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Legal Positions and Institutional Complementarities

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Abstract - Legal positions (such as rights, duties, liberties, powers, liabilities and immunities) are linked together by strong institutional complementarities differing from the usual institutional complementarities that have been recently considered by the Economic Literature. Legal positions do not only satisfy the usual conditions of institutional complementarity stemming from the fact legal positions that "fit" each other do marginally better than the ones that do not. They define also legal equilibria characterised by the social scarcity constraint that is typical of positional goods. Legal positions can be considered as positional goods defining equilibrium conditions that may be violated ex-ante but that must hold ex-post as an accounting identities. In this sense they define "strong institutional complementarities" supported by the "tight glue" of social scarcity. The positional nature of legal relations implies that "ex-ante" disequilibrium is very likely to arise and to generate a constant oversupply of positions such as rights and powers with respect to correlated positions such as duties and liabilities. Alternative systems of capitalism are characterised by both the "strong institutional complementarities" existing among different legal positions and the "weak complementarities" existing among the legal positions and the other characteristics of the system such as the technology and the nature of the resources. In this way, the "ex-ante" disequilibrium, due to the positional nature of legal relations, can spill over other parts of the economic system.

JELClassification: P10, K11, K12, K31, K22, L20, J41, J50

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1. Introduction

Rights and liberties belong to everyday political language. From the political use of the terms one may get the idea that human history is characterised by a constant advancement of both rights and liberties that does not pose any sort of trade-off between them. In this paper we would like to argue that such a trade-off exists and that it is related to basic "equilibrium conditions" that rights and liberties must satisfy[1]. The rights of some individuals must often be jointly consumed with duties (that is an absence of liberties) of other individuals. The same rights that are enjoyed as an output or a good by some agents must be experienced as duties (as an input or as a bad) by other agents. In other words, the legal relations defining rights, duties and liberties involve the experience of opposite legal positions by agents consuming the same objects with opposite signs and may usefully regarded as positional goods. A similar argument applies to second order jural relations involving powers, disabilities, liabilities and immunities.

In the following section we consider Hohfeld and Commons' theories of legal positions and we introduce the concept of *legal equilibrium*. In section 3 we introduce the concepts of positional goods and of social scarcity and we argue that legal relations may be best interpreted in the light of these concepts. A result of the analysis is that there is a natural tendency of the system to accumulate *legal disequilibria* and fail to satisfy the *strong institutional complementarities* that are required by the correlative nature of legal positions. In section 4 we consider some actual cases of the strong institutional complementarities that characterise different systems of legal positions. We show that the positions characterising alternative models of capitalism satisfy in different ways the social scarcity constraint underlying legal equilibria. Finally, in the last section we consider the relations of institutional complementarity that characterise the relationship between rights and the technologies. Also in this case we have multiple institutional arrangements due to the mutually reinforcing relations between different types of rights and technologies. However, we argue that the multiplicity of *organizational equilibria* that characterises these relations is due to *weak institutional complementarities*[2]. Organizational equilibria need not satisfy the social scarcity

[1] However, in some cases we can be below some efficiency frontiers and be able to increase the rights and the powers of an individual without decreasing the liberties and the immunities of other individuals.

[2] On the concept of Institutional Complementarity see Milgrom and Roberts (1990) and Aoki (2001). Pagano (1993) and Pagano and Rowthorn (1994) introduce the concepts of Organizational Equilibria and Institutional Stability. In spite of the different terminology Aoki (2001, p.396) has generously acknowledged that "[a]lso Pagano (1993) and Pagano and Rowthorn (1994) are two of the earliest analytical contributions to institutional complementarity". According to the terminology used in this paper, both organizational equilibria and institutional complementarities are "*weak*" cases of institutional complementarity.

constraint that characterises relations among legal positions. We conclude by arguing that an understanding of alternative systems of legal relations could benefit from both the analysis of the *strong institutional complementarities* characterising the internal relations among legal positions and the analysis of the *weak institutional complementarities* such as those existing among alternative legal entitlements, the nature of resources and other features of the society in which these entitlements are embedded.

2. Legal Equilibria.

Ships that are in danger enjoy the legal right to be helped by other ships. This right is necessarily correlated with the duty of other ships not to leave when another ship is in danger. This duty also necessarily entails that other ships do not have the liberty to leave and that the ship which is danger is not exposed to the liberty of other ships to refuse help. This example shows how, in order to be effectively enjoyed, some rights necessarily entail limitations of some liberties. By the same token, my liberty to direct my ship where I want is limited by the right that other ships have to be helped in situations of danger. As we will see in the next section, the economic trade-off among liberties and rights arises from a situation of social scarcity that cannot be appropriately studied if we concentrate only on private and public goods or bads. The understanding of social scarcity requires the introduction of positional goods.

For the time being, let us consider the analysis of legal relations that, originally introduced by Hohfeld (1919), was later developed by Commons (1924) and is one of the most important contributions of American Institutionalism[3].

To simplify the argument we shall consider only the transactions between two agents i and j. According to Hohfeld, "first order" jural relations define some necessary relations between the two agents i and j . For instance i may have (not have) the claim that j saves him when his ship is in trouble (Action A) and j may be deprived of the corresponding liberty to leave without assisting.

In other words we have that:

(1) Claim (right) of i <---> Duty of j

or, in other words, an agent i has legal claim towards an agent j that j does the action A if and only if j has with respect to i the duty to do A.

(2) No right (exposure) of i <----> Liberty (no duty) of j.

[3] Parts of this section are based on Pagano (2000).

or, in other words, an agent j has a legal liberty towards an agent i to do A if and only if i has no right towards j to prevent j from doing A and is, therefore, exposed to the liberty of j.

Of course, similar relations hold for the claims of j and the liberties of x:

(3) Claim (right) of j <---> Duty of i

(4) No right (exposure) of j <----> Liberty (no duty) of i

In this simple two-individual-relation the set of actions for which i has rights do not only define the duties of j. They also define the remaining actions for which j has the liberty to act (i.e. the set of actions for which i has no right to interfere and is exposed to the liberties of j). In other words, in this simple framework, the jural relations entail that the boundary between the rights and the exposures of i should coincide with the boundary between the duties and the liberties of j and vice versa.

Thus, concentrating our attention on relations (1) and (2) we have the following Table 1 concerning first order jural relations.

Table 1: First order jural relations.

Right of i	Duty of j
Exposure of i	Liberty of j

In terms of our sinking ship example, the boundary between the right of i to be saved and the exposure of i to the liberty of the other ship not to help should coincide by definition with the boundary between the duty of the other ship to help and its liberty to leave.

In Hohfeld's original scheme, "rights and duties - quite as much as the elements in each of the other three pairs of legal positions- were always correlative *by definition* (Kramer 1998 p. 24)". Hohfeld "did not draw his Correlativity axiom as a contingent conclusion from empirical data. He posited the correlativity of Rights and Duties in such a way that each entail the other; each is the other from a different perspective, in much the same way that an upward slope viewed from below is a downward slope viewed from above. Hence, the adducing of empirical counter-examples is a task as pointless as the adducing of empirical counter-examples to the proposition that all bachelors are unmarried (Kramer, 1998 pp 24-25)".

However, an *ex-post/ex-ante* distinction may be useful[4]. Ex-post rights and duties can be regarded as accounting identities. Similarly to savings and investments, their retrospective values must necessarily coincide. *Ex-post* if i benefited from the right to be saved, j had necessarily to bear the burden of exercising the duty to help and could not have exercised a liberty to leave the sinking boat. In this case, as in the case of an accounting identity, rights and duties are really like a slope seen with opposite signs from different standpoints. However, ex-ante i's boundary between rights and exposures may well differ from j's boundary between duties and liberties in the sense that i and j may have different perceptions about their relative positions. For instance, i may believe that, under some circumstances, he has the right to be helped while under the same circumstances j believes that he has the liberty to leave. In this sense an important task of law-making, conceived as purposive activity which has the object of subjecting human conduct to the governance of rules (Fuller, 1969), is to reduce the gap between inconsistent expectations and, as a consequence, the gap between the prospective and retrospective views of the individuals about their entitlements. In other words, the purpose of law is to eliminate "legal disequilibrium" and to induce agents to hold relative legal positions that are ex-ante consistent (that is a situation of "legal equilibrium").

