Y) the generic strategy in the two games $\gamma \ (_w) \ [\ \gamma \ (_b)]$, and with p (Q) its frequency distribution in the population, the problem is determining what happens if a small proportion of players playing x (X) is introduced. Again drawing from the analysis by Bowles (2004, ch.2) and referring to it for a complete derivation starting froth replicator dynamics, the usual conditions follow:

(4a) $\Pi^i(y, y) > \Pi^i(x, y)$,
or, if $\Pi^i(y, y) = \Pi^i(x, y)$, then $\Pi^i(y, x) > \Pi^i(x, x)$, and

(4b) $\Pi^g(Y, Y) > \Pi^g(X, Y)$,
or, if $\Pi^g(Y, Y) = \Pi^g(X, Y)$, then $\Pi^g(Y, X) > \Pi^g(X, X)$.

In words, the *y (Y)* strategy is evolutionarily stable if it is a best reply to itself; but, if it is only weakly so, then the alternative strategy *x (X)* is not in its turn a best reply to itself and therefore does not evolve and does not invade the strategy *y* by inertia (drift).

Firstly, from this definition it follows that the notion of evolutionary strategies is what is called a refinement of the Nash equilibrium, since all evolutionary stable strategies are also Nash equilibria but the opposite is not true. Secondly, as anticipated in the Introduction to Part One, from this definition it also follows that it is a solution concept suited better to the combination between cooperation and division of labour identified by Marx and his contemporaries than to the principle of scarcity and to the view that value derives from given differences. In the general case, in effect, instead of the indifference among alternative strategies, or the same return for an individually-considered production factor among its alternative uses, preference tends to prevail for one or the other, which in the present context amounts to the condition of maximum profit.

In the vast majority of cases, in other words, the Nash equilibria that are not evolutionarily stable are the 'mixed' ones where the population is indifferent between the two strategies while the Nash equilibria that are also evolutionary stable are the 'pure' ones where the whole population chooses the same strategy. This feature in turn depends on the fact that, apparently, in biology, the negative

feedbacks characterizing the notion of scarcity of the production factors individually-considered are relatively rare compared to the positive feedbacks at the core of self-reinforcing mechanisms that typically characterize the processes in which the frequency with which certain phenomena manifest themselves affects the processes themselves.[16]

To summarize, from a simple inspection of pay-offs it follows that both the strategies (*comp*, *comp*) and (*coop*, *coop*) in γ ($_w$) and the strategies (*COMP*, *COMP*) and (*COOP*, *COOP*) in γ_b are evolutionarily stable strategies in their respective dynamics while the intermediate equilibria where players are indifferent between the two strategies represent the point (or the range) defining their respective basins of attractions and for this reason, even if they were to exist -an occurrence that as will be seen shortly is neither particularly intuitive nor easily interpretable- would not be evolutionarily stable.

However, thus far the analysis of the two games γ ($_w$) and γ ($_b$) has been conducted as if they were played independently while the main argument of this second part and the point of notion of institutional complementarity introduced in the previous section is the interdependence between the phase of production and the phase of circulation, or the interdependence between value creation or appropriation and its realization.

In other words, to the –diachronic- cumulative causation mechanism which goes from precedents to expectations and so to the best replies, and then again to precedents, we have to add the –synchronic- one, which from the fundamental parameter of the initial property right distribution goes to the strategy profile in γ ($_w$) and thence to the derivative parameter representing the extent of the market and to the strategy profile in γ ($_b$), and consequently in the end again to the property rights distribution (fig. 4).

property rights $\longrightarrow$ strategies in γ ($_w$) $\longrightarrow$ extent of the market
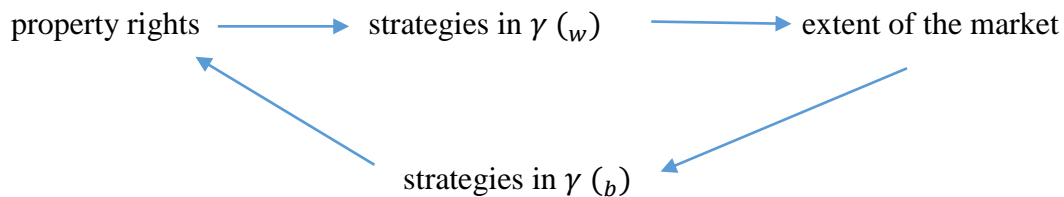
strategies in γ ($_b$)

Fig. 4.

This in turn requires expanding the definition of evolutionarily stable strategies just given in the expressions (4a) and (4b) to establish the conditions under which the strategies that fail to invade the two games considered separately continue to fail to invade even when the two games are considered simultaneously.

Indeed, given that: (i) there is a partial overlapping of the players in the two games; (ii) pay-offs can be assessed differently depending on whether it is done individually or from the point of view of the group, because of the collective nature of production and the conflict between individual and collective interest deriving from the fundamental contradiction of capitalism in the sphere of production; (iii) pay-offs in γ ($_w$) represent the way profit realized in γ ($_b$) is distributed within the firm, illustrating the operation of the Marxian theory of value and distribution and in particular their interdependence, it seems reasonable to add the following conditions:

(5a) if $\Pi_g(\hat{\sigma}|\eta) \notin argmax\Pi_g(\hat{\sigma}|\eta)$,

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[16] An illuminating exception in this respect is the Hawk and Dove game where, if the cost of fight is higher than the value of the contested resource, an increase in number of hawks effectively increases the pay-off of the dovish strategy and vice-versa. If V>C, instead, fighting is the dominant strategy.
.

then $\Pi_i(\hat{\Sigma}|\delta) \in argmax\Pi_i(\hat{\Sigma}|\delta)$ for at least one or ϵ individuals.

