



Laboratory of Economics and Management
Sant'Anna School of Advanced Studies

Via Carducci, 40 - I-56127 PISA (Italy)

Tel. +39-050-883-341 Fax +39-050-883-344

Email: lem@sssup.it Web Page: <http://lem.sssup.it>

LEM

Working Paper Series

**On the tangled discourse between
transaction costs economics and
competence-based views of the firms:
Some comments**

Giovanni Dosi^{*}

Luigi Marengo[†]

^{*} *St. Anna School of Advanced Studies, Pisa, Italy*

[†] *University of Trento, Trento, Italy*

1999/08

August 1999

On the tangled discourse between transaction costs economics and competence-based views of the firm: Some comments.

Giovanni DOSI^a and Luigi MARENGO^b

a. St. Anna School of Advanced Studies, Pisa, Italy

b. Dept. of Economics, University of Trento, Trento, Italy

The views presented here have greatly benefited from discussions with the participants at the DRUID Summer 1998 Conference "Competencies, Governance and Entrepreneurship", Bornholm, Denmark, June 1998 and in particular with Nicolai Foss, Oliver Williamson and Sidney Winter. Support to the research by the European Union (TSER, DG XII, projects Dynacom and Essy) is gratefully acknowledged.

1. Introduction

The insightful and thorough (albeit, in our view, somehow "imperialist") comparative discussion by Oliver Williamson of the governance and competence views of economic organisations (Williamson, 1999a) as well as the daring "counter-reformation manifesto" by Foss and Foss, trying to re-interpret most views on organisation in terms of property rights (Foss and Foss, 1999) provide a unique opportunity for an overall assessment of similarities, convergence, controversies and unexplored issues in one of the most lively fields of current socio-economic theory. It is in this spirit that we contribute the rather sketchy remarks that follow: we begin by briefly recalling some basic elements of the competence perspective (CP henceforth), as we see it (section 2). Next, we offer a quick comparison with equally basic tenets of the "orthodox" view - which for brevity we equate to the "orthodox" agency theory (OA henceforth) - and the transaction costs economics

(TCE henceforth) (section 3). Finally, in section 4 we try to mimic some of the "moves" suggested by Williamson, stressing possible convergence but also potential controversy between TCE and CP.

2. The competence view of organisations: a telegraphic overview

Given the growing number of detailed and rich accounts of CP and germane views¹ – such as "resource-based" theories – of organisations, we can afford to be particularly brief and refer the reader to the other works for details (e.g. Dosi, Nelson and Winter, 1999, Dosi and Marengo, 1994, Kogut and Zander, 1992 and 1996, Nelson and Winter, 1982, Nelson, 1991, Marengo *et al.*, 1999, Teece, Pisano and Schuen, 1994, Teece *et al.*, 1994, Madhok, 1996, Conner and Prahalad, 1996, Leonard-Barton, 1995, Winter, 1988).

The phenomena the theory addresses include first of all heterogeneity among firms and the sources of persistent competitive advantage. For this primary purpose, it elaborates a theory of the nature of the firm whose perspective departs quite significantly from the Coasian one. First of all, firms are not seen exclusively as *loci* of coordination, but also and more importantly as loci of creation, implementation, storage and diffusion of productive knowledge (cf. Winter, 1982). Second, an relatedly, the very existence of firms is not considered in terms of a departure from the original state of nature in which coordination is carried out entirely by competitive markets, but in terms of their being the primary *loci* of the process of division of labour, i.e. of the creation of those separable units which competitive markets might (or might not) coordinate efficiently. Equivalence between markets and organisations might well hold (lacking transaction and bureaucratic costs) for a given state of division of knowledge and labour, but it does not hold if the latter are themselves dependent upon the organisational structure (more on this "anti-Coasian" perspective in Marengo, 1999 and Marengo *et al.*, 1999).

