Ugo Pagano [*].

Redistributions of Assets and Distributions of Asymmetric Information.

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Introduction.

"What new configuration of state, communities, and markets would be permitted by a more egalitarian distribution of residual claimancy and control rights? Among these would any be productivity enhancing?" (Bowles and Gintis, 1994, p. 21)

Bowles and Gintis observe that the answer to these questions depends on two factors:

(factor 1) "on the types of information available to some people and not to others, the way in which the information can be acquired, hidden and shared";

(factor 2) "the way in which governance institutions and property rights distributions alter the information structures of social interactions".(Bowles and Gintis, 1994, p. 22)

Bowles and Gintis offer two compelling reasons for which the differential access to information should be central to any attempt to answer their question. The first is that much

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information is "naturally" asymmetric: individuals know their own preferences[1], needs, personal skills and productive capacities better than other people and, sometimes, it is impossible or, at least, very costly to transfer this private information. The second is that, in a world where everyone knows the same things, such different governance structures as markets and central planning (as well as firms based on different distribution of assets) turn out to be equivalent.

Bowles and Gintis argue that, under some conditions, in spite of any "risk aversion" argument, egalitarian redistributions of assets may be productivity enhancing because they abate the agency costs that are associated to asymmetric information. Or, in other words, given a certain information structure (factor 1), egalitarian redistributions can improve efficiency. This argument seems to be based on an exogenously given information structure. There are some good reasons for which this may be a good assumption: much information is "naturally" asymmetric independently of the ownership of assets and of their governance . Thus, one may argue that egalitarian redistributions may decrease the agency costs due to exogenous asymmetric information.

Still, factor 2 is also very important: asymmetric information is also endogenous in the sense that it is partially determined by a given distribution of assets and governance system. When this type of asymmetric information exists, we cannot judge the efficiency of the present distribution of assets on the basis of the existing distribution of information. A distribution of assets may be efficient when a distribution of information is taken as given (and, vice versa, a distribution of information may be efficient when a distribution of assets is assumed to exist). However, changing both the distribution of information and that of physical assets may improve efficiency. In this case, obtaining an efficient redistribution is difficult for two related reasons: on the one hand one needs to identify and change together the "complementary" distribution of assets and of asymmetric information; on the other

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[1] One should not only consider preferences for consumption goods but also the preferences for alternative ways of carrying production activities. In this respect, traditional neo-classical theory can be very misleading because it includes leisure and not directly working activities among the arguments of the utility function. The asymmetric nature of the information on preferences for working activities can be a powerful argument for the redistributions of assets that is not considered by Bowles and Gintis. Observe that the asymmetric nature of this information underlies a fundamental asymmetry between (physical) capital and labour. Capitals (or their owners) do not get any direct utility from its allocation in production. By contrast, the workers get an indirect utility (via the utility of the product of labour) and also a direct utility from the fact that different allocations of labour involve different working activities to which they are unlikely to be indifferent. On this point see Pagano (1985).

hand a change that fails to deal with these "complementarities" may produce inferior "hybrids" where the distribution of assets does not match the distribution of information.

Economic literature has concentrated its attention on the structure of incentives (including the distribution of assets) that allows us to deal better with a given structure of asymmetric information. In the first section of this paper we will show that, unlike the theory of economic agency, the "scientific management" literature and, perhaps, a relevant part of actual management practice, has focused on the opposite problem: how to achieve the distribution of information that fits a given distribution of assets.

In the second section, we will consider a typical example of the economic approach due to Alchian and Demsetz. In their approach the "optimal" distribution of assets is determined on the basis of a given distribution of asymmetric information. On this basis Demsetz argues that inequality, favouring an "optimal" concentration of assets, promotes efficiency.

In the third section, Bowles and Gintis egalitarian claims are contrasted with the conclusions of Alchian and Demsetz. They are defended on the basis of arguments relying on the endogenous nature of much asymmetric information. We will argue that Alchian and Demsetz may deduce the efficiency of inequality from technological conditions that presuppose its existence.

In the fourth section the argument is developed within the framework of "organisational equilibria". We argue that competition may inhibit the "speciation" of more egalitarian "organisational equilibria" even when these equilibria are more efficient.

In the concluding section we argue that, while the hypothesis of endogenous asymmetric information may reinforce the argument for an egalitarian distributions of assets, its complementarity with the distribution of information poses serious problems for re-distribution policies. In order for dangerous situations of "organisational disequilibrium" to be avoided, these policies should incentivate as much as possible technological conditions complementary to more egalitarian allocations of economic resources. Finally, we argue that, in some cases, "unbundling" ownership rights may be preferable to the redistribution of given bundles of ownership rights considered by Bowles and Gintis.

1. Braverman's analysis of Taylorism: an example of an endogenous re-distribution of asymmetric information.

According to Braverman, the approach of "scientific management", that was started by Taylor at the beginning of this century has had a lasting impact on the development of the organisation of work under capitalism. Taylor realised that the traditional system of management was badly suited to increasing workers' effort. Traditional management relied on the knowledge of the workers in the sense that the managers believed that the workers knew better than they did how to perform their jobs. Under traditional management, the workers could work less than "fairly" by maintaining that a certain time was required to perform a certain job. The situation of "asymmetric information", existing under traditional management, implied that the managers had no means to challenge this sort of statement. Taylor' s solution to this problem was straightforward: the managers (and not the workers) should know how the jobs could be best performed, plan how they should be executed and give the workers detailed instructions about their execution. It was only by gaining the control of the labour process that the managers could invert this situation of asymmetric information and control workers' effort.

Braverman summarises the content of Taylorism in three different principles:

1) *dissociation of the labour process from the skills of the workers*. This is implicit in the following quotation from Taylor "The managers assume... the burden of gathering together all the traditional knowledge which in the past has been possessed by the workmen and then classifying, tabulating, and reducing this knowledge to rules, laws, and formulae...." (F. Taylor, quoted in Braverman 1974, p. 112)

2) *separation of conception from execution*. This can be found in the following Taylor' s statement: "All possible brain work should be removed from the shop and centred in the planning or laying-out department....". (F. Taylor, quoted in Braverman 1974, p. 113)

3) *use of this monopoly over knowledge to control each step of the labour process and its mode of execution*. This is clearly pointed out by Taylor when he states that, unlike under traditional types of management, under scientific management the managers should give the workers detailed instructions about each task to be performed. "The most prominent single element in modern scientific management - Taylor writes - is the task idea. The work of every workman is fully planned in advance, and each man receives in most cases complete written instructions, describing in detail which is to accomplish, as well as the means to be used in doing the work.

...This task specifies not only what is to be done, but how it is to be done and the exact time allowed for doing it... Scientific management consists very largely in preparing and carrying out these tasks" ((F. Taylor, quoted in Braverman 1974, p. 118).

According to Braverman, the analysis of Taylorism is essential to the understanding of the real life capitalist economy because in Taylor' s work "lies a theory which is nothing else than an explicit verbalization of the capitalist mode of production" (Braverman 1974 p. 86).

The prominent role that Braverman gives to Taylorism has been the object of numerous criticisms[2]. However, what is relevant for our argument is simply that, Taylor's scientific management provides an example of a possible way of changing the distribution of information; under the new distribution of information a capitalist system can increase its efficiency. The capitalist system inherits from systems characterised by a different distribution of assets[3] a distribution of information that is poorly attuned to capitalism. That part of the information that is unequally distributed (i. e. that information that is asymmetric) is to an "intolerable" degree "privately" held by the workers. Because of the distribution of assets, the workers have little incentive to use their private information in the interest of the organisation. The "Taylorist" solution is to "expropriate" the workers of their private information and change the distribution of information in favour of the owners and

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[2] In the first place, Braverman has been criticised for seeing Taylorism as the only typical form of organization under capitalism. Other authors have limited the field of application of Taylorism either to an historical phase of capitalism (Edwards, 1979 and Gordon, Edwards, Reich, 1982) and/or to a certain countries (Elbaum, Wilkinson, 1979 and Littler, 1982) or to certain section of the working class (for a survey see Sawyer 1989, part 2) . This point is strictly related to the second criticism: Braverman has ignored successful workers' resistance to Taylorism and the fact that, because or even independently of this resistance, the capitalists themselves have found ways of controlling the workers which are more efficient than Taylorism (Edwards 1979 and Friedman, 1977). Finally, Braverman has been criticised for his thesis that de-skilling has in fact occurred in reality. It has been pointed out that, if some skills have disappeared, new skills have been created in the course of the development of capitalism. The sheer extension of formal training for the majority of the workers seems to prove that re-skilling has occurred (Wood, 1982).

