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Legal and Economic Complementarities

The paradigm of Kelsenian validity of Law presupposes that reciprocal legal positions be strict complements. However, in practice the strict complementarity assumption is seldom satisfied since it requires the existence of costly institutions. Moreover, we observe that production of law often parallels an explicit attempt to introduce some disequilibrium into the legal system. Social and economic rights often become legal rights without specifying the complementary duties. This is major source of conflicts into the legal system. This disequilibrium can be however Pareto superior as long as it becomes more adaptive and respondent to contingent social needs. Under this system, other non-judicial (and centralized) institutions such governments and firms may perform better than judicial interpretation and enforcement.

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1. Introduction.

The paradigm of Kelsenian validity of Law presupposes that reciprocal legal positions be strict complements. According to this view inconsistencies are a-priori eliminated and rights are aligned with corresponding duties. A legal equilibrium is created and enforced in the realm law, saving on ex-post conflicts due to diverging expectations of the agents. However, in practice the strict complementarity of legal positions assumption is rarely satisfied. It requires the existence of costly institutions and may be even unfeasible in some circumstances. The production of law often parallels an explicit attempt to introduce some disequilibrium into the legal system. Social and economic rights often become legal rights without specifying the complementary duties. This is major source of conflicts into the legal system. This disequilibrium can be however Pareto superior as long as it becomes more adaptive and respondent to contingent social needs. Under this system, other non-judicial (and centralized) institutions such governments and firms may perform better than judicial interpretation and enforcement.

The paper is structured as follows. The next section considers the standard complementarities developed by economists to analyse interdependent domain of choices. These interdependences involve that some rules adopted in one domain can entail an increase of the relative advantage of some other rules in another domain. In the third section, we see how this framework relates to the interdependencies which, according to the Kelsenian tradition, characterize the legal system. Here complementarities are stronger because they involve that a rule, adopted in one domain, must be logically compatible with the rules adopted in another domain. We argue that such strong complementarities are often not realized *ex-ante* by real-life legal systems. The Hohfeldian relations (1919) can be re-interpreted a la' Commons (1924) as equilibrium configurations of a system t characterised by widespread disequilibrium in the application and in the production of law. In section 4 we argue that the *ex-post* governance is a salient characteristic of legal systems. Often, legal systems satisfy only "weak" institutional complementarities – a circumstance that makes them closer (but not identical) to the relations considered by economists. In these situations, ex-post adjustment may have an important role and private ordering institutions may have an important role in reducing the costs of legal disequilibrium. We conclude by pointing out that in a unified view of complementarities legal disequilibrium can make sense as an important explanation of the real-life evolution of legal systems.

2. Economic relations and standard institutional complementarities.

The traditional type of institutional complementarities, considered in economic theory, rely on the idea that choices made in one domain may increase the relative advantages of choices in other domains. The relative benefits of different choices are altered by choices made in other domains. Analytically, suppose two institutional domains, X and Y with sets of agents, m and n, that do not directly interact. Assume that the agents in domain X face the choice between a rule from either x_1 or x_2 , while agents in domain Y face the choice of a rule from y_1 and y_2 . Supposing a payoff functions u and v , let us suppose the following conditions, for all agents in m and n:

$$u(x_1, y_1) - u(x_2, y_1) \geq u(x_1, y_2) - u(x_2, y_2)$$

$$v(y_2, x_2) - v(y_1, x_2) \geq v(y_2, x_1) - v(y_1, x_1)$$

The condition [1] implies that the “incremental” benefit for the agents in X from choosing x_1 rather than x_2 increases as their institutional environment in Y is y_1 rather than y_2 ; the condition [2] implies that the “incremental” benefit for the agents in Y from choosing y_2 rather than y_1 increases as their institutional environment in is x_2 rather than x_1 . These two conditions express the idea of complementarity between two different domains. It can be proved that the two strategy profiles (x_1, y_1) and (x_2, y_2) may be Nash equilibrium profiles (Aoki 2001, see also Milgrom and Roberts 1990). When these two equilibria exist, x_1 and y_1 as well as x_2 and y_2 are called ‘institutional complements’. Note that these two equilibria may be ranked in terms of efficiency: for instance, equilibrium (x_1, y_1) may be Pareto superior to (x_2, y_2) . Hence, institutional complementarities may not involve a tendency towards systemic efficiency, but the emergence of an inefficient economic equilibrium.