In addition to this inquiry in the sources and consequences of heterogeneity, CP attempts to interpret both the vertical and horizontal boundaries of the firm (cf. Teece *et al.*, 1994); it investigates the properties of different forms of internal organisation; it tries to establish the sources of differential performance among firms; it analyses the processes by which particular organisations became what they are (i.e. the underlying evolutionary processes).

¹ We consider the resource based perspective as a theory of the firm which is largely germane to CP, though it presents some important differences. In particular, it is very much an equilibrium theory rather than a disequilibrium one, and it is centred on the issue of having control of an asset rather than having the knowledge of how to make use of it.

As a first approximation, and notwithstanding the limitations discussed in Coriat and Dosi (1998), it tries to accomplish the above tasks by focussing on organisations as repositories of problem-solving knowledge and by studying some salient properties of knowledge accumulation and the ways the latter co-evolve with organisational structures and practices (including, of course, routines but also managerial heuristics and strategies).

Organisational specificities and persistently different revealed performances, are interpreted also on the grounds of path-dependence in knowledge accumulation and inertial persistence of organisational traits. Bounded rationality, in its broadest meaning, is the norm. Its general sources include the "complexity" and procedural uncertainty associated with problem-solving procedures (cf. Dosi and Egidi, 1991, Marengo *et al.*, 1999) and the intrinsic "opaqueness" of the relationship between actions and environmental feed-backs, so that it is seldom obvious, even ex-post, to state how well one did and why (cf. March, 1994).

The analysis is, or ought to be, undertaken both in terms of comparative properties of different organisational forms (a methodology deeply shared with TCE) and modal learning processes, properly accounting for initial conditions and for their embeddedness into broader institutional set-ups, such as those governing the markets for labour, finance and products).

All this just to telegraphically recall some basic features of CP. In the next section we sketch some of its relations with the other major perspectives on the political economy of organisations.

3. Knowledge, incentives and organisational forms: theoretical similarities and divides

Before entering at greater detail any comparison between TCE and CP, let us start with a more "bird-eyes" comparative assessment concerning also the orthodox view of agency (OA), where by the latter we mean the whole class of interpretations grounded on equilibrium contracting with fully rational far-sighted agents under asymmetric/incomplete information (this is also not far from the archetype Foss and Foss have in mind when describing what they call "organisational economics").

In table 1 we highlight some major distinguishing features.

*****INSERT TABLE 1 ABOUT HERE*****

In order to emphasise the differences, consider first a major divide concerning the primary dimensions of analysis, which in the case of both OA and TCE regard essentially incentive governance, while CP focuses on the problem-solving dimensions of organisations. In a nutshell,

CP's "primitive story", which finds ancestors in the work of Herbert Simon as well as multiple streams of organisation theory, carries a good deal of "cognitive" emphasis, while it tends to censor (as a first approximation, which is ripe time to overcome!) all governance issues which arise from potentially conflicting interests, opportunism, etc.. Williamson (1999a and 1999b) is certainly right in reminding us that, taken at face-value, that primitive story implies a utopian view of actors as benevolent cooperators. On the other hand, the same epistemological status can be also attributed to the primitive story which is implied by both OA and TCE, whereby one censors the fact that organisations essentially carry complicated procedures to do complicated things such as producing airplanes, shoes, transportation services for people and goods, etc. and that they do it more or less well for reasons which are partly independent from sheer incentive alignment issues. Thus, in the OA and TCE "utopia", the implicit *ceteris paribus* assumption is that organisations naturally possess, in its "optimal" form, the knowledge required to carry out such complex tasks and, moreover, that this optimal knowledge in itself is independent from the actual organisational structure. The members of the "utopian" organisation depicted by OA and TCE are not actually engaged in acquiring and implementing the knowledge necessary to do the complex things actual organisations do, but are only engaged in playing among themselves devious games of cheating, hiding, double crossing, etc.

