

Explaining the existence of different firms' organisational models: from transaction costs (TC) analysis to the capability view (CV).

**How relations, knowledge, resources and institutions can explain the existing variety of firms
(small and large entities and localised production systems).**

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Abstract

This paper is entirely dedicated to disentangling the connections and the ambiguities of something which is fundamental in economic theory: the reasons why firms exist as separate entities from the market, and why they differ in their structure from a pre-supposed “optimality” in their internal resource coordination. This represents, in other words, an analytical exploration of the variety of firm organisational models. In doing so, we shall build a bridge between two quite consolidated theoretical approaches: the transaction costs TC analysis and the capability view CV (or the so-called “resources-based” approach), arguing that only an integrated theory can satisfy the condition of offering a solid analytical frame on the basis of which a positive and a normative theory of the firm (and of productive systems) can be put forward.

I guess, indeed, that it is the suppressed sense of our own fallibility that is responsible for our despicable tendency to form cliques and to go along with whatever seems to be fashionable: that makes so many of us howl with the wolves. All this is human weakness, even to be found among some scientists. And as it exists, we ought to combat it; first in ourselves, and then, perhaps, in others. For I hold that science *ought* to strive for objective truth, for truth that depends on the facts; on truth that is above human authority and above arbitration, and certainly above scientific fashions. (Popper, 1990, p. 34)

1. Introduction: the failing explanatory power of the neoclassical theory of the firm

Mainstream economics has been developing for a long time along a quite consolidated building block of concepts, axioms, and theoretical principals among which, as it is acknowledged worldwide, the most crucial ones refer to the intrinsic properties possessed, in abstraction, by the firm: the subject which represents the unit of analysis of the economic theory.

Few are the main elements that concur to define the analytical frame within which the neoclassical theory explains the existence and the operative functioning of the firm.

First, firms are conceived as perfectly rational decision-making organisations. Secondly, their prescriptive aim is profit maximisation. Third, all individuals that belong to the entity called “firm” are oriented toward a selfish form of behaviour. Fourth, firms are intrinsically viewed as atomistic organisations because the driving-rule which guides the planning of their activity is the law of decreasing returns of all the resource utilised and coordinated during the production phases. The main consequence is therefore that, because firms are conceived to bear the restricted condition of increasing marginal-costs, no growth possibilities are allowed. Fifth, and this is certainly the most unrealistic hypothesis, firms find all the knowledge they need and all the technologies they may implement not through a painstaking process of internal knowledge development, but outside, in the external economic environment. The issue of obvious significance, here, is that neoclassical firms are represented as technologically inert units, in competition with other inert units in a stationary state of knowledge development. At the same time, markets are considered immersed in pure and perfect competition. The neoclassical tradition, as Schumpeter rightly criticised, has expelled the issue of technical change outside the analytical frame of the economic discipline. Here, technical change is exogenous, and all new knowledge created and/or discovered – produced exogenously in the system *deux-ex-machina* by the scientific system or by individual inventors - is with zero costs and without any retardation equally disseminated among all agents: without frictions, and with no specific positions of power detachable among competitors.

In the end, agents are perfectly informed, and they possess the calculative ability to select the unique available “optimum” solution.

Thus, the neoclassical world is populated by maximiser atomistic agents - profit-seeking automates - to which immense faculties of optimisation are given, together with the exploration of an unlimited range of relevant information and knowledge (one must note that in this analytical context uncertainty is not even considered feasible).

Needless to say, by theoretical construct, the neoclassical firm emerges as an entity that is:

- transparent (lacking any organisational form),
- omniscient (it is inevitable here to refer to the Hayekian “problem of knowledge” which pervades the orthodox economics, considering that knowledge is dispersed and unorganised in the economic environment, and that, realistically, knowledge “never exists in concentrated or integrated form, but solely as dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess” (Hayek 1948, p. 77), and no one possesses all knowledge distributed throughout the economic system), and
- arrested in its effort to be creative (here any strategic entrepreneurial function of input coordination becomes insignificant, as well as any investment of the firm’s resources in inventive and innovative activity).

It is not surprising that this theoretical frame is silent about the different firms’ organisational models. Firms are here viewed as pure micro “representative” agents. The dilemma for the mainstream economics is that it does not even incorporate the Marshallian complexity of the “representative firm”, which mirrors the *state-of-the art* of the development of technology, and the perennial battle between large and small business, or, again, that it does not reflect upon the implication of turbulence for the existing industrial structure created by the flows of small firms’ entries and old firms’ exits, related to the entrepreneurial life cycle formulated by Marshall in the *Principles of Economics* .

As a consequence, it is not incorrect to argue that, in the last century, since neoclassical economics has organised its normative statement under a kind of teleological, and deductive frame of supposed ends and means of the *homo oeconomicus*, to which the acting of firms has been assimilated, it has created a monument to an artificial economic world, where the representation of the firm has lost its significance. And it must be stated that this is not just because this discipline seems to have recurred to an excessive level of abstraction, but indeed because it has produced incorrect, a-historical, and unrealistic abstractions¹.

It can be now asked: in which sense is the neoclassical theory a science (Rosenberg, 1983; Demsetz, 1996; Kline, 2001; Hodgson, 2001)? Or a social science (Hanson, 1958; Kirman, 1989; Miroski, 1994)? If science is based on predictions and explanations, thus on experimentation activity, and observed regularities, of the type “when ever event x then event y “, which relations exists among economic causal laws, theorisation of necessary and sufficient conditions, experiment generations, and practical applications? In fact, we have assisted to the development of a surprising vast array of formal modelling, which bears a very little link with the real world. Of course, the modern characterisation of the academic discipline seriously questions if it can be represented as a scientific structure of the social science (Lawson, 1997). And a kind of theoretical disorder now dominates: a contemporary puzzle of theories², competing on incompatible visions, which coexist with a great deal of methodological approaches.

¹ Many have claimed (Loasby, 1976; Langlois and Csontos, 1993; Miroski, 1989) that, in the orthodox economic theory, the working of the firm is largely based on a kind of *a priori* deductivism, where all formulated concepts and hypotheses are certainly integrated in a coherent structure which, however, lacks the necessary realism, testability, predictive power and epistemological falsifiability (Popper, 1965). However, also radical inductivism seems dangerous. Inductive methods attempt to derive knowledge from evidence. But no logical derivation is possible without an appropriate theorisation (Loasby, 1982, p. 15).

² Numerous alternative research programs, as a consequence of these insights, are indeed on the way on various issues (equilibrium: Ingraio and Israel, 1990; increasing returns: Arthur, 1989; evolution: Foss, 1994; human behaviour: Sudgen, 1986) and it is interesting to observe that they are mainly focused on the application of inductive methods where pragmatism of induction is moderated by a parallel procedure of discovering alternative approaches, generation

2. The TC theory as an inductive inference: can the concept of “transaction” explain the “nature of the firm”?

The Coase-Williamson approach to the conceptualisation of the firm has been largely perceived and acknowledged as one of the most important contributions to the theory of the firm. If a new theory must bring in not only a different declarative knowledge, but a different type of problem solutions and a different pattern of activation of concepts, one can affirm that the “transaction costs” theory, developed after the Coase article of 1937, can deserve to be considered a new economic theory of the firm.

The important issue to which Coase has tried to give an explanation is why firms exist as a separate entity from the market, and why markets are not able to work alone (decomposed in *ad hoc* individual transactions performed by atomistic agents occurring throughout the market process) to produce the necessary array of goods that may satisfy the unlimited consumer demand (Witt, 2001). In Coase language, the dilemma of the existence of a firm, of an entity that has a certain command on certain resources, was rephrased in the following way.

Firms exist because they organise production input at inferior costs to those that would emerge through pure transactions in the market. The firm is theoretically defined “in negative”: firms arise from market imperfections (read: costs) in the organisation of transactions, and because the process of “combination” and “integration” of activities is less costly within firms than through “transactions” in an open exchange on the market. But clearly in “perfectly” informed markets, with no costs of negotiations, there should not be any firm at all. Coase interrogates himself (p. 387): “if production is regulated by price movements, production could be carried on without any organisation at all”. So, thus we would have to ask ourselves “why is there any organisation?³”

Is the hypothesis of Coase realistic and tractable at the same time?