[3] Following Marx, Braverman (1974) observed how the organisation of work had been substantially inherited from preceding modes of productions characterised by a more dispersed concentration of ownership; the distribution of information corresponded to technologies that were suited to these types of organisation were the asymmetric distribution considered by Taylor was not damaging. The new system of concentrated ownership favours technologies characterised by a different distribution of information.

management. Under the new distribution of information, the capitalist system can efficiently operate or, in other words, under the new situation of asymmetric information the capitalist distribution of assets is now efficient: the holders of private information are now the owners of the physical assets of the firm or few managers that it is relatively easier to motivate.

In spite of some considerable limitations of his analysis, Braverman has the merit of providing an example of causation opposite to traditional agency theory. In traditional agency theory the distribution of information is exogenously given. The problem is to determine endogenously the incentive structure or the distribution of assets that can best solve the agency problem. In Braverman the distribution of assets is exogenously given and the problem of Taylorism is to determine endogenously the distribution of information which is the best given that distribution of assets. When, under a certain ownership system, because of asymmetric information, the use of a technology is particularly costly, there will be attempts to device technologies that imply a distribution of information that fits better that system.

In Braverman's analysis, under capitalist ownership relations, there is a tendency to device technologies that, inverting pre-existing information asymmetries, make labour an easy-to-monitor factor. A similar process occurs for the specificity of assets. The three principles of Taylorism also imply that much of the specific knowledge, used by the workers, is made redundant by introducing a technology under which the workers are ordered to perform homogeneous tasks requiring only generic skills.

Observe that both the difficult-to-monitor character of resources and their specificity attributes define high-agency-cost resources in the sense that they involve high agency costs when other individuals employ them in situations of goal incongruence. In general, any property right system tends to use technologies that minimise on high-agency-cost resources owned by individuals that have goals different from (or even conflicting with) those of the owners of the firm. Thus, under "classical capitalism" workers tend to become low-agency-cost resources.

By contrast, under "classical capitalism", similar inhibitions do not hold for the owners of resources who have rights on the organisation or can be, somehow, motivated to share its goals. Thus, under "classical capitalism" employers and managers have a tendency to become high-agency-cost resources.

Likewise, under Taylorism and Fordism, a similar process occurs for physical capital.

The owners of physical capital control the production process. Thus, incentive problems do not prevent them from using capital that is difficult-to-monitor in the sense that its user-induced depreciation could not be easily estimated by observing the state of

machinery before and after use. The choice of a technology such that work is easy to monitor cheapens the use of difficult-to-monitor capital: the user-induced depreciation of machines can be easily checked by observing the actions of the workers. At the same time, employers and capitalists can well trust the fact that they will organise the production process in such a way to take into account the user-induced depreciation of their own difficult-to-monitor machinery.

A similar argument holds for the specificity of the non-human assets: the owners of machinery, controlling the organisation, can be sure that the specific nature of their machinery will be taken into account in the future decisions of the firm and that they will be safeguarded against the possible opportunism of the other agents.

The joint implication of the monitoring and of the specificity arguments is that, unlike the workers, machines and employers tend to become high-agency-cost factors. According to Taylorism, any technology, that increases the private information held by the workers, is very costly. By contrast, the increase of private information, that is necessary to manage the workers and the machinery, is not considered to be as costly because it is held by individuals that identify their goals with that of the organisation.

2. Exogenous asymmetric information and the optimality of capitalist inequality.

Typically, economic theory has followed a route opposite to that which we have just considered[4]. It has taken as given a technology characterised by a certain distribution of information and specificity attributes and it has analysed the rights, the incentives and the safeguards that can best suit this technology. A famous example of this approach can be found in Alchian and Demsetz famous explanation of the nature of the firm. We will re-consider their theory for two reasons. In the first place it offers a causation mechanism

[4] A related point is considered by Basile and Casavola (1994).

opposite to that which we have just considered[5] .. Secondly, following this direction of inquiry, Demsetz reaches a conclusion contrary to that advanced by Bowles and Gintis: according to Demsetz, only inegalitarian distribution of assets can ease agency problems and can allow high productivity and accumulation of wealth.

Alchian and Demsetz begin their famous article by concentrating their attention on a simple agency problem concerning the loading of weights. Because of the existence of team work, the marginal products of team members cannot be directly measured and remunerated. In this situation individual contributions can only be estimated by observing the behaviour of the individuals working in the team[6] . However, obtaining this information is costly and it may not pay each member of the team to monitor the activities performed by the other team members.

Under these conditions, each member of the team has an incentive to shirk because some of the costs of her increased leisure will be borne by other team members who cannot, individually, detect shirking at costs lower than the benefits of detection. The result is that each team member will end up shirking. This happens in spite of the fact that each of them would prefer a situation where nobody shirks and where she would realise the trade-off between income and leisure which maximises her utility.

How can team members overcome this problem?

Alchian and Demsetz answer is that they can agree to have some individual specialising in the monitoring of their activities.

"But who will monitor the monitor?" (Alchian and Demsetz, 1972 p. 124). This potentially infinite regression is cut by assuming that the monitor has an incentive to behave efficiently or, in other words, that she would monitor herself. According to Alchian and Demsetz this assumption can hold true if the team members agree that the monitor should have the right to the residual earnings of the team . This agreement, coupled with competition among monitors, constraints the monitors' incentive to shirk. Thus, the foundations for the rationale of the classic capitalist firm are similar to those used by

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[5] The Marxian theory contains both causation mechanisms. Their integration is one of the most stimulating problems of this theory. Some Marxists have emphasised the "primacy" of the productive forces whereas other have given more importance to the influence of property rights on technology. For instance Cohen (1978) defends this "primacy" whereas Brenner (1986) criticises it. Roemer (1988) offers an useful survey of both.

[6] "When lifting cargo into the truck, how rapidly does a man move to the next piece to be loaded, how many cigarette breaks does he take, does the item being lifted tilt downward his side?" (Alchian and Demsetz, 1972 p. 121)

Hobbes to justify the existence of the state[7].: the workers accept capitalist ownership and control to exit from a situation of unfettered freedom where each worker damages the other workers.

In Alchian and Demsetz view, the entrepreneur-monitor must not only be given the right to the net earnings of the team but also the right to hire and fire each individual team member. For this reason the residual claimant will also have the right to terminate and start contracts defining the terms of team membership. An asymmetry does therefore characterise the position of the monitor and that of the other team members[8]. Each team member can only terminate his own contract and leave the team. By contrast, only the monitor can terminate the employment of any team member, can employ new members and sell his right to be the residual claimant of the team. These rights of the monitor define the "ownership (or the employer) of the classical (capitalist, free enterprise) firm". (Alchian and Demsetz, 1972, p.125) .

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[7] As Bowles (1985, footnote n.3) has observed, it constitutes "an economic analogue to the Hobbesian position which asserts that uncoerced citizens in state of nature would in their own interest commit themselves to obey the dictates of the state".

