UNIVERSITÀ DEGLI STUDI DI SIENA

QUADERNI DEL DIPARTIMENTO
DI ECONOMIA POLITICA

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Marrying in the Cathedral:
a Framework for the Analysis of Corporate Governance

n. 571– Settembre 2009

Abstract - The firm can be seen as a centralization of market transactions and as a decentralization of a public ordering which allows the management of joint liabilities. The paper advances the view that the main reason for the firm's existence is the unification and the internalization of liabilities. From this perspective, Coase's and Fuller's contributions to the theory of the firm can be married within the architecture of Calabresi's Cathedral. Because of specific (dis)investments, fundamental transformations from competition to managed bilateral monopoly take place either in the public or the private sphere and provide an explanation for the ultimate nature of the firm.

JEL Classification: K130,K220,D230,D520

A first draft of this Paper was written for "Changing Perspectives on Corporate Law and Economics", a conference in honour of Guido Calabresi held in Rotterdam on 6 November 2008. I thank Guido Calabresi, Hans van Oosterhout, Henry Manne, Pier Giuseppe Monateri, Antonio Nicita, Roberto Pardolesi and Alessio M. Pacces for their useful comments. A revised version of the paper was presented at the EALE annual conference (Rome 17-19 September 2009).

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1. Introduction.

On 2 July 1923, Alfred Sloan – the famous CEO of General Motors – wrote to a distressed Mr. Kettering as follows:

"It was called to my attention recently that there were 143 copper cooled cars out in the territory and it appeared to be desirable to withdraw them and reassemble them. In other words, it was thought desirable, in view of the fact that there were more or less complaints, not dealing with the engine particularly but dealing with the whole car, that they should be taken in and an adjustment made" (Sloan, 1963 p. 90).

Charles Kettering had been head of research for General Motors since 1920 and, also thanks to Alfred Sloan's efforts, he would remain in that position until 1947. However, at that time, Kettering was ready to resign. He believed that the copper-cooled car, which Kettering called the air-cooled car (and was later to be known by that name), was a major invention. It marked an improvement over water cooling systems because it avoided the problem of the water freezing in cold weather. Kettering, backed by Dupont, had pressed for the application of this technological innovation; but the results had been an outbreak of "technological accidents" at GM. However, it was not clear whether the breakdowns were due to the immaturity of Kettering's new device or, rather, to poor implementation of the innovation by the production divisions.

In the same letter Alfred Sloan defended the procedures that had induced GM to halt production of copper-cooled cars, and in his memoirs he added:

The copper-cooled car had failed to meet the test of validity. It had failed at Oakland. It had been adjudged as needing further development by a joint study made by the chief engineers of Buick, Chevrolet and Northway - a highly competent group. Sample cars produced by Chevrolet, and sent into the field

had been withdrawn because of serious defects. The problem was complicated by the uncertainties of a new chassis as well as new engine. We had to recognize that research engineers had little experience, relatively speaking in chassis design as compared with engineering staffs of the operating divisions. I had of necessity to respect all these facts and circumstances. (Sloan, 1963 p. 89)

Even if much of the literature has related the famous GM-Fisher Body integration to hold-up problems, we will argue that difficulties like those considered above can explain most of the reasons for this famous merger.

On the hold-up interpretation put forward by the New Property Rights approach (Hart 1995), the problem arose when GM wanted to expand its production facilities. Vertical integration, and in particular the acquisition of Fisher Body plants, was claimed to be necessary in order to prevent the Fisher brothers from holding up GM.[1] However, it is more likely that the main purpose of the merger was to integrate the Fisher brothers into the organizational structure created by Sloan. He pointed out that the increasing complexity of car design made it more difficult to ascertain the merits of successes and the responsibilities for failures, such as those involved in the production of the copper-cooled car. A turning point came when manufacturers decided to move from the production of open–body cars to closed-body ones. The latter made the distribution of the car's weight extremely important for its stability, and it required an integrated project and full cooperation among all the research and production units. [2]

With closed-body cars becoming the standard in the mid-1920s, any mistake, or any incompatibility among the views of the different departments, would have had much more dramatic consequences. According to Sloan, the

1 The extra power to be gained with acquisition of Fisher Body's physical capital could not be an important reason for the takeover. At the time of the acquisition, GM already owned 60 per cent of Fisher Body, and it was quite unlikely that any hold up could derive from a lack of control over physical capital.

2 According to Sloan, even before the advent of the closed body, there was, of course a "certain relationship between the various parts that was adhered to by almost every car maker for many years. The radiator, for example, had to be in line with the front axle, a relationship which was responsible for the height of the cars of the period. Inevitably, these fixed relationships between the axles and the body of the old car meant that the car had to be high. However, this did not matter much during the period when the industry principally was building open cars - that is, until the mid-twenties." (Sloan, 1963 p. 289).

switch to closed-body cars entailed that the managers, who were responsible for the production of the body of the car (the Fisher brothers), should be brought under the same organizational umbrella. Although GM already had control of Fisher Body (it owned 60 per cent of the company's shares), a merger was necessary to achieve the integration of activities required by the innovation and production processes of the closed-body era.[3]

"*There were operating economies to be gained by co-ordinating body and chassis assemblies, and with the closed body becoming dominant in the industry, it seemed sensible to bring the body operation entirely under the General Motors Roof. And it was felt desirable also to bring the Fisher brothers into closer relationship with our organization" (Sloan, 1963 p. 184).*

The importance of a closer relationship with the Fisher brothers was then given even greater emphasis.[4] The increase of co-specificity due to the advent of closed bodies implied that specific high "second order" investments in the appropriate private ordering were necessary to obtain the smooth co-operation of the Fisher brothers with the other managers involved in construction of the new closed cars. In other words, the main purpose of the merger was to introduce a system of private governance where the fair exercise of power would decrease the risks faced by all the agents investing in co-specific human capital and produce an integrated product (such that individuals' production failures could not be easily evaluated by public courts or other agents external to the organization).

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3 Thus, the extra power to be gained with acquisition of Fisher Body's physical capital could not be an important reason for the takeover. Not only did GM already own 60 per cent of the physical capital of Fisher Body but the main purpose of the integration of Fisher Body into GM seems to have been a more complete "acquisition" of the human capital of the Fisher brothers. Pagano (2000) made this point unaware of the fact that Coase (2000), Freeland (2000) and Casamedus-Masanell and Spulber (2000) made a similar criticism of the standard account of the Fisher Body – GM relationship. The standard holdup interpretation, used by Hart 1995, originated with Klein, Crawford and Alchian (1978) and was developed by Klein (1988). Klein (2000) defends his holdup interpretation.