Needless to say, the crucial issue beyond the caricature is what kind of empirically robust propositions each view is able to generate. In this respect, Foss and Foss advance the proposition that many of the propositions which have been said on organisations can be accounted for within the OA framework, and in particular and even more strongly, by that particular subset of OA which is the property rights framework². We would like to forcefully disagree. If anything, one of the basic tenets of CP is that the whole domain of accumulation and social distribution of knowledge cannot be reduced to a sheer matter of either incentives or property rights allocation. Witness on that, the ample literature on the economics of innovation and organisational learning (cf., among the others, Freeman, 1982, Dosi, 1988, Pavitt, 1999, Dosi, Nelson and Winter, 1999) trying to establish a few "stylised facts" on the patterns of learning at the level of firms, industries and countries, which may be hardly interpreted as equilibrium responses to property rights distributions. This general proposition can however undergo empirical refutation: in that case the challenge would be for the proponents of OA to derive non-trivial propositions on inter-firm, intersectoral and international differences in technological and organisational innovation from their own "primitive

² Foss and Foss (1999) focuses on the theory of property rights rather than agency models. However we believe that, at least for what is relevant for the present discussion, property rights and agency theories are basically equivalent, at least in the case of complete markets and in the absence of slavery.

story" and its refinements. This is of course different from exercises of *ex-post* rationalisation which Foss and Foss seem at times inclined to do in their "counter-reformist" urge to bring everything back into the old church. But imagine somebody asked why Manchester United won 1998-99 European Champions' League, which is indeed quite the same as asking why Intel is the world leader in microprocessors or Toyota swiftly responds to demand changes. CP analysts would build their answer on both the individual skills of Manchester United players and, even more important, on how such skills blend and complement each-other in the team, giving rise to collective routines, tactics, automatisms, plus the "strategic" skills of the team's coach; finally they would acknowledge the important role of chance and random events (and chance certainly had a major role in many United's winning matches). Conversely, OA analysts would give an answer which should sound more or less like: "Manchester United won because they made the optimal use of the property rights on the services provided by the legs (and heads) of their players...."

In fact, OA investigations entail a very important research endeavour, aimed – as we see it – at exploring possible robust features for a wide class of notional, incentive-compatible, organisational designs, derivable from a very parsimonious (and admittedly unrealistic) set of assumptions. This is at least the way we interpret e.g. Laffont and Tirole (1993) and a few other works of this *genre*. It would be unfair to the most sophisticated contributors to that approach to make "imperialist" empirical claims, which actually they never – perhaps with some exceptions – make.

Indeed, it does not do justice to TCE to group it within the catch-all OA camp. In fact TCE does share with OA roughly the same theoretical primitives (see above) and also an inclination to put a weight on the explanatory properties of equilibria which CP practitioners usually consider unwarrantedly excessive. However, if there is some truth in the checklist of table 1, the points of departure are at least equally important. Let just stress two of them.

First, the bounded rationality perspective on microfoundations is indeed a major distinguishing feature (and a major point of overlapping with CP). It is not a matter of religious commitment but one of looking for behavioural assumptions which are in some way disciplined by empirical and especially psychological evidence: in fact how much rationality agents should be attributed is largely a pragmatic matter, depending on the context one is meant to describe, the complexity of the problems they face, etc.. Rather, bounded rationality might admittedly loosen the discipline – roughly speaking – on the "lower bound" of what agents may do and achieve (so that it may allow highly suboptimal outcomes as empirically feasible or even likely) but it also strongly disciplines the "upper bound" on what one theorises as empirically plausible (so that e.g. one cuts out as figments of the imagination all collective outcomes which depend on agents working out transversality conditions, solving Bellman equations, etc.).