[8] The asymmetry between the contractual position of team members and the owner of the classical capitalist seems to give little support to the claim that no form of authority characterises this organization - a claim which is made by observing that "the employee can terminate the contracts as readily as the employer..." (Alchian and Demsetz, p. 125). In fact, this is the only element of symmetry of the relation because, as they well underline, many more contractual options are open to the owner of the firm. He can terminate the relationship with each individual member without terminating the relations with other team members. By contrast, the option of terminating the relation with the owner but continuing the relationship with the other team members is not open to any other individual than the owner-monitor. Or in other words the owner can "fire" each team member, but no one of them can "fire" the owner. Alchian and Demsetz maintain that no difference exists between the relationships between employers and employees and between us and our grocers. According to them, firing employees is not different from the fact that "I can fire my grocer by stopping purchases from them...". (Alchian and Demsetz, p. 119) But this is playing with words. I cannot stop one particular grocer from co-operating with other grocers whereas the employer can obtain this result when he terminates his contract with one particular team member. The ownership of an organization and the possession of hiring and firing rights implies a form of asymmetric power which differentiates it from the ordinary grocer-consumers relationship.

Alchian and Demsetz analysis of the classical capitalist firm is completed by explaining the efficiency reasons for which the owner-monitor does also usually own some of or even all the physical capital employed by the organization. They offer two arguments .

The first argument is based on the idea that the employer-owners must be able to demonstrate his ability to pay to the owners of the inputs employed in the firm. This can be better done by investing in physical capital instead than human capital because property rights in other people cannot be easily enforced. For this reason, they argue, they will invest in the capital equipment of the firm. There is something unconvincing about this argument. For, as Alchian himself has subsequently admitted, this "appears to be incorrect since the owner could supply credibility by using some of his assets completely unrelated to the production process, such as treasury bonds, for collateral." (Alchian, 1984 p. 247).

The second argument is more interesting. It is also more consistent with the analysis outlined above because it hinges again on monitoring costs. Alchian and Demsetz observe that the employment of a durable resource involves a user-induced depreciation. In some cases, this user-induced depreciation is difficult to detect by observing the resource before and after its use. In order for this user-induced depreciation to be detected it is necessary to observe the resource during its use, for instance by watching the care with which the resource utilised. In this case, if the resource is rented, its depreciation will be charged according to some expected depreciation. But, under these conditions, careless use is more likely because the person renting the resource does not pay for careless use inducing greater depreciation. By contrast, if the user owns the resource she will take into account the cost of any misuse. Renting the resource will therefore be more costly than owning it

A possible objection to this argument is that, instead of renting machines, the workers may borrow money, buy the machines and use them as collateral. Still, this objection can be answered by observing that difficult-to-monitor machines are less valuable as collateral than easy-to-monitor machines. The agency costs are simply shifted. The lender will now have to sustain the high costs of monitoring the user-induced depreciation of difficult-to-monitor capital.[9] .

[9] A similar argument holds for the case of specific capital. The workers could borrow money, buy the firm-specific machines and use them as collateral. However, specific machines are less valuable as collateral than general purpose capital because the value of specific capital is very low in the case of bankruptcy. Full ownership rights of the user of specific capital will therefore be also cheaper than arrangements where the lenders of monetary capital have some rights in the case of bankruptcy. In general, the agency costs of using positive-agency-cost capital can only be eliminated by giving the full ownership rights to its users.

In general, when net input performance is difficult to detect without monitoring the use of the input in the production process, owner use will replace contractual arrangements where the input is rented (or other contractual arrangements limiting the ownership rights of the user and involving the use of the input as collateral). For, the owners of a resource, having an incentive to use it efficiently can save on these monitoring costs. This proposition does not only complete the explanation of the rationale for the classical capitalist firm. It also throws light upon Alchian and Demsetz explanation for the existence of profit-sharing firms where the residual-claimant is not the owner of physical capital. This occurs when the situation, examined above, is inverted and labour is the input that is relatively more difficult to monitor. In this case monitoring costs can be decreased by giving the workers some form of joint ownership of the firm and by making them the residual claimants.

"In "artistic" or "professional" work watching a man's activities is not a good clue to what he is actually thinking or doing with his mind. While it is relatively easy to manage or direct the loading of trucks by a team of dock workers where input activity is so highly related in an obvious way to output, it is more difficult to manage and direct a lawyer in the preparation and a presentation of a case. Dock workers can be directed in detail without the monitor himself loading the truck, and assembly line workers can be monitored by varying the speed of the assembly line, but detailed direction in the preparation of a law case would require in much greater degree that the monitor prepare the case himself." (Alchian and Demsetz, 1972 p. 129) Thus, unlike dock workers, "difficult-to-monitor lawyers" will form partnerships and, possibly, hire the relatively more easy-to-monitor capital equipment. According to Alchian Demsetz, in these cases, if the size of the team is not large and the incentive of profit sharing is not too diluted, instead of classical capitalist firms, profit sharing firms will provide an appropriate organisational solution .

Developing the arguments expressed above, Demsetz has expressed the view that wealth inequality can be beneficial for efficiency. If many firms are characterised by the existence of difficult-to-monitor capital and easy-to-monitor labour (and especially when large size is advantageous), the capitalist firm can offer the most appropriate monitoring system.

However, only individuals, who own a considerable percentage of the shares of a firm, will be willing to exercise this monitoring function.

By contrast, "a diffuse ownership structure discourages this undertaking because of well known free rider problem." (Demsetz 1988, p. 231). Even in societies as rich as the U. S., an egalitarian distribution of wealth would not allow investors to own a share of the capital of the big firms that is sufficiently large to induce them to monitor the firm. "If

wealth were distributed equally, we would need to either forsake effective control of efficient sized firms or forsake large-scale production where size is important to efficiency. The lower is the per capita wealth relative to the financial size of efficient productive units, the greater is the degree of inequality in its distribution that is required to maintain effective control."(Demsetz 1988, p. 232).

Alchian (1987) and Williamson (1985) construct a similar argument that explains the nature of rights and safeguards by referring to the specificity attributes of the resources. The owners of the more specific resources tend to acquire the ownership and the control of the organisation. Thus, in "New Institutional" economic theory, Braverman's argument (and, in general, the "Radical Argument"[10]) is completely inverted. In Braverman, owning factors tend to become high-agency-cost resources. By contrast, in the New Institutional approach, high-agency-cost resources get the rights on the organisations for efficiency reasons. In particular, the distribution of asymmetric information is not influenced by ownership relations but it is the factor that explains their existence and their relative efficiency. In the case of Demsetz' argument, this efficiency explanations of ownership relations includes the necessity of an unequal distribution of assets.

3 Endogenous asymmetric information and Bowles' and Gintis' claims.

Alchian and Demsetz approach relies on exogenous asymmetric information or, in other words, on the characteristics of the distribution of information that are independent of the effects of a given ownership system. According to them, the capitalist firm is so widespread because it is the best answer to the large majority of the situations of exogenous asymmetric information.

[10] Besides Braverman and the literature streaming from his book, a similar direction of causation is considered by Marglin (1974), Rowthorn (1974), Pagano (1985), Bowles (1985 and1989).

Exogenous asymmetric information can explain why large capitalist firms are more successful is some sectors than in other sectors[11]. For instance, the nature of the distribution of asymmetric information in agriculture makes it very difficult to have specialised and centralised monitoring for the simple fact that it is not possible to concentrate the agriculture workers in the same location. In industry, the workers are relatively easier to monitor because the concentration of many workers in the same location does not, in general, decrease efficiency. Finally, the service sector does often share many monitoring attributes with agriculture: in many cases, the absence of a physical product that can be moved from the production to the consumption location implies that the worker must be where the service is consumed; again, specialised and centralised monitoring becomes more difficult and large scale capitalist enterprises may become less viable.

Thus, an approach based on exogenous asymmetric information can be very valuable to understand the relative efficiency of different ownership relations in different sectors of the economy; moreover we have seen that an interesting prediction of this approach is that the more intensive the use of difficult-to-monitor skilled labour the less appropriate the traditional capitalist firms.

According to Alchian and Demsetz, the conditions, under which capitalist firms would be the best organisational solution, are the most common ones. One can argue that sectors different from industry (as well as some industrial sectors) do not seem to meet such conditions.

However, in order for Bowles' and Gintis' claims to be sustained, one should also challenge the double claim that, under some conditions, capitalism is the most efficient organisation and that an unequal distribution of assets is a necessary condition for the minimisation of agency costs.