When i and j have different interpretations of their relative positions, and therefore different ex-ante expectations, either the rights of i or the liberty of j are going to be sacrificed. According to the tradition of positive law inaugurated by Kelsen, analysis of this type of problems is the central theme of law. In the absence of law, no agent can state which one of the perceptions entailed by the two ships is "valid", and inconsistent rules followed by the agents may easily arise.

The elimination of these inconsistencies and the establishment of the validity of the rules was according to Kelsen[5] the fundamental purpose of law. The analysis of the validity of law implied that eventual inconsistent interpretations of the rules had to be settled by referring to rules of superior order. This approach did not only assume the necessity of an agent (the State) having the monopoly of enforcement but also the

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[4] The concepts of ex-ante and ex-post were introduced in economics in the 1930s by the famous Stockholm School that included Gunnar Myrdal and Erik Lindahl. For a brief (and fairly unsympathetic account) see Steiger (1987).

[5] Kelsen (1992) considered the validity of the law or its consistency (not its justice or its efficacy) as the proper object of legal studies and argued that the validity of legal rules should be distinguished from their justice and efficacy. If some final "grundnorm" was transcendentally given, the unity, consistency and completeness of the legal ordering could be established by checking the consistency of the rules with the hierarchical superior rules. Only the rules that satisfied this consistency test were valid rules of the legal system. Ferrajoli (1993) has distinguished between a concept of validity based on the consistency with hierarchically superior norms and a procedural concept of validity meaning that the norms were promulgated by legitimate procedure. This distinction helps understanding that existing norms may be valid in the sense that they have been produced by a legitimate procedure but invalid in the sense that they are inconsistent with superior norms.

existence of a constitutional grundnorm. Such grundnorm is necessary to provide an end to an otherwise potentially infinite regress in the analysis of the validity of rules.

A limitation of the Kelsenian approach is that the existence of legal rules can only be thought of within the framework of a developed legal system. By contrast, common expectations about rights, duties and liberties can often arise also in absence of the intervention of the State.

In this respect a meaningful development of the positivist approach to legal theory was due to Hart (1958 and 1961)[6] who used an evolutionary approach to explain the formation of real life legal systems. However, he retained the Kelsenian idea that the validity of law is the central concept of positive law. A primitive society could well develop a system of "primary" rules without the intervention of central authority and some "grundnorm" from which the validity of the other rules could be logically derived. However, such a system will be upset by uncertainty because in many cases the agents will maintain that different rules exist or should be applied in particular cases. It will also be static because, besides custom and tradition, nobody has the power to change the rules even when it may be urgent to do so. Moreover the system will be characterised by numerous contrasts and by an inability to impose sanctions that go beyond a system of private revenge. For this reason any such social arrangements will tend to evolve a system of "secondary" rules that can provide a solution to the problems encountered by the system of "primary" rules that we have just considered. A rule of “recognition", establishing the "Kelsenian" validity of the primary rules, is the first attribute that a proper legal system should evolve. In order for the other shortcomings of a system of primary rules to be overcome, rules of change and of adjudication and sanction imposing rules must also be included in the system of secondary rules. Thus, a proper legal system is necessarily based on the existence of "second order" jural relations that give to some agents the power to identify clearly, change quickly and enforce efficiently those primary rules that may also emerge in a primitive society.

The institution of “second order” jural relations requires that some agents invest in the ability to verify and enforce ex-post the rights and the corresponding duties among the different individuals. In this way, they can also create the conditions for expectations that are consistent "*ex-ante*".

In other words, independent of whether these agents belong to the "private" or the "public" sphere, they make an important contribution to the elimination of the "disequilibrium" between the rights and duties of the individuals. Or, in other words, the role of the "second order" jural relations can be thought of as that of creating the conditions for the existence of "legal equilibria" among the rules defining the rights,

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[6] Hart also "diluted" the Kelsenian separation between ethics and law. For other authors, like Finnis (1980), even a partial separation is impossible. The final "grundnorms" at least must be based on some ethical principles.

duties, liberties and exposures of the different individuals. Such a role must entail the power to define the first order relations and requires analysis of the nature of such power.

It is not surprising that, like rights and liberties, powers and immunities also necessarily limit each other. If, because of the existence of a Bill of rights the State has no power to change legal entitlements and restrict my liberty of speech (Simmonds, 1986 p. 132), this means that in this respect I have no liability towards the state or, in other words, an immunity[7] against its power that is correlated with the corresponding disability of the State. Second order legal relations also should be characterised by the fact that some boundaries must be aligned if the powers of the State are really to hold or the immunities of the individual really respected. In particular, in a two-agent-economy, the boundary between powers and disabilities of one agent must be aligned with the boundary between liabilities and immunities of the other agent.

Thus second-order jural relations are characterised by the following relations that are analogous to those that we have considered above:

(1') Power of i <----> Liability of j

or, in other words, i has a legal power over an agent j to bring about a particular legal consequence C for j if and only if some voluntary actions by i would be legally recognized to have this consequence for j.

(2') Disability of i <----> Immunity of j

or, in other words, an agent j has a legal immunity with respect to an agent i from a specific legal consequence C if and only if i does not have the legal power to do any action that according to the law would have the consequence C for j.

Again, similar relations hold for the powers of i and the immunities of j:

(3') Power of j <----> Liability of i

(4') Disability of j <----> Immunity of i

Second order jural relations also entail symmetric correlation between the positions of the two agents. In this case too, the boundary between the powers and the disabilities of i should coincide with the boundary between the liabilities and the immunities of j and vice versa. Again, concentrating our attention on relations (1') and (2'), we obtain the following Table concerning the second-order legal relations.

[7] Simmonds (1986, p. 132) points out that while "the exact limit of such immunities is, of course, a controversial matter.....American "civil liberties" differ from their British equivalents precisely in their status as immunities". In Britain the enjoyment of freedom of speech could in principle at any time be abridged by Parliament. "Freedom of speech in Britain is enjoyed as a Hohfeldian liberty, not an immunity".

Table 2: Second order legal relations

Power of i	Liability of j
Disability of i	Immunity of j

Both first-order and second-order jural relations have a prominent role in Commons' analysis of transactions and, in particular, in his distinction between authorised and authoritative transactions.

According to Commons the minimum description of a transaction involves the two transacting agents, the two agents who are the next best transacting alternatives for each agent and the working rules according to which the transaction takes place[8]. The working rules of the transaction include the definition of the rights, duties, liberties and exposures of the agents or, in other words, their entitlements. However, there is no guarantee that the working rules of the transactions satisfy the relations considered above[9]. If we concentrate our attention on the two agents i and j that are involved in the transactions, the two agents may well hold different views on their entitlements. For instance, the rights of the agent i may not match the duties of j and the liberties of j may not match the exposures to these liberties of i. In other words, the limit between the rights and the exposures of i may not coincide with the limit between the duties and the liberties of j. An "authorised transaction" occurs when, because of the activity of a fifth

[8] In other words, Commons' notion of transaction costs not only includes the traditional *enforcement costs* that characterize relations with another agent. It also includes the cost of the public institutions and *competition costs* to be sustained by the agents when they seek to exclude their competitors from the market. On this point see Nicita (1999 and 2001) who introduces the notion of *cross competition* that arises when both the assumptions of zero enforcement and competition costs are removed.

[9] Commons (1924) observes that Hohfeld transactions can also be interpreted as ethical relations between the agents which may also be supported by traditional beliefs. However, Commons (1924 p. 85) observes, "There is, however, a difficulty with these ethical mandates. They are mental processes and therefore as divergent as the wishes and the fears of individuals. Hence, when they emerge into action they are individualistic and anarchistic. They are unrestrained in action by an actual earthly authority to whom each party yields obedience." The lack of subjective correlation may express itself in the fact that one agent considers that the boundary of his rights differs from the related boundary of the duty of the other agent. For this reason, according to Commons (1924, p. 86), "It seems that the only procedure that will *collerate* the wishes and fears of each and prevent anarchy is to resort to a third person of an earthly quality whom each consents to obey, or each is compelled to obey."
Wellman (1978) has indicated how Hohfeld relations can be interpreted as both ethical relations and jural relations, and that they can be written as two sets of independent propositions.
Bobbio (1990) points out that ethical rights can only logically imply ethical duties and not legal obligations. According to him we can cause much confusion when we mix ethical and jural relations.

agent (the public authorities), the limit between the rights and the exposures of each agent coincides with the duties and the liberties of the other agent.