In words, if the individual deviation, which is not profitable from the individual standpoint due to the ordinary definition of the evolutionarily stable ordinary strategy, is however profitable from the point of view of the group, i.e. the first part of the expression (5a) applies, then the corresponding group deviation in γ (b), which is not profitable from the group standpoint due to the ordinary definition of evolutionarily stable strategies, is not profitable from the individual point of view for at least one or ϵ individuals who are decision-makers in such a game, i.e. the second part of the expression (5a) applies, and therefore the strategy in question cannot evolve even indirectly. In other words, even though in the general case the profit of the group is not maximized as a function of the individual strategies in γ_w, and consequently the total value of the 'super-group' is not maximized either, the corresponding pair of equilibria turns out to be nevertheless overall stable because the decision-makers' individual profit is maximized even as a function of the group strategies in γ_b, blocking as anticipated in the previous section the transition from the low equilibrium to the high equilibrium in γ_b. Likewise,

(5b) if $\Pi_i(\hat{\Sigma}|\delta) \notin argmax\Pi_i(\hat{\Sigma}|\delta)$ for at least one or ϵ individuals,
then $\Pi_g(\hat{\sigma}|\eta) \in argmax\Pi_g(\hat{\sigma}|\eta)$.

In words, if the group deviation γ (b), which is not profitable from the point of view of the group due to the ordinary definition of evolutionarily stable strategies, is however profitable from the individual standpoint for at least one or ϵ individuals, then the corresponding individual deviation in γ $(_w)$, which is not profitable from the individual standpoint due to the ordinary definition of evolutionary stable strategies, is not profitable either from the group's point of view, that is, from the point of view of the entrepreneurs-partners who are decision-makers as well players in both games. Therefore, here too the strategy associated with the deviation at the start of the process cannot evolve even indirectly. Put otherwise, even though in the ideal case the individual profit is not maximised for every possible individual, if it were to exist the corresponding pair of equilibria too would be overall stable because the group profit of decision-makers, who in the absence of wealth effects in theory could take their decisions unanimously, is maximized even as a function of individual strategies in γ $(_w)$, blocking the transition from the symmetric to the asymmetric equilibrium in γ $(_w)$[17].

And, as anticipated in the Introduction, while referring to these two games in particular, this extension of the conditions of evolutionary stability to the pairs of strategies has a fairly immediate and transparent economic interpretation because it formalizes a situation in which, although there is free-entry and a homogeneous product, profits are not only positive but also increasing or decreasing.

The first condition (5a), in effect, represents the case of the 'altruistic' entrepreneur referred to in section 3 of the Part One, namely the case of an entrepreneur who, seeing that workers are not paid for what they produce, may decide to give up part of his/her profit, obtain the efficiency gains of an increase in the use-value of labour and in this way invade the pair of equilibria (comp, comp); (COMP, COMP). As anticipated in Part One, however, this does not happen because this 'altruistic' entrepreneur will in turn be eliminated by another entrepreneur who obtains the same efficiency gains, and therefore a greater profit, maintaining the same hierarchical organisation of work, a condition expressed by the second part of (5a) which ensures that the corresponding group deviation (COMP to

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[17] To facilitate understanding of this extension, it should be noted that the ordinary definition of evolutionarily stable strategies can also be written as: if $\Pi^i(\sigma_x^i, \sigma_y^j) \in argmax\Pi^i(\sigma^i, \sigma_y^j)$,
then $\Pi^i(\sigma_x^i, \sigma_x^j) \notin argmax\Pi^i(\sigma^i, \sigma_x^j)$.

COOP) is not profitable for at least one or ϵ individuals who are decision-makers, or rather the other standard entrepreneurs who, like the first one, are considering a change in their strategy.

The second condition (5b), a group deviation which is profitable from an individual point of view, represents instead the situation where a standard entrepreneur in a world of entrepreneurs-partners, on seeing positive profits, implements a policy of lowering the use-value of labour and hence the exchange-value of the product, thereby seeking to invade the pair of equilibria (coop, coop); (COOP, COOP). Again, however, this does not happen because in this ideal world of entrepreneurs-partners they obtain a higher profit by increasing the use-value of –their- labour and so the exchange-value of the product. This condition is expressed by the second part of (5b), which ensures that the corresponding individual deviation (from coop to comp) is not profitable from the point of view of the group, i.e. the entrepreneurs-partners who, like the first one, are considering a change in their strategies.

More precisely, the point is as follows. Because of the combination between strategic complementarities in the two games considered separately and institutional complementarities between the two games considered jointly, they turn out to be linked by a recursive relation, in the sense that the equilibria of one game determine the rule of the other and vice versa (Bowles, 2001, p. 58). Consequently, given that the expressions 'super-game' and 'sub-game' already mean different things, the two games $\gamma\,(_w)$ e $\gamma\,(_b)$ could be interpreted as two stages of a single 'multi-level' game, while the two pairs of equilibria [(comp, comp); (COMP, COMP)] and [(coop, coop); (COOP, COOP)] could be interpreted as the corresponding 'multi-level' equilibria, in their turn characterized, in addition to the usual absence of incentives to unilateral changes of strategies defining the Nash equilibrium, by the absence of tendencies to change the rules of the game.

In particular, interpreting the latter in the reduced form of the relationship between strategies and pay-offs, the vehicle of such a relation of interdependence between the equilibria of the two games (or stages) is represented by the parameters η and δ which respectively measure the intensity of the wealth effects and the size of the market. In their turn, they are respectively determined by the strategy profile in $\gamma\,(_b)$ $[\gamma\,(_w)]$ while determining the relationship between strategies and pay-offs in $\gamma\,(_w)$ $[\gamma\,(_b)\,]$.