In economics, and in general in social sciences, there are many standard examples of economic complementarities. Consider, for instance, the relation between the institutional arrangements of families

and firms (Chichilnisky, 2008)¹. Male-dominated families may increase the advantages of discriminatory firms with respect that do not discriminate among genders because females are likely to miss more working days. At the same time, discriminating firms awarding better working conditions to males may increase the advantages of discriminating families where males acts as breadwinners. However, a different equilibrium is possible. Egalitarian families may decrease the advantages of discriminating firms with respect with the ones that treat genders equally while the latter may decrease the disadvantages of families practicing an egalitarian division of work. We have two possible equilibria. In one equilibrium discriminating firms and male-dominated families are institutional complements. In the other equilibrium non-discriminating firms and egalitarian families are also institutional complements. Observe the “weak” nature of complementarity that we have in these cases. A rule in one domain does not make it impossible to have another rule in the other domain. It does simply increase the advantage (or decrease the disadvantage) of a particular rule relatively to another rule. These standard complementarities that we have in economics and other social sciences are different from the rules that we have in the Kelsenian vision of the legal system.

3. Strong institutional complementarities and legal theories.

Assume now that x_1 belongs to the feasible set X (i. e. can be different from 0) only if the rule y_1 is adopted in Y and vice-versa y_1 can belong to the feasible set Y only if x_1 is adopted in Y. Similarly, assume that x_2 belongs to the feasible set X (i. e. can be different from 0) only if the rule y_2 is adopted in Y and vice-versa y_2 can belong to the feasible set Y only if x_2 is adopted in Y. Rules (x_1, y_1) and $((x_2, y_2)$ are also here two complementary equilibria.

However, the complementarity is much more binding and we will denote it *strong institutional complementarity* to be distinguished from the standard institutional complementarities. In this case it is impossible to have an (x_2, y_2) equilibrium in case that x_1 or y_1 is initially chosen. If rule x_1 is chosen in X only rule y_1 is feasible in Y and, similarly, if y_1 is chosen In Y only rule x_1 is feasible in X.

¹ Numerous complementarities have been considered by the literature. The complementarities between

By contrast, in the case of standard complementarities the selection of a more fitting rule in one domain may simply decrease the relative disadvantage of the corresponding rule with respect to other but may not be sufficient to make it the rule yielding the highest payoff. For instance, in the case of standard complementarities, if rule y_1 is selected in Y we have that:

$$u(x_1, y_1) - u(x_2, y_1) \geq u(x_1, y_2) - u(x_2, y_2)$$

but we can still have that:

$u(x_1, y_1) \leq u(x_2, y_1)$ and that (x_2, y_2) is the only possible equilibrium even if the rule y_1 is initially selected in the Y domain.

We will now argue that, in a Kelsenian perspective, the classic Hohfeldian relation can be seen as cases of strong institutional complementarity.

Consider again the two domains of choices X and Y and assume that, in each domain the agents can be given two rules. In the domain X , one rule x_1 involves the right r for i (each of of the m agent acting in this domain) to and another rule x_2 denies this entitlement, involving an exposure e of i to the actions of the agents j acting in the other domain. In the domain Y one rule y_1 attributes the duty d to j (each of of the n agent acting in this domain) and another rule y_2 gives the agents j a liberty l from the duty d .

In the legal tradition if, for a certain set of actions, the rule x_1 is chosen in X then the rule y_1 must be chosen in Y (and vice versa). Similarly if for a certain action, the rule x_2 is chosen in X then the rule y_2 must be chosen in Y (and vice versa). For each action a rule prescribing a right (duty) must be correlated to rule involving a duty (right) and a rule prescribing a liberty (exposure to liberty) must be correlated to a rule involving an exposure to liberty (liberty)

The Hohfeldian relations between rights, duties, liberties and exposures to liberties are summarized in the following table:

Table 1: First order jural relations.

Domain X

Domain Y

Rule x_1 Right of i	Rule y_1 Duty of j
Rule x_2 Exposure of i	Rule y_2 Liberty of j

An analogous argument holds for the second order Hohfeldian jural relations on powers and liabilities. For instance if in the domain X a rule x_1 entitles agents i to have a power, that only a rule y_1 (involving the corresponding liabilities of agents j in the domain Y) is feasible (and vice versa).

Table 2: Second order legal relations

Domain X

Domain Y

Rule x_1 Power of i	Rule y_1 Liability of j
Rule x_2 Disability of i	Rule y_2 Immunity of j

In Hohfeld's 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)".