4 In the 1926 Annual Report of General Motors Corporation, the section referring to what had just become the Fisher Body Division of GM states: "Of even greater importance is the bringing into General Motors operating organization in closer relationship, the Fisher brothers, through whose constructive ability, foresight and energy the institution bearing their name has been built up to the dominating position it now holds" (Dupont et al., 1927, p. 10).

Since the conflicts concerned the copper-cooled engine, the development of a private ordering internal to GM had made remarkable progress. Sloan had perceived the main problem as being "one of conflict between the research organization and the producing divisions, and of a parallel conflict between the top management of the corporation and divisional management (1963, p. 94)", and he had decided that GM should be reorganized in two directions: decentralisation of operating responsibilities to the peripheral units, and centralisation of major policy formation to an Executive Committee. According to Sloan, the Executive Committee, "which views the corporation as a whole and at the same time is closely familiar with operating problems, has a somewhat judicial function" (Sloan, 1963 p. 458). Before Sloan's re-organization of GM, exercise of this judicial function had not been possible. The Executive Committee was composed of division managers, and there were no headquarters acting as intermediary between, and coordinator of, the various divisions. The result was a great deal of horse-trading among division managers. Each manager was ready to approve other projects on condition that he could get a favourable vote on his own project (Chandler, 1962 p.127, Bolton and Scharfstein 1998, p. 103.). Under the organization introduced by Sloan, which would subsequently become the system most commonly used by large firms, the acquisition of other firms like Fisher Body did not cause a sharp increase in internal rent-seeking activities (Breton, Wintrobe 1982) or, to use Milgrom and Roberts's (1990) expression, an increased expenditure in influence costs[5].

The efficiency gains consequent on the acquisition of Fisher Brothers can be seen from two different but complementary perspectives. On the one hand, the acquisition involved the centralization of some market transactions within a larger firm. On the other hand, any controversy arising from the deal between GM and Fisher Body was decentralized from the jurisdiction of public courts to the "judiciary powers" of the GM executive committee.

[5] However, in the case of the Fisher division of GM, this influence costs were far from zero. The integration of the brother in the organizational structure of GM was a very slow process. The six Fisher brothers could distribute themselves among top management and the management of divisions. In this way, in the period 1926 to 1934, they retained control of the Fisher Body division and a monopoly on most of the knowledge concerning the production of the bodies of the cars. It is not surprising that, according to Freeland (2000), in 1934 they could still "holdup" GM obtaining very high compensation for staying at GM.

The first perspective, which will be examined in the next section, can be related to the Coasian notion that the firm should be viewed as a centralization of market transactions. The second perspective, which will be examined in section 3, can be related to a view first advanced by Lon Fuller (1969) and which considers the firm as one of the possible ways to decentralize a the public ordering by setting up a private ordering like the one that Alfred Sloan introduced at GM.

The remaining sections will try to integrate these two views by relying on Guido Calabresi's insight that courts manage “ex-post” transactions for which ex-ante contracts have been impossible or too costly. I shall argue that Calabresi’s cathedral is the ideal setting for a marriage between Coase and Fuller. Under its hallowed roof, the Coasian internalization of transactions and Fuller’s decentralization of the judicial function can be fruitfully integrated into a single framework yielding a better understanding of the evolution of large enterprises like GM. By virtue of this marriage, Fuller and Coase can deliver a rationale for the existence and size of the firm. In my view, their contributions, based on joint liabilities and unified ex-post exercise of power, offer a more useful framework for an understanding of corporate governance than the New Property Rights approach which relies only on unified ownership and ex-ante bargaining.

2. Coase’s centralization of transactions.

Coase's 1960 article on the nature of social cost has become famous for the so-called "Coase theorem" on externalities. However, Coase's world is the opposite of the world of Coase's theorem that relies on zero transaction costs. Indeed, later, in the same article Coase re-states the consequences of the assumption of positive transaction costs. He reiterates the point already made in his famous article of 1937 that the firm represents “an alternative form of economic organization which could achieve the same result at less cost that would be incurred by using the market would enable the value of production to

be raised".[6] The firm is an organisation, alternative to both the market and the state, which enables the "internalisation" of (former) externalities.

As Coase pointed out in his 1937 article, the relevant comparison is that between the administrative costs of organising a transaction within a firm and the costs of market transactions. He maintained that the former are likely to be lower than the latter whenever the "contracts are peculiarly difficult to draw up and an attempt to describe what the parties have agreed to do or not to do .....would necessitate a lengthy and highly involved document.... ". The allocation of resources within the firm is not governed by the price mechanism which characterizes a market economy. In a market economy "*the direction of resources is dependent directly on the price mechanism"* (p. 34) and *"the allocation of factors of production between different uses is determined by the price mechanism"* (p. 35). If in a market economy the price of factor A becomes higher in X than in Y, then A moves from Y to X until the prices of X and Y become equal. By contrast, within a firm *" if a workman moves from department Y to department X, he does not go because of a change in relative prices, but because he is ordered to do so".* Coase defines firms as islands of central planning or, quoting D. Robertson (1928), as *"islands of conscious power"* existing in "*the ocean of unconscious cooperation defining the market economy*, and his question concerning the existence of the firm is rephrased in the following way:

"*But in view of the fact that it is usually argued that co-ordination will be done by the price mechanism, why is such co-ordination necessary? Why are there these islands of conscious power?"*

Coase answers that the explanation of the existence of firms is that the use of the price mechanism is costly and the allocation system used within the firm may be relatively cheaper. Discovering the relevant prices, and negotiating and enforcing contracts, are all costly activities required by the use of the price mechanism. They can be greatly reduced if firm-type co-ordination replaces the

6 As I explained many years ago the firm represents such an alternative to organising market transactions" (Coase 1960, p. 115). Coase emphasises how "unified" private ownership? of a factor of production allows the rearrangement of production to take place without bargains among the owners of the factors of production. He considers how a "landowner who has control of a large tract of land may devote his land to various uses, taking into account the effect that the interrelations of the various activities will have on the net return of land, thus rendering unnecessary bargains between those undertaking the various activities" (Coase 1960 p. 116).

market system. But if firm-type co-ordination implies such a considerable saving of market transaction costs, why does the economy not become a single-firm economy or, in other words, the centrally planned economy advocated by Marx?[7] Or, to reverse the question, *why do markets exist?*

Coase's answer to this "reversed question" is based on the idea that as firms expand, they are faced by increasing organizational costs. According to Coase, there are decreasing returns to management or to the entrepreneur's function. As the size of the organization increases, the entrepreneur is more likely *"to place the factors of production in the uses where their value is greatest, that is, fails to make the best use of resources"* and smaller firms can compete him out of the market. *"Naturally a point must be reached where the costs of organizing an extra transaction within the firm are equal to the costs involved in carrying out the transaction in the open market or to the costs of organizing by another entrepreneur*." (Coase 1937, p. 43). In a competitive system the expansion of the firm will halt at this point, which is characterized by the fact that organizational costs are minimized. The central planning occurring within the firm and the market activities existing outside it will therefore be combined in the optimal way. *"In a competitive system, there is an "optimum" amount of planning"* (Coase 1937, p. 37).

