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Micro-Founded Institutions and Macro-Founded  
Individuals: The Dual Nature of Profit

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**Abstract:** Starting from the observation that surplus-value is almost always due to the collective undertaking of non additively separable human capital investments, this paper introduces a theory of the institutional structure of production where groups are taken as units of analysis in a multi-level competition framework that conceptualizes a mutually-determining co-evolution between individuals and institutions. The main result is that monopoly profit is not the only meaningful notion of profit besides the value of individual contribution, and consequently that free-entry and competition do not necessarily wipe it out. The intuition behind the ‘purest’ case where the incumbent’s profit does not arise from his uniqueness but only from the production process, is that the entrant has no incentives to undercut because he can earn the same profit by doing exactly the same thing.

**JEL:** A12; D20; D33; D74; L22; J21; J64.

**Keywords:** value, power, conflict, competition, Pareto-efficiency.

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## 1. Introduction

In the lecture delivered on receiving his Nobel Prize, Coase (1992) summarized his fundamental contribution to microeconomic theory as having shifted the focus of analysis from the exchange of physical entities such as commodities to the exchange of legal entities such as rights. In regard to industrial organization, in particular, this shift amounted to moving from price and quantity determination to explanation of the institutional structure of production, globally meant as comprising the competitive structure of markets and the firms' organizational structure, or the division of labor between firms and the division of labor within them.

To the extent that Coase's insight is exhausted in the simple extension to production of the logic of Pareto-efficient exchange among given individuals, however, this paper will argue that the entire project is, at best, incomplete.

Not surprisingly, the starting point of the analysis is the notion of 'team production', or non additively separable production functions. By definition, indeed, a non additively separable production function means that productive factors collectively transform themselves in the production process. In turn, this transformation of productive factors, rather than the substitution between them, may be taken as the distinguishing feature of production with respect to exchange, casting doubts on the view of economic phenomena as collections of distinct individual contributions and shifting the focus of the analysis from the allocation of scarce resources to the creation of a surplus. In other words – as long ago anticipated by Marx and, before him, by so-called 'utopian socialists' – cooperation in teams implies that the total product is larger or better than the sum of separable outputs from each cooperating individual, but '[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).<sup>1</sup>

Given that the idea is not new, the theoretical contribution made by this paper is its application of the notion of non additive separability to the concept of human capital investment, the aim being – as anticipated in the title – to expand its standard treatment to account for the feedback effect of the institutional structure of production on 'the productive capacities of human beings as income producing agents in the economy' (Rosen, 1987, p.681).

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<sup>1</sup> In effect, Marx devoted an entire chapter of *Capital* to cooperation as a determinant of the production of surplus-value and as a distinctive feature of capitalism with respect to the previous modes of production (the thirteen). This observation prompted the perception of the difference between the division of labor carried out by the market and the division of labor carried out within the firm, leading to anticipation of many of the issues of the modern theory of the firm (see Pagano, 2007). The labor theory of value as an objective theory of value providing physically comparable measures of value, however, persuaded Marx that 'natural' prices, reflecting the amount of resources used in the production process, could be decoupled from market prices, with the consequent exaggerated policy implication of abolishing markets. See also footnotes 12 and 18.

Accordingly, production processes will be classified depending on whether the team feature applies both ex ante and ex post, ex ante but not ex post, ex post but not ex ante, or neither ex ante nor ex post. Recalling the definition of investment as the current employment of resources to increase future production, the terms ex ante and the ex post refer to the periods before and after the decisions taken become operative, and, to facilitate an abstract representation of working life as consisting of these two periods, throughout the paper they will also be called ‘preparation’ and ‘realization’.

On the basis of this classification it will become clear that the logic of Pareto-efficient exchange among given individuals is best suited to analysis of only one case out of the possible four: namely the rather special one where the production process requires investments which are separable both ex ante and ex post. Indeed, when a production function is additively separable, that is, when it can be written as a sum of single-variable component functions, the maximization of such component functions is a necessary and sufficient condition for the maximization of the whole function. And, as will be seen, since it is easy to interpret this case as implying that individual optimization coincides with collective optimization, this is also the only case where the institutional structure of production (perfect competition among individual producers) can be interpreted in terms of the optimal incentive condition involving a perfect alignment between individual contributions and individual rewards, both deriving from specialization according to comparative advantage.

In the other three cases, however, the separate maximization of the component functions is neither a necessary nor a sufficient condition for the maximization of the whole function. Rather, as also shown by the equivalent notion of strategic complementarity, there are gains to be made from the joint determination of the variables which appear in the whole function. Consequently, the possibility of using Pareto-efficiency as a positive principle requires, as a necessary condition, the assumption of no wealth effects, which re-establishes the logical equivalence between individual and collective optimization.

But, although not particularly unrealistic for firms’ relationships, this assumption covers the element of collective transformation mentioned above, and with it, the related issues of power and conflict, respectively meant as the capacity to impose one’s will on others and as a situation where one’s gains are the other’s loss. Not by chance, in their famous solution to the problem of nature of the firm, obtained by adding the assumption of opportunism to that originally introduced by Coase (1937), and by consequently defining team production in terms of costly metering, Alchian and Demsetz (1972) attribute to the entrepreneur precisely the function of separating individual contributions, so as to make it possible to resume the familiar conceptual

framework of the gains from trade deriving from specialization according to comparative advantage (see also Barzel, 1987). And, again not by chance, this is the reason why in what follows both such assumptions are discarded, transaction costs are mainly understood as coordination costs rather than incentives costs, and the role of free-riding and other forms of cheating are played down in favor of the issue of whether the solution to the coordination problem raised by strategic complementarities is symmetric or asymmetric – a perspective which, moreover, is not entirely inconsistent with the Coase theorem itself.<sup>2</sup>

The rest of the paper is organized as follows. The next section introduces the approach proposed, showing that monopoly profit is not the only possible notion of profit besides the value of individual contribution, and that consequently free-entry and competition do not necessarily wipe it out. More specifically, the results on the institutional structure of production associated with the three cases involving collective investments are set out in the form of propositions in sub-section 2.1., and discussed in their relation to the case of independent production, as well as to the opposite approaches of new-institutional economics and the Marxist literature, in sub-section 2.2. Section 3 provides past and present applications of the proposed reasoning, together with some possible extensions. Section 4 briefly concludes.