Second, in the way we read Williamson's main contribution to TCE, organisations are institutional entities with a "syndrome of attributes" neatly different from sheer bundles of contracts. This is another major distinguishing feature between TCE and OA. It is true that TCE has not done much so far to open up the organisational black-box, but it does hint at an intra-organisational *modus operandi* displaying behavioural patterns akin those identified by sociology and organisation theories – at least in so far as they entail abandoning sophisticated calculations and general intra-hierarchical "acts of forbearance". The opposite interpretation is that in fact TCE organisations may be fully interpreted as bundles of incomplete contracts. The degrees to which Williamson sees e.g. Grossman and Hart (1986) or the relevant parts of Hart (1995) as genuine "reduced forms" of his own theory of organisation is only up to him to say (for an insightful assessment of achievements and limitations of a reduction of TCE to an OA game-theoretic framework, cf. Kreps (1996)). However, the much broader issues here are a) whether organisations are behavioural entities to be studied in their own right, well beyond the possible contractual acts making their constitution; and b) whether all that makes a difference for both theory and empirical predictions. Clearly, CP gives a clear-cut affirmative answer to both questions. In a sense, CP takes for granted a massive "ontological" incompleteness of most contracts one empirically encounters, and it studies the arrangements by which different organisational archetypes master coordination of boundedly rational learning agents. This route is admittedly hard to explore and requires a lot of humble attention to empirical – sociological, organisational and cognitive – details. In the best scenario, it is also likely to nurture novel syntheses between TCE and CP. Conversely, the "incomplete contract reduction" promises quicker formal rewards: incompleteness happens to be more respectable than bounded rationality and leaves even greater degrees of freedom to the imaginative modeller.

Finally, we would like to point to some *caveats* for TCE. First, we believe that a foundation of organisation theory on equilibrium incomplete contracting requires either escalating demands on agents' rationality and/or on the optimality properties of market selection mechanisms. As to the former, there is a growing literature which is trying to extend the standard model of rationality and decision making not in the direction of more empirically grounded behavioural foundations, but in the opposite one of more and more demanding assumptions on rationality in order to embody in the model some treatment of unforeseen contingencies (a good case to the point is Maskin and Tirole (1999) and Tirole (1999) where incompleteness and transaction costs themselves become irrelevant if "only" agents have unbiased priors on their future payoffs and correctly perform dynamic programming; see also Dekel *et al.* (1998) for a survey of recent research on models of unforeseen contingencies). As to the latter, TCE has not yet developed enough in-depth investigation on how

efficient governance structures can emerge spontaneously. The topic is a problematic one, and the "optimistic" views explicitly or, more often, only implicitly embraced by many pieces of TCE research seem somehow unwarranted. At least two problems arise in this respect: a) one is dealing here with a problem of selection of selection mechanisms (governance structure are in fact selection mechanisms themselves), that is a problem whose implications are largely ignored and where one should very likely observe multiple equilibria and path-dependence; b) governance structures are "complex" entities made of many interdependent elements, and we know now that when the units of selection present this kind of properties, selective forces tend to lose their power to drive a population to optimality (cf. Levinthal (1997), Marengo (1999)).

Finally, we also see a danger for some TCE research to lose its predictive power in a sort of ever expanding Kamasutra of "yet another incomplete contracting position" (a bit alike what happened with empirically undisciplined applications of OA to organizational research or of game theory to Industrial Organisation).

4. Competence-based views: mimicking some TCE "moves"

One of the precious contributions of Williamson (1999a) is to offer a sequence of "theoretical moves" which may structure the comparison between TCE and CP. Let us follow some of them.

Human actors

As already mentioned, TCE and CP share a good deal of the emphasis on some form of bounded rationality. There are however at least two important differences worth mentioning.