In Coase' s view, the optimal mixture of firm-type and market-type organization achieved by a competitive system will change over time because technological innovation is likely to alter the relative costs of these two ways of organizing economic activity. An increase (decrease) in the size of the firm will occur if a new invention makes firm-type organization cheaper (more expensive) than market-type organization. *"For instance, if the telephone reduces the costs of using the price mechanism more than it reduces the costs of organizing, then it will have the effect of reducing the size of the firm"* (Coase 1937 p. 46). An optimization problem is continuously solved by the competitive system. The optimal mixture of planning and markets is recalculated and implemented whenever the technological data change.

Yet even this efficiency bias in favour of competitive markets is overcome in the 1960 article. After all, competition is only one of the many costly

7 On the relation between Marx and NIE see Pagano (2007).

institutions whereby human activities can be coordinated; and, as Calabresi has often pointed out, it cannot offer a "super-market" in which it competes with the other institutions.

"But the firm", Coase observes, "is not the only possible answer to this problem", for "an alternative solution is direct governmental regulation" (Coase 1960 p. 116). Unlike a firm, government intervention is not subject to competition. Moreover, unlike a firm, the government can conscript and seize property, and it can deploy the police and other law enforcement agencies. However, Coase maintains that the government "is, in a sense, a super-firm (but of a special kind) since it is able to influence the use of factors of production by administrative decisions" (p. 116). In some cases, "the government has powers which might enable it to get things done at a lower cost than could a private organization....". However, even aside from governmental mistakes, "the governmental administrative machine is not itself costless" and it "can, in fact, on occasion be extremely costly".

Thus, the first part of his 1960 article (where the conditions of the so-called "Coase theorem" would be satisfied) is only instrumental to moving towards a world where no organizational "free lunch" is possible and all types of transactions are costly. The problem is "one of choosing the appropriate social arrangement" in a world where "all solutions have costs". Moreover, given the nature of the problem, the existence of "externalities" does not entail that the costs of setting up a "social arrangement" to deal with these interactions will always outweigh the benefits. Thus, each institution, such as market contracts, firms, judiciary and the state, covers only a part of individual interactions; and, moreover, the overall mix of these "social arrangements" is necessarily incomplete. In a Coasian perspective, the centralization of market transactions within firms like GM should be viewed within this complex framework of numerous and incomplete institutions.

3. Fuller's decentralization to private orderings.

Coase's journey starts from a world of the costless decentralised markets of standard economic theory where a complete institution (complete markets) rules all human interactions. From this imaginary world, Coase sails towards understanding of the real-life complex world characterised by diverse and incomplete institutional orderings. While Coase proposes this fascinating voyage in the Realm of Economics, Lon Fuller makes a related journey in the Realm of Law, starting from a location that seems located at the antipodes of Coase's point of departure: a world of complete, consistent, and centralized public ordering.

According to Fuller (1958), the generality and reciprocity of commands defines the minimum moral contents for a legal system to be distinguished from a simple system of arbitrary commands. The basic concern of law-making is to subject human conduct to the governance of rules. Law-making is a purposive activity which may fail to a greater or lesser extent. Like any other purposive activity, law-making requires attention to be paid to certain practical precepts related to the ultimate purpose of the activity. According to Fuller (1969. p. 39), eight such precepts should be followed if the object of law-making is to be achieved:

(i) there must be rules

(ii) they must be prospective, not retrospective

(iii) the rules must be published

(iv) the rules must be intelligible

(v) the rules must not be contradictory

(vi) compliance with the rules must be possible

(vii) the rules must not be constantly changing

(viii) there must be congruence between the rules as declared and as applied by officials.

According to Fuller, these eight principles represent eight ways in which the enterprise of law-making may go astray. They indicate eight minimum conditions for the existence of anything that we would regard as law or a legal system. For example, a system where all the rules are kept secret, or where all the rules are retrospective, would not normally fit the definition of a legal system. Complete failure to comply with any one of the eight principles results in something that is not law at all. On the other hand, complete success is impossible to achieve for real-life human societies. When human societies aspire to subjecting human behaviour to the governance of rules, "the principle of marginal utility plays an increasing role in our decisions". In this case, "something like an economic calculation may become necessary when a conflict arises between the internal and the external morality of law" (Fuller 1969 p. 44). Costly resources have to be expended to achieve the objectives of law-making: given the limitations of our resources and capabilities, the achievement of one objective implies the sacrifice of others. According to Fuller, there are "trade-offs" not only between law and other objectives but also among the different objectives of law.

A conflict between the internal and external morality of law may easily arise. On the one hand the "internal morality of law" requires that the laws do not change too often: if they do, its rules cannot satisfactorily guide human behaviour (principle vii). On the other hand, "it is obvious that changes in circumstances, or changes in men's consciences, may demand changes in the substantive aims of law, and sometimes disturbingly frequent changes" (Fuller 1969 p. 44).

However, "antinomies may arise within the internal morality of law itself" because "the various desiderata which go to make up that morality may at times come into opposition with one another". For instance, consistency (principle v) and intelligibility of law (principle iv) are both important objectives of a legal system. However an "economic" trade-off between these two goals may well arise and "it may become necessary to pursue a middle course which involves some impairment of both desiderata" (Fuller 1969 p. 45). In this regard, Fuller refers to a conversation that he had with a former Minister of Justice of Poland, who told Fuller that "in the early days of the communist regime an earnest and sustained effort was made to draft the laws so clearly that they would be

intelligible to the worker and to the peasant". However, an "economic" trade-off emerged. "This kind of clarity could be attained only at the cost of those systematic elements in a legal system that shape its rules into a coherent whole and render them capable of consistent application by the courts" (Fuller 1969 p. 45). This made unavoidable some retreat whereby the "marginal utility" of both consistency and clarity were taken into account. If law-making is the enterprise of subjecting human conduct to the governance of rules, it may be carried out with varying degrees of success. Which means that the existence of a legal system is a matter of degree.

A common ground between Coase and Fuller thus starts to emerge. In Coase, a system of markets cannot be taken for granted because costly resources are involved in the use of the market mechanism. According to Fuller, a system of complete rules of law cannot be taken for granted for similar reasons. According to Coase, the cost of using the market mechanism implies that institutions other than markets are used to coordinate human activities. Similarly, Fuller points out that more than one legal system may coexist: numerous public orderings (EEC, national states, regional and provincial governments) co-exist with even more numerous private orderings, such as unions, universities, churches and firms.