## **2. Individuals and institutional rules between methodological individualism and structural holism**

Reversing the order followed in the Introduction, this section initially abstracts from the case of independent production, postponing its full discussion to sub-section 2.2.

The reasoning is as follows (fig. 1). When surplus-value is created by the collective undertaking of non additively separable human capital investments – an apparently ubiquitous situation since otherwise we would not observe such extremely costly organizations as firms – it is reasonable to think of the economy as if it were inhabited by a population of groups, each of them consisting of the individuals who belong to it, of the relationships among them (intra-group relationships), and of the relationships between them and the other groups (inter-group relationships).

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<sup>2</sup> As well known, because of the distance from the original meaning that Coase gave to transaction costs, he has always been rather skeptical about the role of opportunism as a way to ‘operationalize’ his own ‘fundamental insight’ (see, for example, Coase, 2000; see also Matthews, 1986, Milgrom and Roberts, 1990, and Taylor 1976). As to the Coase theorem (Coase, 1960), then, even the assumption of no wealth effects may end up by having to be interpreted as its sister assumption of no transaction costs: not a simplification which does not entail generality losses, but a way to illuminate its role.

Using an approach intermediate between the methodologically individualistic approach of new-institutional economics and the structural holistic approach of orthodox Marxism – that is, seeking not to explain institutions in terms of the interaction between given individuals or individual behaviors in terms of given institutions – the paper takes groups as the units of analysis in a multi-level competition framework where between-group competition and within-group competition are assumed to operate sequentially in logical time and respectively determine inter-group relationships and intra-group relationships.

More precisely, exogenous technological conditions (i.e., the above type of investments) determine the nature of inter-group relationships, these being defined as the institutional rules that govern the process by which groups form, interact with each other, and become extinct. By providing the conditions under which a participation constraint from boundedly rational individuals – the organizational counterpart of a technological feasibility constraint – is satisfied at minimum cost, inter-group relationships will be shown to be determined according to the group-value maximizing pressure of between-group competition. In other words, groups that fail to conform to the right type of inter-group relationship do not minimize technological and organizational costs, or they do not even make the right investments, and are therefore assumed to disappear (see Alchian, 1950). In particular, following the timing structure attributed to the investment process, the three types of inter-group relationships considered in the paper will be called conflictual, fission-fusion with commitment, and fission-fusion without commitment, where these terms respectively mean that groups form, interact with each other, and become extinct through mutual assimilation or absorption (as if they were never ceasing to exist as groups), through a two-period, rule-based association of single individuals, or through a one-period, unregulated association of single individuals.<sup>3</sup>

Such inter-group relationships, in their turn, perform a twofold role. On the one hand, because they are the rules whereby groups interact, they amount to a given surplus-value realization process: that is, the market's competitive structure through which surplus-value is realized and becomes profit. Accordingly, the three cases initially analyzed, and corresponding to the three types of inter-group relationships just mentioned, will be respectively called a between-group competition push (as when surplus-value is realized as profit deriving from oligopolistic price competition), a between-group opportunity pull (as when surplus-value is realized as profit arising from monopolistically

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<sup>3</sup>I adapt this terminology from the evolutionary group selection models in biology, anthropology and economics (see, respectively, Sober and Wilson, 1998, Einrich, 2004, and Bowles, 2004, ch. 13).

competitive product differentiation), and a within-group competition push (as when surplus-value is realized as profit arising from a perfectly competitive squeezing of the other group members' shares of the surplus).<sup>4</sup>

On the other hand, because inter-group relationships are the rules whereby groups become extinct, they determine who the (next generation) intra-group decision-makers are, that is, the structure of property rights on the relevant assets and skills, and the associated system of shared distributional beliefs ensuring that they are self-enforcing.<sup>5</sup>

The decision-maker's value-maximizing pressure of within-group competition, then, determines intra-group relationships, these being defined as the institutional rules governing the division of labor and the distribution of the surplus within the group. To put it another way, given the outside options of the other group members, decision-makers manage the production process so as to maximize their share of the surplus (see Veherencamp, 1983).

Such intra-group relationships, finally, will be distinguished according to two basic features. The first is whether they are hierarchical or egalitarian, both in the organizational sense of how decisions are taken (by authority or by consensus), and in the distributional sense of how surplus is distributed (by appropriating or sharing). The second is whether they are decentralized or centralized, in the sense of whether or not recruitment occurs in the presence of equally attractive outside options.

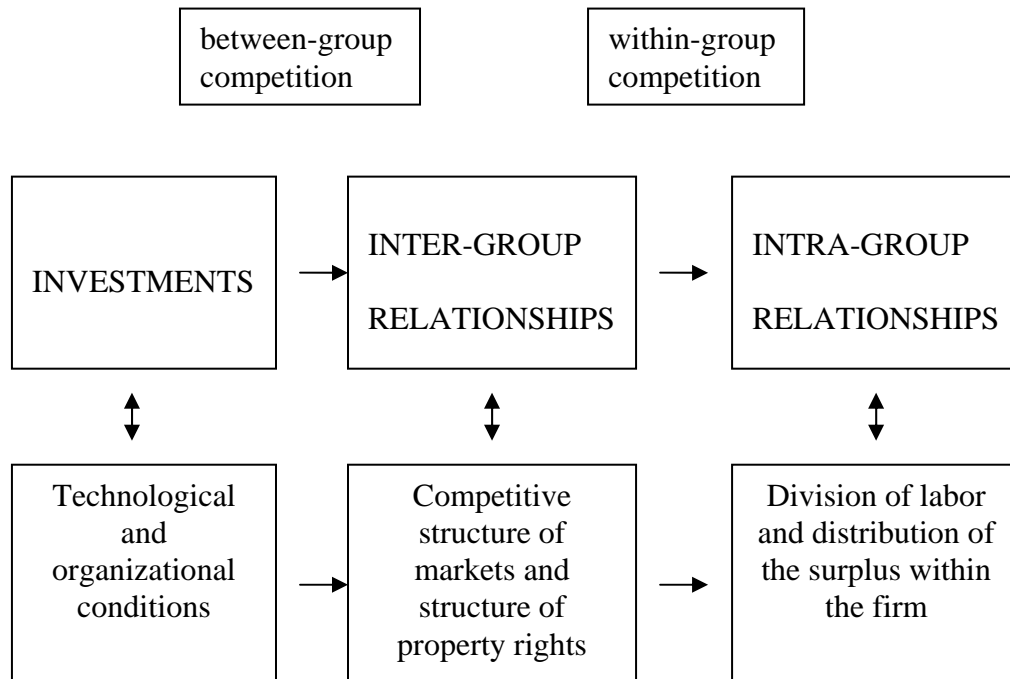
In sum, the more the institutional structure of production is akin to what Schumpeter called 'pure' capitalism, meant as consisting solely of private property, competition and division of labor, the more it is likely that a sharp distinction between decision-makers and subordinates obtains. Because the assumption of no wealth effects has been dropped, the value of the group will not be maximized in the game, so to speak, within the group, so that total value (or the value of the super-group) will not be maximized either. For the time being, this focus on the possibility that, especially as far as employer-employee relationships are concerned, there exist Pareto-efficient allocations that do not maximize total value may be taken as the main motivation for the assumption about the sequential operation of the multi-level selection process, echoing the