In other words, such parameters represent the material – or structural - counterpart to the role played in the cognitive domain by beliefs, which in the jargon of game theory represent the players' understanding of the relationship between strategies and pay-offs. While in the learning process based on the best reply adopted in this paper they – the expectations - are assumed to coincide with the frequency distribution of the strategies in the game under examination, in epistemic game theory, the stream of literature devoted to identifying the conditions under which it is reasonable to expect that players will play a Nash equilibrium, they are indicated as 'beliefs systems' and formalized as a probability distribution over players' types, self-evident although allowing for asymmetric information and established by a player emphatically called 'Nature' (Baumann and Brandeburger, 1995).

Indeed, while the fundamental parameter of the initial distribution of property rights (η) determines the 'types' of players in $\gamma\,(_w)$ – capital owners and workers, or partners -, and consequently the decision-makers in $\gamma\,(_b)$ too, the secondary parameter measuring the extent of the market and therefore the demand (δ) determines the 'types' of firms in $\gamma\,(_b)$ – value-appropriating or selfish firms vs value-creating or self-interested firms.

And, given the three observations just made, the problem is that behaviours associated with strategies that are not the best reply in the two games (or stages) considered separately could nevertheless evolve if profitable from the standpoint of the two games considered jointly, that is, in the 'multi-level' game.

This is exactly what is ruled out by conditions (5a) and (5b). In the case of the 'altruistic' entrepreneur, who deviates from (comp) to (coop) in $\gamma\,(_w)$ and from (COMP) to (COOP) in $\gamma\,(_b)$

because $\bar{\bar{V}} > \bar{V}$, were it not true that the strategy profile in $\gamma\ (_b)$ maximizes the decision-makers' individual profit, because $\bar{V} - \bar{w} > \bar{\bar{V}}/2$, other entrepreneurs could deviate from (COMP) to (COOP) in $\gamma\ (_b)$, so as to determine a change in the strategy profile of such a game as well as a change in the rules of the other, destabilizing the starting equilibrium in $\gamma\ (_w)$.

Analogously, in the case of the standard entrepreneur who, in a world of entrepreneurs-partners deviates from (COOP) to (COMP) in $\gamma\ (_b)$ and from (coop) to (comp) in $\gamma\ (_w)$, because $\bar{V} - \bar{w} > \bar{\bar{V}}/2$, were it not true that the individual strategy profile in $\gamma\ (_w)$ maximizes the profit of the group, and therefore the individual expected profit as well, because $\bar{\bar{V}}/2 > \bar{V}/2$, other entrepreneurs could deviate from (coop) to (comp) so as to determine a change in the strategy profile of such a game as well as in the rules of the other one, destabilizing the initial equilibrium in $\gamma\ (_b)$.

In both cases, if the relationship between the division of labour within the firm and the division of labour between firms were not materially and structurally determined in an 'iron way' by the fundamental parameter of the property rights distribution, behaviours associated with strategies which are not the best reply in the two games (or stages) considered separately could nevertheless evolve if profitable in the two games (or stages) considered jointly, meaning that the cost incurred by choosing a strategy which is not a best reply in the single game would be more than off-set by the benefit deriving from the effect of the change in the rules of the game on the equilibrium strategies of the complementary game.

This is indeed what happens in Battistini (2011), where the vehicle of the effect of the strategies profiles of a game on the rules of the other game is not just the material one out of the fundamental parameter of the existing property rights distribution, but also the cognitive one out of the mental models or ideologies according to which players justify such a distribution. Given that in this context players are also given the possibility to change such mental models, an occurrence that is all the more probable the closer the system is to the pair of equilibria which maximize the capitalists' individual profit rather than total value, to the extent that such changes bring about a new shared beliefs system and pay-offs in the two games are evaluated according to a property rights distribution different from the existing one, the strategy (COOP) in $\gamma\ (_b)$ becomes the dominant strategy determining a change in the rules of the game in $\gamma\ (_w)$ which makes possible to conclude that the only pair of equilibria (or the only 'multi-level' equilibrium) robust to such changes in the beliefs systems is indeed the one which maximizes total value. However, since that mechanism for updating beliefs is different from the one based on the best response and, even more, from the Bayesian one, the interested reader is referred to the paper just cited.

Finally, in the present context such observations are of particular relevance because from the definition of super-modular functions given in footnote 19 in Part One, which holds for the strategic complementarities in the two games (or stages) as well as for the institutional complementarity between them, it follows that: (i) a strategies change gives better results if it is done jointly rather than separately, so that the optimal choice may change if strategies are considered jointly rather than separately; (ii) the marginal return on such strategies increases with the level at which the other strategies are chosen, so that such an optimal choice may not be a marginal decision; (iii) from the preceding observations it follows that the existence conditions of the equilibria are given according to an ascending order with the possibility of jumps from the low equilibrium to the high equilibrium and vice versa, a feature which is all the more relevant in the present context where, due to the asymmetry of the pay-off in $\gamma\ (_w)$, rather than the mixed intermediate equilibrium – in any case unstable - more probable is the existence of an interval of strategies' frequency distributions among the population according to which one type of player prefers a given strategy and the other prefers the other strategy, determining a disequilibrium situation in both games (see eq. 1). Moreover, since pay-offs are actually a function of the parameters η and δ, in the neighbourhood of the extremal points the – other - parameters regulating the numbers of players who update their strategies and the sensitivity to

differences in pay-offs associated to them could also change, similarly to what happens with the notion of punctuated equilibrium introduced by Elredge and Gould (1967; see also Bowles, 2004, ch. 2).[18] □

On the one hand, therefore, unlike random biological mutations, the mutations or changes of strategies analysed in of this section – ordinary or cross-mutations - are motivated by the principle of profit maximization. Consequently, this is presumably the most relevant element in regard to the differences of a possible analogy between the self-expansive nature of the gene in the biological domain and that of capital in the economic domain.[19]

Indeed, it is always the conflict between individual and collective interests which determines the potential instability of the equilibria (comp, comp) in γ $(_w)$, and (COOP, COOP) in γ $(_b)$. And it is always the property rights' distribution which ensures the overall stability of the associated pairs of equilibria in a sort of game of 'cross vetoes' where, if an individual strategy does not maximise the profit of the group, then the corresponding group strategy maximizes also the individual profit of the decision-makers while, if a group strategy does not maximize the profit of every possible individual, then the corresponding individual strategy maximizes the profit of the group and therefore even the individual expected profit of the existing decision-makers as well.