Observe that the agency cost argument, outlined above, defends the efficiency of capitalism in a way different from that considered by Bowles and Gintis. According to them, whereas the risk aversion argument may favour the capitalist enterprise, the agency cost arguments favours the democratic firm. By contrast, Alchian and Demsetz believe that, under some conditions, the capitalist firm is superior from an agency cost point of view: their argument is that, when physical capital is difficult-to-monitor and workers are easy-to-monitor, then giving the status of residual claimant to a centralised monitor (who also owns the difficult-to-monitor capital) minimises agency costs.

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[11] In Marxian words, in some cases, the "primacy" of productive forces may be a good working assumption.

Bowles and Gintis offer two general arguments that are intended to show the superiority of the democratic firm and that can be used against the claims of Alchian and Demsetz..

The first argument can, indeed, be viewed as a direct criticism of the view advanced by Alchian and Demsetz. Bowles and Gintis argue that the workers can be more effective than a centralised monitor in controlling their own activities. They justify this claim by observing that "workers have access at low cost to information concerning the work activities of their fellow workers" (Bowles and Gintis, 1994 p. 39). However, if workers are easy-to-monitor, these advantages may be less important than the disadvantages that are due to fact each individual worker may have very little incentive monitor the other workers. In this situation a centralised capitalist monitor, having a stronger monitoring incentive, may overcome this free rider problem. The capitalist monitor may also exploit the fact that easy-to-monitor workers cannot hide much private information or actions. Moreover he may also easily take advantage of the economies to scale that are likely to characterise the monitoring activities. The situation is different when the distribution of asymmetric information involves that the workers are difficult-to-monitor; here Bowles' and Gintis' claim becomes convincing but it does not contradict the argument advanced by Alchian and Demsetz.

The second argument, developed by Bowles and Gintis, relies on the idea that the capitalist firm is typically inefficient in that it uses too many monitoring resources and not enough wage incentives. The workers-owners would not replicate this inefficient choice of the capitalist firm for the obvious reason that they will regard paying themselves to be more convenient than hiring monitors. However, the amount of extra-monitoring employed by the capitalist firm is unlikely to be very relevant when work is an easy-to-monitor factor. Moreover the advantages of highly specialised and large scale monitoring, performed by strongly motivated agents, may again imply that the capitalist firm enjoys lower agency costs.

The advantages of having a centralised capitalist monitor do not only depend on the easy-to-monitor characteristics of work but also on the difficult to monitor nature of managers, capitalists and physical capital. We have seen that the distribution of specificity attributes can have effects similar to those due to the distribution of asymmetric information and that the distribution of both attributes determines the low or high agency cost nature of the resources. Thus, the objections to the Bowles and Gintis argument can be summarised by saying that, when labour is a relatively low-agency-cost factor, traditional forms of capitalist organisation may be superior and inegalitarian distribution of assets, allowing the concentration of ownership, may increase efficiency.

The Bowles and Gintis paper contains some more suggestions that could be used to answer the objections considered above. However, I would like to develop a particular point advanced in their paper. This point is related to the idea that the distribution of information is endogenous and it cannot be taken for granted as it is implicitly done by Alchian and Demsetz.

Bowles and Gintis (1994) summarise the implications of their papers in three major claims:

Claim1. *Inequality impedes economic performance by obstructing the evolution of productivity enhancing governance structures* (p. 7).

Claim 2. *Where hard work, innovation, maintenance of an asset and other behaviours essential to high levels of economic performance cannot be specified in costlessly enforceable contracts, the assignment of control rights and residual claimancy status influences the kinds of exchanges that are possible and costs of carrying out these exchanges* (p. 11).

Claim 3. *Some distributions of property rights are more efficient than others; in particular there exists an implementable class of distributions that are both more egalitarian and more efficient than the concentrations of asset holding observed in most capitalist economies* (p. 11).

Bowles and Gintis observe that the three claims are strictly interdependent and they form a logical chain where each ring supports the subsequent rings. Claim 2 is the essential one. It can be made stronger by pointing out that the efficiency of the present assignment of control rights and residual claimancy status should not be judged taking as given the present nature of the assets and the present distribution of information. By contrast, it should be compared to that which would be possible to develop under the governance system that one could set up in a more egalitarian society. In this way, we can challenge the anti-egalitarian argument developed by Alchian and Demsetz.

In order to develop this analysis, we need to re-consider the rationale of Braverman's analysis of Taylorism. If one considers a system that has undergone the re-distribution of knowledge skills and other information suggested by Taylor, one could easily buy Alchian's and Demsetz' argument: in a "Tayloristic" organisation an inegalitarian distribution of resources would indeed minimise agency costs. One could visualise their argument as follows:

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Tayloristic information	Need for concentrated	Efficiency of an unequal

	----->	----->	(F1)
and agency attributes	capitalist ownership	distribution of assets .	

However, according to Braverman, the "Tayloristic" distribution of information and the other agency attributes are not natural characteristics of technology. They are themselves the result of the unequal distribution of assets that characterises the capitalist system. Indeed, the Braverman's argument can be visualised by a causal chain that runs in a direction opposite to that of Alchian and Demsetz:

Unequal distribution	Concentrated	Efficiency of the Tayloristic	
	----->	----->	(F2)
of assets	capitalist ownership	information and agency attributes.	

If we join together (F1) and (F2) we obtain that:

Unequal distribution	Concentrated	Efficiency of the Tayloristic	
	----->	----->	----->
of assets	capitalist ownership	information and agency attributes.	

Tayloristic information	Need for concentrated	Efficiency of an unequal	
----->	----->	----->	(F3)
and agency attributes	capitalist ownership	distribution of assets	

Thus, Alchian and Demsetz may just be claiming that the efficiency of inequality is justified by its own existence in the sense that it induces a distribution of information and other resource attributes under which inequality is efficient.

In spite of the fact that the distribution of information and the other agency attributes seem to justify their argument in favour of inequality the claims advanced by Bowles and

Gintis may be right: it is possible to improve welfare by changing both the distribution of assets and that of asymmetric information.

In the Tayloristic firm, inequality does not seem to impede efficiency. It seems to favour governance structures associated to distribution of assets such that high-agency-cost resources get the appropriate incentives. Under the Tayloristic technology, observing and sanctioning workers is cheap and standard labour market contracts can work very well; it may seem that the incentives of residual claimancy can be left to the owners of the other resources. But this may be mere appearance. One should take into account the efficiency loss that is due to the choice of a technology where workers can be employed by using standard market contracts. The "complete" market contracts, existing for labour, may hide the choice of an inefficient technology.

For instance, the employment of the Tayloristic techniques may sacrifice the advantages of team-work: unlike the case considered by Alchian and Demsetz genuine team-work does often imply that it may become very difficult for an external observer to understand the values of individual contributions. Moreover, in the case of "non-primitive teams", each individual becomes specific to the skills of the other members of the team. If genuine team work is necessary to increase productivity, then the cost of the Tayloristic organisation can only be evaluated by comparing its net benefits with those of alternative systems.

For example, when one compares Taylorism or Fordism with Toyotism where team-work is highly developed, one may observe that under the latter system standard employment contracts cannot be easily used. A different system of rights is a necessary condition for operating this system. The fact that a traditional system of capitalist ownership impedes this type of technology is a relevant opportunity cost of these rights. Even if "classical" capitalist rights are the best rights under the existing technology, this is no proof of their overall efficiency.

4. Organisational equilibria and the distribution of assets.

(F3) describes an organisational equilibrium[12] where technology, distribution of assets and distribution of information reinforce each other. In this section we will consider the nature of organisational equilibria and we will try to clarify the role of the distribution of assets on the selection of a particular organisational equilibrium.

We have already observed that, according to Braverman (and, indeed, according to almost all the Radical literature), owning factors have a greater tendency to become high-agency-cost factors. This is due to the fact that an owning factor has no "inhibitions" to become firm-specific nor to develop situations of asymmetric information under which it becomes a difficult-to-monitor factor. The incentives due to ownership allow a saving of the agency costs that would otherwise arise in these situations..