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<sup>4</sup> I take the terms 'competition push' and 'opportunity pull' from Ghiselin (1995). In more familiar terminology, they correspond, respectively, to a movement along and a movement toward the Pareto-frontier. See also Calabresi (1991).

<sup>5</sup> The role of (cultural) beliefs in representing institutional elements exogenous to every individual whose behavior they influence, but at the same time endogenous to all of them when it comes to their equilibrium reproduction, has been pointed out by Aoki (2001; 2007), Greif (1994, 2006), and Hodgson (1998; 2006). A more detailed, but still informal, treatment of the process of beliefs' formation and updating in the present framework is conducted at the end of section 3. The specific types of (distributional) beliefs associated with the various structures of property rights are made explicit in the next sub-sections.

famous opening sentence of Marx's *Critique of Political Economy*.<sup>6</sup> At the end of section 3, however, where the paper outlines the possibility that those Pareto-efficient allocations that do not maximize total value are contested, it will be argued that the underlying attempt to conceptualize the co-evolutionary nature of the interaction between individuals and institutions may be rationalized as a more general consequence of the difference between social and natural sciences.



**FIG. 1**

<sup>6</sup> As the definition of groups given above makes clear, relinquishing state of nature abstractions with isolated individuals does not mean attributing causal force to higher order entities independently from the individuals who belong to them. In this sense, an even better quotation can be taken from the *German Ideology*, where Marx urges us to consider individuals '(...) in the material conditions under which they live, both those which they find already existing and those produced by their activity' (Marx, 1845, p. 7). But, of course, since this evolutionary interpretation of Marx's method may not be entirely convincing from the point of view of the history of economic thought, like the other recurrent references to his work, it is made mainly for the sake of explanation.



## 2.1. The institutional structure of collective production and the dual nature of profit

Equipped with the above methodological and terminological material, we are now in a position to state and demonstrate the propositions concerning the three cases involving cooperative production. Before doing so, however, it is useful to specify the timing structure and simplify the relation between price and quantity.

**HYPOTHESIS 1:** individuals live in only the two periods necessary for the investment process, the ex ante period ( $t=0$ ) and the ex post period ( $t=1$ ), but they leave their property (assets and skills) to their (one for each) offspring.

To fix ideas, it may be useful to think of only two pairs of individuals per generation ( $T=-1$  and  $T=0$ ), randomly drawn from the entire population. Note also that parents enter the problem only to satisfy the individual participation constraint ensuring that investments are made. Quite similarly to what evolutionary game theory assumes, and in effect representing the technical solution to the problem giving the paper its title, parents are assumed to be only myopically rational. The subsequent decrease in the uncertainty faced by actors across generations, captured by the evolution of the shared system of distributional beliefs, is thus rationalized as an effect of the complexity-reduction function usually attributed to institutions.

**HYPOTHESIS 2:** production is assumed to consist in producing a single item.

Unlike the previous one, this is a simplifying assumption which does not entail generality losses. For the same results would be obtained if the quantity produced were equal to the one minimizing organizational and technological costs, an outcome usually associated with price-taking and which is perfectly consistent with the present framework. Moreover, the assumption also highlights the fact that there is no necessary relation between non-separability and the nature of returns to scale.

**PROPOSITION 1:** when the best investments are non-separable either ex ante or ex post, inter-group relationships are conflictual, the surplus-value realization process is a between-group competition push, and intra-group relationships are hierarchical and centralized (fig.2, box to the upper left; see also fig. 3, same box).

When the most productive investments create a surplus both ex ante and ex post, they can never profitably stay independently on the market; rather, as a

consequence of technological and organizational non-separability, they must be undertaken collectively in both the preparation and realization periods (with the introduction of a new machine and on-the-job training, for example). Accordingly, since groups must be in place at  $t = 0$  and last until  $t = 1$ , the group-value-maximizing pressure of between-group competition implies that cost-minimizing groups emerge from conflictual inter-group relationships.

Consequently, the surplus-value realization process is a between-group competition push, whilst intra-group relationships are hierarchical and centralized. On the one hand, the equilibrium price is equal to the higher of the two investment costs. On the other hand, the decision makers are the offspring of the winners of the previous conflict, and the pressure of within-group competition drives them to take control of the entire investment process, appropriating the entire surplus. With hierarchical beliefs implying that any arrangement satisfying a constraint in terms of participants' market value will be accepted, subordinates are left with what they can get from totally independent participation in the production process (subsistence wages, to anticipate the literal application in the next section). Recruitment, finally, is centralized because it does not occur in the presence of equally attractive outside options, and, in this sense, the entire situation can be said to involve coercion.<sup>7</sup>

**PROPOSITION 2:** when the best investments are non-separable ex ante but are separable ex post, and the (net) value of a truncated investment of this kind is lower than the (net) value of the available investments separable both ex ante and ex post, inter-group relationships are fission-fusion with commitment, the surplus-value realization process is a between-group opportunity pull, and intra-group relationships are egalitarian and decentralized. Otherwise, proposition 3 below applies (fig.2, box in the middle; see also fig.3, same box).