On the other hand, this role of external driver of the analysis played by the principle of profit maximization avoids the risks of infinite regression that may be incurred when, particularly in the game-theoretic analysis of institutions, these potential relationships between the equilibria and the rules of the game are dealt with, as the latter are usually understood in their turn as equilibria of a 'meta-game', whose rules, and particularly where they come from, should be also explained in some way.

What is more, in the general Marxian case these two games and their relationship represent the way in which the conflict between individual and collective interests deriving from the fundamental contradiction of capitalism in the sphere of production (rather than from various forms of market power) is not eliminated by competition, which instead makes that conflict systemic and to a certain extent independent from the will of the individual capital owners, in the sense that even in this case the awareness or the intentionality of the oppressive behaviour is not necessary for the logic of the argument.

Consequently, these two games and their relationship may be interpreted as a representation of the Marxian notion of economic structure, that is, of production relations production where one finds him or herself already in, which would not have been chosen but whose rejection would lead to economic extinction, and upon which -as said- an ideological super-structure is built.

Hence, in analogy with the opportunities and the constraints of a cognitive nature by which the evolutionary approach explains apparently 'irrational' behaviours such as those associated to the notion of bounded rationality – because only satisfying -, or 'more than rational' such as those associated with the 'enlightened self-interest' which makes it possible to solve social dilemmas such as the Prisoner's Dilemma thanks to the existence of social norms in their turn evolved by group selection, the material opportunities and constraints deriving from belonging to such production

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[18] Technically, this latter feature is due to the fact that the existence theorems are based on the ones developed by Tarski, which ensures the existence of extremal fixed points, rather than on the usual ones by Kakutani, which instead ensures the existence of intermediate fixed points. Another notable technical feature is that the relevant functions do not have to be quasi-concave in their arguments taken separately. See Vives (1995).

[19] In fact, a more in-depth analysis of this possible analogy is probably one of the most interesting extension of this paper. As for now, however, it appears at least premature from both sides. As Grafen warns (2006, p. 544), indeed: "It has already mentioned that the question of how to define inclusive fitness in the absence of additivity has not been settled, and so fundamental theory on the non-additive case can hardly yet begin". For the sake of completeness, the theory of 'inclusive fitness' is a theory that explains parents' altruistic behaviour toward offspring as an *appearance* behind which lies the self-interested maximization of their genetic representation in the population. In addition to this school of thought, known as 'socio-biology', interesting for the just mentioned extension are also Veherencamp (1976) and Bohem (1995).

relations can be used to explain apparently 'irrational' behaviours such as submitting to exploitation or abuse of power, or 'more than rational' one such as being the agent of such exploitation or abuse of power.[20]

In the case of workers, as mentioned in the previous section, we are dealing with situations which are only accepted, satisfying a participation constraint that even from a terminological point of view confirms its character of improvement rather than of (abstract) optimality. In the case of the capital owners, as mentioned in the quotation from Marx in the Introduction to Part One, we are dealing with situations not necessarily intentionally chosen in the sense that they could be the ways in which "(..) the laws, immanent in capitalistic production, manifest themselves in the movements of the individual masses of capital, where they assert themselves as coercive laws of competition, and are brought home to the mind and consciousness of the individual capitalist as the directing motives of his operations".

Consequently, this type of rationality, which is still a form of individual rationality even though it is different from the canonical condition because of the differences in the context to which it is applied, and particularly because it is driven by the principle of profit maximization, can be interpreted as involuntary or unintended rationality. Since this type of rationality is the very essence of the notion of evolution and at the same time of the difference between systemic and physical coercion, in its turn the whole point of the legacy of Marx as a critical economist, this is also the reason why it is possible to conclude that an evolutionary approach is not just compatible with Marx's re-interpretation proposed in this paper but it is also necessary.[21]

4.1. Discussion.

On the one hand, the just provided counter-example to the 'zero profit condition' commonly used to 'close the model' is some respects quite obvious because scarcity as a defining principle of what is economic and what is not, the substitution between production factors considered individually as the central mechanism of the phenomenon of production and the condition of indifference between alternative uses of the same factors, in this context have been respectively replaced by the combination of cooperation and division of labour, the coordination of the same productive factors in the sense of the theory of organization and finally by the maximum profit condition.

On the other hand, it is less obvious because the result for which it is possible to create value even by doing the same thing contradicts at its root the neo-classical view that value arises from given differences and consequently allows to re-submit a growth engine, already at the centre of the analysis of classical economists, for which there still seems to be room since, in general, empirical analyses show that about 2/3 of growth is residual, i.e. is not explained and taken as exogenous -although of course this should at least pose the rhetorical question of where it ends up (Battistini, 2013a).

In addition, both in the ideal case and in the general one, the qualitative re-interpretation of the Marxian theory of value and distribution is clearly inconsistent with the neo-classical one and in

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[20] In particular, while the evolutionary approach calls into question the postulate of methodological individualism in the sense that knowledge is considered as a relation between individuals, so that its effect on the individuals themselves is acknowledged, it does not reach the point of calling into question its corollary from the point of view of reality, i.e., the restriction to additively separable contexts such as the Prisoner's Dilemma and the other common interest situations. This is also the feature of the recent models of group selection, which are based on the same intuition –deriving directly from Darwin- on which is based the extension of the conditions of evolutionary stability introduced in the text, that is, the possibility that behaviours which are not adaptive within the group turn out to be adaptive in the enlarged context which also takes account of the relationships between groups.