In some ways, changes in property rights have an effect similar to changes in relative prices. They increase the agency costs of using the non-owning factors relatively to those of the owning factors. Thus, similarly to changes in relative prices, changes in property rights have a substitution effect: the high-agency-cost resources of the non-owning factors tend to substituted away; for this reason non-owning factors tend to become low-agency-cost factors. Or, in other words, they tend to become less firm-specific and more difficult-to-monitor than owning factors.

Thus the re-distribution of asymmetric information and of the specificity attributes (that, according to Braverman, occurs as a consequence of the process of capitalist concentration) can be explained by a familiar mechanism of standard economic theory. A change in the distribution of wealth induces a form of concentrated capitalist ownership under which it is convenient a process of technological substitution that tends to make labour a low-agency-cost resource. Denoting property rights by P and technology by T the radical assumption can be summarised by saying that property rights (P) determine the characteristics of the technology (T), or:

$P \dashrightarrow T$ (F4)

In particular, in Braverman's analysis capitalist property rights (P^c) bring about a technology (T^c) characterised by a distribution of asymmetric information and specificity characteristics such that capital and management tend to become high-agency-cost-factor and labour tends to become a low-agency-cost factor; or :

$P^c \dashrightarrow T^c$ (F5)

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[12] For a more detailed analysis of the properties of "Organisational Equilibria", see Pagano (1991, 1992 and 1993a) and Pagano and Rowthorn (1994).

In the Radical approach it is, also, assumed that, in the long run, under a property right system P^L, where the workers have some rights in the organisation, there would be a tendency to develop an alternative technology T^L. under which labour, instead of capital and management, tends to become a relatively high-agency-cost factor:

P^L ----> T^L (F6)·

Also the New Institutional Assumption can be explained by a familiar mechanism of economic theory: for any given technological combination of factors it will be convenient for the high-agency cost factors to buy out the low-agency-cost factors. For a given technological combination the high-agency-cost factors can save more on agency costs when they own the organisation and can therefore offer the highest price for the control of the organisation. Or, in other words, according to the New Institutional assumption:

T ----> P (F4').

that is technology explains property rights.

In particular, a technology T^c characterised by the employment of much high-agency-cost capital and little high-agency-cost labour will favour capitalist rights P^c because, under those property rights this technology involves lower agency costs; that is:

T^c ----> P^c (F5')

Likewise, according to the New Institutional approach, technologies characterised by a high intensity of high-agency-cost labour explain the existence of firms where the workers have property rights on the organisation:

T^L ----> P^L (F6'')

We assume that both the Radical Assumption and the New Institutional Assumption are simultaneously true. Following David (1975), we assume that, in the short run, the agents know only the combinations of factors that they are actually using and that exploring new technologies may require time and effort. Thus, the existing property rights shape technology; knowing and applying the technological combination associated to alternative property rights takes time: the substitution effect of new property rights can only work in the long run. At the same time, the existing technology influences property rights; agents will tend to select those control rights under which the existing technology can be operated with minimum agency costs; when, for some combinations of factors, agency costs can be saved by shifting control from some agents to the other the agents will find that it is their mutual interest to do so.

We say that we are in an *organisational equilibrium* when both the Radical and New Institutionalist assumptions are simultaneously satisfied: in an organisational equilibrium the behaviour of the firm under particular ownership conditions must bring about technologies characterised by factor intensities that do not upset the initial ownership conditions. We can therefore give the following definition of an organisational equilibrium:

Definition of Organisational Equilibrium:.

An institution of production is an organisational equilibrium when it is defined by a system of property rights P and a technology T such that T is the technology that maximises rent under the property rights system P, and P is the property rights system that maximises ownership rent with the factor intensities associated with T.

In other words, in an organisational equilibrium (F4) and (F4') are simultaneously satisfied. Therefore, the existing property rights and the technology will be mutually consistent or:

----> P ----> T ----> P ----> (F4")

In particular we will be in a capitalist organisational equilibrium when (F5) and (F5') are both satisfied and capitalist rights P^c and capitalist technology T^c imply each other:

$$\xrightarrow{} P^c \xrightarrow{} T^c \xrightarrow{} P^c \xrightarrow{} \quad (F5")$$

and we will be in a labour organisational equilibrium when (F6) and (F6') the labour rights P^L and the labour technology T^L are such that:

$$\xrightarrow{} P^L \xrightarrow{} T^L \xrightarrow{} P^L \xrightarrow{} \quad (F6")$$

In a "capitalist" organisational equilibrium capitalist property rights P^c maximise ownership rent given the "capitalist" technology T^c and vice versa the capitalist technology T^c maximise profits given the capitalist property rights P^c. Likewise, labour property rights P^L are the best given the "labour" technology T^L and vice versa the labour technology T^L maximises profits given the labour property rights . P^L. It follows that the situation of organisational equilibrium are always superior to the situations of organisational disequilibrium. In other words, the organisational equilibria defined by capitalist rights and technology (P^c T^c) and by labour rights and technology (P^L T^L) yield higher rent than the organisations characterised by the hybrids (P^L T^c) and (P^c T^L).

Organisations share some "formal" characteristics with natural species: in the same way in which in each organisational equilibrium technology and property rights tend to fit optimally with each other, in each natural species each gene tends to be optimally adjusted to the other genes .

The analogy between the emergence of new organisational equilibria and speciation, that is the formation of a new species, can be fruitful because the emergence of new organisational equilibria satisfies one of the typical aspects of speciation: the inferiority, or even the impossibility, of the "hybrids" between the two groups that is a necessary condition for differentiating them into different species[13] . For instance, in our simple model any combination of capitalist rights and labour technology "genotypes" produces an organisational "phenotype" that is inferior to both capitalist and labour organisational equilibria.

The analogy between organisational equilibria and natural species turns out to be useful to answer the following fundamental question: does competition select the most efficient organisational equilibrium?

Indeed, the analogy with natural species may even help to clarify the meaning of the question above. In natural selection the pressure of competition helps to select the best members of a given species; however, the effects of competition on speciation are much more controversial. Our question is related to the case of speciation: we are not asking whether competition can select the best member of a given species of organisation but whether it can help the formation of a new more efficient species of organisation characterised by a different technology and property rights "genotypes"..

Each species is characterised by important "development constraints": the fitness of each mutation is constrained by the other characteristics of the species. This implies that many evolutionary paths may be blocked. Unfortunately, in the case of organisational equilibria these obstacles may work exactly against those changes that may otherwise lead

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[13] If the hybrids between two species were at disadvantage, "selection would act to increase the reproductive isolation because each form would do better not to mate with other and produce disadvantageous hybrids: speciation would be speeded up by selection in sympatry. The process is called *secondary reinforcement*. It is secondary if the reproductive isolation has partly evolved allopatrically, and is then reinforced on secondary contact. The process by which selection increases reproductive isolation independently of the history of the populations is simply called *reinforcement*"(Ridley, 1993 p. 412). Reinforcement is a necessary condition for the new species not to merge if they happen to share the same territory but it is not a sufficient condition for speciation. By contrast "the theoretical conditions for speciation to take place by reinforcement are difficult" (Ridley, 1993 p. 414)

to the formation of a superior species of organisation. Suppose that there are some efficient alternative potential owners that could get a higher ownership rent than the present owners. These alternative owners are efficient because their employment by the present owners involves very high agency costs that could be saved if they own the organisation. For this reason, the factors of the potential alternative owners are promptly replaced by factors that are cheaper for the present owners. In other words, an "anti-speciation" mechanism is embodied in each "species" of organisational equilibrium and it has the unfortunate characteristic that its strength is related to the efficiency of the alternative potential species [14] ..

However, suppose that this "anti-speciation" factor is overcome and one of the characteristics of the old species mutates into one characterising also a potential more efficient new species of organisation. For instance, some organisations are characterised by new property rights that, if were coupled with the associated optimal new technology, could form a new more efficient organisational equilibrium. Until this new technological combination is developed and employed, we will have a situation of organisational disequilibrium or, in other words, an inferior hybrid between the new property rights and the old technology. If the pressure of competition by the members of the old species is strong, the hybrid is likely to be wiped out before it has any chance of turning into the new superior species.