However, "authorised transactions" cannot be taken for granted. They require "authoritative transactions" and second order jural relations. In other words, a legal system can help to guarantee a perfect fit between the entitlements of the different agents.

As in the case of the first order jural relations, authoritative transactions may also occur in a situation of "disequilibrium" where the boundary between the powers and the disabilities of one agent does not coincide with the liabilities and immunities of the other agent. Commons observes how, from the Magna Carta[10] onwards, legal systems have progressed towards the establishment of an increasingly clear correlation between powers and liabilities on the one hand, and disabilities and immunities on the other.

The type of transactions considered by standard economic theory requires a complex equilibrium that involves both "authorised" and "authoritative" transactions. For instance, the boundary between the claims and the exposures of i must coincide with the boundary between the powers and the disabilities that public officials have to enforce his entitlements with respect to j . In a similar way, the limit between the duties of j and his liberties must coincide with the limit between the relative liabilities and immunities that j has with respect to public officials. Similar "equilibrium" relations must hold for the entitlements of j with respect to i.

Concentrating on the entitlements of i with respect to j , Table 3 below describes a situation of “legal equilibrium” that is a set of ex-ante consistent first and second order legal positions.

Table 3: Legal equilibrium.

Power of i via p. o.	<------>	Right of i	<------>	Duty of j	<------>	Liability of j via p. o.
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Disability of i via p. o.	<------>	Exposure of i	<------>	Liberty of j	<------>	Immunity of j via p. o.

[10] However, Commons points out how the role of the Magna Carta was somehow limited. "When, in the Magna Carta, the barons claimed their "liberties" they were claiming personal privileges, or the right to exercise the powers of sovereignty. .....In short, "liberty meant, not liberty nor property, but political privilege" (Commons, 1924 p. 51).

In a legal equilibrium the broken line separating the rights and the exposures of i coincides with the power and the disabilities that are granted to public officials (p. o.) to enforce her rights. It also coincides with the broken line separating the duties and the liberties of j , which in turn coincides with the broken line that defines the boundary between the liabilities and the immunities that j has towards public officials.

However, the broken lines of table 3 do not necessarily need to be aligned. In reality a situation of legal disequilibrium, such as that considered in table 4, may well arise.

Table 4: Legal disequilibrium.

Power of i via p. o.	Right of i	Duty of j ----------	Liability of j via p. o.
---------- Disability of i via p. o.	---------- Exposure of i	Liberty of j	---------- Immunity of j via p. o.

In table 4, the broken line, defining the boundary between the rights and exposures of i, does not coincide with that defining the boundary between the duties and the liberties of j . In this case the powers of and the liabilities towards public officials fail to match the legal entitlements of the two agents. By contrast, a well working legal system, equilibrating the power and liabilities that agents acquire through public officials, tends also to equilibrate their rights and duties or, in other words, tends to achieve the legal equilibrium considered in table 3.

According to Commons, the correlation between the entitlements of i and j requires a corresponding correlation of the second jural relations between the two agents and public officials. While Kelsen sees the unity and the consistency of the legal system as a pure matter of Logic and concentrates on the analysis of the validity of rules, Commons points out how the jural relations considered by Hohfeld cannot be taken for granted. They notably require the costly intervention of public officials who attribute corresponding powers and liabilities to the agents (via public officials) and, in this way,

also equilibrate their rights and duties. The limits to the powers and to the liabilities of public officials (or their disabilities to act in the interest of i and the immunities of j from their intervention) also equilibrate the exposures and the liberties of the agents. In other words, while both first and second jural relations may well be in disequilibrium, with the help of public officials a good legal system tends towards the realisation of a complex "legal equilibrium" where the conditions considered above are satisfied.

While Commons does not use the term "legal equilibrium" (or the term legal disequilibrium), perhaps, this term can usefully catch the originality of his contribution and his distance from the Kelsenian tradition of the analysis of the validity of legal rules[11].

In the Kelsenian tradition the "consistency" of rules is purely a matter of Logic and eventual discrepancies have to be solved by stating which rule is hierarchically superior. For instance, if under some circumstances the rules simultaneously stipulate the right of i to be assisted and liberty of j to do something else, the matter has to be logically solved by checking which of the two rules has priority. In a way, inconsistency never arose for scholars who were aware of the logical rules governing the system and could easily judge the validity of each single rule.

By contrast, according to Commons the consistency of a legal system is only an ideal goal of such a system and some degree of disequilibrium is a permanent feature of the working of a legal system[12]. Moreover, in Commons' view, the elimination of disequilibrium is not a pure matter of Logic which requires a "corner solution" stating the priority of the rights of i over the liberties of j or vice versa. The costly elimination of disequilibrium is a real process that may either involve “corner solutions” or “intermediate solutions” characterised by some dilution of the rights of i and of the liberties of j .

According to Commons, elimination of legal disequilibrium cannot be carried out only by public officials but, as Fuller (1969) also emphasized, it must also be performed by the many agents that have a similar function in the private sphere. In particular, firms may be seen as "going concerns" where some working rules are established by private agents who bear the costs of setting up a "private" legal

[11] In some respects, the Kelsenian concept of the validity of rules establishing the complete consistency of lawful behaviours is analogous to the Walrasian concept of economic equilibrium. On this point see Pagano (1995). However, the level at which this consistency is established is different. As Gianformaggio (1993) has pointed out, lawful behaviour is made of normative statements that are not intended to represent the actual behaviour of the individuals.

[12] Like most economic relations, legal relations become “ex-post” simple accounting identities. “Ex post”, if x was exercising some rights, y was necessarily observing some duties. However, the existence of these “ex-post” accounting identities does not imply that there was “ex-ante” equilibrium between the perceptions of x concerning her rights and the perceptions of y concerning his duties. In other words, “ex-ante” disequilibrium is consistent with the “ex-post” identity between rights and duties (or between liberties and exposures etc.).

equilibrium which is specifically tailored to certain types of transactions. Similarly, arbitrators and the private orderings of many other institutions contribute to the costly elimination of legal disequilibrium[13]. Each one of these institutions has some relative advantages that depend on the type of action that has to be governed. The more specific is the nature of the relations among the individuals, the more specific are the skills and the knowledge that are required to eliminate legal disequilibrium. In this sense, the first-order specificity of the positions of the individuals involves a comparative advantage of second-order specific investments aimed at their efficient governance. The costs of investments, which public courts make to verify and enforce private contracts, can only be recovered when they are applied to a wide range of legal relations. Thus public courts are more likely to have a comparative advantage in the general purpose invetsments in human capital that are required for the ex-post governace of standard contracts. Arbitrators, intermediaries and firms' managers may be interpreted as private orderings that, thanks to second-order specific investments in human capital and their familiarity and involvement with the relations among the agents, can govern better than public courts relations characterised by first-order specific investments. In such cases private internal organization is likely to replace some of the institutions of public markets.[14]

3. Positional goods and social scarcity.

The correlative nature of legal positions implies that these positions are characterised by some form of social scarcity that is associated with the fact that each position is available to an individual only if a corresponding position (but, to use the analogy of Kramer mentioned above, with an "opposite slope") is occupied by some other individual.

The same action belongs to the rights of one individual only if, at the same time, it is a duty for some another individual. The set of actions that defines the rights of

[13] The importance of private orderings and of the other many institutions that may contribute to subject human behaviour to the observance of law has been forcefully pointed out by several authors such as Fuller (1963 and 1969), Hayek (1973), Leoni (1990) and Williamson (1985).