When the most productive investments create a surplus ex ante but not ex post, they must be undertaken collectively in the preparation period but can be realized independently – as, for instance, with collective specialization in a new professional field like, say, class action. In this case, indeed, groups must be in place at  $t = 0$  but not necessarily at  $t = 1$  since in the absence of the team

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<sup>7</sup> I use the term 'coercion' to denote a situation where subordinates have no equally attractive outside options and cannot undertake any of the investments by themselves, although of course physical violence is not implied (subordinates are paid what they can earn from independent participation in the production process). *A fortiori*, this is true of the situation where subordinates have equally attractive outside options but cannot begin or realize the investment independently (propositions 2 and 3), where I use the term 'force'. As will be seen at the end of the next sub-section, however, they are both an instance of power as defined in the Introduction. See also the quotation from Mokyr (2002) in section 3.

production feature, technological and organizational costs are minimized with self-organizing producers. Hence, if the above condition holds, the group-value-maximizing pressure of between-group competition implies that the most successful groups emerge from fission-fusion with commitment inter-group relationships.

The surplus value realization process therefore consists of a between-group opportunity pull, while intra-group relationships are egalitarian and decentralized. On the one hand, following the convention of representing the benefit of product differentiation with a reduction in transportation costs, the equilibrium price is equal to the cost of the other investment. On the other hand, because the commitment prevents would-be dominant individuals from appropriating the entire surplus by realizing the investment independently (as exemplified by the non-compete clauses commonly used in partnerships, to anticipate an application in the next section), property rights and the associated system of shared distributional beliefs are such that nobody is provided ex ante with the assets and the skills for autonomous participation in the production process, so that the decision-maker is the whole group. The investment process is therefore regulated by consensual decision making, while the joint surplus is shared according to inter-subjectively defined rules (as a consequence of egalitarian beliefs implying that only arrangements where the constraint is articulated in terms of the market value of the joint product will be accepted).<sup>8</sup> Finally, in this case, recruitment is decentralized in the sense that previous groups disband into their constituent parts and the new ones are formed by single individuals ‘choosing’ among equally attractive outside options.

**PROPOSITION 3:** when the best investments are separable ex ante but not ex post, and the (net) value of a truncated investment of this kind is higher than the (net) value of the available investments separable both ex ante and ex post, inter-group relationships are fission-fusion without commitment, the surplus value realization process is a within-group competition push, and intra-group

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<sup>8</sup> From a normative point of view, the already cited Hodgskin (1825, p.83) puts the matter in the following terms when describing the rules of just distribution in his ideal society: ‘There is no principle or rule, as far as I know, for dividing the produce of joint labour among the different individuals who concur in production, but the judgment of the individuals themselves; that judgment depending on the value men may set on different species of labour can never be known, nor can any rule be given for its application by any single person.’. Shortly afterwards, Hodgskin singles out the conditions under which market-based distribution would be acceptable: ‘*If all kinds of labour were perfectly free, (...) there would no difficulty on this point, and the wages of individual labour would be justly settled by what Dr. Smith calls the “haggling of the market.”*’ (ibid., pp. 85-86, emphasis added). In this sense, Marx’s harsh critique of ‘utopian socialists’ as unscientific –that is, lacking the precision of the natural sciences– may have been decisively influenced by the positivist climate of his times, though of course it also true that their economics was rudimentary at best.

relationships are hierarchical and decentralized. Otherwise, proposition 2 applies (fig.2, box to the lower right; see also fig.3, same box).

When the most productive investments create a surplus ex post but not ex ante, they can be undertaken independently in the preparation period but must be realized collectively – as, for instance, when a given product is designed and assembled.

If the above condition holds (as it may in the case of subsidized middle-level education or immigration, for example), since groups must only be in place at  $t = 1$ , the pressure of between-group competition implies that the most successful groups arise from fission-fusion without commitment inter-group relationships.

Since investments are not to be realized with specific counterparties, they cannot be much better or very different from each other, so that they will be basically the same (as must be the case with outsourcing, to anticipate the two applications in the next section). Hence in this case the process of surplus-value realization amounts to a within-group competition push, while intra-group relationships are hierarchical and decentralized. On the one hand, the equilibrium price is equal to the cost of the next best type of investment (as in the following case of totally independent production, the point here is that there is no strategic interaction between groups, so that there is nothing to gain from lowering prices). On the other hand, decision-makers are (the offspring of) previously successful surplus-takers and the pressure of within-group competition drives them to dominate realization of the investments, this time appropriating the surplus created at this stage. With the same hierarchical beliefs of Proposition 1, in effect, subordinates have no reason to expect better terms elsewhere, but they cannot realize the investment independently and are consequently forced to accept being paid the value of their truncated investment. Finally, in this case too, recruitment is decentralized because new groups are formed by individuals coming from the independent investments period, so that they still ‘choose’ the group among equally attractive outside options.<sup>9</sup>

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<sup>9</sup> Of course, the most probable situation is one where subordinates are in excess supply, so that also market power enters the picture. Remarkably, however, the situation is theoretically consistent with free-entry and full employment (after which the condition given in the text becomes meaningless, prompting a change in the resulting inter-group relationships and the associated surplus-value realization process). This point is especially relevant to the analytical Marxist approach which, dropping the labor theory of value and working in a market imperfections framework, tends to view power solely as a consequence of workers being on the short side of the market (see Bowles and Gintis, 2008).

If, conversely, the above condition does not hold (as in the case of costly elitarian education or a sufficiently high ‘basic income grant’, for example), the pressure of between-group competition implies that the most successful groups arise from fission-fusion with commitment inter-group relationships, so that Proposition 2 applies (the only difference being that they form at  $t=1$  with the commitment implicitly covering  $t=0$ , instead of being formed at  $t=0$  with the commitment explicitly covering  $t=1$ ).