Coase was clearly aware of the neoclassical definition of the firm, where if pure and perfect competition exists (and it must exist by definition itself), firms are assimilated to small entities endowed with no market power and characterised as individual atomistic agents. What was he really trying to demonstrate? He was confronting himself with the situation of contemporary capitalism made by large entities. Having rejected the idea that the replacement by a firm of activities existing on the market could be associated with a specific kind of “systematic benefits” on which a theory might be built (the four factors of production, thus the organisation: Marshall⁴; the coordinative function of the entrepreneur: Clark; the control of uncertainty through management: Knight; the specialisation of resources which creates an “island of conscious power” in an ocean of unconscious cooperation: Robertson), Coase was left with few possible “exogenous” acceptable alternatives.

If firms exist, and they do exist, this must have an economic meaning. Why then do they exist? Coase’s answer was: they exist because they are cost-saving organisations in comparison with markets. In Coase’s analysis the use of the market mechanism by the firm is costly, so he accommodated us with the view that firms exist because activities might be produced internally with inferior costs. But Coase’s answer did not consider any deeper explanation on the motives why

of new rules, observable laws, confirmation and abduction. Both the new institutional school and the evolutionary economics which have been strongly influenced by the neo-Austrian approach, and by Hayek, have abandoned the radical deductivism for “thinking in order” through a morphological modelling (Labrousse and Weisz, 2000; Nicita and Pagano, 2000).

³ If we take this point too far we do not understand why firms should exist at all. As Hodgson (1988, ch.9) has observed, why are corporations and not clusters of workers trading partially finished goods? Also there is not much here under the scope of public goods... This criticism can be addressed also to some implications of Hayek’s work. Hayek excludes market failures and endogenous disturbances that only government action can abate.

⁴ Capital consists of knowledge (Marshall, 1920, p. 138). The total power over nature derives from organisation and knowledge (Marshall, 1961, p. 355).

firms are cost-saving organisations. Can the saving only be placed in the internal direction of resources (in term of contracts) as he proposed?

Are firms not perhaps endowed with superior entrepreneurial capacities in comparison with markets? In terms, both, of: a) increasing returns (Marshall and Young), b) imagination and knowledge coordination (Hayek and Kirzner), c) new knowledge creation through innovations (Schumpeter), and d) the ability to extract rents from the services of organisational capabilities (Penrose).

Coase's answer was negative. Coase never arrived at a theorisation of the firm in which he describes firms as knowledgeable organisations where the coordination of the activities reaches a superior performance on the basis of use and creation of specific modes of knowledge.

But, more striking, as many others of his predecessors, Coase took a hard task: he started with a teleological and a-historical explanation of the nature of the firm.

Why did the "factory model" of the first industrial revolution came about? Because suddenly transaction costs rose? Or internal firm organisation costs decreased? But if they decreased (one thinks of the decline of the "putting out system" at that time), the most important issue is to explain through which organisational model and technology these costs declined. Was the new organisational model of the "factory system" really influenced by market information costs? And why were market transactions eliminated and a vertical integrated mode preferred?

The same type of issues can be put forward for the surge of the managerial capitalism of the twentieth century, described by Chandler (1977) with the upsurging of the Fordist large firm. Are transaction-type explanations relevant?

3. Hierarchies and intermediate structures of networks and on-spot transactions

Independently of the subsequent elaborations of Coase-follower economists, what Coase really tried to explain was not the nature of the firm but the mechanism of division of labour among firms, which can be set up through the coordination of the markets or through specific contracts. The most relevant theoretical contribution of Coase is in fact the definition of the theoretical explanation of the "borders" of the firm. This is the theoretical basis on which Williamson explored the nature of external contractual relations (being subcontracting networks or on-spot relations, or, again, access to market procurement) for which he proposed the operational rule of thumb of "the make or buy" alternative (Williamson, 1986).

What are called "markets" in the TC approach are in fact other producers with which its ideal firm establishes indirect (through market) or direct relationships, through economic alliances and contracts (for example, manufacturing-subcontracting activities, acquisition of specialised services, research oriented collaborations, etc).

Coase focused his attention on the vast array of activities that typically firms do not judge convenient to produce in-house, or for which they consider it wasteful to invest resources, or for which they are not technically equipped (this topic, which points out firms cooperation - between activities interconnected but based on dissimilar capabilities - was indeed more thoroughly presented by Richardson, 1972).

An important theoretical criticism of Coase's argument is that market *per se* are not means of production, but places for exchanging what other firms (large or small, individual or public companies, etc) have produced.

Let us consider a hypothetical situation where no transactions can exist or are the lowest possible: information is freely available to all producers, agent behaviours are cooperative, and firms can transact in a freely interchangeable way. Is it really true that, as Coase thought, firms would not exist? Let us consider a heavily decentralised production system, such as the one of Prato, for a long time observed and interpreted in its local dynamics by Professor Becattini (Becattini, 2003).

Let us consider, in particular, the figure of the "impannatore", the men who coordinate the work in the Prato production district, which is typically not organised through any integrated firm

with multiple activities, but subcontracts all production to the district firms. Is the impannatore figure a firm or a market? The inevitable answer is that he or she is a firm, albeit a marginal firm. A productive figure that was historically created more than two hundreds year ago by the local conventions and institutions.

Nowadays we witness a “virtual model” of firms where all productive and manufacturing activities are subcontracted outside, through outsourcing and collaborative contracts. Even if we hypothesise that ICT technologies allow more decentralisation, this does not eliminate the firm as an “agent of production”.

A typically decentralised firm is for instance Nike. This is a classical case of a firm bearing no internal costs for production activities, and also many internal services have been with time outsourced externally. However, in the segment of sport shoes Nike is the biggest international multinational and a dominant incumbent firm, which covers about 40% of the international market demand. But even if, in the future, all the creative and coordinative capabilities are concentrated in a single subject, this firm will exist, because it possesses immaterial resources (design capabilities) and reputation (brand). Markets do not possess coordinative power to organise filières of finished products and they do not extract value from brand. It is the entrepreneur that produces shoes, not the markets. Markets *per se*, as Nelson rightly acknowledged, do not possess alone the knowledge to produce cars, airplanes or chemical factories (Langlois and Robertson, 1989). They are a place for exchange not for “organising” production.

Therefore, the markets in Russia, which recently emerged out of the “fatal conceit” of the planned economy, if let alone are not able to produce much automatically; the same applies to most African or South-American countries, for different reasons.

In fact, in his article, Coase did not explain why firms exist, nor which role is specifically played by them within the economic sphere. He simply invoked the costs of using the price mechanism, and he did not even further define what subsequently Williamson called search of information, bargaining and decision, and enforcement.

If Coase failed to distinguish the firm system in the capitalistic market, as a specific mode of production, he deserves the merit of having pointed out the issue of the firm boundaries, allowing the discovering of intermediate forms of hierarchies, which in a meso-approach define all the productive tasks of a complex filière of activities (Arena, Rainelli and Torre, 1985) that are involved for the production of each commodity. If, to use a modern term, internal governance costs are rising, we can expect firms to react with the moving of more activities outside, in the market, but not to the market, in the epistemological definition used here, where individuals-agents-firms produce and markets exchange.

Of course, the Coase “vision” of a modern organisation is quite interesting. Firm size is no longer technologically determined. Firms can shrink and expand, like an “accordion” in the hands of the firm owners and stakeholders, in relation to market opportunities. But is this the *raison d’être* of the firm? Here it is suggested that the Coase discussion is focused on the moving boundaries of firms, not on the nature of the firm as he claimed. And internal organisational costs are only a part of the explanation of the firm’s movements between a “centred” mode of production or a “disaggregated” one, as in modern language we will term for instance network-firms, international supply chains, industrial districts and clusters.

4. The moving boundaries of firms: technological and institutional effects

In his 1991 article Coase asked himself about the cause that brought his article to be “much cited but little used” and only in the 1990s was he aware of the incredible banalities of much of the so-called neoclassical theory of production, which fails to explain the internal organisation of the firm, being an integral part of the theory of equilibrium.