First, bounded rationality in TCE has been taken so far to mean bounds on the strategic sophistication by which agents may behave opportunistically and by which they can anticipate other agents' opportunistic behaviour. Conversely, in CP that has largely stood for individual and, especially, collective bounds to problem-solving competencies. This difference might be a fruitful source of complementarity in so far as it pushes CP to take fully in hand the incentive/conflict governance dimension (cf. Coriat and Dosi, 1998) and TCE to account for the knowledge dimension of organisations. Incidentally, note that Williamson (1999b) begins to offer a taxonomy of organisational arrangements based on combinations of different means and variances in cognitive abilities and conditions of opportunism. This is indeed a welcome move, but possibly not enough yet to meet the requirements of CP which sees competence also as a collective property of organisational procedures, irreducible to intrinsic individual skills.

Second, TCE emphasises bounded rationality with foresightedness, while CP – Williamson stresses – is much more inclined to see its myopic aspects. Again, how myopic or foresighted agents are supposed to be is a question which should be settled essentially on empirical grounds. The only case CP would normally find hard to accept is "bounded rationality cum rational expectations" – as much an oxymoron – with forward looking agents who know the damaging effects of their pursuit of "self-interest with guile" and thus design institutions which purposefully exploit at best bounded rationality in order to tie their own hands (a sort of institutional Ulysses expecting the sirens to come out of his own soul...).

Unit(s) of analysis

As well known, transactions, with their characteristics, are the basic unit of analysis of TCE; for CP, we suggest, the basic units of analysis are the elementary (physical or "cognitive") problem-solving procedures. However, for many purposes CP analyses take a coarser grain resolution and study the properties of collections of elementary procedures (e.g. organisational routines).

Since the unit of analysis issue is clearly fundamental in assessing differences and possible complementarities between the two approaches, we shall discuss it at greater length in the sequel.

On transacting vs. problem-solving procedures.

TCE "primitive story" deals with the efficiency of different governance structures in managing transactions across given technologically separable interfaces: technology and the division of labour, i.e. the solution to the productive problem at hand, are taken as already in place in their optimal form. Behind this story one can find an implicit assumption that organisations merely perform coordination tasks and that what is being coordinated (i.e. the pieces of "productive knowledge", cf. Winter, 1982) is independent from the organisational arrangement itself.

CP approaches tend to emphasise the opposite view that organisations are first of all responsible for designing and putting to work solutions to productive problems and that specific organisational arrangements are essential parts of such a design process, actually determining which solutions can be generated and tested (more on this in Marengo *et al.*, 1999).

Trade-offs, balances and co-evolution between transaction-coordinating and problem-solving organisational procedures and arrangements are probably the most promising and yet almost entirely unexplored research area where TCE and CP can meet. Multiple "organisational equilibria" and path-dependence are likely to weaken the explicative power of the principle of transaction costs minimisation: one could in fact imagine a multiplicity of organisational solutions with similar overall efficiency but very different arrangements for coordination and problem solving, ranging

from organisational arrangements with very effective problem-solving procedures but possibly high transaction costs to the opposite case of low transaction costs with low problem-solving efficiency (from which another source of heterogeneity among organisations).

On the nature of the firm

On this issue, CP basically subscribes the description offered by Williamson (1999a) but it adds to that the organisational attributes associated with the intra-organisational distribution of a) information (roughly speaking who talks to whom about what...); b) authority (as such not a theoretical specificity of CP, but a domain where our interpretation of CP is well in tune with more sociological theories of organisation); c) problem-solving tasks (cf. Dosi and Marengo, 1994, Coriat and Dosi, 1998).

Refutable interpretative implications

We have already mentioned the main interpretative purposes of CP in terms of the nature and internal characteristics of organisations, their horizontal/vertical boundaries, their comparative performances and their origins. As such, they largely overlap with TCE's research program, although the lines of explanation and also the predictions are likely to be partly different. The operationalisation of CP is admittedly at an earlier stage than TCE, but one ideal line of investigation runs as follows:

1. identify the salient characteristics of particular problem-solving activities (i.e. of particular "technological paradigms" in the terminology of Dosi, 1982);
2. derive the organisational implications of the above (admittedly not an easy task, but an achievable one, on the grounds of what we increasingly know from both the economics of innovation and micro-organisational studies);
3. check the empirical robustness of the predictions;
4. test, both cross-sectionally and longitudinally, whether specific organisational forms – conditional on specific "learning regimes" – sustain differential corporate performances.