In other words strong complementarities are seen in legal theory as a logical necessity. In Kelsenian terms the validity of rule x_1 in X is incompatible with rules x_2 and y_2 and requires the co-existence of rule y_1 in the domain Y .

The Kelsenian approach does not admit the incompleteness of legal relationship. That is, Kelsen excludes that legal (complementary) relationships can be non-exactly identified (or incomplete). On this view, ambiguity in the legal system is an interpretative problem to be delegated to the judicial system, which is always able to redefine the correlativity of legal positions. The legal system is always in equilibrium in the sense that each legal position is matched by correlative and strictly complementary other legal positions.

Drawing on the theory of strategic incomplete contracts (Williamson, 1975, 1985; Bernheim and Whinston, 1998), we investigate the theoretical foundations and the welfare properties of legal disequilibria arising from legal incompleteness and involving lack of legal correlativity. Our basic claim is two-fold. First, we argue that Kelsen approach cannot fully capture the spectrum of legal positions existing in a given legal system. Second, we argue that legal disequilibrium (i.e., a positive level of ambiguity into the legal system) is normatively desirable because it can induce more social cooperation and allows for state-contingent re-adaptation of legal positions.

To illustrate our argument we consider the basic case of a first order legal relation where the legal system specifies the right of i but imperfectly specifies j 's correspondent duty. (The same reasoning can be developed using whatever first or second order legal relations.) We can see that forms of "ex-ante disequilibrium" can arise in several cases:

A. Parties' Inconsistent Beliefs and Legal Interpretation

From a legal perspective the position of *i* is a claim, which is not enforceable without the mediating function of the judicial system and, hence, is, to some extent, an ambiguous claim. The judicial system provides an essential interpretative function that consists in identifying the counterparty's corresponding duty. For Kelsen, the above ambiguity does not challenge the basic structure of the legal system, which is assumed to be complete in nature. This ambiguity only operates at the implementation level to the extent that *i* and *j* have inconsistent beliefs about the degree of institutional complementarity of their rights and duties, respectively. These inconsistent beliefs are the result of incomplete (or asymmetric) information between the parties. For example, *i* has an inference about the substantive content of her legal pretenses and *j* has a different inference. For example, injurer and victim are aware of (i) the underlying facts; (ii) the existence of some rights and duties, but they have different priors about the exact correlativity of their reciprocal rights and duties. Viewed through this lens, the function of ex-post judicial adjudication is to restore a complete hierarchy of beliefs between *i* and *j*. Once the judicial decision is made, *i* and *j* will have the same beliefs about the contents of their reciprocal obligations and, therefore, common knowledge of their legal positions.

B. Parties' Non-Identification and Production of Law

The Kelsenian approach, however, cannot explain the more extreme case of ambiguity that arises in the *production* - rather than the mere interpretation - of law is delegated to the judicial system, as is typical in the common law tradition. In these contexts, *i* and *j* may have an inference on the factual underpinnings (e.g., *i* was injured), but their beliefs on their reciprocal rights and duties are very far or even absent. In this respect, the legal system is incomplete at that point in time, because the law cannot lead to a legal equilibrium or legal complementarity even through an interpretative process.

This case fits the paradigm of market share liability. Before the California decision of *Sindell v. Abbott*, the victim's right to obtain damages presupposed the identification of the injurer. In other words, a victim's abstract right to obtain damages upon the occurrence of an accident strictly required the identification of the counterparty holding the correlative duty. *Sindell v. Abbott* overcame this deterministic identification approach and established that the market share of potential injurers was to be deemed sufficient to identify their correlative duties toward the victim. In this respect, a preexisting legal disequilibrium (or ambiguity) was solved by the production of new law.

C. Strategic Legal Incompleteness

An additional case occurs when the law explicitly recognizes the right of *i*, but purportedly fails to identify 1) *j* and/or her complementary duty to *i*; and, consequently, 2) does not accord a remedy to *i*. In a classical consequentialist approach to the law, Calabresi and Malamed (1972) and Levinson (1999) support the view that rights and remedy exist in a symbiotic relationship, and each plays an important role in defining the other. Since exact identification is a structural requirement from a remedial perspective, a right without a remedy falls more in the realm of morality than in that of the legal relations.