However, even if speciation is successful, the survival of the new species can endangered by a strong competition by many members of the old species.

In the firs place, if there are few members of the new species, "interbreeding" with the many members of the old species will be very frequent and will produce numerous inferior hybrids. In these conditions interbreeding may lead to the extinction of both mutations. When the new technology is imitated and run under the old property right system it turns out to be inferior and, vice versa, when the new rights are influenced by the old technology they also turn out to be inferior.

Secondly, in nature, the efficiency of each species depends on its frequency. Also organisations share the same characteristic. For instance, network externalities in property rights and in technologies may imply that few firms characterised by different organisational equilibria are not viable: they would be outcompeted by firms that, even if

[14] The strength of this mechanism depends on the elasticity of substitution that also determines the multiplicity and the efficiency of organisational equilibria. For a formal intuitive argument see the Appendix to this paper. For a more complete analysis see Pagano and Rowthorn (1994).

inferior when they exist with the same frequency, can better benefit of network externalities because of their present large number.

Summing up, the same competitive pressure, that favours the "micro-mutations" improving the fitness of a given species, may inhibit the "macromutations" that are necessary for the beginning of a new species.

Speciation theory offers a useful framework to understand the dynamics of organisational equilibria and the effects of competition. Organisational equilibria cannot gradually evolve into superior organisational arrangements. Because of the "institutional stability" of these equilibria we should expect that long period of "stasis" characterise these equilibria that may be "punctuated" by periods of sudden changes to new "species" of organisations[15]. Thus, the analysis of the emergence of different organisational equilibria seems to be closer to that of the "punctuated equilibria" discussed by Eldredge and Gould (1972) with reference to the evolution of new species than to any "gradualist" approach[16].

In natural species as well as in organisational equilibria, after a period of one by one changes, because of selection mechanism, each part of the whole may well become optimal given the nature of the other parts: for this reason, after this point, a better arrangement cannot be approached by a gradual change of each one of the parts but it requires simultaneous complementary changes. In this context no gradual tendency to move away from inefficient equilibria can arise. Because of the "complementarities" that are necessary for successful macromutations, these macromutations may never occur; if they do, they will be characterised by abrupt changes leading to the formation of other species that have a substantial number of different features. Like the evolution of natural species, the speciation of organisational equilibria is likely to be "punctuated" by long periods of stasis and by sudden changes. In both cases, their "efficiency" will be limited by the sequence of the mutations that were actually made or, in other words, by their history.

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[15] For a complete analysis of the analogies between economics and evolutionary biology see Hodgson (1993).

[16] However, as Mayr (1991) points out, even the "speciational evolution", considered by Elredge and Gould, is in some sense gradual. "Such speciational evolution, because it occurs in populations, is gradual in spite of its rapid rate and therefore is in no conflict whatsoever with the Darwinian paradigm". (Mayr 1991 p. 154). However, it is in sharp contrast with the view of some geneticists who see evolution as a gradual change of gene frequencies in populations and do not see the abrupt nature of speciation and the long periods of stasis that characterise the evolution of species (Mayr 1991, p. 137).

Since competition can inhibit the formation of new species, speciation is likely to be characterised by "allopatric" conditions; or, in other words, it occurs when a physical barrier protects for an initial period the mutants from the competition of the members of the original species. Competition may be very important to select the one by one changes that improve the fitness of a given species of organisation but a temporary protection from competition may well be necessary for the speciation of "new organisational equilibria" requiring the complementary change of property rights and technology.

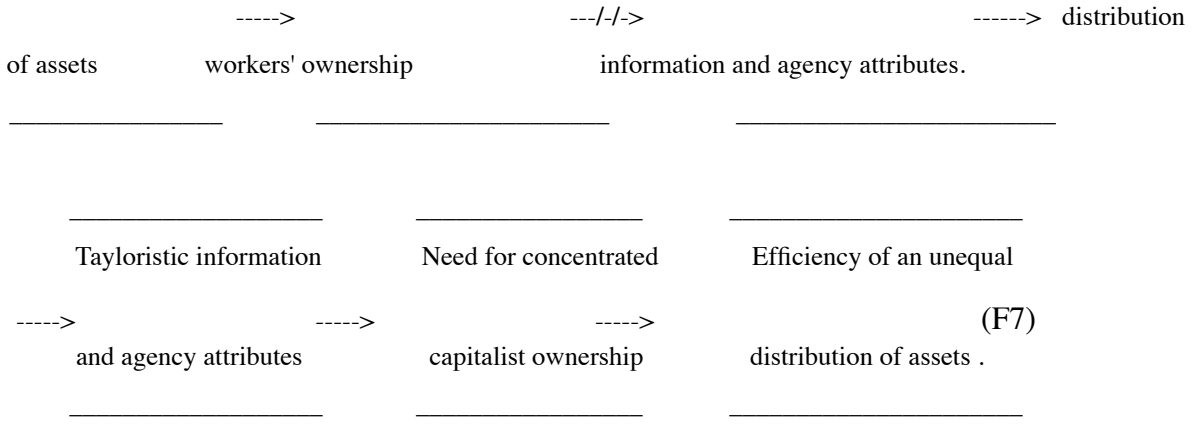
The analogy with natural selection, considered above, has some implications that support the claims put forward by Bowles and Gintis. Because of the endogenous nature of asymmetric information and of the other characteristics of the technology we cannot expect from competition an efficient re-allocation of assets that decreases agency costs. Although competition can be very useful in selecting the micromutations that improve the efficiency of a given species of organisations, it can inhibit those re-distributions of assets that are the necessary ingredients of successful macromutations. We cannot rely on laissez faire. An active policy of asset re-distribution may well be justified.

Conclusion.

The argument that we have developed supports policies of re-distribution of assets also in cases where the existing technological and information conditions may seem to imply the contrary. However, the same rationale implies that a policy that focuses only on the re-distribution of assets is likely to fail.

Even if the present system of asset distribution is efficient only relatively to its own endogenous information and technological features, it is still true that these characteristics will be inherited by the new system. Indeed a re-distribution of assets is likely to generate the formation of inferior hybrids. Or, in other words, after the re-distribution of the assets, there could be a situation of "organisational disequilibrium" that referring to (F3) can be characterised as follows:

Egalitarian	Concentrated or dispersed	Efficiency of the Tayloristic



(F7)

According to the characteristics of each sectors the more equal distribution of assets would, perhaps, create forms of concentrated or dispersed workers' ownership[17]. This would not imply anymore the efficiency of "Tayloristic" information and agency attributes. In this sense we would have a situation of "organisational disequilibrium": an inferior hybrid between the new rights and the old technology would now exist. In these conditions the existing Tayloristic information and agency attributes would still require a concentrated capitalist ownership that would imply the efficiency of an unequal distribution of assets.

Thus, under the conditions that we have considered, a policy of egalitarian distribution of assets produces a situation of organisational disequilibrium. This situation of organisational disequilibrium may be very undesirable from the point of view of economic policy for two reasons.

In the first place, the situation of organisational disequilibrium is likely to be an hybrid inferior to the initial organisational equilibrium. Thus disequilibrium is costly in terms of economic resources. Moreover a long duration of disequilibrium will give the impression that the policy of asset-redistribution is not going to work.

In the second place, the situation of organisational disequilibrium does neither imply that the "speciation" of a new organisational equilibrium is necessarily guaranteed nor that there is some "natural" tendency to move towards the new equilibrium. By contrast, it is well possible to go back to the old organisational equilibrium. While the new rights are "pushing" for a new technology, the old technology is "pushing" for the old rights and, in principle, it is not clear in which way the disequilibrium is going to be eliminated. A failure

[17] Bowles and Gintis leave this point open. In some cases, a redistribution to the workers may make it more efficient to break the capitalist firms; in other cases, unified governance is still convenient after changing property rights.

to complete the transition to the new equilibrium would have dramatic consequences for egalitarian policies. The poor results, due to the inferior hybrid, could be attributed to the final outcome of the re-distribution policy.