[14] We mean by *public markets* markets where the task of eliminating legal disequilibrium is mainly performed by public courts. By contrast, as Williamson (1996 p. 98) observes, the "implicit contract law of internal organization is that of forbearance. Thus, whereas courts routinely grant standing should there be disputes over prices, the damages to be ascribed to delays, failures of quality and the like, courts will refuse to hear disputes between one internal division and another over identical issues. Access to courts being denied, the parties must resolve their differences internally. Accordingly, hierarchy is its own court of ultimate appeal." In this sense, in the case of firms, one of the roles of management is to act as a substitute for public courts.

individual i imposes duties for some individual(s) j , limiting the set of actions that define the liberties of j . The same action (the sinking boat of i being saved by j) is consumed with opposite signs as a desired output by i and as a costly input by j , and any increase in the rights of i necessarily limits the liberties of j .

In a similar manner, the same action belongs to the powers of one individual if it constitutes a liability for another individual. The powers of i limit the immunities of j and no increase in the set of powers of i can be obtained without decreasing the set of immunities of j . Again, the same action is consumed with opposite signs as a power by i and as a liability by j (or as disability by i and as a immunity by j).

Rights, Liberties, Powers and Immunities have some characteristics that distinguish them from other goods. We can easily imagine a society where everyone consumes large quantities of goods such as rice, cars and housing space. It is much harder to imagine a society where everyone consumes "large quantities" of rights, liberties, powers and immunities. For some individuals the exercise of their rights must be limited by the liberties of others (that imply that they are not bound to perform the duties corresponding to these rights). Similarly, for some individuals the exercise of their powers must be limited by the immunities of other individuals (that imply that they are not subject to the exercise of these powers).

Any positive amount of rights and powers must be jointly consumed with negative quantities of other goods. It is impossible to exercise a right or a power if somebody is not subject to the exercise of these rights and powers: positive amounts of rights and power must be jointly consumed with negative amounts of liberties and immunities (that is with duties and liabilities)[15].

Unlike traditional economic goods, rights and powers inevitably involve different *positions*[16] of the individuals with respect to other individuals; for this reason, following Fred Hirsch's terminology, we can call goods like power and prestige *positional goods*.

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[15]Parsons (1986) disagrees but, as Aron (1986) maintains, he seems to be confusing the power over somebody with the power to do something. The former (and obviously not the latter) is a zero-sum good. This implies that the exercise of power may decrease overall welfare because "one may well experience being subject to the power of another as a welfare loss" (Bowles, Franzini, Pagano 1999, p. 6). At the same time, the exercise of power can be Pareto efficiency enhancing if its exchange is agreed on a competitive market and it helps to solve the problem of contractual incompleteness. On this point see Bowles and Gintis (1999). On the concept of power see also the other essays collected in Lukes (1986).

[16] Such positions are more generally the fundamental ingredient of a social system. A 'social system can be conceived as a set of structured processes of interaction characterised by networked, internally-related positions with associated rules and practices, while an institution may be defined as those structured processes of interaction "that are relatively enduring and identified as such" (Lawson, 1997 p. 318). While this paper focuses on the relations between "formal" systems of private and public orderings, the study of these systems cannot be abstracted from the informal rules, the customs and the ethical codes that have evolved in different countries and have a fundamental role in determining the positions of the individuals. As Hodgson (1988, p. 160) points out "The vision of a 'pure' market or capitalist system which has driven out all vestiges of habit and tradition is both theoretically implausible and unrealisable in practice". For this reason the stream of institutional economics related to Commons' work should be

In traditional economic theory we usually consider two types of goods (and their intermediate combinations): private and public goods.

Pure private goods are characterised by the fact that other individuals consume a *zero amount* of what each individual chooses to consume. The other individuals are excluded from the consumption of private goods that do not belong to them and their position with respect to the consumption of these goods is not altered by the consumption choices of the other agents. In all cases they are excluded from the consumption of the goods consumed by other individuals.

This exclusion is impossible in the case of a pure public good. In the case of a pure public good, each agent must consume the *same positive amount* that other agents decide to consume. Here the position of each of the two agents is not relevant in the sense that in the case of the consumption of a public good all individuals are in the very same position. In a similar way in the case of a public bad the positions of the individuals are irrelevant because all the individuals must consume the *same negative amount* of the public bad.

In an economy consisting of two individuals, a pure positional good is a good such that, given the consumption choice of one agent, the second agent must consume *a corresponding negative amount* of what the first chooses to consume. In this respect , positional goods define a case polar to that of public goods[17]. Unlike the case of private goods, here the consumption choices of the agents are interdependent and, unlike the case of public goods, the consumption of the goods differs between individuals having *different positions* (negative and positive consumption) relative to the good.

A visit to Robinson Crusoe's island, though unoriginal, may clarify the difference between these goods. In this island Crusoe will not perceive the difference between the public and the private goods that he is consuming. At same time, he will not consume any positional goods. In particular, he does not enjoy any right, liberty, power or immunity and he has no duty, exposure to liberty, liability or disability. Only when Friday arrives the distinction between private and public goods will become clear and

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integrated with that deriving from Veblen. On the different streams of institutional economics see Hodgson (1998).

[17] This definition is given in Pagano (1999). A different definition, based on rank, is given by Frank (1985). Being related to the definition of status, Frank's definition cannot be easily extended to cases of the exercise of power and to legal relations. Pagano (1999) distinguishes among different particular cases of "semi-positional" goods. Bi-positional goods are defined by the fact that only one other individual consumes the corresponding negative amount while "multi-positional" and "pan-positional" goods are defined by the fact that many individuals consume it. In what follows these distinctions are not relevant because we will concentrate on the case of a two individual economy. However, in a more general framework, they may be useful to distinguish among legal relations occurring "inter partes" and those holding "erga omnes".

negative and positive consumption of positional goods will become possible. Before the arrival of Friday only *economic scarcity* can be perceived. Both private and public goods may be consumed in limited quantities because either these goods, or the inputs that are necessary for their production, may be available in fixed supply. However, after the appearance of Friday, a new type of scarcity - *social scarcity* is experienced by Robinson (and even more by Friday!).

Social scarcity is not due to the fact that the consumption of the two agents cannot exceed some given amount that is fixed by technology and/or limited by the natural availability of resources. Instead, it is due to the fact that whatever one individual consumes as a positive quantity must be jointly consumed by the other individual as a negative quantity. The constraint is not anymore (or, at least, not only) fixed in terms of a positive maximum quantity. It is rather due to the fact that aggregate consumption must be equal to zero.

Like a slope viewed from above and below, the same action must be jointly consumed as a positive quantity (i.e. as a right or as a power) and as a negative quantity (i.e. as duty or as a liability). The rights that are enjoyed by Robinson may imply numerous duties by Friday and squeeze his liberty. The power consumed Robinson may be so extensive to give him the possibility of interfering with all the possible actions that Friday may carry out and eliminate any sort of immunity. While Friday may be granted by Robinson some liberties, he may enjoy no immunity against the unlimited power of Robinson to restrict them.

In the case of legal positions (and, in general, in the case of positional goods) the main limitations do not arise from a situation of *economic scarcity*, that is from a positive limited amount of resource availability. Instead they derive from a form of *social scarcity*, that is from the fact that the aggregate consumption of positional goods by the two individuals must be equal to zero. This implies that, while for private goods the consumption choices of each individual are independent of each other, and for public goods and bads they must move in the same direction, in the case of positional goods consumption must move in opposite directions. Thus, the different categories of goods may be characterised in terms of the following table:

	Robinson	Friday
Public good	+	+
Private good	+	0
Private good	0	+
Positional good	+	-
Positional good	-	+
Public bad	-	-

Positional competition is much harder, and sometimes more violent, than competition for "private" goods.

Consider the case that if all the individuals work harder they may all consume more private and public goods. The same is not true for positional goods like power and prestige. If we all work harder none of us can consume more of them. *Social scarcity* constrains the welfare of humankind much more than *natural scarcity.*

Conflicts may easily arise even in cases where voluntary agreement has been reached about their supply.

In the case of private goods such agreement would separate a public sphere where the agreement takes place and a private sphere where consumption is carried out without affecting the welfare of the other individuals.