Inter-group relationships		Intra-group relationships		
		(1) Hierarchical and centralized	(2) Egalitarian and decentralized	(3) Hierarchical, decentralized, or case (2)
(1) Conflictual	non-separable either ex ante and ex post <i>between-group competition push</i>			
(2) Fission-fusion with commitment	non-separable ex ante, separable ex post <i>between-group opportunity pull</i>			
(3) Fission-fusion without Commitment, or case (2)	separable ex ante, non-separable ex post <i>within-group competition push</i>			
Investments / <i>Surplus-value realization process</i>				

**FIG. 2**

The conclusion to be drawn from this section, of course, is not that free-entry and competition do not eliminate monopoly profit. The point is instead that, even if there are neither rents nor collusion, there is still another sort of profit which arises from realizing the surplus-value created by the collective undertaking of non-additively separable human capital investments, and it is measured by the difference between the cost of such investments and the cost of the next best investments (the equilibrium price or opportunity cost). Rather than being eliminated by competition, therefore, it is this other sort of profit that determines the competitive structure of markets as the way in which surplus-value is realized.

Accordingly, such a result can be understood as a consequence of moving from a ‘neo-classical’ perspective basically deriving from the logic of exchange (where surplus-value can only arise from some form of scarcity, competition is an exogenous condition, and prices reflect the technical rate of substitution between productive factors) to a somewhat more ‘classical’ perspective (also) based on production (where surplus-value arises from the team feature, competition is an endogenous process, and prices reflect the cost of transforming productive factors).

Indeed, the intuition behind the ‘purest’ case where the incumbent’s profit does not arise from his uniqueness, but only from the production process (Proposition 3, first part), is that the entrant has no incentive to undercut because he can earn the same profit by doing exactly the same thing.<sup>10</sup> Finally, as also anticipated in the Introduction, although the fact that economic agents can create value even if they do the same thing may seem somewhat encouraging, this other sort of profit must be characterized as having a dual or ambivalent nature because, while essentially originating from cooperation, it is likely to create conflict on the terms of both its production and its distribution.

The next sub-section illustrates how the proposed framework can be adapted to account for two other popular notions of profit: the value of individual contribution, and the profit arising from collective monopoly over the means of production. For both the associated explanations of the institutional structure of production, respectively, the new institutional approach and the orthodox Marxist approach, it will be shown that a special case is mistaken for a general case owing to a considerable degree of methodological inflexibility.

The analysis, however, begins with what can be presented as an institutional understanding of a general competitive equilibrium.

## **2.2. Discussion: the role of groups in institutional analysis**

Contrast the above results with the fourth possible case, the one in which the most productive investments are separable both *ex ante* and *ex post*. Clearly, in this case no surplus is created by cooperation, no collective transformation of productive factors takes place, and investments must be undertaken independently both in the preparation and realization periods (as in traditional agriculture or craftsmanship, for example). It is therefore obvious that groups never form and that inter-group relationships collapse into intra-group relationships.

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<sup>10</sup> In the mixed cases of Propositions 1 and 2, instead, that part of profit which arises from strategic interaction with competitors is to be understood as a quasi-rent.

Consequently, since immediate and impersonal spot market intra-group relationships satisfy the participation constraint at minimum cost, the surplus-value realization process is a within-group opportunity pull (surplus-value is realized as profit deriving from a competitive evaluation of individual contribution, in its turn created by specialization according to comparative advantage.). On the one hand, the intuition being the same as in Proposition 3, first part, equilibrium prices are again equal to the cost of the next best type of investment. On the other hand, as also suggested by the quotation from Hodgskin (1825) in footnote 8, in this case distributional beliefs are such that only arrangements articulated in terms of the market value of individual products will be accepted. Accordingly, as anticipated in the Introduction, such a perfectly competitive institutional structure of (individual) production can be fully rationalized in terms of the optimal incentive condition requiring the full appropriation of individuals' own efforts. Notably, however, even in this case, competition does not eliminate profit but is instead determined as a way to realize surplus-value.

Of course, the situation is unfortunately (and possibly unfairly) consistent with some individuals appropriating all the gains from trade, that is, with unequal exchange. But to the extent that this kind of investment creates a surplus-value with respect to autarchy, every individual has the appropriate incentive to make it. In sum, as importantly shown by the Fundamental Welfare Theorems, distribution has no impact on efficiency; and as equally importantly implied by Samuelson's (1957, p. 894) statement that in general competitive equilibrium 'it does not really matter who hires whom', neither power nor conflict is involved.<sup>11</sup>

This is not the case when surplus-value is created by the collective undertaking of non-additively separable human capital investments. Depending on the nature of inter-group relationships, that is, on the market's competitive structure and the consequent structure of property rights, there may be a tension between the group-value-maximizing pressure of between-group competition and the decision-maker-value-maximizing pressure of within-group competition. When this is the case – that is, the group is sharply divided between decision-makers and subordinates as in the already mentioned Schumpeterian vision of 'pure' capitalism – the investment process is managed (*in toto* or in part) to maximize the former's share of the surplus, and the latter are left with what they can get from independent participation in the production process (implying technological and organizational inefficiency as well as

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<sup>11</sup> To put it another way, in Marx's terminology, market power may arise as a consequence of past circumstances in the sphere of circulation, but independence in the sphere of production means that the logic of an exchange economy successfully applies to production, and distribution policies can only be justified in fairness terms (see Rowthorn, 1974).

exploitation: proposition 1 and proposition 3, first part).<sup>12</sup> When this is not the case – that is, when commitments delineate a sort of ‘regulated capitalism’, so that the decision-maker can be roughly identified with the whole group – the investment process is managed to maximize the joint surplus and individual shares are determined according to inter-subjectively defined sharing rules (possibly implying efficiency and egalitarianism, without exchange among individuals: proposition 2 and proposition 3, second part).<sup>13</sup>

In no case can the institutional structure of production be explained in terms of an efficient alignment between individual contributions and individual rewards, as in the new-institutional literature’s stretching of the logic of exchange. As mentioned, the result may be understood as deriving as much from the dropping of the assumption of no wealth effects as from the dropping of the behavioral assumption of generalized opportunism.