4. The ex-post governance of legal relations.

Commons (1924) re-interpreted the Hohfeldian relations in a un-Kelsenian way. One could not look at law as at piece of consistent inert material aligning ex-ante the legal positions of the different agents. Rights (and the corresponding duties) could not be defined in a framework such as Crusoe's island inhabited only by two individuals. Robinson's arrogance with Friday cannot be limited by third party intervention and trans-actions (that is actions that have consequences on other individuals) can cause all sort of unpaid damages. Commons (1924) observes that Hohfeld's positions can also be interpreted as ethical relations between the agents that are supported by traditional beliefs. In this this sense, they could even hold in Robinson's island. 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."

In order to have *trans-actions* respecting the rights of the individuals, one needs a third-party authority (that may be a little community or a modern legal system) that authorizes only fair transactions aligning the legal positions of the individuals. A society with enforceable rights is characterized by the existence

of (un)authorized transactions involving an authoritative transaction with a third party. According to Commons, the description of a transaction involves at least two transacting agents, the two agents who are the next best transacting alternatives for each agent as well as the working rules according to which the transaction takes place. 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.

Even when a third party has the authority to govern the transaction, there is no guarantee that the working rules of the transactions satisfy the Hohfeldian relations. 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 and/or the behavior of the enforcing third party. 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 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 which involve some exercise of power. In other words, a legal system can help to produce a fit between the entitlements of the different agents but only some times can be completely successful ex-ante. It must often integrate ex-ante and ex-post intervention as well as rely on third parties different from the public legal system.

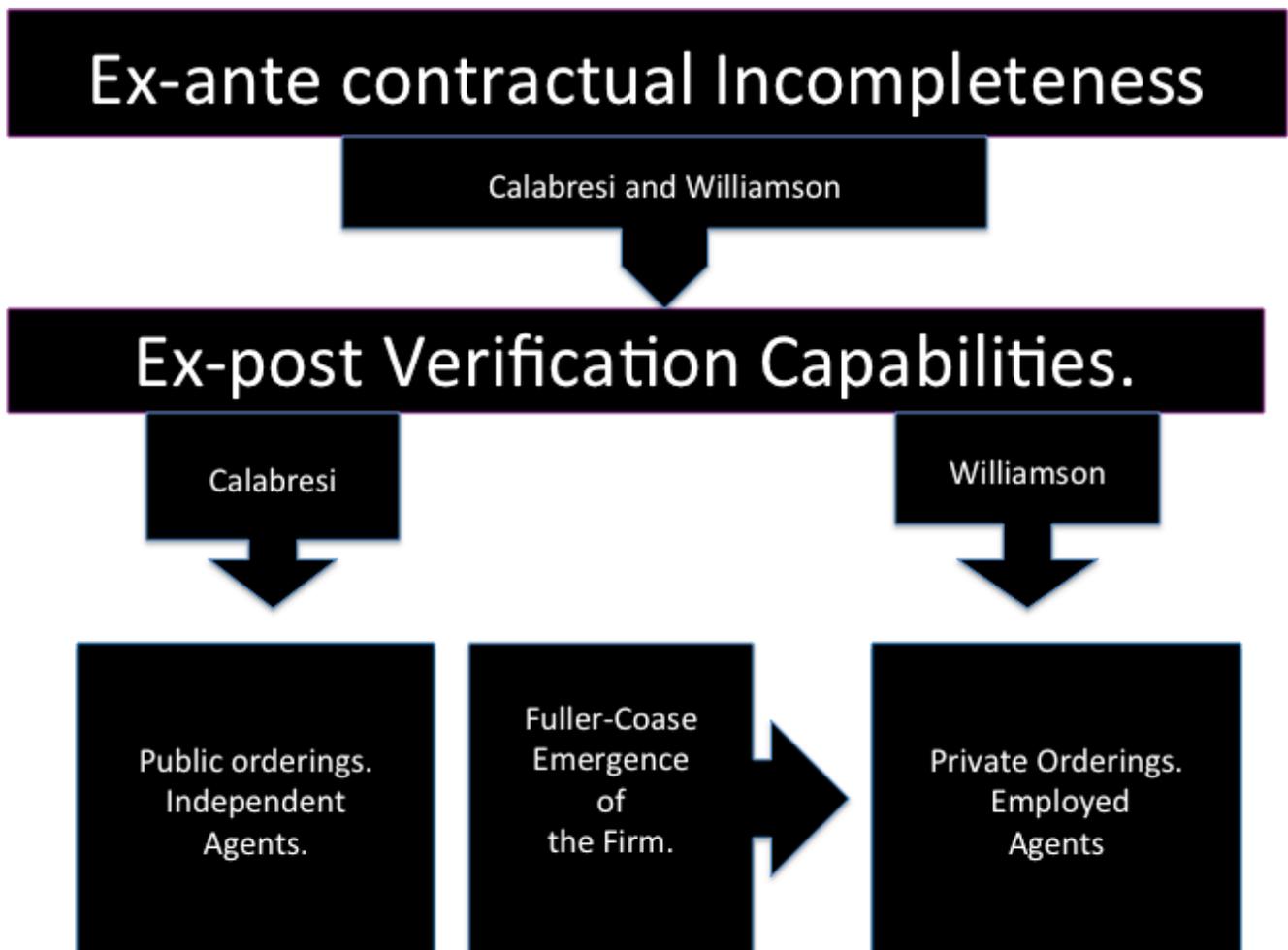
According to Williamson and Calabresi, who developed Commons' insights, legal rules cannot always define ex-ante legal entitlements. Some ex-post governance by public or private organizations is often necessary. Williamson's argument concerns business relations and the necessity of private orderings that adjudicates ex-post quasi-legal entitlements such as rights, duties, liabilities etc. within organizations. Calabresi argument concerns ex-post deals about damages related to unexpected accidents. However there is no reason to limit the arguments to particular transacting spheres.