As Loasby (1999, p. 72-73) has suggested, Coase failed, as did many other economists, to understand why Marshall (1920, p. 139) wrote that “it seems best sometimes to reckon organisation

as a distinct agent of production”; if he could have received more economic training he would not have formulated his problem in the way he did: in the time when Coase was writing, economists were struggling to outline the elements of a theory of imperfect competition, where “firms existed for their monopoly advantages. In this theory, firms were not a solution to a problem of economic organisation but themselves a major source of problems. What mattered was not organisation but market structure” (p. 139). And as concerns economists, the focus of interest was the so-called “structure-conduct-performance” paradigm, and the relative allocative efficiency of different market structures. So, as Loasby has authoritatively argued, economists “had no reason to use” the Coase article.

The man who took up the task was Oliver Williamson. He was convinced that the performance of firms as organisations could not be properly analysed without the specification of an organisational alternative: hence he resorted to the help of TC analysis, which offered him the possibility to work “in the margin” and to articulate different organisational models. He focused upon the organisational incentives of the “make or buy” alternative, and starting with the idea that in the “beginning there were markets” (Williamson, 1975, p. 20) he conceived the alternative solution of the “hierarchy”, a reduction of Coase’s concept of the firm to a pure agent which manages employment relations subtracted from market dominance.

In his work of 1985, Williamson also made another important contribution to the development of the TC economy.

He identified the form of the intermediate hierarchy, a model between pure markets and hierarchies. This specific contractual form was considered an efficient way to deal with the “use of the market”, and with not too acute problems of uncertainty, opportunism, and resources specificity. Thus, in the presence of a combinative high degree of uncertainty, opportunism by commercial partners, and resource specificity, firms were forced to choose the integrated form of the hierarchy (as the best available administrative solution). Therefore, hierarchies could perform better than the market itself. “Intermediate degrees of asset specificity”, on the contrary, will give rise “to mixed governance in which some firms will be observed to buy, others to make... Non standard contracts may arise in these circumstances” (1986, p. 191). This is an important point that should be noted. For Williamson, the vertical integrated form is the device through which market failures can be transformed into an efficient mode of resource allocation. When market failure is incomplete, intermediate forms will tend to emerge. In the *pursuit* of his work (1996), he develops his theory as a “contract theory”, focusing on incomplete contracts, lack of trust, hazard, along a complex line which includes also the property right issue, and the principal-agency theory (Jensen and Meckling, 1976; Grossman and Hart, 1986).

It is not our intention here to survey the impressive quantity of TC articles that have appeared in the last two decades⁵. Our operational effort is to extract from the TC theory what is valuable: not a theory on the *nature* of the firm that can be provided, as we will discuss later in section 4, by the capability-evolutionary approach, and not even a history-friendly model on the evolution of path-dependent firm organisational models, as we will explore explicitly in an evolutionary context in section 5, but some illuminating guiding rules for setting the “organisational boundaries” of firms⁶.

It interesting enough to observe that TC theory was rarely matched with other competing explanations on the nature of the firm (for instance, the organisational view, where firms are

⁵ For a comprehensive review see Ménard (2003).

⁶ Also Foss (1997) has taken a similar pragmatic point - “It is possible to argue that the evolutionary and the contractual theories of the firms are rivals. However, it is also possible to argue that they are overlapping and complementary areas of research.”, (p. 1) without explaining too much how these two theories can really match. On the interdependence among transaction, coordination and production see also Antonelli (2003), and Antonelli and Quéré (2003). On a similar perspective cf. Mariti (2003), Amin and Cohendet (2000), Nooteboom (2003), and Leoncini, Montresor and Vertova (2003).

considered endowed with specific capabilities, with cannot be found as *given* in the market; or the Schumpeterian approach, in which heroic entrepreneurs develop market dynamics and dominate markets through innovation), where typically approaches were juxtaposed rather than integrated (Putnam, 1986; Egidì and Turvani, 1987). Our task here is to reflect upon the firm boundaries (and thus upon the centralised or decentralised mode of firms' coordination). We shall not dismiss the importance of the TC approach, but we shall develop a frame, which attempts to use the TC-guiding rules together with other explanatory variables, that we have selected from the capability approach, and from the evolutionary and the institutional view. This frame is actually a pure theoretical reflection, that is supported by empirical evidence and by narrative case-study, more than by explicit research work, but it indicates the avenue for useful implementations with more quantitative analyses, which formally could correlate the sign of the various variables selected, or that could estimate the impact of some of the independent variables indicated here on the organisational form of the firm, clearly identified, in this approach, as the dependent variable.

So, the articulate frame proposed emerges *prima facie* (see fig. 1) from the dialectic between centripetal and centrifugal forces, which pushes organisations towards a centralised or a less centralised (decentralised) mode of resource coordination. Some general regularities may be presented here.

Firstly, they refer to the TC analysis and to the impact of market uncertainty, assets specificity, and relational costs on the mode of activity coordination. The idea behind this is that high "information/transaction costs" in the use of the market will favour the administrative solution, thus a high integrated level of firm governance, and *viceversa*. It is interesting to observe that the Marshallian hypothesis is quite different and relates the existence of risks with the decentralised solution.

Secondly, the issue of organisational knowledge and internal efficiency is introduced. Here an integrated level of firms governance is explained by the existence of a condition of increasing return related to the association of tasks and activities within a given organisation. Let us suppose that the R&D and the productive function bear technological indivisibilities and complementarities, or that specific technologies could be applied profitably only through a large batch production, or again, that some advantages are associated with the government of resources by specialised management (who exploit organisational efficiencies, etc within the given organisation scale or scope economies,.). We thus witness the emergence of the large Chandlerian firm, or the implementation of Fordist techniques through large oligopolies. If all the relevant knowledge is kept inside the firm, this will favour centralisation. If the development of technology brings about a significant process of knowledge externalisation, with a contemporary standardisation, division of labour, and modularity, as discussed by Marshall (1920), Rosenberg (1976), and Langlois and Robertson (1992), this will favour a decentralised solution. In short, we must expect that a Fordism-type of organisational development will give rise to a centralisation of economic activities, while a post-Fordism type will corrode, decentralise, or brook incumbent oligopolies.

Thirdly, the exploitation and exploration of new technologies is associated with the centripetal force created by the innovating firm, as emphasised a long time ago by Schumpeter. Innovating firms will tend to be more profitable. Even if initially small, they will tend to grow, and to become dominant in their markets. This effect is not related to the make or buy alternative but to the fact that just one or few firms will possess the unique capability to serve the specific market. So, markets characterised by the presence of Schumpeterian firms will tend to become oligopolistic. Oligopolistic firms are not automatically highly verticalised firms and they may or may not resort to a decentralised mode of coordination. Their size will change in relation to the number of tasks organised internally, sub-contracted externally or bought directly in the market as "ready made" products. However, to recall the Schumpeterian metaphor, the production of new combinations often occurs within large industrial groups. And as long as the innovator is not imitated, he or she enjoys monopolistic profits. So innovating firms can dominate their market. The resulting market

structure is thus typically concentrated. The socialisation of knowledge and the imitative activity of competitors mirror the alternative process in which the degrees of activity concentration decline in the economy. But again, we repeat, this is not directly related *strictu sensu* to the make or buy alternative, but to the concentrated vs. de-concentrated (perfect competition) market structure. However, because we are also interested in the analysis of firms' size, a clear correlation exists between verticalisation and concentration.

Fourthly, it is necessary to investigate the effects of institutions. We are referring here either to informal rules or created-by-design institutions, as assumed by the new institutional economics (Rutheford, 1994; Dezaun and North, 1994; Vanberg, 1994; Hodgson, 2000; Witt, 1987; Vanberg, 1988; Hayek, 1963) which strongly refers to the Hayekian twin idea of spontaneous order and evolution of norms under different sets of constraints (1973). In a general sense "institutions can be defined as sets of rules that allow a plurality of persons to coordinate their behaviour and to routinely solve typical problems that arise in social interaction and cooperation" (Vanberg, 2001, p. 24). However, institutions are also "constructed" and embedded into the constitutional asset of the market economy (Kasper and Streit, 1998). We may ask ourselves about the influence that institutions exert on the firm centralisation/decentralisation costs of tasks and activities.