In the case of public goods the agreement should be such that the free riding problem is overcome and the good is supplied; however the consumption of pure public goods and bads is not conflictual because everyone consumes the same quantity of the good.

By contrast, in the case of positional goods, reaching an agreement about their supply cannot move their consumption to a non-conflictual sphere. Positive and negative consumption are not separable and conflicts may easily arise. Take the case of the sinking boat example. It involves all the seamen and women enjoying a safety gain by agreeing ex-ante that each one of them has the right to be saved. However, the ex-post consumption of this right can be conflictual because it must be jointly consumed with the corresponding duty.

It is not surprising that the problems of positional goods are the reverse of those of public goods. It is very likely that we will have over-investment in positional goods when all the agents try to consume positive amounts of these goods. A well-known example of this problem is social status. Social status is a typical positional good. It involves a shared feeling of the superiority of some individuals and of the inferiority of some other individuals. The Veblenian theory suggests that important consumption decisions are not motivated by the desire to enjoy the private benefits of these goods but rather by the desire to consume more positive status. However, the positive consumption of status by some individuals implies the negative consumption of status by other individuals and a reaction to try to maintain their status. "Keeping up with the Jones'" involves an over-consumption that is wasteful because both consumers spend a

lot of their resources to consume unchanged status and could be better off by reaching a co-operative agreement where they both limit their consumption.

Rights, liberties, power and immunities may often share a similar characteristic of over-supply. Typically, politicians prefer to speak the language of rights, liberties, immunities and powers while they know that the language of duties, expositions to liberties, disabilities and liabilities is much less popular. However, in each society there is a very *strong institutional complementarity* between the structure of rights, liberties, powers and immunities and the structure of duties, exposition to liberties, liabilities and disabilities. This is due to the fact that a consistent legal equilibrium is necessarily governed by the constraint of social scarcity typical of positional goods.

In a sense, this type of strong institutional complementarity is a particular case of the concept of institutional complementarity. Standard conditions of institutional complementarity are defined by the two following circumstances:

3.a) the additional benefit of having institution X_1 instead of institution X_2 in some domain X is greater when institution Y_1 (instead of institution Y_2) is chosen in the domain Y.

3.b) the additional benefit of having institution Y_2 instead of institution Y_1 in some domain Y is greater when institution X_2 (instead of institution X_1) is chosen in the domain X.

These propositions considered by Aoki (2001) re-state in terms of institutional choices the super-modularity conditions among strategies considered by Milgrom and Roberts (1990) and are concerned with the property of incremental pay-offs with respect to a change in parameter value. They do not exclude the possibility that the level of the pay-off of one rule is strictly higher than that of the other for the agents of one domain or of both domain(s) regardless of the choice of rule in the other domain. There is the possibility of a unique equilibrium. However, under the supermodularity condition, there can be two pure Nash equilibria (institutional arrangements) for the system comprised in X and Y i.e. (X_1,Y_1) and (X_2,Y_2). When such multiple equilibria are possible, we say that domains X and Y are institutional complements of each other and that:

(i) X_1 and Y_1 are institutional complements

(ii) X_2 and Y_2 are institutional complements

The relations that define legal equilibria imply some sort of institutional complementarity in the sense outlined above.

Consider X and Y as two different domains where the rights (X_1,X_2) and the duties (Y_1,Y_2) are respectively chosen. Assume that (X_1,Y_1) and (X_2,Y_2) satisfy the conditions necessary for a legal equilibrium in the sense that individual i has the legal claim X_1 towards an agent j , that j does the action A if and only if j has the duty Y_1=-X_1 with respect to i to do A (and vice versa for the rights of the individual j and duties of the individual i). In this sense, any increase in the rights of i (j) is perfectly matched by a decrease in the liberty of j (i) and vice versa. Or, in other words, (X_1,Y_1) satisfy (as an equality) the social scarcity constraint. Assume that similarly (X_2,Y_2) are rights and duties that satisfy (also as an equality) the social scarcity constraint for each couple of individuals i and j.

Legal disequilibrium is costly in a double sense. Being outside the set of feasible arrangements defined by the constraint implies costly social conflict. Being at a point within the interior of this feasible set implies that the rights or the powers of j can be increased without a sacrifice of the liberties or the immunities of j. For this reason, it is clear that the additional benefits arising from the system of rights X_1 with respect to the system X_2 are larger when the corresponding system of duties Y_1 (instead of Y_2) is chosen in the other domain Y. In a similar way the additional benefits arising from the system of duties Y_2 with respect to Y_1 are the greatest when the system of rights X_2 (instead of X_1) is chosen in the other domain X.

Thus, in some sense legal equilibria can be regarded as cases of institutional complementarity. However, they are a case of *strong institutional complementarity* in the sense that hybrids (such as X_1,Y_2 and X_2,Y_1) are particularly unstable. Indeed, when rights and duties are not aligned ex-ante in terms of the expectations of each other's behaviour they must still satisfy ex-post the social scarcity constraint as an accounting identity and this social constraint makes hybrids particularly fragile. Take again the sinking boat example. The agents may have different expectations concerning their rights to be saved and their liberties to sail away. However ex-post, if a right has been really enjoyed, the corresponding duty must have been consumed, while if the liberty to sail away has been really taken, the sinking boat must have been exposed to the consequences of this liberty. While the legal system provides various mechanisms to link the different domains and eliminate disequilibrium *ex-ante*, the failure of the formal legal system to eliminate disequilibrium is not the end of the story. *Ex-post*, the nature of positional goods implies that legal positions must match as accounting identities. This ex-post adjustment can have several solutions. For instance, rights may adjust to duties, or duties may adjust to rights. However all sorts of intermediate non-corner

solutions may also arise ex-post[18] and involve some dilution of rights and some partial limitations of liberties. Indeed, Norberto Bobbio (1990) has claimed that the latter type of ex-post adjustment towards intermediate solutions has become a fundamental mechanism in creating new generations of rights. Rights - especially social rights - are claimed and enacted without stating the corresponding duties and/or the corresponding powers of enforcement hoping that some intermediate compromise may later take place thanks to a partial enhancement of these duties[19].

In the case of legal relations the diachronic linkages between the domains of rights, liberties, powers and immunities and the domains of duties, exposures to liberties, liabilities and disabilities are stronger than the linkages that are usually implied by institutional complementarities. While individuals may sometimes use strategically the social scarcity constraint and other times may be unaware of it, this constraint is endowed with its own *ex-post* ways of shaping legal and social relations.

Bobbio's statement expresses two important characteristics of the production of law.

The first characteristic is that the production of law is often characterised by disequilibrium due to the oversupply of the "positive side" of positional goods.

The second characteristic is also due to the positional nature of legal relations. Infringement of the social scarcity constraint and legal disequilibrium are not without consequences. The strong institutional complementarities that characterise legal positions may be violated *ex-ante* only at the cost of some form of *ex-post* adjustment.

While these two characteristics reinforce Bobbio's point that legal disequilibrium has become an integral part of the production of law, the convergence to some equilibrium should not be taken for granted especially in case of a widespread and dramatic inconsistency among the ex-ante legal positions of the agents. A strong and persistent disequilibrium may discredit the entire legal sysem and, in some cases, lead to its collapse[20].

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[18] The Kelsenian solution, where the conflict is resolved by appealing only to superior order norms, usually implies corner solutions. Typically, only the rights or the duties will be consistent with the superior norm. In reality non-corner solutions, as Bobbio (1990) implies, may easily arise.

[19] According to Kramer (2001) these rights are not genuine rights but simply nominal rights. According to his "Interest Theory approach" there are similarities and differences between a nominal right and a genuine legal right. A nominal right "is a legal right because of its connection with the upholding of the people's interests through the law's setting of standards and requirements, and it is only nominal because the implementation of it by judicial and executive officials cannot go beyond the mere restating of the relevant norm or decision" (Kramer 2001, p. 73).

[20] This observation was suggested by Professor Schäfer who has also pointed out to me how such circumstances characterised the unfortunate experience of the Weimar Republic.

4. "Strong institutional complementarities" and alternative systems of legal positions.