Another more qualitative but equally important line of investigation uses the theory, so to speak, "heuristically", as a diagnostic guide (e.g. where do the distinguishing competencies of a given firm reside? How do they map into underlying differences in organisational routines *vis-à-vis* other firms? Etc.)

Of course, empirical observations of organisational forms and performances are likely to be influenced by both transaction cost- and competence-related factors. However, the observational non-equivalence of the two "pure" theories is likely to derive precisely from what we could call the

learning ineffectiveness of complete incentive alignment vs. the incomplete incentive alignment of pure problem-solving. Let us elaborate on the idea. The advantage of having a theory – CP – which "pushes the fiction of zero-opportunism to completion" (Conner and Prahalad, 1996) and another one – TCE – "exploring the fiction of homogeneous problem-solving abilities across organisations" might give precious clues on how empirical organisations trade off problem solving exploration vs. economising governance and how that affects corporate performance (for an interesting, albeit preliminary, investigation of CP vs. TCE factors in technology acquisition cf. Delmas, 1999). The evidence so far is too weak to disentangle first vs. second order effects, e.g. whether one should call upon TCE for generic make-or-buy decisions and CP for the particular, as Williamson (1999a) suggests, or the other way round. In any case it is a fundamental question in its own right, whose answer is likely to depend also on specific technologies, stages of the industry life cycles and country-specific institutions.

From individual organisations to competitive advantages

Note that CP allows also an easy link between the theory of organisation and a (testable) theory of competitive performance, in so far as it predicts persistent heterogeneity in problem-solving competencies (also due to path-dependent idiosyncratic learning). Conversely, the more TCE relies on equilibrium and optimality considerations in order to account for particular organisational forms, the less it can interpret the observed empirical variance in corporate performance (which does indeed occur also across firms mastering rather similar transactions). TCE would in fact predict (through "economizing" and "remediableness" arguments) that in equilibrium all transactions of a given class (that is transactions across similar technological interfaces and characterised by similar degrees of asset specificity, frequency and uncertainty) should be subject to the same governance structure and have the same efficiency properties.

Processes vs. outcomes

One of the problems with a full operationalisation of CP – as Williamson rightly points out – stems from the fact that it is to a good extent a theory of organisational processes, in both senses that it has the ambition of becoming a theory of organisational learning and also in the more humble sense that even incumbent competencies are largely revealed through their exercise (this applies to individuals who might not know how good they are in doing something except by doing it and even more so it applies to organisations). However, in our view, the qualitative understanding – and eventually also the formalisation – of the processes of organisational exploration, learning, adaptation is one of the central challenges of organisation theory. It is also what makes the crucial

link between exercises in a comparative statics mode and the dynamics of organisational innovation (or, for that matter, the appreciation of the determinants of organisational inertia). Leaving aside the general difficulty of the task, dynamics could and ought to assume a more central position into TCE analyses, in the sense that: a) considerations of dynamic adaptability ought to enter the comparative assessment of different organisational forms (as advocated by Langlois, 1992), and also that b) it does not appear at all inconsistent with TCE to assume some competitive dynamics selecting over different organisational arrangements. These are indeed areas where a dialogue between TCE and CP (especially in its more "evolutionary" forms) theories could be more fruitful. But, especially with regards to the issue of evolutionary dynamics, this is where we do not find in current research much response. On the contrary, Williamson (1999b) seem to suggest a purely purposeful equilibrium design of organisational arrangements, further strengthened by a stand against path-dependence on the grounds of a "remediableness" argument. The bottom lines of the latter are that feasible (observed) organisations must not be compared with unfeasible (ideal) ones – a very sound point indeed – and that the observed ones are the "best" of the feasible ones because all achievable cost-minimising opportunities are always exploited – a much more dubious and problematic assumption, carrying TCE unnecessarily near the Panglossian territory where one always lives in the best of possible worlds.