As a general setting we must draw attention to the fact that they allow a more decentralised mode of activity coordination. Three particular areas are underlined in our scheme: a) the influence of the antitrust legislation and the activity of regulation conducted by public agencies, b) the informal institutions of trust, reputation, and cooperation that especially managerial literature has addressed as a substitute mechanism of activity coordination instead of the administrative solution (through hierarchy) (Nooteboom, 1996; 1999), c) the way in which the social institution of entrepreneurship (forms of start-up, intensity of entry, mechanism of financing, mechanism of risk socialisation, etc.) is promoted within the economic environment.

The encoding of these reflections into a more formalised argumentation suggests these still preliminary statements.

Proposition 1. Two competing hypotheses

Williamson-Coase approach.

A centralised model of firm coordination will be organised when, simultaneously, organisational costs are low and uncertainty, relational contracting and asset specificity are high. A reverse sign of these variables will on the contrary favour a decentralised mode of coordination.

Marshallian approach.

A decentralised mode of governance will be adopted by agents bearing high risk and volatility of demand.

Proposition 2.

Organisational knowledge renders the grouping of resources, inputs, and tasks, more advantageous. Thus, in the presence of technical and/or scale economies (or economies related to specific activity: R&D, marketing, distribution), a typical firm organisational model will be reflected in the centralised mode of coordination (cf. the Fordist firm of the 1920s or the post-Fordist models of contemporary multinational and global firms). Conversely, the emerging of standardisation (market-driven standard like IBM-Dos or policy-driven standard like the European mobile telephone SGS), and the division of labour (planned explicitly by firms, or emerging progressively in the market as spontaneous order of mutual adjustment and evolution *à la Hayek*) will push toward an opposite direction⁷.

⁷ In the opposite direction goes the effect of the extension of the market (Stigler, 1951), which supports a further division of labour, the externalisation of tasks, and the reaching of external scale economies.

Proposition 3.

In relation with the Schumpeterian gale of “creative destruction”, the following argument can be outlined. At the beginning of the innovation cycle, prior or serial innovating (inventing) firms will be organised through a centralised mode of resource coordination. Also the capability of the firm to retain and protect knowledge (through high appropriability or patents) will drive toward a more centralised mode of coordination. Conversely, in the second step of the innovation cycle, imitation and diffusion of knowledge will favour decentralisation.

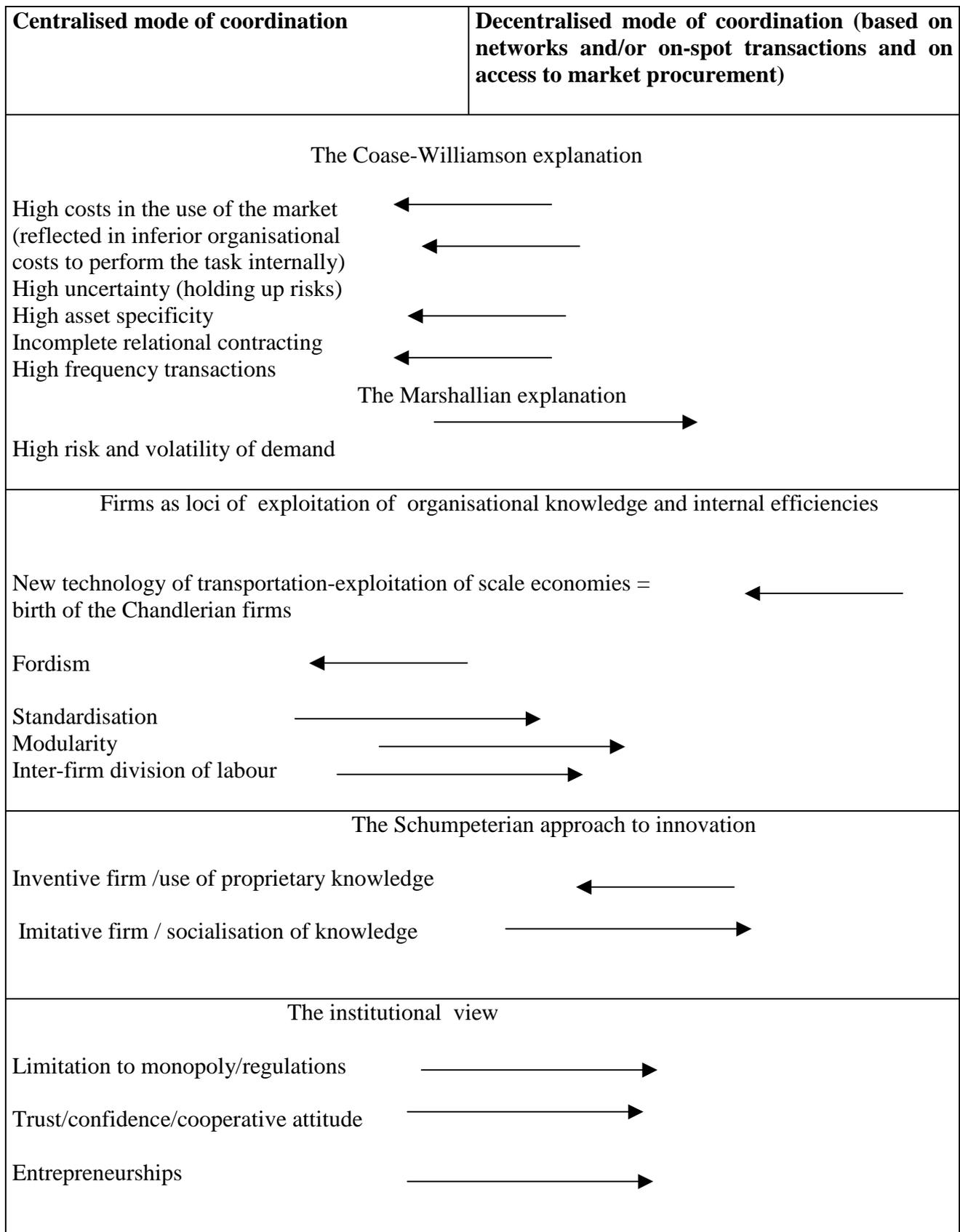
Proposition 4.

Finally we must consider the fundamental role played by institutions⁸ (planned or spontaneous⁹) which are not above the market but a visible scaffold of market functioning (North, 1990). *Ceteris paribus* we can predict that a strong and competent institutional frame will favour decentralisation, through the opening of competition (antitrust policies or competition policies in the modern language), the reduction of uncertainty among the economic agents, and the internalisation of norm-guided behaviours (based on trust, cooperative attitudes, conventions, etc.; Elster, 1989). From this perspective also a high propensity towards entrepreneurship will decrease the levels of economic concentration because new entries erode incumbent market shares, and often introduce novelties into the economic system. Antitrust and regulative policies will favour the decentralised mode of governance.

⁸ A direct link among the institutional approach and the division of labour approach has been traced by Peil (1999, p. 114). “The idea of the *invisible hand* and the win concepts of *natural* and *market price* have encouraged economists to interpret Smith’s economics as a general equilibrium theory *in nucleo*. However...the sympathetic model of man and society differs substantially from the economists’ rational choice approach simplified by the Walrasian general equilibrium analysis.Smith understood competition for wealth, rank and distinction as being motivated by the human desire for *praise (worthiness)*. Economics as a discourse on the production and distribution of wealth is, according to the sympathetic model, as an integral part of moral philosophy”. So, “people themselves produce both their social order and corresponding world view in the course of interacting with each other in a context of sympathetic communication, competition and concurrence” (p. 126). ..”As in the *Theory of Moral Sentiments* so in *The Wealth of Nations*, the invisible hand is used as a metaphor to illustrate the point that, contrary to traditional thought, self-interest is not necessarily in conflict with public interest. Embedded in the social context of mutual sympathy, behaviour and action motivated by self interest reflect the interest of society” (135).