Thus, a policy of egalitarian asset re-distribution must try to avoid as much as possible situations of organisational disequilibrium. This may only be achieved by taking into account the complementarities between distribution of assets and the distribution of information and specificity characteristics.

Together with asset-redistribution it is necessary to improve the quality of education and the skills necessary for alternative management and production systems. Moreover, a policy of asset-redistribution must go together with the development of new technologies that do not refrain from relying on skilled labour and team-work even when they involve the intensive use of high-agency cost labour[18]. Finally, these policies must provide incentives for the new technologies even when the property rights structure is not yet best attuned for their employment.

In other words, it is necessary to act simultaneously on rights and technology. We should stick to the elementary principles of economic policy according to which the number of policy instruments should not be inferior to the number of objectives.

The successful speciation of new organisational equilibria does not only require that each firm deals successfully with the complementarities between its own rights and technology. Because of network externalities there are also important complementarities among the organisational models adopted by different firms.

The existence of network externalities can cause a homogenisation of technology[19]. A single technological standard may be the only possible equilibrium outcome when common inputs produced under a regime economies to scale are used by all the firms.

Although the case of property rights has not received the same attention, network externalities can also cause the homogenisation of ownership systems. For all the firms using the same system of property rights, some pieces of legislation and the skills, that are necessary to its application and enforcement, are common inputs produced and used under

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[18] These technologies and rights based on team-work may help the development of a sense of community that is also highly complementary to the new organisational equilibrium. Other policies, favouring this sense of belonging to communities, may, in turn, help the new right and technologies. The concept of organisational equilibrium should be somehow extended to take into account these factors. An attempt to move in this direction is made in Pagano (1993b).

[19] See Agliardi (1991) and Arthur (1989).

a system of pronounced economies to scale. A piece of legislation can be used an infinite number of times without being destroyed.

For instance, the legislation on limited liability has been very important for the development of all joint stock companies and for the quality of collective governance by shareholders. By contrast, the legal instruments by which workers could exercise their governance are relatively underdeveloped. As Bowles and Gintis claim re-distributing assets to the workers should not imply going back to small scale production. However, the institutions by which the workers should exercise their control in large firms are still unclear at theoretical and practical level. For instance, these institutions should face the fact that the interests of the workers are much less homogeneous than those of shareholders. For this reason, the means by which collective decisions should be taken are necessary more complex[20].

The complementarity between technology and property rights that is encompassed by the concept of organisational equilibria implies that network externalities can act indirectly on property rights via technology and also indirectly on technology via property rights. Network externalities among firms' technologies may also imply the homogenisation of property rights. Vice versa, network externalities among the ownership system may also imply the standardisation of technologies. When these complementarities between technological and property rights standards exist, the speciation of few alternative organisational models may become very difficult. Redistribution policies become fairly complex because they should deal with both inter-firm and intra-firm complementarities between rights and technologies[21].

Finally, a policy of asset redistribution must be better specified. It can involve the re-distribution of given bundles of rights (on which Bowles and Gintis focus their contribution) and/or the "unbundling of rights" and their attribution to different agents. Even if this form asset redistribution has not yet received the attention that it deserves[22]., it

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[20] For this reason, the "influence costs" considered by Milgrom and Roberts (1990) could be relatively high in the "democratic firm".

[21] The existence of these complex complementarities characterise also the privatisation policies in the former socialist economies that, because of their different socialist experiences, inherit different distributions of asymmetric information. On this point see Earle J., Frydman R., Rapaczynski A. (1993). On the notion of complementarities see Milgrom and Roberts (1992).

[22] An exception is Roemer (1995). I have also benefited from his comments during the conference.

has had great practical relevance and it has had often the effect of increasing both equality and efficiency

In real-life capitalist economies the workers have often acquired two types of rights with respect to the work that they perform. In some cases (that are very frequent in the "*company workers' type of capitalism*" characterising the Japanese Economy) they have the right on some unspecified job in a particular organisation for a long time and, in some cases, until retirement. In some other cases (that are typical of "*the unionised type of capitalism*" that has been developed in the German economy) a union of workers can have the exclusive right to perform some well specified jobs in all organisations but the single worker does not have the right to a job in a particular organisation; the specification of the contents of these jobs and the relative training is to be agreed by the unions and employers' associations.

The cases, considered above, correspond to different types of "unbundling" and redistributions of the rights on physical assets existing under "*classical Tayloristic capitalism*"[23] ..

Consider first the case of "*company workers capitalism*". If a worker has some job security, the owners of the physical assets do not have the right to employ the assets of the firm without that worker. So employers do not have a right on physical assets that they have under "*classical capitalism*". So "*company workers capitalism*" involves the "unbundling" and the redistribution of a right on physical assets that belongs to the employers under "*classical capitalism*".

Likewise, in the case of "*unionised capitalism*", if only the workers having certain qualifications and belonging to a certain union can work in a certain trade, the owners of assets do not have the right to employ the asset with other workers. Moreover, if the employers' associations and the unions have the right to specify and standardise the nature of the jobs across the firms, then the ownership of physical assets does not entail the right to employ the assets with any organisation of production; also under "*unionised capitalism*", some rights, that are held under "classical capitalism" by the owners of the assets, are "unbundled" and redistributed from the single asset-owner to the workers' union and to the employers' association

The unbundling and redistribution of rights, considered above, is likely to dilute the incentives of owners of the employers to invest the high-agency-cost physical assets whose

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[23] For a more precise definition of "classical capitalism", "company workers' capitalism" and "unionised capitalism" see Pagano (1991). For a (very short) explanation of the reasons why the major three western economies have developed alternative "organisational equilibria" see the concluding section of Pagano (1993).

user-induced depreciation cannot be easily monitored and that cannot be easily re-allocated to alternative uses.

However, the same unbundling and redistribution of rights is likely to have positive incentive effects on the high-agency-cost human capital. In the case of "*company workers capitalism*" job security can favour investments in firm-specific human capital that is safeguarded against the threat of "unfair" termination. And, in the case of "*unionised capitalism*" the standardisation of jobs across firms, safeguarding the generality of the learning acquired by doing, favours investments in human capital that can be utilised in other firms in case of job termination (or, in other words, this system of rights creates a market for skilled workers[24]). In both cases, the sense of belonging to a firm or to a craft-union and the satisfaction of learning by doing should make "difficult-to-monitor" jobs less costly.

Observe that, in both cases, the "unbundling" and redistribution of rights is likely to shape the nature of resources in a self-sustaining manner.

In both systems the truncation of the rights of the asset-owners may cause the under-employment of high-agency-cost physical capital . In turn, this under-employment may make the asset-holders value less those rights on the physical assets that have been redistributed to the workers. If the new rights are allowed to survive for a sufficiently long period then, after some time, we would have a lower intensity of high-agency-cost capital that is consistent with the new rights.

A similar self-reinforcing process between the nature of human capital and rights will take place either under "*company workers capitalism*" or under "*unionised capitalism*". In the first case, the increased employment of firm-specific human capital will, in turn, increase the value of the firm-specific job rights for the workers. In the second case, the increased employment of general purpose (but trade-specific) human capital will, in turn, induce the workers to give greater value to the rights that their union has in that particular trade.

Under both systems the workers will have a greater incentive to acquire the knowledge that can be useful to perform their jobs; by contrast, the incentives of managers and asset-holders to acquire the knowledge to direct the labour process will become weaker. In other words, in both cases, the unbundling and the redistribution of rights on the physical assets will also have a tendency to induce a redistribution of asymmetric information.

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[24] Thus, the unions and the employers' associations that are usually seen an impediments to the unfettered working of efficient markets can, at the same time, be institutional preconditions for a system of property rights that allows the existence of markets for skilled labour. On this point see section 4 of Pagano (1991).

Thus the definition and the distributions of physical assets, defining "*classical Tayloristic capitalism*", "*company workers' capitalism*" and "*unionised capitalism*" characterise alternative "organisational equilibria" that involve very different degree of (in)equality and welfare. In principle, the unbundling and redistribution of rights", that occurs in the transition from "*classical capitalism*" to either "*company workers' capitalism*" or "*unionised capitalism*", can increase equality and enhance efficiency. It is an open question which unbundling of rights is more likely to achieve these objectives. It is also an open question whether redistributions based on the unbundling of rights are more likely to achieve these goals than the redistributions of given unbundled rights on physical assets.