The relatedness between Coase's and Fuller's theories becomes particularly clear when we consider the role that the firm – one of the possible private orderings – also plays in Fuller as an ideal destination for his journey. In a way similar to the state – the mythical King Rex considered by Fuller – also the employer may find it convenient to set up a legal system in miniature. However, when he tries to do so, like King Rex, he runs the same risks of failing to satisfy the eight principles that characterise a legal system.

The employer "must not only invest some effort and intelligence in the enterprise, but its very success limits its own freedom of action. If in distributing praise and censure, he habitually disregards his own rule, he may find his system of law disintegrating and without any open revolt, it may cease to produce for him what he thought to obtain from it." (Fuller 1969 p. 47-8)

In other words, in order to reap some benefits from a private ordering, the employer not only has to sustain the relative "set-up" costs but must also incur the "rigidity costs" of submitting him/herself to the rules that s/he has created.

The effort may, however, be worthwhile because the "public ordering" may be unable to provide the specific rules that may adequately regulate the principles of conduct that are appropriate to run that particular business.

Sloan's separation between executive committee and the other divisions can be seen as a Fuller-type decentralization of the judicial function to a private ordering. Before Fisher Body's transformation from an independent firm to a GM division, any disputes had to be adjudicated by public courts, which relied mainly on general rules and drew very little on inside information. The task was now decentralized to GM's executive committee, which had taken over the judicial function of the state.

4. Marriage opportunities.

Coase and Fuller reach the same conclusion that the internal structure of the firm may be rather important for the success of business activities. Their starting points seem to be located at opposite poles, however. The Coasian "centralization" argument is founded on the costs that are otherwise sustained by separate economic agents performing "decentralized" market transactions. If these costs were zero, one could not explain the existence of a costly institution like the firm. By contrast, the Fuller "decentralization" argument starts by considering the costs of a completely "centralized" public ordering. If the costs of running and using a complete public ordering were nil, there would be no possible explanation for the "set-up" and "rigidity" costs that are sustained to run that particular form of "private ordering" which defines the firm.

In other words, in Coase and Fuller, the firm seems to arise from two contrasting processes: in Coase it does so from a "centralisation" of market transactions, in Fuller from a "decentralisation" of the public ordering. However, the two processes refer to opposite faces of the same coin. Many of the costs of performing market transactions happen to coincide with the costs of using a "pure" public ordering. When firms, unions, arbitrators and other forms of private orderings do not exist, the market transactions of agents can only be

regulated and enforced by the public ordering. In this situation, the cost of defining and enforcing the rights of agents, their bargaining and their litigation costs, and many other costs besides, may be classified either as the costs of using the market mechanism or as the costs of using the public orderings. Alternatively, these costs can be classified under a single heading: they are the costs of using only "public markets"[8] or, in other words, markets that are not supported by the numerous "private orderings", like firms, that exist in all the modern real-life capitalist economies.

For both Coase and Fuller, market contracts are necessarily incomplete. Public markets are costly. Their incompleteness would be a necessary feature of an optimal world where these costs are an endogenous aspect of the economic analysis. In an optimal world, public markets should only exist when their benefit is greater than the benefits of private orderings. Moreover, even in an optimal world designed by some omniscient God, the mix of private and public orderings should not aspire to perfection and completeness: all institutions are costly and the benefit of regulating human interactions should always be compared to its costs. An omniscient God, knowing that humans have limited resources, will find it unreasonable to allocate an unlimited amount of resources to a perfect and complete structuring of human interactions. Alternative uses (for instance, food production and health services) may be more compelling at the margin.

Summing up, a shared awareness of costs and of incompleteness engages both Coase and Fuller in a common journey from a world of decentralized markets and centralized public orders to centralized transactions and decentralized private orderings. In some circumstances the firm may emerge as a system of centralized transactions organized within a private decentralized legal ordering.

Fig 1. *The Coase-Fuller Engagement* about here.

8 The term "public markets" was suggested by the well-known concluding lines of Alchiam and Demsetz (1972, p. 795) who observed:
"In contrast to markets and cities, which can be viewed as publicly or non owned market places, the firm can be considered a privately owned market; if so, we could consider the firm and the ordinary market as competing types of markets, competition between private proprietary markets and public or communal markets. Could it be that the market suffers from defects of communal property rights in organising and influencing uses of valuable resources?" .

Calabresi's[9] Cathedral can provide the setting for a marriage between Coase's and Fuller's theories. Calabresi has greatly enriched the transaction cost approach and our understanding of the multiple legal orderings by which human behaviour can be subject to the observance of rules. In one famous article (Calabresi 1970) he clarified how liability rules can reduce transaction costs in the case of accidents and how courts can operate as ultimate ex-post price setters for transactions which have been forced upon the sellers. Moreover, his contribution[10] has shown us the complexity of the institutions dealing with non-alienable resources.[11] Ordinary markets, liability rules and inalienable resources offer the foundations of a Cathedral that can be expanded to accommodate a fruitful analysis of other institutions.

Fig. 2: *Calabresi's Fundamental Transformation* about here.

In Calabresi's framework some prices must be settled ex-post after some involuntary transactions have already taken place. In the typical case of accidents, it would be too costly to state prices before the accident took place and rely only on property rules or on transactions taking place in a framework of ex-ante complete contracts. In such a world, Calabresi suggests, liability rules become more advantageous than property rules. *Liability rules emphasize the role of courts having the ultimate power to set the prices of transactions that have already taken place in a situation of incomplete contracts.* Property rules have a clear advantage when it is possible to anticipate future events. In this case entitlements will be transferred only under conditions that have been ex-ante agreed between buyers and sellers. By contrast, in many cases future interactions and events are impossible, or very costly, to forecast, and the entire

9 See Calabresi and Melamed (1972).
10 See Calabresi and Bobbitt (1978)
11 This greatly enriched the framework within which to study markets, firms, public and private orderings, and other institutions, and "carried Coase further" by clarifying the complex relation between efficiency and distributive choices (Calabresi 1991).

bargaining process has to take place ex-post under the supervision and ultimate price-setting authority of courts.

In his celebrated work on accidents, Calabresi (1970) considered the different liability arrangements regulating the transfer of the entitlements between the culprit and the victim of an accident. In principle, in a world of zero transaction costs, property rules would be able to regulate an ex-ante exchange of entitlements in competitive markets. However, in the case of accidents, the costs of the ex-ante transactions among potential culprits and victims would be prohibitive. Such costs could only be saved by having transactions relate only to accidents which actually happen. However, after the occurrence of an accident, the transfer of entitlements has already taken place and the negotiation will necessarily happen in conditions of bilateral monopoly where competitive markets cannot help in setting prices and courts must assume this role. Calabresi's analysis highlights a "*fundamental transformation*" in the nature of the possible contracting process: before accidents the contracts between potential victims and culprits can be agreed in a competitive framework; by contrast, after accidents occur, the relation is transformed into a bilateral monopoly.