As Simmonds (1986, p.132) points out: "The right of ownership is really a complex bundle of claim-rights, liberties, powers and immunities. An owner of land, for example typically enjoys (*inter alia*) the claim-right that others not trespass on his land, the liberty to walk on his land, the powers to transfer title to others, and immunity against having his title altered or transferred by the act of another."

The assignment of private property rights involves the establishment of a legal equilibrium. The right of exclusive use of assets by some individuals has to be correlated with the duties of others not to consume these resources and the liberty that the owners have to choose among different uses of the resources has to be correlated with the exposure of others to these liberties. Similarly, the power that the private owner has to transfer her title has to be aligned with the liability that the other agents have towards these transfers of property, while the immunity of the owner against having his title altered or transferred by the act of another has to be aligned with the disability of others to perform these acts. In other words, the constraints due to the existence of social scarcity necessarily characterise the institution of private property rights.

A system of well-defined private property rights involves the condition that no disequilibrium exists between all these legal positions. When standard economic theory assumes that such a system exists and considers the equilibrium conditions that hold for the competitive exchange of private property rights, it is also implicitly assuming that no economic resources were expended to establish this legal equilibrium. By contrast, the establishment of the legal equilibrium that is necessary to define private property rights is very costly and valuable economic resources must be expended by the private and public orderings that are engaged in this enterprise[21]. Moreover, transacting rights is also costly and constitutes a fact essential to perceiving some of the fundamental advantages of private property that do not make sense in the standard framework.

In the case of "pure private goods", private property allows an optimal decentralisation of decisions because no individual is exposed to the liberty to choose of other individuals. Each new set of uses that improves the utility of the owner of the private good necessarily leads to Pareto improvements. This characteristic of private property holds independently of exchange. This quality of private property cannot be seen in a world of zero transaction costs where individuals take consumption and exchange decisions together. In the traditional setting one misses the main quality of

[21] See Holmes and Sunstein (1999) and Pagano (2000).

private property, which is the possibility of taking decisions without incurring the costs of transacting with other people[22].

The cost of transacting may be such that the assignment of private rights may be worthwhile even when the liberty that an individual is entitled to with respect to her private property involves exposures among which other individuals are not indifferent.

In the case of positional, public and complementary goods, the assignment of private property rights cannot "separate" consumption decisions from transactions with other individuals. An externality can be seen as the impossibility of private property rights eliminating interference between the "liberties" of different individuals. However, if such interference involves sufficiently limited losses of welfare, unfettered private property may still be convenient because the costs of organising the relative transactions may well offset the gains obtained when each individual takes into account the exposures correlated with the exercise of his liberties.

In this respect, the assignment of private property rights in physical assets is an important way in which economic decisions are decentralised to other individuals. In the case of "pure private goods", rivalry in use implies that it is desirable to assign an exclusive right to somebody (and such that the corresponding duties do not interfere with others). Otherwise, costly conflicts will necessarily arise. At the same time, complete exclusion from the benefits and the damages (another important characteristic of "pure private goods") implies that the other agents are not affected by the way in which the owner exercises her liberty to consume and allocate the good among different uses. For this reason, in the case of "pure private goods", exposure to the liberties of the owners has no effect on other individuals and it is best to grant them to the owners. Similarly, third parties are not affected by the identity of the owner and, for this reason, it is best to grant the owner the power to transfer her title as well as the immunity against having his title altered by others.

While in a world of positive transaction costs the virtues of decentralisation of private property may make its institution desirable in circumstances outside the strict limits of "pure private goods", in many cases the opposite is true.

Some goods seem to belong to a private sphere and seem to be subject to a perfect definition of private property rights. However, a more careful analysis shows that it is impossible to claim that private property rights can be easily defined in the

[22]Private property in physical assets is the most elementary way in which an overall legal equilibrium can be broken into simpler subsystems. This quality of private property can only be appreciated in a world of positive transaction costs where the interactions among these subsystems are costly. In a world of positive transaction costs the same quality is shared by more complex private orderings or lower-level governance structures like firms, which complement the formal norms of the legal systems. The type of legal equilibrium posited by Hohfeld's classification would be impossible if the many agents working in these subsystems were not to share the burden of eliminating the legal disequilibrium.

sense that we have considered above. We will be here concerned with the difficulty of defining "private property rights" in human labour and the implications of this difficulty for other rights and liberties that are related to it by "strong institutional complementarity" associated with the existence of social scarcity.

In neo-classical theory human activity is divided into two parts. One part is an argument in the utility function and is called leisure. The other part is an argument in the production function and is called work[23]. In the standard framework there is no difference between human activity and other commodities and, in both cases, similar rules govern the definition and the exchange of private property rights. While it is generally recognised that human capital cannot be bought and sold, in standard economic theory the rental of human capital is not substantially different from the rental of other resources.

Indeed, in a famous passage Samuelson has argued that: "In a perfectly competitive economy it doesn't really matter who hires whom...." (1975 p. 894) - a statement that underlies the perfect symmetry that exists in neo-classical theory between human and non-human assets as well as its irrelevance for relations between the nature of the firm, its ownership, and the type of technology, division of labour and labour process which take place within it.

Samuelson's sentence can be understood by observing how in orthodox economics, perfect competition brings about the same efficient allocation of resources independently of the initial distribution of property rights including those rights that the individuals have in the firms[24].

Neo-classical economics considers a perfectly competitive economy, where the prices for all goods exist, property rights in these goods are well defined and the agents can exchange these rights without any transaction cost. In this economy the individuals will sell their rights to those agents who can employ the goods, over which the rights are defined, in the uses where a marginal unit of them is most highly valued. As a consequence, under perfect competition, the final allocation of property rights is Pareto

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[23] This formulation is due to Walras and emerged as a compromise between the British and the Austrian stream of the marginalist revolution. While Jevons and Edgeworth had underlined the preference for and the disutility of work, Menger Bohm-Bawerk and von Wieser tended to consider human activity similar to all other non-human resources. A similar divide characterizes the classical economists, while Marx occupied an intermediate position claiming that the fulfilment of the preference for work was the fundamental aspect of communism while the same preferences did not matter under the conditions of alienated work that characterized capitalism. For the "full story" see Pagano (1985).

[24] We could argue with Coase (1937) that, in the Samuelsonian framework, the firm, as an internal allocation mechanism does not exist, and ownership of the firm by an agent simply means that this agent has hiring and firing rights. When transaction costs are taken into account the firm should also be seen as a private ordering (Fuller, 1969). On the substantial equivalence between the views of Coase and Fuller see Pagano (2000). A very early criticism of the fact that neo-classical theory did not allow a comparative analysis of alternative organizations of production was put forward by Rowthorn (1974).

efficient: the value of production is maximised and it is impossible to improve the welfare of an individual without worsening the welfare of other individuals. The techniques and organization will be optimal independent of the initial distribution of property rights. The initial distribution of property rights matters in determining the distribution of wealth but is irrelevant for the nature of the organization of production. For, a perfectly competitive market economy determines endogenously an efficient final allocation of any initial distribution of property rights.

In this framework questions like "who owns the firms" and "who hires whom" also become irrelevant": the techniques and organization of production will not change because, in any case, they will be efficiently determined by the competitive system.

Take the case in which capital owns the firm and hires labour. The workers will rent their labour to the "capitalists" who can employ their labour power in the uses where it is at the margin most productive and can therefore be paid the highest wage. The "capitalists" will have an interest in employing not only the labour that they hire but also their own capital in those uses where its marginal productivity is highest.

Consider now the case in which labour owns the firm and hires capital. The capitalists will now rent their capital to those workers' co-operatives that can employ it in those uses where it is most productive at the margin and that can therefore pay them the highest rent. The workers will have an interest in employing not only the capital that they rent, but also their own labour, in those uses where its marginal productivity is highest.

In both cases, at equilibrium the organization of production will be such that the marginal productivity of each factor is the same in each use and, as a consequence, such that the productivity of each factor is maximised[25]. In a competitive economy each rational agent has an incentive either to employ or to make other agents employ its resources in those uses where they yield the highest benefits. This holds for either workers co-operatives or capitalist firms acting in a competitive economy and implies the equivalence and the efficiency of these alternative institutions. A competitive economy always brings about an efficient organization of production. In this sense, who owns what and who hires whom do not matter.