[21] That Marx has been one of the most influential thinkers reflecting on the distinction between formal and real freedom confirms that his work as a critical-economist can be interpreted as showing how capitalism *embodies* such a difference between systemic and physical coercion. That thereafter, in the so-called first phase of single- firm socialism, the tendency was inevitably that of re-establishing the *coincidence* between those two types of coercion, as is also the case of all the economic systems before and after capitalism, was a risk that the losing side of the political and economic debate within the workers' movement warned against the winning side, which includes Marx.

particular with its formalisation in terms of Euler's theorem, as well as of course with that in terms of independent individuals mentioned in section 4 of Part One and in section 2 of this part.

Naturally, there are probably not many economists –not even standard ones - who consider the neo-classical theory to be valid in a literal sense. However, interpreting reality in terms of imperfections with respect to the general equilibrium model, besides being questionable in logical and realistic terms, also risks being counter-productive: for example, the signature policy of the neo-classical economist – increase competition so as to take the price-taking condition closer - in the case of the organization of production does not bring reality closer to the neo-classical labour market, whose autonomous existence seems limited to economics textbooks, but to Marx's definition of capitalism in a strict sense, which is then one of the most probable theoretical explanations of the relevance and modernity of Marx's approach from the point of view of praxis (see also Piketty and Saenz, 2006).

It is therefore within this theoretical framework - in my opinion richer - that the Schumpeterian theory of incremental innovation can also be understood. Of course, in itself, incremental innovation has nothing negative but analysed independently from the link between firms and markets risks being misinterpreted. Indeed, in none of the six examples discussed by Schumpeter himself (a new product, a new organizational method, a new organization of the market, a technological innovation of a (strictly) non-scientific nature, the penetration of a new market previously inaccessible, the discovery of new sources of raw materials) this interdependence can be disregarded. And, depending on whether or not there are wealth effects, because of the interdependence between the sphere of production and the sphere of circulation, innovation and related changes are compatible with both Marx's 'bad' competition and Smith's 'good' competition, thus confirming that, in the absence of specifications, incremental innovation is neither a necessary nor a sufficient condition for growth. Consequently, the justification of monopoly profit as a guarantee of the reward for innovation itself collapses, a type of profit that – by the way - needs anything but additional justification.[22]

Moreover, if Schumpeter had had in mind the organizational aspects of the firm in the sense illuminated by Coase, even the figure of the entrepreneur-innovator would be far from obvious since, as happens more often than not, the innovation itself, particularly if incremental as already argued above, can be sold to an existing firm like the other services that do not pertain to its nature as discussed in Part One.

Secondly, to be noted is that adherence to the neo-classical approach induced Schumpeter to adopt an elitist view of the figure of entrepreneurs, contrary to the egalitarian view of Smith already mentioned in the Introduction and for whom: "A great part of the machinery 'made use of' in those manufactures in which labour is most subdivided, were originally the inventions of common workmen, who, being each of them employed in some very simple operations, naturally turned their thoughts towards finding out easier and readier methods of performing it." (Smith, 1776, p. 20). Hence, as also anticipated by Schumpeter himself in his later works, the possibility that like the entrepreneur-separator of Alchian and Demsetz also the entrepreneur-innovator could suffer the same curious destiny of being made obsolete by the same technical progress that he himself introduced, given the increasingly collective and scientific character of the innovation process.

More relevant, finally, is the observation that to this elitist view is associated with a conception of growth which at best can be summarized by the slogan 'selection of the extraordinary', but which is inevitably reduced to the protection of those who are extraordinary by birth, while the egalitarian view can be associated with the slogan, at the same time less anxiety-inducing and more robust, of the 'transformation of the ordinary'.

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[22] In fact, even if the interpretation of Schumpeter by the evolutionary theory of the firm were relevant in the economic domain, it would be just the umpteenth justification in efficiency terms of monopoly, which does not contradict but even glorifies the neo-classical idea that value comes from given differences.

This observation could then contribute to clarification of two quite popular notions such as that of equal opportunities and that according to which there would be a trade-off between efficiency and fairness. As regards the former, even though it is true that, like capitalism is preferable to the feudal system or to slavery, the absence of formal discriminations is equally preferable to their presence, if this absence of discriminations is not substantial, the above notion boils down to requiring that the 'club' of extra-ordinaries by birth be open, albeit with door selection organized by the management, a situation that not everyone finds necessarily justified or acceptable (see also Akerlof and Kranton, 2000).

As to the latter notion, also the product of the habit of conceiving the value of economic relationships in the invariable terms of the sum of individual and separate contributions and deriving in particular from equalizing distribution with the transfer for moral purposes of something that has been well earned and deserved to those who have been unable to fulfil those requirements or have been less lucky, to be noted is that to the extent that production involves joint activities, an egalitarian perspective does not contradict the conditions of greater efficiency but is instead one of them, obviously within limits –those of tolerable victimism- and distinguishing clearly between (i) Pareto efficiency, which, as we have seen in this paper, is essentially a normative principle whose origin lies in the period when it was still believed that democracy would benefit the relatively poorer majority, and (ii) efficiency in the sense of the value of economic relations, two notions that often contradict each other.

Such considerations seem therefore to confirm that the dynamics which Schumpeter had in mind consisted of a continuous process of departure and rapprochement to the general equilibrium model, and it is indeed this looked for compatibility with the steady state where economic agents receive exactly their contribution to production that explains the difficulties encountered by the neo-classical approach in explaining the phenomenon of growth which -as Smith's lesson teaches- is based instead on overcoming scarcity.