The Cathedral framework helps us to understand in which cases this role of public courts could be internalized within firms, as happened at GM after the copper-cooled engine problems arose. In this sense the Cathedral offers the ideal setting for a Fuller-Coase marriage whereby the firm arises as a system of unified liabilities (towards external agents) and as a conscious island of power (which must assign and adjudicate tasks and responsibilities among internal members sharing these liabilities).

However, marriages should not be rushed, and alternative arrangements must first be considered.

An alternative arrangement has, indeed, been offered by the New Property Rights approach. This has sought to marry standard economic theory – suitably modified with 'holes of incompleteness' – with the Coasian approach. The result has been a theory that views the firm as a unified ownership of assets and predicts that the agents best able to invest in human capital will own its assets.

In the New Property Rights approach,[12] third parties cannot verify the efforts or the results obtained from investing in human capital. It is therefore impossible to write a complete contract. In these circumstances each agent is exposed to the risk of non-cooperation by the other agents, and the first best result cannot be achieved because the public officials cannot impose penalties that eliminate the advantages of this type of behaviour. In this situation, the private ownership of physical capital can give the owners some advantages that would not arise in a situation of zero transaction costs (or of zero cost verification by the public ordering). Owners are entitled to do with their goods whatever is not explicitly forbidden by contracts, and their residual liberties may well include actions that expose other agents to the negative consequences of the exercise of those liberties. Moreover, when this possibility is not explicitly ruled out by contractual obligations, private property gives the owners the right to exclude the other agents from the use of physical capital (also in the case when their human capital investment is specific to those inputs).

When contracts are incomplete, private property matters for human capital investments, and the ownership of physical capital becomes most valuable for those agents making the most substantial and specific investments in human capital. In the case of breakdown in cooperation, owners can at least count on the access to physical capital. Ownership increases bargaining power with respect to other agents and provides owners with a greater incentive to invest in human capital in comparison with the other individuals. Efficient allocations give ownership of assets to the agents best able to invest in specific human capital and the extent of ownership depends on the nature of the assets.

In this framework, it is possible to make sense of a U-shaped cost curve, which, in spite of its intuitive appeal, is otherwise hard to justify in standard neoclassical theory. The effect on costs of increasing the concentration of ownership is U-shaped because under ex-ante contractual incompleteness, *complementary assets should be owned jointly* but *independent assets should be owned separately*.

The fact that *complementary assets should be under common ownership* follows directly from the definition itself of complementarity. In the New

12 See Hart 1995.

Property Rights approach, two assets are defined to be (strictly) complementary if they are unproductive unless they are used together. In other words, access to both sets of (complementary) assets is the *conditio sine qua non* for any agent to benefit from increases in its marginal productivity. Starting from a situation of separate ownership, any form of integration enhances efficiency because transferring ownership rights over one of the assets to either party increases the latter's marginal returns without decreasing the returns to the party excluded from ownership. This is because control of one of the assets alone has no effect on an agent's marginal productivity in the absence of an agreement with the agent controlling the complementary asset. Conversely, attributing ownership rights to different agents negatively affects actors' incentives since it increases the number of possible hold-ups. An analogous line of reasoning suggests that attribution of ownership rights over complementary assets to the same right-holder may have a positive impact on efficiency also because, under common ownership, outside agents have to negotiate with only one agent rather than two in order to use the assets.

By contrast, it is possible to show that *independent assets should be owned separately*. Here again the result follows from the definition itself of "independence". Assets are independent when their concentration in the hands of one individual decreases the incentive to invest of one of the individuals deprived of the asset without increasing the incentive to invest of the individual acquiring it. Thus, assets that are independent should be owned separately and the decentralization of ownership can be a means to provide greater incentives to invest in human capital.

The *complementarity-independence* argument gives a rationale for the U-shaped curve: concentrating ownership decreases costs until one acquires complementary assets but increases them when one starts acquiring independent assets. The argument explains how a change in technology, such as the switch from the production of open-body cars to closed-body ones would increase the complementarity of production plants and stimulate a GM - Fisher Body type merger [13].

13 Hart (1995, p. 7) observes that "for a long time Fisher Body and GM were separate firms linked by a long-term contract. However, in the 1920s GM's demand for car bodies increased substantially. After Fisher Body refused to revise the formula for determining price, GM bought Fisher out".

(Fig. 3: the New Property Rights fictitious transformation, about here)

In the New Property Rights approach, similarly to the world of Calabresi accidents, there are two periods; and similarly to the Cathedral liability case, agents cannot write complete contracts in the first period. In both models the first period is characterised by potential conditions of perfect competition and the second period by conditions of bilateral monopoly. However, whereas in the Cathedral setting some actions can occur in the competitive phase (contracts and accidents) and some others in the bilateral monopoly phase (bargaining by the agents and price setting by courts), in the New Property Rights approach all the action is squeezed into the first period (or in other words, into the competitive phase). This miraculous squeeze is obtained by making very special assumptions. In the competitive initial period the agents perfectly forecast what will happen in the subsequent situation of bilateral monopoly, and they take all decisions (including the level of under-investment in human capital and the exchanges of non-human capital) at the outset of their relation. Since the agents perfectly anticipate all the decisions to be taken in the bilateral monopoly stage, no decision is really taken in this period. Thus the second period is a fictitious stage whose life can be entirely run ex-ante only in the minds of the super-rational individuals.

The ex-post activity of the courts, which plays such an important role in the Cathedral, is useless in the New Property Rights framework because no unanticipated activity takes place at this later stage. It is also economically unfeasible because the model has implicitly ruled out all verification activities by dividing human actions into two extreme categories: those involving zero verification costs (exchange of machines) and those whose verification by third parties would require infinite verification costs (investment in human capital). On the one hand, the contracts concerning physical assets are complete, and they are enforced at zero costs. On the other hand, the contracts concerning human capital investments are impossible because, while investments are observable for the contracting parties, third parties cannot verify them. As in a "Swiss cheese", we observe smooth surfaces of complete contracts and perfectly carved holes of contractual incompleteness (Pagano 2000).

The "Swiss cheese assumption" implies that third party verification is either costless or infinitely costly, and it implicitly rules out the endogenous search of a reasonable degree of (in)completeness that could be achieved by the public ordering by means of investments in contract verification capabilities. In this way, it rules out Calabresi's liability rule and the price-setting role of public courts in ex-post conditions of bilateral monopoly.