Both Calabresi's and Williamson's contribution are relevant for our argument. Indeed the two approaches can be unified in a single framework specifying the circumstances in which the ex-ante incompleteness of legal positions and the impossibility of complete contracts involve the emergence of either public or private forms of governance. In Calabresi's framework the specific dis-investment due to accidents involves an ex-post intervention of public courts, which aligns rights after that the accidents

have occurred. The one-shot nature of accidents implies that the two agents involved in the transaction have no incentive to create a form of private governance. In this case public orderings and independent agents characterize the transaction.

By contrast, as Williamson (1985) points out, in case of frequent interactions with specific (dis)investments the transacting agents can have the incentive to build forms of private governance. These circumstances may explain the emergence of the firm, conceived as a form of decentralization of the public ordering into a private ordering (Fuller 1968) allowing a centralization of transactions within a private hierarchy (Coase 1937) (See figure 1). In both cases, within certain limits, the rights may be specified ex-post after that some relevant transactions of the individuals have taken place in a situation of incompleteness of the public and/or the public ordering involving a certain degree of legal disequilibrium.

Figure 1



When the ex-ante definition of a legal equilibrium is too demanding or even totally unfeasible, the unilateral specification of rights without the corresponding duties may be a way of producing new laws. The ex-ante consistency between rights and duties may not exist. This is not only due that the agents i in the domain X and j in the domain Y have inconsistent expectations respectively about their rights. Because of information or political constraints, the legislator, may decide to state a rule x_1 concerning the rights of the individuals acting in the domain X and only later try to introduce a rule y_1 in the domain Y . *In this case the production of law is characterized by an explicit attempt to introduce some disequilibrium in the system.*

Observe that, since legal inconsistencies are costly, each legal rule is marginally better than alternative rules when the corresponding rules exist in the other domain. For this reason, weak institutional complementarities are always satisfied by legal rules.

By contrast legal relations do not necessarily satisfy ex-ante the conditions strong institutional complementarities. Rights and duties are ex-post identities but does not involve imply ex-ante consistency.

However, even when legal relations involve only weak institutional complementarities, they have a distinctive character. One can guess the existence of most standard complementarities only from the fact that some (marginal) improvement is possible (by a comparison with an hypothetical reality). However the existence of legal complementarities can be also observed by the existence of costly conflicts among agents acting in different (but related) domains with incompatible expectations. These complementarities may often need an ex-post equilibrating mechanism that cannot be provided by the ex-ante Kelsenian definition of legal positions. In some cases specifying strict ex-ante complementarity may be either impossible or aggravate the ex-post disequilibrium. The lack of detailed ex-ante rules may indeed prove either the only feasible one or be more adaptive to external contingencies in the following cases:

1. Legal Disequilibrium and Feasibility

Feasibility and political considerations justify strategic legal incompleteness as (relatively) efficient law production. For example, establishing correlative legal positions may not be optimal as long as it increases the level of social conflicts. When identification of legal positions is exact, i has a direct claim against j with the result of a new distributive allocation. As long as j is not willing to cooperate in order to

implement this new distribution, exact identification may come at huge enforcement cost. Furthermore, when lawmakers do not enjoy unanimous legitimacy (which occurs rather frequently in representative democracies), exact identification may be politically impractical. This may occur, for example, when j has not supported the appointment of current lawmakers and, therefore, may be reluctant to accept her duties as established by them.