The fact remains, however, that this view is any case markedly different from imagining a general equilibrium model growing at a constant rate over an infinite horizon and, Marx would add to the benefit of the globalization designers, independently from the other elements of the public life, moreover assumed to follow completely opposite logics such as the effect of society on individuals (as in sociology) or the physical coercion stemming from the monopoly over the use of force (as in politics) –a tribute of dubious benefit to the academic division of labour.

Analogous considerations, *a fortiori*, can be made in regard to the more recent endogenous growth theory, which explains growth either with the incremental innovation of Schumpeterian descent or with various types of externalities, and which shares with Schumpeter himself and the neo-institutional approach the conceptual framework of the general equilibrium plus compatible imperfections. From this point of view, if such sought-after compatibility prevents the theory of the firm from having a theory of the markets, the theory of endogenous growth is constrained by not being able to have a theory of the firm, thus confirming the intrinsic limits of this conceptual framework.

Moreover, as already discussed extensively in the Part One, since this conceptual framework is based on the reversal of the causality from contribution to reward, normally guaranteed by the market, the question remains as to how this reward can be determined.

Indeed, either the problem is circumvented by *ad hoc* notions such as monopoly rent, quasi-rent in monopolistic competition or the difference between external costs and benefits associated with localized externalities, or, in the case of non-additively separable production functions, a general alternative to the neo-classical theory of value and distribution would be necessary to make it possible to overcome the notion according to which the value of the product is invariably determined by the sum of individual and separate contributions.

In this regard, it may therefore be useful to clarify briefly the difference between localised externalities and strategic complementarities, just as in Part One it was important to distinguish between the latter and the increasing returns at the firm level which give rise to monopoly profits (see footnote 20, Part One). Indeed, while a localized externality represents an effect on the objective function of either the victim or the beneficiary, so that there is an effect of the action of an individual on the utility of the other individual, in the case of strategic complementarity, as just pointed out, the effect is on the marginal values of this objective function, so that there is an effect of the action of an individual on the action of the other individual (see also Bowles, 2004, p. 157). In addition to this being the reason why in the two games analysed in this second part the attention has focused more on the relationship between equilibria than on the path to reach the equilibrium within every single game, or on the stability of the 'multi-level' equilibrium, this difference makes it possible to distinguish between internalising such localized externalities and internalising strategic complementarities.

As regards the former, which are about external effects of individual and separable activities, although the assumption of no wealth effects is necessary, the institutions that allow this internalisation do so because they solve the problem arising from the non-excludability of such external effects by separating individual contributions and rewards. As in the case of prices in the general equilibrium model, in other words, these institutions can consequently be rationalised as an alignment between individual costs and benefits, even if this condition differs from the canonical one - individual and independent - because of the transition from a situation of strategic independence to a situation of strategic interdependence, which, incidentally, from a cognitive point of view raises more problems than is usually recognized (Gintis, 2008, par. 8.8.; see also footnote 20).

As regards the latter, instead, which concern the internal effects of a joint activity and are characterized by the existence of a residual that cannot be attributed to any individuals in particular but to their relationships, one finds the outcome, as already repeatedly noted, for which this residual is either appropriated or shared depending on the presence or absence of wealth effects; a feature that on the contrary is in any case incompatible with the canonical condition of individual maximization even if this does not mean that it is incompatible with individual notions of rationality that are more suitable to the context considered here.

Finally, halfway between localised externalities and strategic complementarities, finally, are the so-called 'network externalities', which are characterized by the fact that the effect on the utility of an individual depends on the level at which the action in question is exercised by the rest of the economic agents as a whole. In this case, as noted by the relevant and already quoted literature, it is likely that there will be an impact also on marginal values. We thus return to the domain of the just highlighted incompatibility with the idea that the value of economic relationships is invariably determined by the sum of separate individual contributions and consequently with the neo-classical theory of value and distribution.

To sum up, while increasing returns at the level of the firm are incompatible with the general equilibrium model because, unlike the strategic complementarities, they are incompatible with the price-taking condition, localised externalities, unlike strategic complementarities, are compatible with the general equilibrium model because they are not inconsistent with its theory of value and distribution but rather extend it to particular cases which do not call into question its overall structure. Accordingly, they may be understood as 'added', more or less in the sense of the 'islands of conscious power' in the 'ocean of unconscious cooperation' of the quotation from Roberston provided in section 3 of Part One, although within the limit of not leaving the latter completely submerged by the former.

In their turn, these considerations make it unavoidable to point out that the possibility to follow the same path taken for the notion of team production as introduced by Alchian and Demsetz holds true also for the distinction between physical capital and human capital introduced by Becker (1962): the recognition of its clear Marxian origins, the understanding of how, within the neo-classical

approach, it appears in the opposite way with respect to how it was originally conceived and, finally, the observation of how such a reversal is anything but non-problematic in logical terms thus confirming the difficulty of transferring concepts born within one tradition of thought into another, highlighted also by the anonymous referee's quotation to whom, also in this case despite appearances, this paper is dedicated.

Indeed, if such a Beckerian distinction cannot fail to recall the Marxian one between constant and variable capital, in particular with reference to the standard one between fixed and circulating capital (see note 4, Part One), it is equally true that while in Marx the self-expansive property of physical capital is derived from that of labour, in Becker the opposite argument applies: the self-expansive property of human capital is derived from that of physical capital, which is actually like claiming that humans derive their intelligence from robots.

Moreover, whilst in Marx the combination of firm and labour market is such that variable capital is paid its exchange-value to extract its use-value, for Becker, who, for example, studies the training of workers in firms within the neo-classical theory of the firm, that is to say without having a theory of the firm, the same combination ensures that human capital is always paid its use-value, presumably meant as marginal productivity less the costs and benefits of learning, rather than its exchange-value, equally presumably meant in terms of instantaneous marginal productivity.