However, the symmetry between capital and labour is a joint result of three assumptions:

a) the costless definition and enforcement of private property rights

[25] When the preferences for alternative uses of labour-power are properly taken into account, the condition that the marginal productivity of a factor is the same should be changed into that requiring that the sum of the marginal utility and the marginal productivity of labour should be the same in each use. Moreover, under these conditions, the maximization of productivity and technological efficiency are not necessary conditions for the overall maximization of the welfare of the individuals and the latter implies an allocation of labour that does not coincide with that maximising profits. On this point see Pagano (1983 and 1985).

b) the costless transfer costs of these rights

c) the division of human activity into leisure and work.

The third assumption implies that humans can be treated in the same way as other non-human resources. The welfare of individuals is only assumed to be affected by the time that they keep for themselves but not by the time that is used by others in the production process. Thus, individuals are assumed to be sensitive only to working more or less but not to be affected by the allocation of their time in production among different uses (as long as the amount of leisure is unchanged).

In this framework, there is a perfect symmetry between labour and other non-human resources. The only difference becomes that human resources can be used in an additional production process by which one unit of labour can be transformed into one unit of leisure. Once this fictitious production process is added to the economy, labour should be allocated among different production processes in the same way as steel, iron or buildings - that is in such a way that the marginal productivity is the same in all the possible uses. In other words the third assumption implies that the part of human time that is hired by others can be allocated by a simple profit maximising rule. Employers can acquire temporary private property in the human labour of the other individuals; in particular, they can obtain an exclusive right to the use of other individuals' labour and a liberty to allocate it according to their interests that parallels the private property rights that they have in non-human assets. However, there is a fundamental difference between non-human assets and labour: one cannot rent out one's labour power to others and walk away. Workers cannot be indifferent towards the allocation of labour time because it is the allocation of themselves (the very same individuals to which preferences are attached in the traditional framework!). Thus, in the case of human labour, the "temporary private property" arising from the fact that capital hires labour cannot imply the same liberties that the hiring agents would have in the case of non-human assets. Workers necessarily suffer from the exposure to this sort of liberty. This point becomes very evident when we add also that humans can also be exposed either to a virtuous process of *learning by doing* or to a vicious system of *deteriorating by doing*. An exposure to the unfettered liberty of employers may have not only short-term consequences but also lasting effects on the well-being of the workers.

The distinguishing characteristics of human labour become even more important when they are coupled with two other important points that are usually not adequately considered in standard neoclassical analysis: that the definition and enforcement of rights as well as their transfer are usually costly. If these costs (that may be grouped under the label of transaction costs) were absent, then it would be possible to have a separate transaction for each possible use of labour power. However, when this solution is not possible, some "voice" should be given to the preferences of the workers for the

allocation of their labour and for their need to invest in a working environment that favours a process of learning by doing. The allocation of labour cannot then be seen as a private exercise of some rights giving the employer the liberty to dictate working conditions. When this unfettered liberty is granted, we have a Marxian model of *classical capitalism* where the alienation of labour and the underinvestment in human capital can be two undesirable consequences of institutions assimilating the employment relationship with the other transactions of the private sphere.

A possible alternative institutional arrangement to *classical capitalism* may rely on the transfer of control rights from the owners of machines to the workers who could either rent the machines or borrow money and buy them. This solution is tantamount to transferring the bundle of rights that the employers have in the machines and in the labour that they hire to the workers. In this case the workers, having acquired the liberty to decide on the use of their own labour power, could take due account of their preferences for good work and skill enhancing production processes. In many cases[26] this could be a good solution. However, it may turn out to be very problematic in industries that make intensive use of difficult-to-monitor and/or specific capital. In this case capital-owners would be exposed to the liberty of management and workers to use (and abuse) their capital[27].

For this reason, the protection of workers has often not been based on the transfer of some bundles of rights from capitalist owners to workers. It has rather taken the form of an unbundling of some property rights and their redistribution to different agents. Such unbundling and redistribution can be seen as a different type of legal equilibrium that is characterised by different legal positions of capitalist owners and workers. These legal positions must also be linked together by the strong institutional complementarities that are associated with social scarcity.

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 to 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 content of these jobs and the associated training is agreed by the unions and employers' associations.

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[26] The advantages of this solution are considered by Bowles and Gintis (1998). Some comments on their claims are advanced in Pagano (1998).

[27] Similarly, in these industries financiers who have lent their capital against difficult-to-monitor and specific collateral would be exposed to expropriation hazards.

The cases, considered above, correspond to different types of "unbundling" and redistribution of rights in physical assets from those existing under "*classical Tayloristic capitalism*"[28] where the workers do not have any of these rights. However, even more relevant is that the conditions of legal scarcity that characterise a legal equilibrium imply that these unbundling of rights involve a re-definition of the relations that define private property in physical assets under *classical capitalism*.

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

Likewise, in the case of *"unionised capitalism"*, if only workers having certain qualifications and belonging to a certain union have the right to work in a certain trade, the owners of assets do not have the liberty 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 firms, then the ownership of physical assets does not entail the liberty to employ the assets with any type of organisation of production. Thus, similarly to *workers capitalism*, under *"unionised capitalism"* some rights held under "classical capitalism" by the owners of the assets are "unbundled" and redistributed.

Observe how hybrid types of organization would involve a violation of the conditions of social scarcity that characterise legal equilibria. Such a situation would arise if the workers expect a right to job security and/or to the exclusive access to and co-definition of some occupation while, at the same time, the owners of physical assets expect to have the unfettered liberty to employ their assets with any worker. While other liberties (such as the possibility to change the allocation of machines in such a way as to change the product mix) can still be held by the employers, one particular liberty must be unbundled and replaced by a duty. Otherwise, the rights of the workers would fail to be in equilibrium with the duties of the employers and the first would be exposed to the unfettered liberty of the latter.

A financial system that is based on the mechanism of take-overs as an ex-post control mechanism for inefficient managerial choices may require such an unfettered liberty to be exercised by the new owners after a take-over. These liberties would be in

[28] For a more precise definition of "classical capitalism", "company workers' capitalism" and "unionised capitalism" see Pagano (1991a). 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).

situation of legal disequilibrium with respect to the rights of workers that characterise unionised or workers' company capitalism.

By contrast, the bank-based financial system, which relies on a "contingent property right system" of financiers (Aoki 2000), may be in equilibrium with these rights. In a bank-based financial system the liberty of the financiers to interfere is limited to the case in which the incumbent management and the workers of the company are not able to re-pay their debts.

Thus, financial and labour markets must satisfy *strong conditions of institutional complementarity* related to the social scarcity constraint that characterises legal equilibria. The two domains are also related together by *weak conditions of institutional complementarity* in the double sense that:

a) in the financial market domain a bank based system is marginally better than a share-holder dominated system when some forms of rights are given to insiders in the labour market domain (instead of the absence of rights typical of classical system);

b) in the labour market domain the absence of rights is marginally better than insiders' rights when a shareholder-based system prevails in the financial market domain (instead of the bank-based system).

The *weak conditions of institutional complementarity* also follow from the fact that each of these arrangements must satisfy the conditions of *strong institutional complementarity* characterising legal equilibria. When shareholders' liberties and insiders' rights are coupled together, the social scarcity constraint is not satisfied and costly conflicts arise. Similarly, when a bank-based system and no-insider rights prevail, the liberties of interference of the financiers could be increased without decreasing the rights of the workers. Here, the inefficiency of an unsatisfactory institutional fit arises from the fact that we would be in an interior point of the feasible set defined by the social arrangements satisfying the social scarcity constraint. The super-modularity conditions would follow from the fact that we are worse off when we are either inside or outside the set of feasible arrangements satisfying the social scarcity constraint that characterises legal equilibria.

5. "Weak" institutional complementarities and organizational equilibria.