Indeed, while the assumption of no wealth effect is necessary to re-establish the logical equivalence between Pareto-efficiency and value maximization, it is not sufficient to cast the problem as a conflict between individual and collective rationality and, consequently, to conceive its solution – the firm – as a way to internalize the externalities generated by the existence of transaction costs or contractual incompleteness, bringing the surplus value realization process back under the comfortable blanket of a within-group

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<sup>12</sup> The notion of exploitation referred to in the text has already been introduced in another paper (Battistini, 2007) and can be now confirmed by noting that wage is price and, as such, is equal to the opportunity cost of the investments. In some sense, then, this could be interpreted as an attempt to update the labor theory of value by substituting the physical quantity of socially necessary labor time with the value of independent participation in the production process, exploitation being precisely the reason why reality may seem in contradiction with the abstract representation of working life as consisting of the two periods of preparation and realization. Making similar considerations about cooperation as a determinant of surplus-value, Elster (1982, p. 225) quotes the first part of the following, well-known passage: “Now, in my presentation, the earnings on capital are not in fact “only a deduction or ‘robbery’ of the worker”. On the contrary, I present the capitalist as a necessary functionary of capitalistic production, and show at length that he does not only “deduct” or “rob” but forces the production of surplus- value, and thus helps create what is deduct; I further indicate in detail that even if in commodity exchange only equivalents are exchanged, the capitalist –as soon as he has paid the labourer the real value of his labour-power- quite rightfully, i.e. by the right corresponding to his mode of production, obtains surplus-value.” (Marx, 1977, p. 382). See also Pagano and Rowthorn (1994).

<sup>13</sup> Interestingly, in this case the attractive features of exchange in the sphere of circulation (mutual benefits, no power, and no conflict) may be available at the level of the groups. Unfortunately, however, since this is not very likely to occur spontaneously, as a consequence of inserting groups as an intermediate layer of analysis between individuals and society, rather than more and more competition, what may be required is its suppression within the group. The reason is that, as it happened with health and education policies in the so-called Golden Age of capitalism, for example, in the present context it is the empowerment of ordinary people that creates value. See footnote 19.



opportunity pull. This is in effect the role performed by generalized opportunism, both in the asymmetric information literature pioneered by Alchian and Demsetz's 1972 paper, where the emergence of a centralized monitor reverses the market-based relationships between individual contributions and individual rewards, and in the specificity-based literature, where property solves the incentive-depressing lack of coincidence between individual contributions and individual rewards due to the hold-up problem (see Williamson, 1985, for transaction cost economics, and Hart, 1995, for the incomplete contracts approach). In the first case, as shown by the famous grocery example, this logic leads to the conclusion of denying the very existence of power, since, as happens with perfect competition, exit is free. In the second case, this quite extreme conclusion is at least avoided because, by definition, with specific investments exit is instead generally costly. However, perhaps because the analysis is mainly focused on vertical integration, the same logic implies, somewhat paradoxically, that the exercise of power is Pareto-improving.

A less obvious consequence of the assumption of no wealth effects is that groups can be treated like individuals, so that compatibility with the perfect competition model, whose existence and properties are usually assumed, explicitly or otherwise, from the outset, is assured. Ex ante, this general competitive equilibrium 'state of nature' with given individuals is the tool necessary to evaluate comparative advantages and guarantee that property rights flow to those able to make the most efficient use of them. Ex post, supposedly by eliminating monopoly profits, competition guarantees that the ensuing power positions are not abused. Hence the famous statement that 'Economics has gained the title Queen of Social Sciences by choosing solved political problems as its domain' (Lerner, 1972, p. 259) is confirmed, whilst the equally famous metaphor of a competitive economy composed of 'islands of conscious power in this ocean of unconscious cooperation' (Robertson, 1923, p. 85) is borne out.

However, to the extent that the commitment to methodological individualism does not allow one to go beyond the conceptual framework of the gains from trade deriving from specialization according to comparative advantage (actually, a sequence of within-group opportunity pulls), one may argue that is no coincidence that, while neo-classical economics does not have a theory of the firm, new-institutional economics does not have a theory of markets, leaving the Coasean project unfinished.

On the other hand, however, the same type of criticism can be made of the opposite, structural holistic approach taken by the orthodox Marxist theory of the firm (see especially Marglin, 1974). Because of the commitment to the concept of class, indeed, in this case it is individuals that can be treated as groups, so that inter-group relationships again collapse into intra-group

relationships. Hence the only differences are that intra-group relationships now refer to the super-group comprising the two groups (classes) of (industrial) workers and (industrial) capitalists, and that their exploitation-driven, hierarchical character – the firm – implements a surplus-value realization process which is inevitably a within-group competition push. Here, realism is at risk because, without the labor theory of value, profit can only arise from assuming that capitalists collude to enforce their collective monopoly over the means of production, for example engaging in a sort of ‘conspiracy’ to prevent their more ‘enlightened’ fellows from introducing more egalitarian and possibly more efficient forms of organization of production.<sup>14</sup>

The identification of the sort of profit discussed at the end of the previous sub-section instead allows the conclusion to be drawn that, under certain conditions, there exists a group or class conflict which is in the interest of each as well of all the individuals involved, so that no collusion is necessary. In other words, since in this case, as with Marx’s original labor theory of value, it is competition, rather than the lack of it, which determines class behavior, the latter may have to be understood not so much as a conscious will to oppress but as a consequence of a ‘real’ structure which is only partially under the control of the economic actors (and, of course, of which markets are a ‘mere’, if ineliminable, manifestation).<sup>15</sup>

In its turn, however, the existence of this kind of conflict also makes it clear that, to be exercised, power does not need the exit from a given relationships to be costly or even impossible, thus casting doubts on the liberal distinction between the economy as the ‘province of will’ and the polity as the province of ‘coercion’ (see, for instance, Acemoglu, 2003).

### 3. Applications and extensions

This section uses some stylized facts about firms and markets to illustrate past and present applications of the propositions stated in sub-section 2.1 (fig.3).

Firstly, the box to the upper left pertains to oligopolistic competition between hierarchical firms, the best example being the ‘classical’ firm. The main feature of the industrial revolution, in effect, was the rise of the factory, that is, the grouping of previously separate branches of trade under one roof. In the terms used here, this means that investments were non-separable either ex ante or ex post, so that they could not profitably stay independently on the

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<sup>14</sup> Owing to the role played by the micro-foundations of institutions, instead, in the cases of proposition 1 and 3, first part, the reason why more efficient (and more egalitarian) groups do not emerge is simply that they are more costly.