While for capital accounting rule allow to distinguish between capital gains and income from capital, in the case of labour this is impossible because, explains Becker (1962, p. 14), "The underlying cause of this difference undoubtedly is the widespread reluctance to treat people as capital and the accompanying tendency to treat all wage receipts as earnings.".

But, since human capital is also the sole candidate for the generation of non-additively separable production functions, here too it is possible to raise a problem of compatibility with the methodological individualism and the neo-classical theory of value and distribution.

Moreover, the reason why these marginal productivities of individually considered production factors are so difficult to observe and measure can only depend on the fact that in reality they are never considered individually, other than in the case of independent production, which again illustrates the role of a fully developed theory of the firm with regard to the capital-labour relationship, whose *raison d'être* is precisely that, to refer to the quotation in footnote 9 of Part One, '[With cooperation] [t]here is no longer anything which we can call the natural reward of individual labour. Each labourer produces only some part of a whole, and each part having no value or utility in itself, there is nothing on which the labourer can seize, and say: It is my product; this I will keep to myself' (Hodgskin, 1825, p. 85; quoted in Marx, 1867, p.355). And, of course, this is even more true for the animalistic-but-also-forward-looking notion of marginal efficiency of capital introduced by Keynes.

 In other words, the neo-classical analyses in terms of human capital do not seem to have tackled the problem raised by Alchian and Demsetz (that is to say, the fact that beyond the general equilibrium model productivity does not automatically generate its reward) and even if they have done so, they could only find themselves in the same deadlock, since they at most interpret its effects in terms of externalities, such as the long-term contracts or the increasing profile of wages throughout the career which – at least- arise from Becker's analysis.

Hence, also in this case - and not only because of obvious issues relating to intellectual property - the legitimacy and the opportunity to bring the distinction between physical capital and human capital back into the context in which it was originally conceived, and consequently replacing the neo-classical theory of value and distribution with the classical one in which the value of the product, determined in the phase of production and realized in that of circulation, ultimately resolves itself in the distributive shares rather than being determined by them, with the added benefit of being able to give an account of the generally conflictual nature of economic reality since, aside from the ideal case, the residual nature of profit implies an inverse relationship with wages.

A first consequence of such a re-positioning would therefore be to allow to take into consideration also the aspects of disinvestment and devaluation of human capital - of the subordinated type - which are endogenous to the capital accumulation process, as described in section 2 and as of course already identified by Smith (1776, pp.616-617) as well: "The man whose life is spent in performing very simple operations, of which the effects are perhaps always the same, or very nearly the same, has no occasion of exerting his understanding or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally become as stupid and ignorant as a human creature can become. But in every improved and civilized society this is the state in which the labouring poor, that is, the great body of the people must necessarily fail, unless governments take some pains to prevent it".

From this point of view, too, Smith seems therefore disconnected from the neo-classical view that technical progress is neutral rather than exogenous as regards the introduction of the various techno-economic paradigms and endogenous as regards their development. Technical progress that as we have seen about to the introduction of electronic wristbands and cameras by the entrepreneur-separator discussed in section 4, Part One, is as neutral as an algorithm developed for commercial purposes or a State-sponsored mass surveillance system could be.

The second consequence of this re-positioning would also have to do with the distinction between the elitist and the egalitarian views to which reference has just been made. In contemporary analysis human capital is - not entirely innocently - identified with highly educated labour which, unlike unskilled labour, would share with physical capital the property of being able to reproduce itself within the production process and therefore to operate like the latter as an engine of development, generating increasing returns in the aggregate production function, whose micro-foundations, as previously pointed out, are anything but clear and whose mathematical treatment appears even more wobbly since the logarithmic transformations applied to it confirm the refractory nature of the standard economic approach against multiplication.

In this sense such a re-positioning, re-establishing the direction of causality that goes from the devaluation of subordinated labour to the appreciation of physical capital, once again illustrates, on the one hand, that the self-expansive property of capital is only *an appearance* and, on the other hand, that wealth effects have a role in determining the relationship of substitution or complementarity, and therefore devaluation or valorisation, between capital and labour.

Since the point is important, it may be useful to proceed step by step and start again with Schumpeter. As mentioned in note 5, with his theory of profit and development the Austrian economist intended to replace the then existing theories of interest, understood as a permanent flow of income. In particular, by narrowing the analysis to productive interest (*produktivzins*) and abstracting from sources of permanent income such as monopoly rents or patents, the point is that without a reason why a certain sum of money today is worth more than the same sum tomorrow, you cannot help but conclude that: "the exchange of present for future is no more an exchange of like for like, and therefore meaningless, than the exchange of something in one place for something in another place. (…). The analogy between loan transactions and exchange arbitrage is obvious, and maybe recommended to the reader's attention." (Schumpeter, 1911, p. 188).

And, of course, that reason cannot be the abstinence of those who offer such a sum of money nor the impatience of those who ask for it, whose consequential nature illustrates how for Schumpeter, too, the variations of supply and demand in the market of the capital are in reality endogenous to the processes of value creation happening within the firm. Nor, for that matter, that reason may be the simple passing of time, which becomes an element of cost only because interest already exists, or the increase in the productivity of the original production factors due to produced production factors such as machines, since such an increase must then be attributed ('imputated') to the former, while

competition erases any possible difference between the latter's value and the value of its product –a point that does not sound badly from a Marxian perspective.

But – precisely - the creation of surplus-value that Schumpeter attributed to the entrepreneur's innovative behaviour.

Hence, for one thing, the proposition according to which: "Interest acts as a tax on profit" (ibidem, p. 175) and secondly the need to observe a continuous turnover of innovative entrepreneurs and the consequent confirmation of the instantaneous nature of monopoly profit as it was intended by him. This constant burst of innovations, on the one hand, explains the permanent character of interest and on the other hand identifies a conflict of interests (!) between entrepreneurs and capitalists, or between debtors and creditors, although partly mediated by the not always stabilizing banks' function to create purchasing power and, in fact, hidden by the confusion between the notions of interest and profit –in the less 'precise' versions, 'profit is simply interest on capital'.