2. Focal Points and Equilibrium Selection

Social interaction very often leads to a multiplicity of equilibria. In the Battle of Sexes, for example, the mixed selection -- going to the preferred event more often -- is inefficient, because players miscoordinate with probability higher than $\frac{1}{2}$. This simple coordination game can be reframed as the case where no right (duty) of i (j) is specified in the legal system. Now assume that the legal system asymmetrically identifies the right of i , without specifying the correlative j 's duty. Although i cannot enforce her right against j , it is reasonable to assume that satisfying i 's pretense is a focal point in the social game. In this case, the unilateral attribution of a right shapes the individuals' beliefs and consequently refines the possible equilibria. This mechanism can be probably better understood in a social context where other agents (different from i and j) observe the legal specification of i 's right and exert social pressure on j (or other agents) so that j is encouraged to comply with her non-legal duty to i . Put differently, the specification of i 's right contributes to change the agents' beliefs and attitudes within the society, or, à la Durkheim (1893), to change *la conscience collective*.

The above example can be made tangible if we think to the attribution of a social (or economic) right to (a group of) individuals without the contextual identification of the corresponding duty of other (group of) individuals. With the act of establishing a right, the collective conscience (or, in a game theoretic framework, the individuals' beliefs) changes, especially when the attribution comes from lawmakers that incarnate the (social) preferences of the majority of the individuals.

For example, a few Continental Europe constitutions attribute economic rights such as the right to obtain a job to their citizens. For both Kelsen and the consequentialists, such attribution is meaningless. There is no legal right since there is no correlative legal duty. However, the legal attribution of a non-correlative right has important information implications. Individuals in the society know that i 's right is not a mere wish, which exists in the realm of her psychological dimension. Common knowledge on the

existence of *i*'s claim, makes *i*'s pretense legitimate at least in its political dimensions. Individuals know about the existence of a positive recognition and may thus change their behavior in the social interaction with *i*. Take the case of *i* who is state-contingent jobless and is forced to adapt her social behavior because of this condition. In a society where *i* has the right to a job (although such a right is not correlative to an identified correspondent obligation) and she is currently jobless, other individuals are likely to be more willing to recognize that *i* has been deprived. From a strategic perspective, the affirmative recognition of *i*'s right makes it more likely that the other individuals would cooperate with *i*, because they may collectively feel in debt for *i*'s "expropriation". In a similar way, the explicit recognition of *i*'s right changes her relationship with the government, which is politically obliged to satisfy *i*'s pretense or seek a remedy for *I* in its capacity as representative of individuals as a collective.

3. Legal Disequilibrium and Non-Judicial Adjudication

Another property of legal disequilibrium is to be adaptive to external contingencies. When *i*'s right is perfectly identified by *j*'s correlative duty, the legal system has determined a rigid architecture. However, given some external contingencies, it may be better that *j*'s duty changes or even shift to a different party. Perfect correlativity of legal positions requires adaptive modification to respond to changes in the external world. This may be costly, especially when it involves a deliberative legislative process. To mitigate the costs associated with a rigid system, lawmakers can establish correlative legal positions state-contingently. For example, the law could provide that the *i*'s right is *x* with a correlative duty of *j* upon the occurrence of *A*, while *i*'s right should change to *y* with a correlative duty of *k* rather than *j* upon the occurrence of *B*, and so on. This adaptive strategy may be desirable as long as the number of possible contingencies that require modification of the original legal positions is limited and the contingencies themselves are easily verifiable. When, instead, the external states that require adaptation are numerous and not easily verifiable, the administration of this system may become extremely costly.

Strategic incompleteness allows *i*'s right to be re-determined upon the occurrence of external contingencies more easily (i.e., at a lower cost), making the system more adaptive. Redetermination should then be delegated to a non-judiciary adjudicator. This is indeed one of the cases in which the process of emergence of firm as private ordering (Fuller), centralizing market transactions (Coase) may emerge as it has been synthesized in figure 1 and offers one possible legal rationale for the transition to Williamson's world of private governance.