Thus, the choice among alternative redistribution policies is very complex. It must take into account the institutional characteristics of the country where it is supposed to take place and, in particular, whether some unbundling of rights on physical assets has already occurred in that country. In other words, the complementarities that we have seen to characterise the distribution of assets and the distribution of asymmetric information must be studied in the contexts of different economies. Different redistribution policies may well turn out to be appropriate for different countries.

In spite of these difficulties, an egalitarian re-distribution of physical assets and asymmetric information that improves efficiency belongs to the world of real utopias. It is certainly reasonable to believe that there are not only trade-offs but also complementarities between efficiency, equality and democracy: a more egalitarian distribution of assets and a more egalitarian distribution of information and decision-making are very likely support each other. In some cases, they are also likely to improve productivity.

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Appendix.

We assume the existence of a standard production function Q (k, K, l, L) such that the output Q can be produced with different combinations of low-agency-cost capital and labour (k ,l) and high-agency-cost capital and labour (K,L).. Q (.) can be interpreted as a

"long-run" production function. Thus, the substitution effects induced by property rights are not immediate and it is possible to have short run mismatches between property rights and the associated technology.

We assume that when workers own the organisation they pay an additional agency cost Z in order to employ a unit of difficult-to-monitor or specific capital K - a cost that is saved when K is employed under capitalist ownership . By contrast, when the capitalists own the organisation, they pay an additional agency cost H when they employ a unit of difficult-to-monitor or specific labour L - a cost that is saved when L is employed under labour ownership. No such additional costs are paid for easy-to-monitor and general purpose labour and capital k and l when they are employed by either capitalists or workers.

We denote by r and w the prices of respectively easy-to-monitor and/or general capital and labour and by R and L the prices (net of agency costs) of respectively difficult-to-monitor and/or specific capital and labour. We also set the price of output equal to 1. Thus, we can formulate our "Radical" assumption as follows:

Radical Assumption:

Under capitalist ownership firms maximise profits equal to:

$$R^{c} = Q(k, K, l, L) - [rk + RK + wl + (H+W)L] \quad (1)$$

Under labour ownership firms maximise profits equal to

$$R^{L} = Q(k, K, l, L) - [rk + (Z+R)K + wl + WL] \quad (2)$$

This way of formalising the "radical assumption" makes it very clear why property rights influence technology in a way similar to changes in relative prices: for instance, the relative prices of the high-agency-cost factors are (H+W)/R under capitalist ownership and W/(Z+R) under workers' ownership. Thus, under standard assumptions, the intensity of high-agency-cost capital relatively to the intensity of high-agency-cost labour is higher under capitalist ownership than under labour ownership. Observe that in this framework, the value of the elasticity of substitution among factors becomes a measure of the "strength" of the effects of changes of property rights on the nature of the technology.

We have seen that the "New Institutionalist assumption" runs in a direction opposite to that of the "Radical Assumption"; taking as given a certain technology the firm is supposed to be owned by that factor which can earn the highest ownership rent. This rent is equal to the difference between the cost of employing the factor in a firm that is property of the owners of the factor and the cost of employing it in a firm that is property of other owners.

New Institutional Assumption:

For any given combination of factors employed in the firm, ownership of the firm will be acquired by the factor which can get the highest ownership rent. Therefore: capitalist property rights can prevail if, given the factors currently employed, $R^c \geq R^L$ or, alternatively,

$$ZK - HL \geq 0 \qquad (3)$$

workers' property rights can prevail if, given the factors currently employed, $R^L \geq R^c$, or alternatively,

$$HL - ZK \geq 0 \qquad (4)$$

Conditions defining organisational equilibria.

There will be a capitalist organisational equilibrium (COE) if there is a technology that maximises (1) and satisfies (3) and there will be a labour organisational equilibrium (LOE) if there is a technology that maximises (2) and satisfies (4).

Let:

$$(k^c, K^c, l^c, L^c) = \text{argmax } R^c(k, K, l, L) \qquad (5)$$

$$(k^L, K^L, l^L, L^L) = \text{argmax } R^L(k, K, l, L) \qquad (6)$$

Then a firm will be in *a <u>capitalist organisational equilibrium</u>* (COE) if:

$$ZK^c - HL^c \geq 0 \qquad (7)$$

and in *<u>a labour organisational equilibrium</u>* (LOE) if:

$$HL^L - ZK^L \geq 0 \qquad (8)$$

Condition (7) has an immediate intuitive meaning. Suppose that a firm is under capitalist ownership and the technique of production is such as to maximise profits. Condition (7) implies that, <u>with this technique,</u> the ownership rent occurring to capitalists is at least as great as the rent which workers could obtain if they owned the firm. Hence, <u>with this technique of production,</u> the workers would have no incentive to buy out the capitalists. This is what is meant by a capitalist organisational equilibrium. Condition (8) has an analogous intuitive meaning.

The conditions for COE and LOE can also be written in the following equivalent ways:

$$K^c/L^c \geq H/Z \qquad (7')$$

$$K^L/L^L \leq H/Z \qquad (8')$$

Conditions (7') and (8') have also an intuitive meaning. Observe that K/L is the ratio of high-agency-cost (H-A-C) capital to H-A-C labour or the H-A-C capital intensity; observe also that H/Z is the agency cost ratio between the capitalist's extra-cost in employing H-A-C labour and labour's extra-cost in employing H-A-C capital. Thus (7') means that a COE is feasible when the intensity of H-A-C-capital is greater than the agency cost ratio and (8') means that a LOE is feasible when the intensity of H-A-C capital is lower than the agency cost ratio. For instance, high agency costs per unit of labour could be compensated by the employment of a great amount of H-A-C capital and make it feasible a COE.

Under standard assumptions, the high-agency-cost capital intensity will be higher under capitalist ownership or:

$$K^c/L^c \geq K^L/L^L \qquad (9)$$

The value of the agency cost ratio H/Z either falls in the interval defined by these two values or outside it .

Let us first consider the case in which it falls in this interval. In this case H/Z is such that:

$$K^c/L^c \geq H/Z \geq K^L/L^L \qquad (10)$$

Then both (7') and (8') are satisfied and we have multiple (capitalist and labour) organisational equilibria.

Consider now the cases in which H/Z does not fall in this interval.
H/Z may be smaller than the high-agency- cost capital intensities. Or:

$$K^c/L^c \geq K^L/L^L > H/Z \qquad (11)$$

Then (7') is satisfied but (8') is not satisfied. In this case only a COE exists.

By contrast, if H/Z is such that:

$$H/Z > K^c/L^c \geq K^L/L^L \qquad (15)$$

(8') is satisfied but (7') is not satisfied. In this case only a LOE exists.

Observe that since the ratio H/Z must necessarily fall in one of the three intervals considered above, for any H/Z ratio at least one organisational equilibrium must always exist.

We can visualise the three possibilities considered above in the following figure 8. For H/Z that goes from zero to infinity we have first unique COE equilibria, then multiple equilibria and, finally, LOE unique equilibria.

$$0 \text{ ------(COE)-----} K^L/L^L \text{ -----((LOE+COE)------} K^c/L^c \text{ ----- (LOE)-----> } \infty \qquad \text{(F8)}$$

(F4) "assumes" a certain value of the elasticity of substitution and it can give us some intuition of the effects of its changes. An increase in the elasticity of substitution widens the values of the agency cost ratio for which multiple equilibria exist. It moves K^L/L^L leftwards and K^c/L^c towards the right widening the interval of multiple equilibria defined by them. Within this interval any initial set of property rights will induce technologies such that their interaction will define organisational equilibria. Thus, an increase of the elasticity of substitution widens the interval where property rights can shape technologies in a self-sustaining manner. Because of the "Radical Assumption", the higher the elasticity of substitution the more powerful the effects of ownership on technology .