<sup>15</sup> See Wright (1996) for the ontological difference between the uses of the word ‘class’ as a noun or an adjective.

market either at preparation or at realization. As a consequence, inter-group relationships were conflictual and the surplus-value realization process was a between-group competition push (as shown by the early obsession with increasing the volume of production and lowering prices in order to appropriate market share from competitors). As for intra-group relationships, works by Ure (1835), Babbage (1832) and Braverman (1974) leave little doubt that they were hierarchical (both in the organizational sense that investments were intended to diminish the skill content of workers' jobs, and in the distributional sense that wages were fixed at subsistence), and centralized (in the sense that recruitment occurred without meaningful outside options from the outset).

Whilst a non-literal interpretation of the previous case can be extended to contemporary high volume, low-price mature industries (especially in developing countries where market mechanisms are more pristine), the box in the middle instead represents the case of oligopolistic competition between cooperative firms like, for instance, partnerships (see Rayan and Zingales, 1998, and Levin and Tadelis, 2005, for efficiency-based explanations). As a consequence of investments which must be undertaken collectively at the beginning but can be realized independently, inter-group relationships are fission-fusion with commitment (up-or-out promotion rules, non-compete clauses). In turn, the latter can be seen as implying a surplus-value realization process consisting in a between-group opportunity pull.<sup>16</sup> Flat hierarchies and profit sharing, then, are obvious examples of egalitarian intra-group relationships, while their decentralized character is due to the relative mobility of professionals' 'labor markets'.

Finally, the box to the lower right corresponds to perfect competition between flexible firms such as those of the 'putting-out system'. Since this consists of the assembly of separate parts of the product, investments can stay independently in the market at preparation but not at realization. To the extent that this system was the first step in pushing independent crafts out of the market, the surplus-value realization process was a within-group competition push (the piece-rate wage system being an example of subordinates left with the value of a truncated investment), in turn generated by fission-fusion without commitment inter-group relationships (there was no point in having stable groups, and workers typically could sell their produce to multiple 'putter-outers'). Intra-group relationships, on the other hand, were hierarchical also in the organizational sense, and they were decentralized, as evidenced by this quotation from Marglin (1974, p. 81): 'The minute

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<sup>16</sup> After their detailed analysis of the specialization of lawyers in law firms, Garricano and Hubbard (2003) conclude that 'Lawyers are more likely to work at the same firm with lawyers in their own field than with lawyers from any other field' (p.30).

specialization that was the hallmark of the putting-out system only wiped out one of two aspects of workers' control of production: control over the product. Control of the work process, when and how much the worker would exert himself, remained with the worker until the coming of the factory'.

Closer to our times, another example is, for want of a better term, the contemporary 'global' firm.<sup>17</sup> As in the putting-out system, investments can be undertaken independently in the preparation period but must be realized collectively (as implied by the fact that even relatively simple products are the result of a myriad of small components made in different plants often located in different parts of the world). To the extent that the condition given in proposition 3 holds, inter-group relationships are fission-fusion without commitment and the surplus-value realization process is a within-group competition push (as especially demonstrated by private equity firms). On the other hand, intra-group relationships are hierarchical both in the organizational sense (as shown by the new forms of separation between conception and execution embodied in the growing indifference as to where production actually takes place) and in the distributional sense (as confirmed by the 25-year long increase in the earning gap between skilled and unskilled labor). Finally, the super-mobility imposed on relatively unskilled manual or intellectual workers means that they, too, are decentralized.

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<sup>17</sup> Of course, the phenomenon is not confined to multinational firms but is part of the general trend toward sub-contracting and flexibility driven by information technology and the increasing importance of immaterial goods.

Inter-group relationships		Intra-group relationships		
		Hierarchical and centralized	Egalitarian and decentralized	Hierarchical and decentralized
Conflictual	<b>oligopolistic competition between hierarchical ('classical') firms</b>			
Fission-fusion with Commitment	<b>monopolistic competition between cooperative firms (partnerships)</b>			
Fission-fusion without Commitment	<b>perfect competition between flexible firms (putting-out system; 'global' firm')</b>			
<b>Institutional structure of production</b>				

**FIG. 3**

Though somewhat ineliminable, the imperfect match between the taxonomic approach of section 2 and the underlying evolutionary paths just outlined can be improved by tackling the problem of institutional change. On the one hand, indeed, the industrial revolution and the advent of information technology have both been such large-scale pushes that the shift from the putting-out system to the classical firm, and that from Keynesian Taylorism to the contemporary 'global' firm, can be easily accommodated. Indeed, they strengthen the paper's evolutionary characterization because, as the following quotation inspiringly summarizes, in the real world, Pareto-efficient allocations that maximize total value not only exist, but may also change: "For the economist, it is a logical puzzle why, in the absence of *coercion*, workers would voluntarily agree to work in factories if doing so reduced their utility. Many workers were paid a factory or a coal-mine premium as a compensating differential, and workers were provided with benefits such as housing, schooling for their children, and even milch cows (...). Insofar as this was inadequate, however, factory owners, especially in the countryside, relied on pauper children and orphans 'borrowed' from workhouses. Beyond that, however, the *economic logic* of the Industrial Revolution implied that workers might end up working in factories even if it made them worse off than they were before (*though not worse off than if they stayed at home*). The reason is that opportunity cost of many of these potential factory employees was set by

what they could earn in the cottage industry. This alternative declined rapidly because of factory competition and by 1850 was, in most cases, no longer available. The factories, by relentlessly driving down the price of manufactured goods, reduced the earnings of those working at home and thus *forced them (or their offspring)* to abandon their cottages and seek work in the mills or to emigrate” (Mokyr, 2002, p. 128, emphasis added; see also Piccione and Rubinstein, 2007).<sup>18</sup>

But, on the other hand, other complex determinants, such as ideologically and scientifically driven institutional changes, have played a comparable role in other cases (the unions and the role of the state in the post World War II shift toward the Western welfare states, for example). Because knowledge is not only technical but also economic, these latter considerations highlight the main theoretical deficiency of the framework proposed: namely, the feedback effect of the institutional structures on their supporting systems of shared distributional beliefs.