5. Some conclusions on research opportunities

Given what we have argued in these brief notes, our conclusions are bound to be very similar to Williamson's ones: TCE and CP are at the same time rival and complementary. Explorations of both the ways they could fit into a more comprehensive theory of organisation and their observational non-equivalence are only at the beginning. In the process, some (moderate) imperialistic drives are perfectly understandable. So, while Williamson seems to suggest CP refinements over the basic TCE framework, our inclination is to suggest the full development of a "second generation" CP theories accounting for the co-evolution of problem-solving and governance functions in organisational arrangements, hardening and operationalising the conjectures sketched in Coriat and Dosi (1998). In any case, a civilised, empirically attentive and theoretically sophisticated dialogue is beginning to emerge.

References

- Chandler A.D., P. Hagstrom and O. Solvell (eds.) (1998) , *The Dynamic Firm. The role of technology, strategy, organization and regions*, Oxford, Oxford University Press
- Conner K.R. and C.K. Prahalad (1996), A resource-based theory of the firm: Knowledge vs. opportunism, *Organization Science*, vol. 7, pp. 477-501.
- Coriat, B. and G. Dosi (1998), Learning how to govern and learning how to solve problems, in Chandler *et al.* (1998).
- Dekel, E., B.L. Lipman and A. Rustichini (1998), Recent developments in modeling unforeseen contingencies, *European Economic Review*, vol. 42, pp. 523-542.
- Delmas, M.A. (1999), Exposing strategic assets to create new competencies: The case of technological acquisitions in the waste management industry in Europe and in the United States, *Industrial and Corporate Change*, forthcoming.
- Dosi, G. (1982), Technological Paradigms and Technological Trajectories, *Research Policy*, vol. 2, pp. 147-62.
- Dosi, G. (1988), Sources, Procedures and Microeconomic Effects of Innovation, *Journal of Economic Literature*, vol. 26, pp. 1120-71.
- Dosi, G. and M. Egidi (1991), Substantive and Procedural Uncertainty. An Exploration of Economic Behaviours in Complex and Changing Environments, *Journal of Evolutionary Economics*, vol. 1, pp. 145-68.
- Dosi G. and L. Marengo (1994), "Toward a Theory of Organizational Competencies", in R.W. England (ed.), *Evolutionary Concepts in Contemporary Economics*, Ann Arbor, Michigan University Press, pp. 157-78.
- Dosi G., R. Nelson and S.G. Winter (1999) (eds.), *The Nature and Dynamics of Organizational Capabilities*, Oxford, Oxford University Press.
- Foss, K. and N. Foss (1999), The knowledge-based approach and organisational economics: How much do they really differ? And how does it matter?, this volume.
- Freeman, C. (1982), *The Economics of Industrial Innovation*, 2nd edition, London, Frances Pinter.
- Grossman, S. and D. Hart (1986), The costs and benefits of ownership: A theory of lateral and vertical integration, *Journal of Political Economy*, vol. 94, pp. 691-719.
- Hart, D. (1995), *Firms, Contracts and Financial Structure*, Oxford, Oxford University Press.
- Kogut, B. and U. Zander (1992), Knowledge of the firm, combinative capabilities and the replication of technology, *Organization Science*, vol. 3, pp. 383-97.
- Kogut, B. and U. Zander (1996), What do firms do? Coordination, identity and learning, *Organization Science*, vol. 7, pp. 502-17.
- Kreps, D.M. (1996), Markets and hierarchies and (mathematical) economic theory, *Industrial and Corporate Change*, vol. 5, pp. 561-96.
- Laffont, J.J. and J. Tirole (1993), *A Theory of Incentives in Procurement and Regulation*, Cambridge MA, MIT Press.
- Langlois, R.N. (1992), Transaction-cost economics in real time, *Industrial and Corporate Change*, vol. 1, pp. 99-127.
- Leonard-Barton, D. (1995), *Wellsprings of Knowledge: Building and sustaining the sources of innovation*, Boston, Harvard Business Scholl Press.
- Levinthal, D. (1997), Adaptation on rugged landscapes, *Management Science*, vol. 43, pp. 934-50.
- Madhok, A. (1996), The organization of economic activity: Transaction costs, firm capabilities and the nature of governance, *Organization Science*, vol. 7, pp. 577-90.
- March, J.G. (1994), *A Primer on Decision Making. How decisions happen*, New York, Free Press.
- March, J.G. and H.A. Simon (1993), *Organisations*, New York, Wiley, 2nd ed..
- Marengo, L. (1999), *Decentralisation and market mechanisms in collective problem-solving*, mimeo.