Similarly in this framework, more investments by private agents (like Alfred Sloan) cannot increase the capacity to devise better working rules and to verify the behaviour of other agents more efficiently. In other words, in the New Property Rights approach, the firm cannot be explained as a private ordering where some agents make "second order" specific investments to manage some specific relations (or, in other words, develop specific organizational capital). The institutions of corporate governance, and all the investments made to overcome the problems of contract incompleteness, do not make any sense within the New Property Rights approach. The Coasian firm conceived as an island of power cannot exist because no power is ex-post exercised outside the competitive ex-ante setting. For the Coasian theory of the firm, the marriage with a neoclassical competitive setting with incomplete markets turns out to be unsatisfactory. It may generate an interesting theory of second-best ownership but cannot deliver a theory of the firm. If such a marriage has already taken place, an amicable divorce is necessary. A new marriage between Ronald Coase and Lon Fuller must, finally, be arranged in the Cathedral.

5. Marriage in the Cathedral.

The New Property Rights approach provides a bad marriage arrangement for the Coasian theory because, unlike Calabresi's liability analysis, its promised transformations are fictitious and misleading. The claim that future bilateral monopoly is included in the analysis turns out to be false. The fiction of hyper-rational agents, perfectly forecasting the future situation of bilateral monopoly, implies that no real fundamental transformation takes place. Good marriages require authentic transformations from pre-marriage competitive conditions to post-marriage successful monopolies.

Two witnesses are required in the Cathedral for a marriage to be valid. One has already been introduced in the person of Guido Calabresi. He is best able to tell us about situations in which fundamental transformations from competition to bilateral monopoly are the *unintended* results of accidents among unknown agents, and the ex-post action of public courts avoids serious ex-post problems. The other best man must necessarily be Oliver Williamson. He is best person to certify the real existence of fundamental transformations from competition to bilateral monopoly which, unlike the Calabresi's accidents cases are the *intended* results of agents making specific investments. In this framework, all sorts of private orderings (including marriages) are constructed to avoid serious ex-ante problems.

(Fig 4: Williamson's fundamental transformation around here.)

Fig 4 shows Williamson's (1985) "*fundamental transformation*" due to asset specificity. Before specific investments are made, the potential investors are agents acting in a competitive framework. By contrast, after the specific investments have taken place, the agents are engaged in a bilateral monopoly relationship where each agent can damage the other and where both agents are likely to be jointly liable for their efforts. In Williamson, too, this *fundamental transformation* requires some form of third-party governance.

Comparing figures 2 and 4 reveals an analogy between the fundamental transformations of Guido Calabresi and Oliver Williamson. Unlike the case of figure 3 schematizing the New Property Rights approach, figures 2 and 4 bear

witness to real-life transitions both moving from competitive conditions to bilateral monopoly, which become two stages of the same process.

Specific investments play a well-known role in Williamson's fundamental transformation. Agents become aware that specific investments entail the impossibility of re-allocating the investments made in the relationship to its outside, and when these types of investments are relevant and/or frequent, they try to centralize transactions into the hands of reliable private orderings.

Even if Calabresi's theory is not usually phrased in this way, it can be re-cast in terms of specific (dis-)investment. Also the specific dis-investment caused by accidents cannot be re-allocated in other accidents, and the agents are confronted by a typical bilateral monopoly related to asset-specificity.

Car accidents are typical cases in which specific (dis)investments are not repeated with the same partners. It is, indeed, very unlikely that one will be involved in frequent car accidents with the same person. However, the type of accidents that occurred at GM were frequent and with well-known partners. In this case, specific (dis)investments mean that it may become convenient to internalize courts and change to a system of joint liabilities towards outsiders. More in detail, the two cases are different for the following reasons:

In the first place, in cases like car accidents, the two agents are unlikely to have ever personally met in competitive markets with any awareness of their future roles. Thus, they are not able to agree on any contractual clause under competitive conditions that may constrain the future development of the relation under conditions of bilateral monopoly. One does not choose the victim or the culprit of a car accident. By contrast, one is likely to choose the persons and a (incomplete) contractual framework within which one can make specific (dis-)investments occurring with predictable partners. Moreover, unlike the car accident case, choices made under competitive conditions may also include the choice of the third party who will have judicial power in the future situation of bilateral monopoly.

In the second place, not only the identities but also the duration is different in the two cases. In cases like car accidents, the ex-post relation lasts only for the time required to redress the damage, and there are not the gains from continued cooperation which characterize co-specific investments. By contrast, in other cases of specific (dis)investments, while the relation develops, it is

worthwhile investing in a "second order" specific structure that governs relations with increasing insight.

Finally, lasting relations with predictable partners induce the a-priori supply of private governance structures. In an "ex-ante" competitive market, the parties can choose the individuals who make the "second order specific investments" in the governance of their relation. Moreover, also the opposite possibility is open in the case of frequent and voluntary specific investments: the persons who make second-order specific investments can set up governance structures that favour the first-order specific investments of the individuals joining them. Richard Posner (1981 and 1983) has maintained that public judges maximize the total wealth of the agents. While his theory is subject to several limitations and counter-tendencies in the public domain, it can find a partial and, somehow, more convincing application in the case of the private judges making second-order specific investments. Private judges may offer governance structures where individuals are able to make specific investments without fear of expropriation. In this case, some, and only "ex-ante", competition may induce private judges – or, in other words, firms' top managers – to look for wealth-maximizing solutions. Even if internal rent seeking, information asymmetries and incentive misalignments set serious limitations on this tendency, private governance structures are also sensitive to this competitive pressure.

In Cathedrals, time cannot be squeezed into the present. Past, Present and Future all have equal dignity, and fundamental transformations must be taken seriously. Transitions from one fundamental transformation to the other must be taken even more seriously: they are the essence of the Fuller-Coase marriage.

(Figure. 5: Marriage in the Cathedral, Around Here)

Unlike the New Property Rights approach, the Coase-Fuller marriage delivers a theory of the firm, and not simply a theory of the optimal allocation of

ownership. The restrictive assumption that verification costs are either zero or infinite is also removed, and the relative performance of the investments in verification of public and private orderings can be fruitfully compared. The firm emerges when a system of dispersed liabilities and public courts mutates into a system of joint liabilities and unified power where management is able to exercise an internal judicial function.

GM as a whole was liable to its customers for providing an overheating engine. Alfred Sloan was well aware of the complications of dividing the responsibilities between Mr. Kettering and the production engineers. Moreover, after the introduction of the closed body, it became impossible to distinguish between the effects of the engine and the body shape on the car's road-holding. Settling disputes judicially became extremely costly because courts could not accumulate as much expertise as the top management of a unified firm in order to assess the responsibilities of the engine and closed-body production departments. A system of joint liability of GM and Fisher Body became necessary, and an internal system of governance became important to stimulate the co-specific investments.