While the relations of strong institutional complementarity associated with legal equilibria also imply the existence of weak institutional complementarities among legal positions, in general *weak institutional complementarities* can also well exist

independently of *strong institutional complementarities*. In particular, each system of legal positions may be linked by weak relations of complementarities to the type of resources (i.e. the technology) over which the legal relations apply. These relations are only weak in the sense that they do not have to satisfy the social scarcity constraint that characterises legal equilibria. However, they otherwise have a very important role in determining the economic feasibility of a particular legal equilibrium.

The relations between rights and technology have traditionally been very controversial. It was the core of the Marxian theory of history and has recently attracted the attention of both New-Institutional and Radical Economists who have stressed one of the two possible directions of causation between rights and technology. However, these two approaches should rather be seen as two complementary ways in which the "double-neutrality assumption" that characterised Samuelson's statement can be challenged. Both can contribute to the conclusion that different systems of rights and technologies can be institutional complements and bring about the existence of multiple organizational equilibria.

In a world of positive transaction costs technology ceases to be neutral. The employment of different factors is likely to be associated with different agency costs because some factors will be relatively more costly to monitor and to safeguard against the hazards of specific investments. Consider the case in which we have only of two factors: factor 1 and factor 2. The agency cost that factor 1 has to sustain to hire factor 2 will in general be different from the cost that factor 2 has to bear when it hires factor 1. Define now by T_1 and T_2 two technologies such that T_1 contains a higher intensity of agency costs of factor 1 relatively to T_2. Denote now by P_1 the system of property rights where 1 hires 2 and denote by P_2 the system of property rights where 2 hires 1. The choice between P_1 and P_2 occurs in a domain P where actors such as financiers, stockbrokers and various types of investors search for the best system of property rights given the prevailing technology. By contrast, the choice between T_1 and T_2 occurs in a domain T where agents such as production managers, engineers and all sorts of technologists search for the best technology given the prevailing system of property rights.

We can now show that the relations between technologies and property rights satisfy the following conditions:

5.a) the additional benefit of having the property right system P_1 instead of the property right system P_2 in the domain P is greater when the technology T_1 (instead of the technology T_2) is chosen in the domain T.

5.b) the additional benefit of having the technology T_2 instead of the technology T_1 in the domain T is greater when the property right system P_2 (instead of the property right system P_1) is chosen in the domain P.

In other words we are now going to argue that 5.a and 5.b satisfy the supermodularity conditions 3.a and 3.b.

Indeed, 5.a coincides with what may be denoted as the "new institutional assumption"[29]. A property right system P_1 is marginally better than P_2 if factor 1 can save a bit more on agency costs. This occurs when in the domain T the prevailing technology is T_1 (instead of T_2). Since under the technology T_1 the agency cost faced by 2 when it employs 1 is higher than under technology T_2, under the former technology agent 1 can save marginally more on agency costs than under the latter technology. Thus, the relative advantage of P_1 over P_2 increases when T_1 (instead than T_2) is employed in domain T.

The economic meaning of 5.b is also quite straightforward and coincides with what in some papers[30] we have denoted as the "radical assumption". In an analogous manner a technology T_2 is marginally better than a technology T_1 if it allows us to save a bit more (or to waste a bit less) on agency costs. When the property right system P_2 (instead of P_2) prevails in the domain P, (parts of) the agency costs of employing factor 2 are saved, whereas the agency costs of employing factor 1 are (completely) paid. Thus, the relative advantage of technology T_2 over T_1 increases when P_2 (instead of P_2) is adopted in domain P.

Thus, (P_1 T_1) and (P_2 T_2) satisfy the supermodularity conditions and can give rise to multiple organizational equilibria[31] or, in other words, they can be institutional complements.

Observe the self-reinforcing character of these equilibria. P_1 is reinforced by the existence of T_1 in domain T and T_1 is reinforced by the existence of P_1 in domain P. Similarly, P_2 is reinforced by the existence of T_2 in domain T and T_2 is reinforced by the existence of P_2 in domain P. While our analysis has been framed in a 2 factor world, this self-reinforcing characteristic is not lost when the complexity of the system is

[29] It is clearly related to the seminal works of Alchian and Demsetz (1972) and Williamson (1985).

[30] For instance see Pagano (1991b, 1993), Pagano and Rowthorn (1994 and 1996) and Pagano (2001).

[31] Organizational equilibria define situations where the technology is optimal given the current property rights and property rights are optimal given the current technology. The formal analysis of organizational equilibrium shows the precise conditions under which we can have multiple organizational equilibria and how the set of agency costs for which multiple equilibria arises increases with the elasticity of substitution among factors. The properties of institutional stability to shocks in agency costs are also dependent on the value of the elasticity of substitution. See Pagano (1991b and1993) and Pagano and Rowthorn (1994 and 1996).

augmented by more factors, more technologies and by more sophisticated systems of property rights.

In general, the unbundling and redistribution of rights (that is typical of forms of non-classical capitalism and that we have considered in the preceding section), is likely to dilute the incentives of capital owners to invest in high-agency-cost physical assets whose user-induced depreciation cannot be easily monitored and which 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 agency costs of 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[32]). 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.

Thus, technologies characterized by easy-to-monitor and generic unskilled labour and high intensity of specific and difficult to monitor capital do marginally better than alternative technologies when the system of rights of *classical capitalism* prevails against alternative forms of property rights in the property rights domain, while this is not true under these latter systems of rights. In this sense, we may think that direction of causation from rights to technologies holds also for more complex cases. However, the opposite direction of causation is also likely to hold and a self-reinforcing mechanism generating multiple organizational equilibria may easily arise.

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

Under both company workers and unionised capitalism the truncation of the rights of 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 in 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*

[32] Thus, the unions and the employers' associations that are usually seen as 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 (1991a).

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 redistribution of rights in the physical assets will also tend to induce a different complementarity technology characterised by a different distribution of specificity characteristics and asymmetric information. At the same time, these alternative types of technologies may make the unbundling and the redistribution of rights more or less convenient and may favour complementary systems of rights.

Conclusion.

While the rights prevailing in the financial markets domain and the labour market domain must satisfy the conditions of *strong institutional complementarity* that characterise legal equilibria, the relationship between the financiers' and workers' rights and the technology of each system is likely to satisfy only conditions of *weak institutional complementarity*.

In the first case, the supermodularity conditions follow from the fact that the social scarcity constraint that characterizes the relations of legal positions implies that legal disequilibrium is costly. The different positions do marginally better in each domain when they match *ex-ante* in a *legal equilibrium* with the legal positions existing in other domains. Otherwise, costly disequilibrium will arise *ex-post* and will decrease the benefits arising from those legal positions.

In the second case, different legal positions (taken as a whole and possibly defining a legal equilibrium), do marginally better in their own domain when they fit together in a consistent *organizational equilibrium* with the nature of the technology and the characteristics of the resources (that are shaped by decisions taken in some other domain). Here, the supermodularity conditions do not follow from the costs of (ex-post) conflicts but from the fact that the benefits arising from a certain set of legal positions are marginally greater when they are matched by a certain technology (instead of some other technology) and vice versa. In this case, the mismatch between rights and technologies, or *organizational disequilibrium,* is only indirectly costly. Individuals do not directly experience the conflicts of some costly disequilibrium but they may realize

that they could be better off by moving to situations where the choices made in the different domains fit each other. In this sense we have referred to these as cases of *weak institutional complementarity* and, in our opinion, they can be usefully distinguished from the strong cases of *institutional complementarity* that arise from social scarcity.

However, one should consider some higher levels of institutional complementarity where all these "strong" and "weak" complementarity relations influence each other. We have seen that the positional nature of legal relations implies a constant creation of inconsistent claims and costly legal disequilibrium. Such a *legal disequilibrium* may often induce *organizational disequilibrium* and bring about processes that are not limited to the relations existing among different legal positions. In a similar way technological change may often induce situations of organizational disequilibrium with a certain attribution of rights. While it is possible that the system moves orderly to a new consistent attribution of rights that fits the new technology, it can also happen that organizational disequilibrium induces legal disequilibrium.

In other words, the system may easily undergo fairly complex dynamics where both "weak" and "strong" complementarities interact with each other. By contrast, this paper has examined each institutional complementarity independently from the other. In this sense, it can at most offer some preliminary material for the study of these complex interactions.

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