5. Conclusion: towards a unified theory of institutional complementarities.

In the Kelsenian approach the complementarities existing in the realm of law seem to differ from the standard complementarities existing in social sciences. They seem to be strict complementarities driven by logical necessity such that the existence of a rule involves that another rule is unfeasible and not simply made less appealing than another. However incomplete, or even conflictual system of rules, are a real possibility. In this sense legal disequilibrium is an important aspect of reality. The *ex-ante* strict complementarity of legal rules is an interesting particular case on which only sometimes legal systems can rely. However, the *ex-post* necessary matching of legal positions is a distinctive case of these complementarities and involves that rules in one domain are always improved with respect to others by more consistent arrangements existing in other domains. In this sense legal institutions work in way similar to other institutions. Satisfying complementarities can improve on costly mismatches. However breaking them may be sometimes a necessary, even if costly, way to reach different equilibria. Legal institutions cannot be assumed to pre-exist and produce valid rules balancing rights, duties and other legal positions. They may even emerge from a legal disequilibrium that the legislators have consciously introduced in the system.

References

- Aoki M. (2001) *Towards a Comparative Institutional Analysis*. MIT Press, Cambridge.
- Belloc M., Pagano U. (2013) Politics-business co-evolution paths: Workers' Organization and capitalist concentration. *International Review of Law and Economics*. V. 33 pp. 23-66.
- Calabresi G. and A. Douglas Melamed, (1972) 'Property Rules, Liability Rules, and Inalienability: One View of the Cathedral' 85(6) *Harvard Law Review*.
- Chichilnisky G. (2008) *The Gender Gap*. In Bettio F., Verashchagina A. *Frontiers in the Economics of Gender*. Routledge, London and New York.
- Commons J. R. (1924) *Legal Foundations of Capitalism*. Augustus M. Kelley . Publishers, Clifton [reprinted, 1974]
- Durkheim Émile (1893), *De la Division du Travail Social*, PUF, Paris.
- Gagliardi F. (2009) Financial Development and the Growth of Cooperative Firms. *Small Business Economics* pp. 439-464.
- Gurpinar E. (2013) Institutional Complementarities and Property Rights-Technological Equilibria in the Knowledge Intensive Economy. *Department of Economics and Statistics. Università di Siena Working Paper N. 673*.
- Hohfeld W. N. (1919) *Fundamental Legal Conceptions*. Yale University Press, New Haven and London.
- Holmes Oliver W. (1881), *The Common Law*, Harvard University Press (reprinted, 2009).
- Kelsen H. (1992) *Introduction to the problems of legal theory. A Translation of the First Edition of the Reine Rechtlehere*. Clarendon Press, Oxford.
- Kramer M. (1998) Rights without Trimmings In Kramer M., Simmonds N. E., Steiner H. *A Debate over Rights*. Oxford University Press, Oxford.
- Kramer M. (2001) Getting Rights Right. In Kramer M. ed. *Rights, Wrongs and Responsibilities*. Palgrave, Basingstoke and New York.
- Daryl J. Levinson (1999), Rights Essentialism and Remedial Equilibration, 99 *Colum. L. Rev.* 857.
- Landini F. (2012) Technology, property rights and organizational diversity in the software industry. *Structural Change and Economic Dynamics*. V. 23 (2) pp. 137-150.
- Milgrom P. and Roberts J. (1990) "Rationalizability, Learning and Equilibrium Games with Strategic Complementarities" *Econometrica* v. 59 pp. 511-528
- Milhaut C. J., Pistor K. (2008) *Law and Capitalism*. The University of Chicago Press. Chicago and London.

Pagano U. (2010) Marrying in the Cathedral: a framework for the analysis of corporate governance. In Paces A. M. *The Law and Economics of Corporate Governance*. Edward Elgar, Cheltenham U. K. pp. 264-289

Pagano U., Rossi M. A. (2004) Incomplete Contracts, Intellectual Property and Institutional Complementarities. *European Journal of Law and Economics* (V. 18 n 1, 2004 pp. 55 -76)

Pagano U. and Rowthorn R. (1994) "Ownership, technology and Institutional Stability" *Structural Change and Economic Dynamics*. Vol.5 No 2 pp. 221-243.

Williamson O. E. (1985) *The Economic Institutions of Capitalism*. The Free Press, New York.