Two different orderings were devised for the two different types of accident. In case of car accidents possibly due to bad road-holding, the public courts still had the ultimate judicial power to ascertain the responsibilities of the new unified governance structures with respect to GM's customers. However, in order to assess the responsibility of a particular production department, it was now up to top management to settle disputes between the former GM and Fisher Body production units. As long as this system of unified and internally adjudicated liabilities was able to produce better results than market interfaces and public courts, the firm could expand, possibly well beyond the limits that the advantages of common ownership of productive assets would have allowed.

Joint liability and the internal adjudication of responsibilities are the essence of the firm and the foundations of corporate governance: they involve a centralization of transactions as well as a decentralization of some powers of a public ordering to private orderings amid recognition that business organizations are legal persons.

Legal personality is a crucial feature that most modern firms have taken from public orderings. When an institution is a legal person, it has an existence

independent of its members. Therefore its rights and obligations do not terminate with the death of its human founders and members; it can sue and be sued in tribunals with respect to contracts as well to crimes, even in relation to its members; and it can own property in its own name.

The legal personality of an organization entails the limited liability of the shareholders and of the agents acting on their behalf. In other words, it implies the organization's full and joint liability for its actions, separating the responsibilities of the organization from those of its members. Individuals cannot be made personally liable for the debts of an organization, which, because of the joint stock principle, can be managed as a single unit by the individuals delegated to run it.[14]

It has been a great achievement of modern nations to separate the legal personality of the state from its rulers. Only when the state became liable for its obligations independently from its mortal representatives did a legal public ordering become possible. Only later were churches, universities, unions and firms also granted incorporation like the state. By the time Sloan was planning the merger with the Fisher brothers, firms could also freely choose to become legal persons and set up joint liabilities, with the internal attribution of responsibilities. At GM, the Coasian process of centralization of market transactions could go together with a Fullerian process of integration of liabilities in a sophisticated private ordering. Marrying in the Cathedral is not only about law and economics; it also involves two real-life historical processes. It involves opening up to a novel analysis of the corporation where the legal indipendence of the corporation (and the independence of its board) from the shareholder allows each shareholder to lock-in large specific investments (some times, unfortunately, specific disinvestments!) without being afraid of being deprived of co-specific capital (as it could happen under a partnership arrangement). As Lynne Stout (2005) has convincingly argued, the legal independent personality of the corporation should be associated to a third-party fair judicial role of its managers. As long as the managers of the do not favour a particular constituency (for instance its shareholders or, even worse, a group of shareholders), the corporation does not only allow the lock-in of specific

14 See Cerri 2007. Pacces (2007, chap 1) gives a complete analysis of all the conditions which define the modern corporation.

physical capital but also the specific investments in human capital of the other stakeholders. The managers of corporate legal person should not simply behave as Coasian centralizers of market transactions but also as dispersed pieces of the body of the Sovereign[15] which still retain some remains of its powers and of its fiduciary duties.

6. Conclusion.

The paper has advanced the view that the main reason for the existence of the firm is the unification and the internalization of liabilities. Corporate governance can be viewed as a centralization of market transactions and as a decentralization of a public ordering which enables the management of joint liabilities and the internal adjudication of responsibilities. Coase's and Fuller's contributions to the theory of the firm can be married within the architecture of Calabresi's Cathedral. Because of specific Willamsonian (dis)investments, fundamental transformations from competition to bilateral monopoly take place either in the public or the private sphere. Marrying Coase and Fuller in the Cathedral can deliver an analysis of corporate governance founded on the comparative analysis of alternative forms of governance. The imaginary journey from decentralized transactions and centralized public ordering to centralized transactions and decentralized private orderings could continue towards a better understanding of the various public and private governance systems. In particular, it can help us to analyze those institutions, like the corporation, which are located at their fuzzy boundaries.

[15] This point was suggested to me by Professor Pier Giuseppe Monateri.

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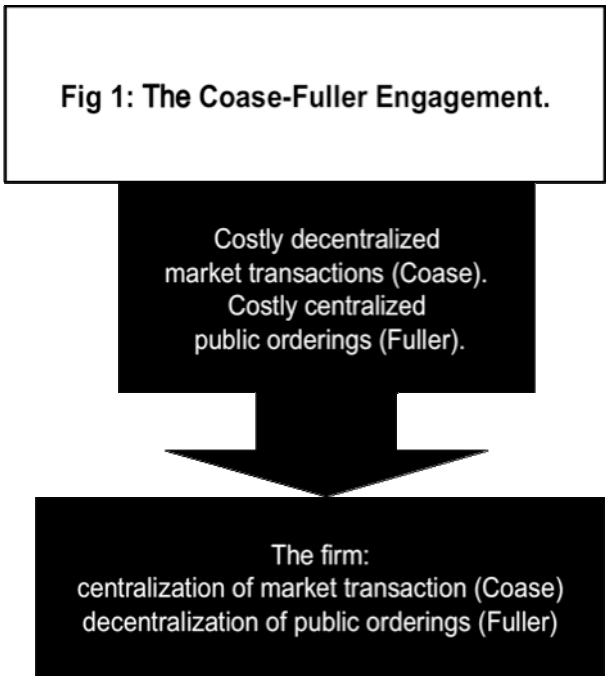
Fig 1: The Coase-Fuller Engagement.
Costly decentralized
market transactions (Coase).
Costly centralized
public orderings (Fuller).
The firm:
centralization of market transaction (Coase)
decentralization of public orderings (Fuller)

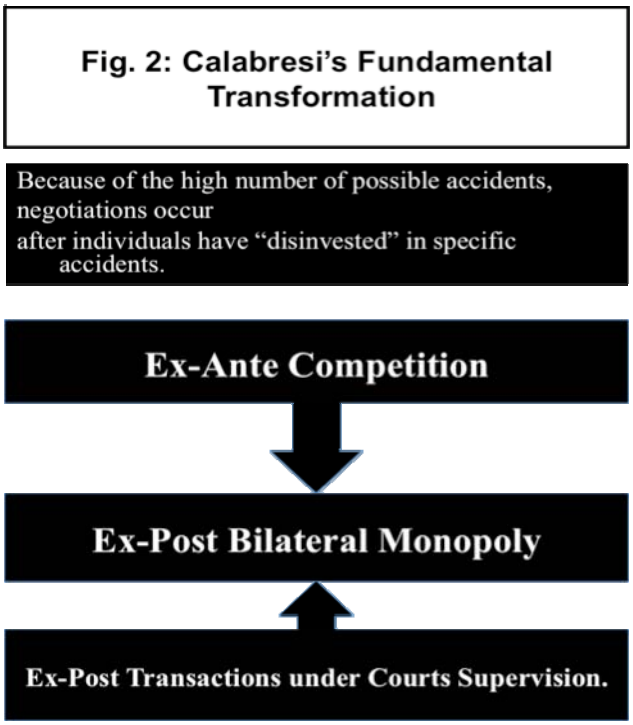
Fig. 2: Calabresi's Fundamental Transformation
Because of the high number of possible accidents,
negotiations occur
after individuals have "disinvested" in specific accidents.
Ex-Ante Competition
Ex-Post Bilateral Monopoly
Ex-Post Transactions under Courts Supervision.