The complexity of the problem suggests that it should be left to future research, but the reason why it should be investigated is obvious. In the language of the game-theoretic approaches to institutions (Aoki, 2001; Bowles, 2004; Greif, 2005; Young, 1998), inter-group relationships are the equilibrium of the (previous generation) game between groups, and at the same time they determine the rules of the game within the group (players, strategies, and pay-offs) and the associated system of shared distributional beliefs. Intra-group relationships, instead, are the equilibrium of the (present generation) game within the group. But, whilst in this paper the rules of the game between groups have been taken to be determined by technological and organizational conditions alone, one can also speculate that intra-group relationships,

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<sup>18</sup>A promising link with the economic-evolutionary literature can therefore be established by extending the analysis to long-run growth, which in the present framework should be conceptualized as the economy-wide, rapid shift from one type of investment to the other, in analogy with the biological concept of ‘punctuated equilibria’ (Eldredge and Gould, 1972). Though the periodization is more closely related to that proposed by Maddison (1982) and, more generally, by the long wave literature (Freeman and Louça, 2001), the logical sequence of the paper’s argument is quite strikingly similar to that embodied in the notion of ‘techno-economic paradigm’, introduced by Perez (2002) and also containing a detailed analysis of capital markets. The identification of another sort of profit in addition to monopoly profit, on the other hand, has two obvious consequences for the neo-classical theory of growth: for one thing, capital accumulation turns out to be a consequence of growth rather than its engine (see Roemer, 1990, for a contrary view); for another, since innovation is not the only such engine either, the indulgence on profit and, consequently, on inequality, as a necessary condition for growth loses much of its appeal, independently of any internalization-of-externalities argument (see, for example, Galor and Moav, 2004). Note, finally, that since updating of the labor theory of value as mentioned in footnote 12 means diluting the distinction between constant and variable capital into the more encompassing concept of human capital, no tendency to a falling rate of profit is implied.

depending on whether or not they maximize group value, may have the effect of either confirming or disrupting the shared beliefs motivating the equilibrium play, thus either confirming or inducing a change in the rules of the (next generation) game between groups (with only the former being, so to speak, a multi-level equilibrium of the super-game comprising the two, doubly recursive games played between- and within-groups).

As anticipated in section 2, in methodological terms, such a development can be justified as a consequence of the difference between the social and the natural sciences. Given that the former, but not the latter, are concerned with observer-relative phenomena, special attention must be paid to the deontological process through which human institutions are collectively recognized and accepted (Searle, 1990; 2005; see also North, 2005 and Gintis, 2007). At the cost of restricting the analysis to economic institutions, in this respect the point to be made should be that this process may be captured by the evolution of shared system of distributional beliefs, in its turn driven by the value-maximization processes implied by the sequential operation of the multi-level selection process. As outlined in the discussion of Hypothesis 1 in sub-section 2.1., in other words, the idea is that players are assumed initially to know neither the game nor the super-game; then they know the game but not the super-game; and finally they know both the game and the super-game but may have conflicting views; in which case institutional change is triggered.<sup>19</sup>

Differently from the classical game theoretic approach, where players are assumed to know everything of interest from the beginning, but – now – also differently from the evolutionary game theoretic approach, where players are never allowed to perform deductive reasoning, this development should consist in representing the knowledge that players possess about the games

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<sup>19</sup> While analytically this kind of cognitive conflict may have to be formalized in terms of uncertainty over a (common) probability distribution on players' types and related strategies, logically it is a straightforward extension of the repeatedly cited result that, with wealth effects, value maximization implies Pareto-efficiency but the reverse does not hold. A shared system of distributional beliefs, understood as referring to a situation where every player knows that every other player will accept a particular distribution of property rights and that every other player knows that every player will do the same, indeed implies Pareto-efficiency but, again, the reverse does not hold. Accordingly, the assumption about the sequential operation of the multi-level selection process may now be seen as a logical trick to point out the possibility that, as a consequence of non-separability, Pareto-efficient allocations that do not maximize total value end up by being (feasibly) contested, which is also the reason why the result should be that the equilibrium just mentioned may exist only by chance but, if it does, it must be efficient and egalitarian.

they play as evolving into forms which may turn out to be critically dependent on the point of view adopted.<sup>20</sup>

#### 4. Conclusion

A much debated divide in theories of institutions is that between those that explain institutions in terms of the interaction between given individuals in a state of nature and those that explain individual behaviors in terms of given institutional structures. In the theory of the firm, this divide reflects the difference between the new-institutional approach, where the organizational structure of the firm is seen as the result of Pareto-efficient exchanges of property rights between given individuals, and the orthodox Marxist approach, where the organizational structure of the firm is seen as the result of the pre-existing conflict between capitalists and workers. In the former case, unlike in the perfect competition model, the assumption of no wealth effects is crucial because otherwise there is no logical equivalence between Pareto-efficiency and value maximization. In the latter case, the assumption of collusion is crucial because otherwise, as a consequence of the dropping of the labor theory of value, individual capitalists would face an ordinary collective action problem.

Consequently, while in the former case groups are treated like individuals so that there are no groups, in the latter case individuals are treated as groups so that there are no individuals. Moreover, for opposite reasons, in both cases group or class conflict is not an economic, but a political, phenomenon.

In seeking to fill this gap, this paper has attempted to conceptualize the co-evolutionary nature of the interaction between individuals and institutions by taking groups as the units of analysis in a multi-level competition framework assumed to operate sequentially both between and within groups. The other, related and even more critical assumption has been that surplus-value is almost always due to the collective undertaking of non additively separable human capital investments. Whether or not this notion of non additively separable human capital investment can be better understood as an updating of the labor theory of value, laying the basis for a re-submission of Marx's critique of the notion of formal freedom, is an issue which has been repeatedly touched upon throughout the paper but, on the whole, is left to a future article.

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<sup>20</sup> Naturally, social sciences are subjective only in an ontological sense, being instead objective in the epistemic sense that their claims are observer-independent (otherwise no social science would be possible).



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