⁹ Hayek, in particular, has focussed his attention on the cultural evolution as a “spontaneous order” where rules emerge out of complexity. But at the same time, the tradition of the Freiburg school (the *ordo-constitutionalists*) which is in one sense related to Hayek’s work, has put much more emphasis on the construction of “designed rules”, and on the role of institutions as regulators of market competition. See Schäfer (1999). On the role of the markets as institutions *à la* Coleman, which facilitate firms adaptively efficiency, see Moran and Ghoshal (1999).

Fig. 1 The make or buy alternative and the activity coordination models



5. The evolutionary-capability view is a necessary complement to the TC analysis on the nature of the firm: firms as “coordinators of organised firm-specific knowledge”

The state of disarray of the neoclassical economics and the numerous signals of dissatisfaction have given rise to what could be named an alternative scientific paradigm, that since the seminal 1982 publication of Nelson and Winter, falls under the label of “evolutionary economics” (Vromen, 1995; Hodgson et al. 1993; Hodgson, 1994; England, 1994; Anderson, 1994, Saviotti, 1996; Witt, 2003).

In contrast with the neoclassical approach, firms are here envisaged as dynamic and active knowledge-bearing and knowledge-seeking agents, endowed with “limited rationality”, uncertainty¹⁰, and significant informative gaps (Nelson and Winter directly refer in their work to the seminal opus of Simon¹¹), but enriched by an organisational structure, influenced not only by possible conflicting aims but depositary of the firm’s idiosyncratic “routines” - the codification of the firm know-how into replicable practices, and work task instructions - which historically represent the firm’s past evolution.

Also in this case firms are governed by the search for profit. But no simplified rules are established. The exploration of profit-opportunities is limited by the subjective capability of the entrepreneur to foresee his or her future as regards the various variables that are known to influence the firm performance: technology, consumer preferences, market signals, and so on, and by the existence of radical uncertainty (Heiner, 1986) in relation to the market evolution and to the development of new technological opportunities.

It follows that firms can no longer be thought of as “maximisers”, because they are not capable of defining ex-ante any optimal solution; on the contrary what they may follow is, thus, only a “satisfying” solution¹², which may in the future reward the firms with positive profits.

An alternative conception is developed within the evolutionary approach (Winter, 1987), as concerns the role of the market, wherein it plays the fundamental task of “ex-post selection” (of successfully implemented routines - those that with time reward the adopting firm with positive economic results). If not all agents present on the market are maximisers, the population of firms will be composed of two arrays of firms, those that are successful, and those that are not. In substance, with time, firms with negative results will be forced to exit. While for mainstream economics the market is the *locus* of a “Paretian equilibrium” (competitive equilibrium), the “evolutionary” market¹³ is essentially a *locus* dominated by the Darwinian selection of the *fittest*

¹⁰ Even without referring to Knight or Keynes, the two most important critics of the neoclassical view of perfectly informed agents (for a deep discussion cf. Schmidt, 1996 and Greer, 2000), economists were well aware of the uncertainty that surrounds the economic environment. As Chamberlain (1954, p. 220) observed, citing Lloyd G. Reynolds, “production and sales plans are rarely viewed with much confidence for more than three months ahead”.

¹¹ See Simon (1982), Simon and Egidi (1992); Bourguin (1992).

¹² The idea that profit maximisation was a pure abstraction has long been widely spread among economists, but it was always considered the best existing approximation even if “the assumption that a firm pursues maximum profits is an extreme simplification” (Clark, 1961, p. 91), and “the maximisation of profits is a process of trial and error” where the firm’s reaction to uncertainty is an essential feature” (p. 93). And again, “Profit maximisation may be the most nearly dominant motive of the business firm, but it is part of a complex, the whole of which cannot be understood in terms of profit maximisation alone.” (p. 96) Also oligopolistic American firms for Clark were under the pressure of “competitive undercutting” and “new entries” controlling prices. In addition managers will not tend to follow policies of “small volume and high prices”. So, “it appears that the highest degrees of foresight tend to profit policies that are closest to the competitive ideal, if this be constructed to allow the more successful concerns what may be called growth profit policy as contrasted to minimum-survival profit”. (p. 96)

¹³ It is interesting to note that, following Werner Stark, Clark (1990) describes a proposed evolutionary process approach to society which overcomes both the *unity view* where individuals are considered simply a part of the whole, and at the same time the *multiplicity view* in which society aggregates a collection of individual actors without the human experience of being a community. Referring to Smith’s work, Clark proposes a third evolutionary view, where the interaction between the individual and the social institutions adjust to the influence of the other. Based on Smith’s

and adaptation (Metcalf, 1988), and by the Schumpeterian gale for innovation among firms (Schumpeterian competition), a *locus*, recalling the anti-neoclassical neo-Austrian approach, where the process of competition is the result of “market process interaction of people each of whom possess only partial knowledge” (Hayek, 1948 p. 91).

The epistemic role of the market means that modern economy must cope with the division (Hayek, 1949, p. 50; 1960, p. 26) or “fragmentation of knowledge” (Hayek, 1973, 14). This is not just a problem of allocating given resources but of securing the best use of resources known to any member of society. It is a problem use of knowledge which is not given to anyone in its totality (Hayek, 1949, 77-8). Nobody can know “which kind of things or services are wanted, and how urgently they are wanted” (Hayek, 1978, 182). Such knowledge is dispersed throughout society. “The knowledge of what means of production exist and of the various uses to which they may be put often depends on a familiarity with local circumstances”. (Hayek, 1978, p. 136).

This is another dimension of knowledge: its *latency*. Often economically relevant knowledge does not exist already and must be first discovered or generated. The market is the coordination mechanism capable of dealing with dispersed and fleeting information. “Market prices embody the latest information and they serve entrepreneurs future decisions. To produce cheaply is not only a technical solution. One may also decide which realisation of which of the alternative factor combinations imaginable. This is a veritable discovery” (Hayek, 1949, p.196)... alertness and adaptation to fluctuation in the prices and a more genuine discovery as finding new productive uses for familiar things (Hayek, 1978, p. 181-2). So, competition is a procedure for the discovery of such facts as, without resorting to it, would not be known to anyone, or at least would not be utilised (Hayek, 1978, 179).

The market here is not a regulative mechanism but a constitutive mechanism in the course of which scarcities are alone established and continuously re-established (Kley, 1994, p. 55). But market knowledge, as Hayek has emphasised, is not the type of knowledge which is produced in the course of scientific discoveries. Economic competition is different from science because “the former is a method of discovering particular facts relevant to the achieving of specific, temporary purposes, while science aims at discovery of what are sometimes called “general facts”, which are regularities of events” (Hayek, 1978, p. 181). On the contrary the ability of entrepreneurs is a sort of practical knowledge which drive them to be alert to all market opportunities. The equilibrium world is one without scope for entrepreneurial discovery and creativity (Fleetwood, 1996) and, as Kirzner (1998) argued, “without the possibility of entrepreneurship, no genuine explanation for market coordination is possible (aside from arbitrary *postulating* that coordination always and fully instantaneously prevails). The ‘chaos’ introduced by entrepreneurship is required to account for the systematic character of real word market processes “. (p. 39-40).

At this point of the reasoning it is important to emphasise that profitability is not the only parameter selected by the market. Many equally satisfying competitive solutions may remain on the market and firms diversity resembles the ecological variations of the vital species left to us by nature in the world by the historical Darwinian selection mechanism.

Firms diversity, in this new analytical context, appears to be endogenously created by the same mechanism of competition (Nelson, 1991) and by the technological opportunity and appropriability existing in different sectors (Nelson, 1987), while in a neoclassical context competition is perceived as a great levelling mechanism (of profits, of firm competitive conditions, and of firms capabilities).

Competition supports the discovery of new methods and new products, and thus sustains the technological variation of firms. Also firms resources are non homogeneous and their utilisation

historical and institutional analysis, this implies a view of society as an evolutionary process of change as the evolution of institution and habits. He gave sense and meaning to the contemporary process of liberalisation and commercialisation in the production and distribution of wealth. Smith did not interpret the idea of the market economy as a representation of pre-given economic laws. “This is the legacy of Smith that must be carried on”. (842)

gives rise to differently organised firms, which struggle for survival on the market place. Survival logic may represent a cheap rule of thumb over the costly neoclassical optimisation (Conlisk, 1996).