However, since Schumpeter's theory is logically flawless but unfortunately not true, one can only return to Marx's point that, since interest is a tax on profit and profit is a tax on labour, it is capital itself that in general case acts as a "fetter" or, employing the less dramatic expressions used by Schumpeter, as a 'brake' or indeed as a –gigantic- 'tax' on the economy and more generally on society as a whole (for a first step in the determination of the exchange value in the ideal case, see the Italian version).

The third and related consequence, in effect, would have the non-secondary effect of avoiding another type of confusion, that between two concepts which, instead of being two sides of the same coin, are linked by a relationship of cause and effect. It is not unusual, for example, for a patent or the ability to perform analyses to be considered as forms of human capital, distinguished according to the degree of rivalry and excludability and with a consequent preference for the former given the ability to generate growth and – permanent and monopolistic - profits stemming from the fact that they are artificially scarce public goods which can be copied at zero cost. And, especially in regard to what has just been said, this is of course a remarkable difference with respect to the profits of the Marxian or industrial type deriving from the transformation of labour, which does not occur for free but anyway at a cost which is lower than the benefits it generates (Battistini, 2013b).

Despite being a goal that even in this case could hardly be seen personally, the enhanced clarity - also terminological - implied by passing from physical and human capital, or constant and variable capital, to capital and labour, whereby the former is meant as money in motion in the Money → Commodity → More Money circuit, and the latter according to the common sense meaning, would have the equally desirable effect of leading to the eventual demise even of notions such as that of 'social capital' and 'political capital', likewise based on the misunderstanding that depends on the just stressed solely apparent character of the self-expanding property of capital but, with the possible exception of natural capital, are even more out of place given the domains, not even economic, to which they are applied.

Finally, despite this habit of standard economic theory not to distinguish between things and people, which Marx called "fetishism", is present in it from its birth and in modern times attributable at least to Walras, though absent in both Smith and Schumpeter, it seems appropriate to note that this tendency towards the reification of social and economic relationships is certainly one of the causes of the situation where, even when attempts have been made to tackle Smith's reasoning on the division of labour and the extent of the market, there has been no more than the alternative between increasing returns at the firm level, whose relationship to the limits of obsession with discipline can only be attributed to the fact that it is also the only way in which capital can give the appearance of creating value, or vertical disintegration, i.e. the expulsion from the circuit of capitalist production of no longer profitable activities, which instead of being a way to approach what in the standard economic theory

is called the 'first-best' condition, is actually an almost inevitable characteristic of the 'flood-like' nature, so to speak, of the capital accumulation process (Stigler, 1963).[23]

5. Conclusions.

This paper has outlined an institutional and evolutionary interpretation of Marx's version of the labour theory of value. In other words, the original analytical formulation in terms of the quantity of labour socially necessary to produce subsistence goods has been substituted with a qualitative – and consequently monetary- formulation in terms of the amount that is possible to earn from an independent participation in the production process, without specific means of production in the usual meaning of the expression.

In its turn, this formula for wage determination is an application of the pricing rule which holds for the other commodities, that is, their exchange value: the amount that would have been cost to obtain the same commodity by buying it on the market of independent producers, i.e. those who do not participate in the capitalistic Money→ Commodity → More Money circuit but in the non-capitalistic Commodity → Money → Commodity circuit, took the place of the direct and indirect quantity of working hours contained in a given commodity.

As in Marx, therefore, the distinguishing feature of capitalism in a strict sense is precisely this tendency to treat subordinated labour as it were a commodity like the others but, as in Marx, since it is instead a highly distinctive commodity, indeed unique, the origin of surplus-value should not be sought in the sphere of circulation or exchange, which actually can be assumed to be "exchange among equivalents", but in the sphere of production, i.e., in its 'consumption' within the production process.

The utility that the owner of such a production process derives from this consumption of labour-power corresponds in fact to its use-value and, as in the present qualitative version the passage in terms of surplus-labour is skipped for theoretical as well as practical reasons, this use-value of labour-power corresponds to the exchange-value of the produced good. From this it follows the existence of a kind of profit that derives from the difference between the use-value and the exchange-value of labour-power, but measured in terms of transaction costs.

To clarify the point, which emerges neither from the 'orthodox' nor from the 'heterodox' approaches, what has been just indicated as the distinguishing feature of capitalism in a strict sense, i.e. the definition of capitalism in terms of wage-labour referred to in the text, is actually a biased feature, not to say a plainly discriminatory feature: differently from what happens in the markets of the other production factors such as capital or professional labour, where property rights on the end product are exchanged, in the unskilled labour market the right to use labour-power is exchanged, precisely as it happens for raw materials or consumer goods such as homes and cars –and as should be the case for capital, as just pointed out.

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[23] As Bowles and Gini's (1998, p. 84, emphasis in the text) point out: "Adam Smith exemplified the liberal tradition in his lively concern with the self-interested pursuit of economic goals and its ramifications in economic theory. Leon Walras, by contast, had defined the pure science to which he aspired as the study of relationships among *things*, not *people* and sought, with notable success, to eliminate human relationships from his purview. His device for accomplishing this, the *Walras' fiction* as we call it, was the notion that economic interactions among economic agents may be represented as if they were relationships among economic outputs. Walras (1873 [1954, p. 225) wrote: "Assuming equilibrium, we may even go so far as to abstract from entrepreneurs and simply consider the productive services as being, in a certain sense, directly exchanged for one another…" He added (p.71): "the pure theory of economics resembles the physico-mathematical sciences in every respect.".

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