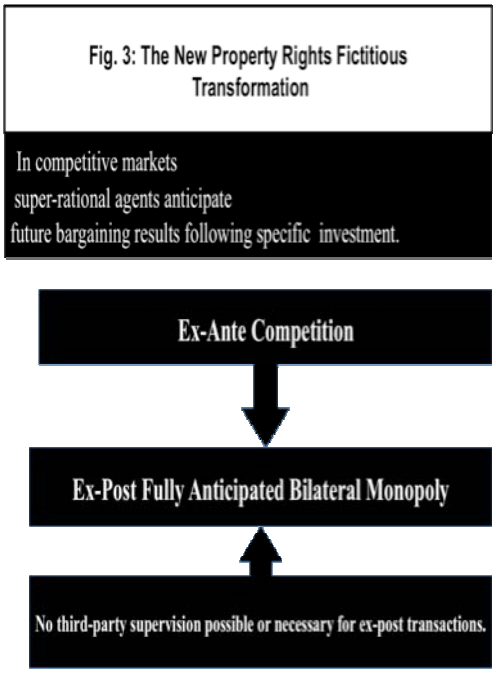
Fig. 3: The New Property Rights Fictitious Transformation
In competitive markets
super-rational agents anticipate
future bargaining results following specific investment.
Ex-Ante Competition
Ex-Post Fully Anticipated Bilateral Monopoly
No third-party supervision possible or necessary for ex-post transactions.

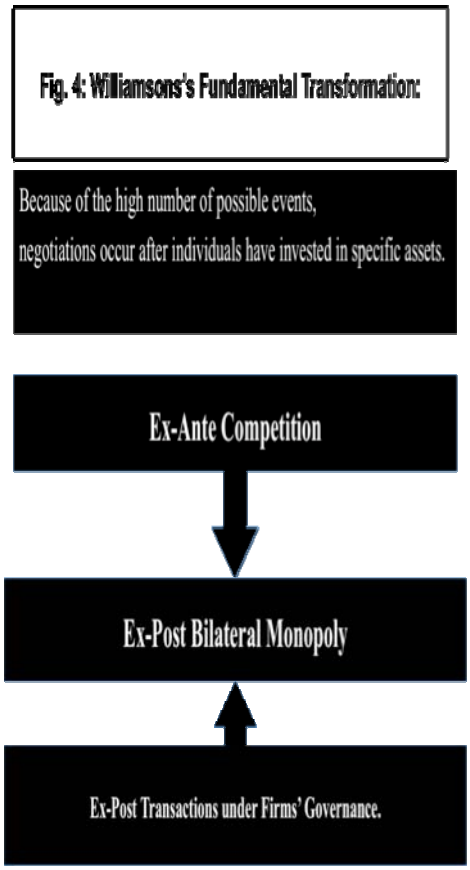
Fig. 4: Williamsons's Fundamental Transformation:
Because of the high number of possible events,
negotiations occur after individuals have invested in specific assets.
Ex-Ante Competition
Ex-Post Bilateral Monopoly
Ex-Post Transactions under Firms' Governance.

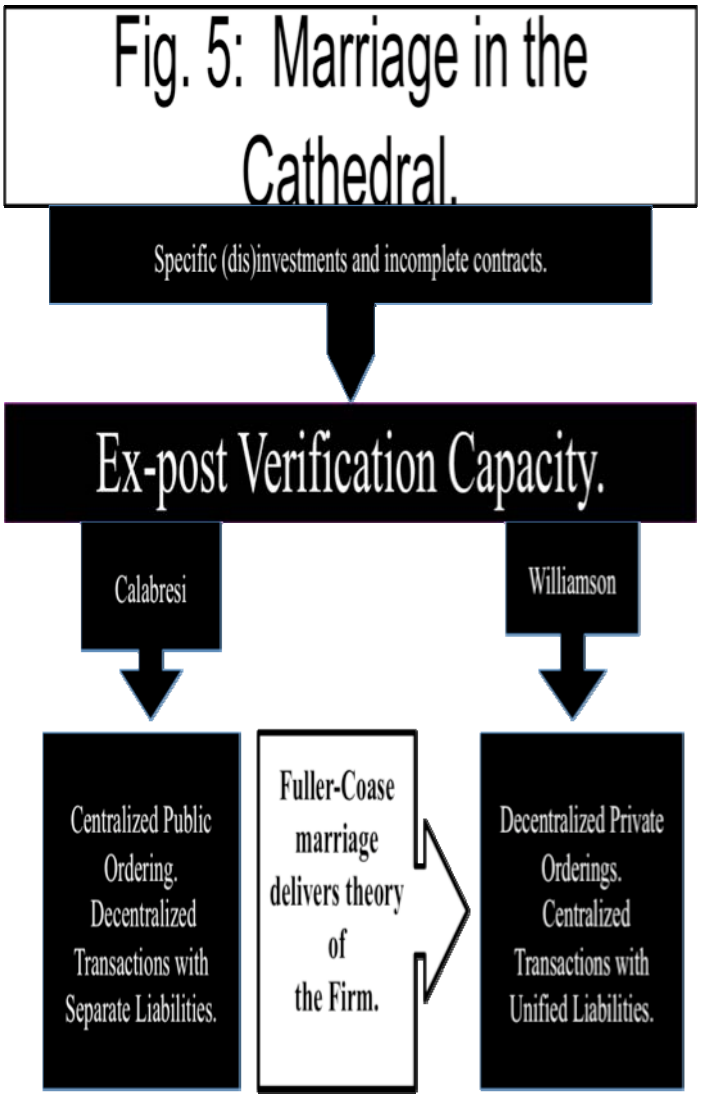
Fig. 5: Marriage in the Cathedral.
Specific (dis)investments and incomplete contracts.
Ex-post Verification Capacity.
Calabresi
Williamson
Centralized Public Ordering. Decentralized Transactions with Separate Liabilities.
Fuller-Coase marriage delivers theory of the Firm.
Decentralized Private Orderings. Centralized Transactions with Unified Liabilities.