Why here are firms supposed to vary with respect to each other? Because, even in the same market niche, each firm appears to be the result of a specific entrepreneurial vision, the result of idiosyncratic organisational and technological capabilities, related to the entrepreneur himself or herself, or to acquired firm's input.

The notion of diversity deserves further comment. In the evolutionary theory two mechanisms are at work: a continuous effort of diversification among firms in line with their random and planned searching of new modes of production, of new organisational techniques, and of new products, and a strong process of convergence activated by the imitation of the more successful innovations, firm strategies, marketing techniques, organisational models, etc.. So, in some cases, different firms will converge, at least in some parameters like the adoption of the same process technologies, or the same product innovation (Mansfield, Rogers).

So, the degrees of similarity among firms (when some parameters are operationally measurable) may vary from zero (a case in which we reemployed the neoclassical metaphor) to infinity (this is clearly a limit perspective), and this even among firms that compete in the same market¹⁴. In addition to that, we have to acknowledge that the differentiation of firms runs parallel to a synchronic and a diachronic pattern.

But also a different research issue is legitimate here: which is the level of variation of firms in a given context during time? This implies a dynamic analysis of the same parameters throughout a time-series matrix. Typically with time firms grow at a different rate, and very similar firms at the beginning show an increasing differentiation.

We have now traced a clear division between the neoclassical approach and the evolutionary-capability view:

1. In neoclassical economics the firm is essentially a processor of information on the basis of market signals to which it responds by activating a standardised optimal decision process in a perfect equilibrium market.
2. Evolutionary theories emphasise knowledge creation, variety and selection in markets out of equilibrium (or multiple equilibria markets).

The evolutionary-capability view has two quite distinct "progenitors": Edith Penrose (1959) and Nelson and Winter (1982), whose work has been slowly integrated in a converging approach where firms can be described as coordinators of organised firm-specific knowledge.

Nelson and Winter acknowledge explicitly that they base their evolutionary theory of the firm on an organisation theory. Even if they dedicate an entire chapter (ch.5) to the issue of organisational capabilities and behaviours, they interpreted capabilities as "the nature and sources of continuity in the behavioural patterns of an individual organisation" (p. 96), in other words as "routine" or "program" which "refer to a repetitive pattern of activity in an entire organisation" or to "an individual skill". In their conceptualisation routines are organisational memory: a set of skills that a particular member of the organisation can perform in some appropriate environment. A *repertoire* where knowledge resides, and where organisational knowledge is stored. But organisations remember by doing under irrelevant equilibrium conditions. There is much more in

¹⁴ At first sight, an analysis which, in a given moment of time, compares the various firms belonging to a specific sector or to a given economic system (national, regional, local), would be able to appreciate firms diversity by measuring different performances, in terms of: a) profitability (ROE, ROA, ROI), b) innovativeness (number of innovations introduced, or number of patents registered or required), c) innovative efforts (R&D investment, design and engineering expenditures), d) learning capabilities (delay in innovation adoption, absorbing capability), e) growth strategies (variation of output and internal employment), f) level of diversification and differentiation, g) degree of verticalisation (as opposed to decentralisation and outsourcing), h) different composition of products sold in the market and input and resources, and so on.

organisations than having appropriate routines in their repertoire: it is also “a matter of knowing what routine to perform, and when to perform it”. Thus, tasks are typically complex and composed of various abilities. Productive capabilities include the “ability to operate plants and equipments”. Organisations do not become capable of a productive performance merely by acquiring all the necessary “ingredients” (inputs, like technology or capital). And even if they have the “recipe” (prescriptive instructions on the use of resources), they may fail in the end in the organisation of the tasks: the organisational performance is based on a fine-tuning of complex activities coordination. “Blueprints” are only a small part of what is needed to be stored in the organisational memory of a firm, in order to reproduce and replicate a task effectively. Routines, thus capabilities, change when firms resort to an innovation, that in the Nelson and Winter frame occurs when the process of searching and exploring end up with a change in routines (p. 128).

But Nelson and Winter enlarge the significance of routines also to the process of searching itself. They propose assimilating the concept of routine to “all of the patterning of organisational activity that the observance of heuristics produces, including the patterning of particular ways of attempting to innovate” (p. 133). They also underline that viewing innovation activity as “routine”, does not entail treating its results as predictable.

The menu of routines in firms is not broad but narrow and idiosyncratic: routines in organisations are equalized to genes. The important consideration captured by this model is that “imitation, though costly and imperfect, is a powerful mechanism by which new routines come to organise a larger fraction of the total activity of the system”. (p. 135).

By contrast, following Penrose¹⁵ (1959), firms may be regarded as a “repository of assets”, a pool of resources, the utilisation of which is organised in an administrative framework” (p. 149). Capabilities are a collection of physical and human resources, which may be developed in a variety of ways to provide a variety of services. As commented by Loasby (1999, p. 49), Penrose avoided the term “factors of production” because she did not want to obscure the difference between resources and the services that they yield when they are oriented. Penrose’s definition of the firm fits very well with Marshall’s conception of the firm as an organisation, which aids knowledge (Loasby, 1999, p. 91).

For Penrose, a cluster of capabilities resembles a production set only in one aspect: it indicates, with some ambiguity and errors, a range of possibilities. So, Penrose (1959, p. 31) specified that there are “productive opportunities” that match capabilities with the perception of potential use.

“Routine” is an ambiguous surrogate for capabilities because it is an executable program for repeated performance in some selected context learned by an organisation in response to selective pressure, while the concept of capabilities refers to the organisational knowledge that lies behind the executed performance. However, these two conceptualisations share a mutual understanding, and the contemporary evolutionary literature generally refers to both (Loasby, 1999). Of course it must be said that in firms much knowledge (or know-how) is very poorly articulated, or latent. But this might represent a consistent part of their capability. Even if the concept of routine has its potential value, we must not fail to acknowledge that not-routinised knowledge, perception, knowledge surprise, and imaginative knowledge are important conditions for firm creativity.

After its introduction in 1959, the term capability was then discussed by Richardson (1972), in a seminal paper in which he set down the criteria on the basis on which, in the industrial organisation, an extensive cooperation emerges in the market. Activities are carried out by organisations with “appropriate capabilities, or, in other words, with appropriate knowledge, experience and skills” (p. 888). The emergence of a complex web of cooperation is explained by the

¹⁵ The comment of Nelson and Winter (1982) on Penrose’s work is singular “Though she was apparently unaware of Coase’s (1937) transaction costs approach to the nature of the firm, her analysis is largely consistent with it. ...and, again.. More recently Williamson in a number of works has woven the transaction costs theme together with other conceptual strands in a series of highly insightful analyses of firm scope, organisational structure, and related policy issues” (p. 36-37).

need to combine closely complementary but dissimilar activities (from R&D to marketing) that in certain circumstances cannot be allocated either straightforwardly to the market (because the existing complementarities with firm assets), or to the firm itself (because it lacks the required capabilities). The focus of Richardson's article is the distribution of economic activities between firms in competitive markets and the ways in which these activities are coordinated through indirect and direct forms of cooperation.

Richardson's contribution of 1972 can be considered the necessary complementary explanation for Coase's motivation of the existence of the firm as a separate agent in the markets.

Firms exist as independent actors from the enlarged mechanism of atomistic exchange in the market because they possess "distinctive" capabilities, which markets, in their pure form, do not have. Capabilities influence the way in which firms choose to coordinate their resources.

Markets lack strategic behaviour and imagination. Firms are guided by strategic behaviour and entrepreneurial imagination (Witt, 1996). During their functioning, firms develop redundant resources: excess managerial and organisational resources are continuously created within firms to be put to new uses. Capabilities are directly related to the technological activity of firms and share a cumulative nature, but they are path-dependent. In other words, firms may be victims of their past history, become inertial, and experience lock-in effects (a successful organisation will tend to conserve its capability even if the context would require some adjustment or replacement, Fransman, 1984). In order to develop their capabilities, firms invest in knowledge and in the development of new technology through R&D and innovation search processing (Cohen and Levinthal, 1990).

In its development, evolutionary economics soon bridged the business literature that during 1970s and 1980s was stimulated to work on firm "competitive strategies" (Porter), on the issue of "intangible assets" and "core competencies" (Prahalad and Hamel, 1990)¹⁶, "dynamic organisational capabilities" (Grant, 1996), and on organisational learning (Argyris and Schön, 1978). Firms as "assemblers of specific competences" base their existence on a chain of articulated knowledge, learning, innovation, and experience (Guilhon, 1992; Azoulay and Weinstein, 2000).

Core competences are the legacy of a firm's own history, they are built through a cumulative process of acquisition of knowledge, knowledge adjustments, new experimentations, trial and errors, knowledge exploration and exploitation (March, 1991). This literature has focused on the reason why some firms are better than others in performing certain tasks, or in some activities. Accordingly, core competences constitute an essential part of the embodied and disembodied tacit knowledge existing in each organisation. Competences are the essential result of a dynamic process of competence-building and competence-destroying. Firm competences can be related to the organisation of technological interdependencies (Foss, 2001).

Using the Schumpeterian competition, they build a competitive advantage through innovation, learning (Nelson, 1992; 1994) and investment in related complementarities (Teece, 1987). But successful firms are those which invest in "strategic resources", not just R&D or new technology, but human capital, know-how, managerial organisation, efficient relations with suppliers and sub-contractors, marketing and post-sale services, etc. (Wernerfelt, 1984; Teece, Pisano, and Shuen, 1997).

Another element, which is at the disposal of firms for accumulating strategic resources (Belussi, 1994), is to increase their internal knowing by developing numerous channels to absorb information (meetings, participation in fairs), codified technical knowledge or know-how (use university R&D, consultants, reverse engineering techniques, strategic alliances with knowledgeable suppliers, etc.).

¹⁶ Core competences allow firms ample access to the market (for instance competences in display systems enable a company to participate in such diverse business as calculators, miniature R.V. sets, monitors for laptop computers, and automotive dashboards, p. 83-84); in addition, competences are difficult to imitate because they show an important tacit dimension.

To conclude, let alone, TC theory appears to be a quite weak analytical device to explain the origin of the firm and the emergence of various organisational models in the market economy without the suitable support of the evolutionary-capability view. Only the latter can in fact offer a realistic explanation of why within markets, “competition and cooperation together ensure that effective use is made of capabilities that are not possessed by any single firm” (Foss and Loasby, 1998, p. 3). And Richardson’s work deserves a special mention. He “by emphasising competition as a process based upon differentiated firms, anticipated many questions credited to modern evolutionary economic theory” (Metcalf, 1994, p. 241).

6. The evolution of firm organisational models

We have now arrived at a crucial point in our discussion. Knowledge and organisational capabilities are the micro-foundations of the emergence of the firm model. But can we find some dominant designs and patterns of evolution that can explain at the same time firm variability and an emergent regularity in firm morphological shapes? Are models of firms a-historical or do they obey an evolutionary destiny of speciation-variation-adaptation and selection-and-retention? How did the different models of firms develop?

Fig. 2 illustrates a pattern of evolution without corroborative evidence, but only as a theoretical scheme. Our reflection utilises two main parameters. On one hand, on the vertical axis, we find the historical expansion of the firm external relations (in TC language, the economic and technological progress is related to a more and more intense use of the external firm governance of the various transactions). Thus, with time, we can hypothesise that firms tend to specialise in their specific assets and to resort more to other agents of their productive filière. On the other hand, on the horizontal axis, we have inserted the growth of knowledge and organisational capabilities: a process, which has sustained the firm’s growth in the past, and, thus, a dimensional expansion of the neoclassical atomistic agent toward an organisation which coordinates tasks and firm’s specific idiosyncratic knowledge. The firm’s model evolution¹⁷ is not the result of gradualism and incremental changes (Eldredge and Gould, 1972), but can be described as speciation events, which occurs through punctuated equilibria (Darwin, 1859). Three genotypes can be indicated in the scheme, which has been discussed extensively by Di Bernardo and Rullani (1990).

1. The first firm model derives from the first industrial revolution and it is the result of the application of the scientific principle to production. The factory system begins. This first phase characterises the emergence of small individual firms, organised on a specific activity/product. The size of the firm coincides with the technical scale economies granted by technical progress. Let us call this era the era of “machinism”.

2. The second passage is characterised by the growth of managerial organisations. It is characterised by the upsurging of the Chandlerian firm. As Chandler observes (1974), until the 1840s nearly all business enterprises in the United States were still small, single unit and single function. They were owned by an individual or by two partners. Very few employed salaried managers, and they rarely hired more than one or two. Such enterprises had no need for an internal complex organisational structure. Beginning in the 1840s, the application of new technologies permitted the beginning of rapid industrialisation. These technologies also required large investments in plants, machinery and other equipment. These new large enterprises appeared first in transportation and in communication, and then in marketing, manufacturing and mining. During the

¹⁷ See also (Nicita and Pagano, 2000).

period 1850-1860s the managers of the new large railroads pioneered the ways of modern big business. They created detailed and complex operating structures by using the line and staff concept (Berle and Means, 1932). With the expansion of Fordism the second genotype of the firm model was already finished. Large firms (Marris, 1969) were guided by the firm specific organisational knowledge (managerial knowledge) and technological knowledge (R&D and the scientific control of labour tasks), which resides in the capabilities of internal coordination, and which resulted in a great concentration of capital and labour under the same roof. On the other hand, in labour intensive, low-tech industries no scale intensive economies were present. In industries such as textiles, leather, lumber, clothing, furniture, and other wood processing, small, single unit enterprises continue to compete successfully with large integrated firms. It must be observed that in some cases firm coordination evolved into the so-called “Marshallian model” of the industrial district (Fig.2). So, coordination with suppliers and subcontractors assumed a marked territorial dimension. In other cases small firms simply co-existed with the presence of large organisations, being complementary to them or simply competitors working on more customised products (Steindl, 1945).

The organisational development of the 1930s brought about another important enrichment of the firm’s model: the multidivisional structure (a spatial net of multi-localised activities), and during the 1960s the conglomerates model (multi product firms). In this second phase firms lose activity towards “the market”, but grew as oligopolies within their markets.

3. The third phase starts during the 1980s, with the network-inducing technologies (ICT), and with the radical crisis of Fordism as a technique of efficient coordination of firm activities within turbulent and flexibility-demanding environments (Belussi, 2000). Large hierarchies, which had worked quite well in the past, in stable environments and stationary technical progress, started to suffer due to even greater internal (organisational and managerial) costs. Moreover, when rapid change was necessary, Fordist firms showed limited learning abilities. Considering the complexity of the technological environment, old Fordist firms lost the exclusive possibility to organise the necessary creation of new knowledge only through internal means (internal R&D laboratory). Because the growth of knowledge has become exponential, knowledge cooperation among firms automatically increased in different forms (R&D cooperative alliances, University-firms relationships, users-producers relationships, etc.) Now firms must systematically learn how to absorb external knowledge (Antonelli, 2000), how to enable knowledge creation and how to become a “learning organisation”.

The third firm genotype sees a breaking of the hierarchy for more flexible, reversible and irreversible forms of nets (Belussi and Arcangeli, 1998). It is important to underline that now the relevant knowledge resides in nets and in firm interactions between public sources and private (specialist) sources of knowledge. Now firms need to maintain their own capabilities, but in order to contrast growing internal costs, the TC solution of “buy instead of make” appears more viable than before (Langlois, Yu, and Robertson, 2002). This solution is offered to the old verticalised oligopolies that broke. And this solution is offered also to new growing network-firms whose organisational model emerges from the bottom (Harrison, 1994), or via the re-aggregated dynamics of clusters (Guerrieri, Iammarino, and Pietrobelli, 2001; Panizza, 2002; Belussi, Gottardi, and Rullani, 2003) of small firms (evolutionary business districts), as sketched in fig.3.

These three models emerge not halfway from a continuum of organisational solutions ranging from the market to the hierarchy. These genotypes are punctuated equilibria (new speciation): on one hand, the fruit of the evolution of technology (mass production) and of organisational management, and on the other hand, a relentless evolution of external firms links and cooperation driven by the enlargement of division of labour in the markets, and by a growth of inter-firm relations.

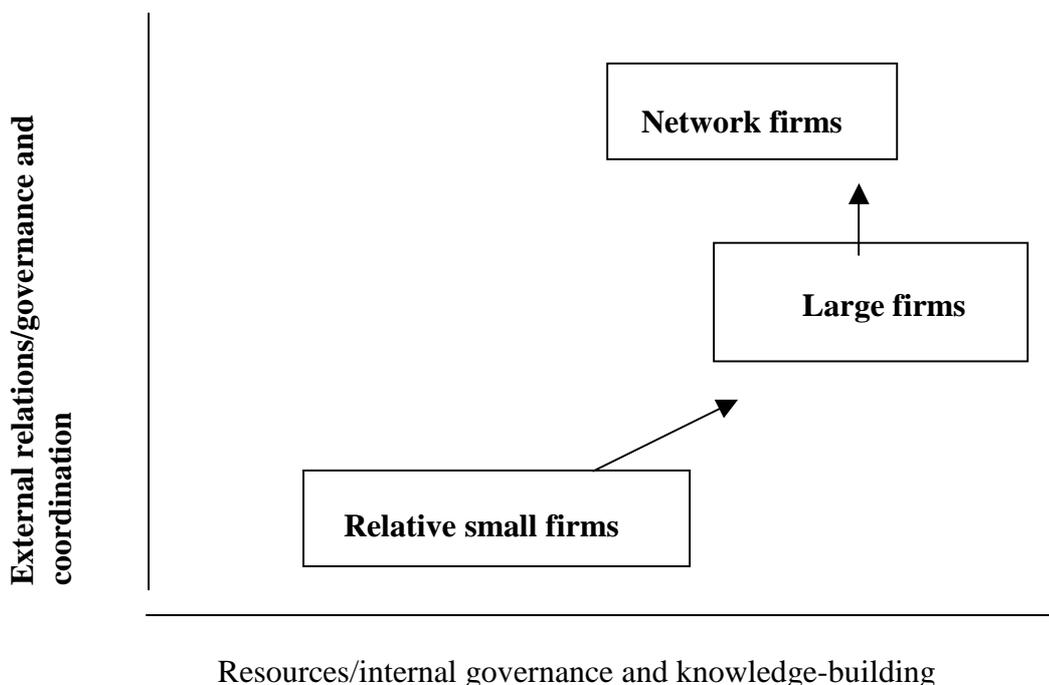
In this epochal scenario the evolution of the mode of coordination does not appear linear.

At the beginning, a decentralised mode of coordination dominated.

Subsequently, the organisational power of managerial capitalism pushed toward the domination of a centralised model. In this phase transaction costs seemed not so relevant in determining the average size of firms because large firms enjoyed scale and scope economies, managerial rents and increasing returns.

The third passage favours the emergence of networking: an intermediate “model” of contemporary decentralisation and centralisation (Castells, 2000), depending on the networking of activities in more (or less stable) productive nets, which through an extended connection can capture and internalise “network externalities” and benefit from spillovers, exchanging and replicating knowledge, languages, code-boxes, identities, trusts, reciprocity, and cooperation. In contemporary capitalism, markets and hierarchies are both being transformed. The search for speed of adjustment, variety, flexibility and innovation has forced firms to decompose themselves into quasi-autonomous units of “system goals” capable of taking actions in the face of local circumstances. While we now see markets full of “cooperative nets”, hierarchies introduce artificial markets inside themselves, through the constitution of internal competitive nets (profit centres). In the contemporary evolution of capitalism there is the double form of vertical and horizontal nets, like a) giant global firms, and b) non-centred nets, the two emerging dominant solutions. A new characteristic of the modern phase is the development in many sectors of contingent “organisations” (project firms which diffuse marketing, design, advertising, and media activities¹⁸) and virtual “communities”. It is the consequence of the application of TC motivation to many services activities that liberate “self-employment” and give rise to knowledge-intensive creative jobs (Petit, 2003).

But why in the open communication economy do hierarchies not dissolve? If hierarchies have limited learning abilities, markets have limited capacities to process information, to retain knowledge and to govern resources, and to “imagine” innovative solutions of knowledge coordination. Markets transfer signals and incentives, but entrepreneurs activate the market process of searching, discovering and developing their own function of strategy setting, managing and controlling (Fama and Jensen, 1983).



¹⁸ See Bathelt and Boggs (2001), Gann and Salter, (2000); and Asheim (2003).

Fig. 2 A path dependent history-friendly model on the evolutions of firms organisational models

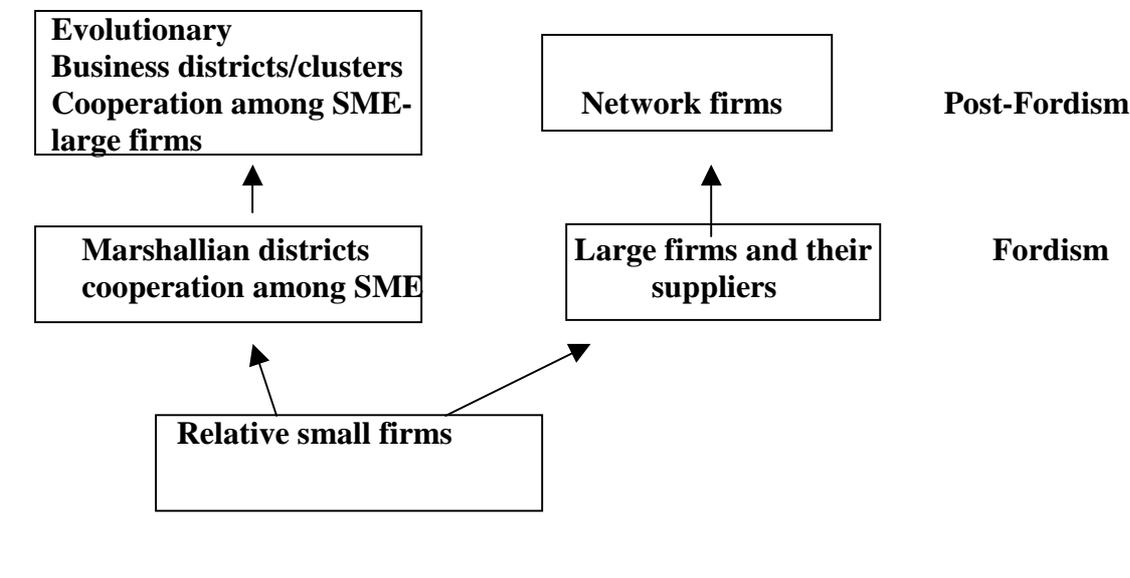


Fig. 2 Evolving models of firm cooperation

7. Conclusions

In this article we have discussed the most significant elements of the evolutionary-capability view of the firm, trying to provide an answer on the reasons why firms exist as separate entities from the market, and why they differ in their structure from a pre-supposed “optimality” in their internal resource coordination. Despite the focus of TC literature on “contracts” and individual transactions, the notion of the firm appears to have remained remarkably resilient.

We have criticised the simple market-hierarchy dichotomy (Grandori, 1999), which stems from the TC approach, arguing that Coase’s reflection on the “use of the market” can help us to explain the firm’s boundaries, but not the nature of the firm, which resides in its irreplaceable function of knowledge coordination and development of productive and organisational capabilities.

In the discussion over the emergence of different firm organisational models, the use of the historical-evolutionary approach has appeared appropriate to us. We have described the emergence of three firm genotypes (the small firm resulting from the first industrial revolution, the Chandlerian model, and the network) as a process of selection of the more appropriate model to the current existing conditions of knowledge coordination, acquisition and development, and learning. This has implied a passage from the dominant “small firms” world of the nineteenth and twentieth century, to the large corporation world of the twenty-first, and, then, from the large corporation to the contemporary net-economy, where do coexist global multinational, centred network firms (subcontractors and suppliers built around a unique large final firm), international sub-contracting supply chains and evolutionary models of localised clusters and post-neo Marshallian districts,

where nets of nets (re-verticalised and hierarchical nets, open nets, institutional nets, community nets, Cohendet and Llerena, 1992) operate in a co-localised environment open to global linkages.

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