- Marengo, L., G. Dosi, P. Legrenzi and C. Pasquali (1999), *The Structure of Problem-Solving Knowledge and the Structure of Organisations*, mimeo.
- Maskin, E. and J. Tirole (1999), Unforeseen contingencies and incomplete contracts, *Review of Economic Studies*, vol. 66, pp. 83-114.
- Nelson, R.R. (1991), How do firms differ, and how does it matter?, *Strategic Management Journal*, vol. 12, pp. 61-74.
- Nelson R.R. and S.G. Winter (1982), *An Evolutionary Theory of Economic Change*, Cambridge MA, Harvard University Press.
- Pavitt, K. (1999), *Technology, Management and Systems of Innovation*, Cheltenham, Edward Elgar.
- Simon, H.A. (1991), Organizations and markets, *Journal of Economic Perspectives*, vol. 5, pp. 25-44.
- Teece, D.J., G. Pisano and A. Shuen (1994), *Dynamic Capabilities and Strategic Management*, CCC Working Paper #94-9, Berkeley, University of California.
- Teece D.J., R. Rumelt, G. Dosi, and S.G. Winter (1994) : Understanding Corporate Coherence: Theory and Evidence, *Journal of Economic Behavior and Organization*, vol. 23, pp. 1-30.
- Tirole, J (1999), Incomplete contracts: Where do we stand?, *Econometrica*, vol. 67, pp. 741-781.
- Williamson, O. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications*, New York, Free Press.
- Williamson, O. (1985), *The Economic Institutions of Capitalism*, New York, Free Press.
- Williamson, O.E. (1999a), Strategy research: Governance and competence perspectives, this volume.
- Williamson, O.E. (1999b), *Human Actors and Economic Organization*, Berkeley, University of California, mimeo.
- Winter, S.G. (1982), An Essay on the Theory of Production, in H. Hymans (ed.), *Economics and the World around It*, Ann Arbor, University of Michigan Press, pp. 55-93.
- Winter, S.G. (1988), On Coase, competence and the corporation, *Journal of Law, Economics and Organization*, vol. 4, pp. 181-197.

Table 1. Orthodox agency, transactions costs economics and competence perspectives: a comparative appraisal.

Dimensions of analysis and theoretical building blocks:	Orthodox Agency	Transaction Costs Economics	Competence (and Evolutionary) Perspectives
1. Problem-solving/ cognition/knowledge	No	Not so far (but see Williamson, 1999a and 1999b)	Yes (central dimension of analysis)
2. Incentive governance	Yes (central dimension of analysis) via equilibrium contracting	Yes, possibly via organisations as substitutes for equilibrium contracting	Not so far (but see Coriat and Dosi, 1998)
3. Behavioural microfoundations	Perfect, farsighted rationality	Bounded rationality with farsightedness	Bounded rationality (usually with 'myopic' attributes)
4. Organisational behaviours	Strategic (in the game-theoretic sense)	Cost-economising	Driven by routines, heuristics, etc.
5. Learning	No	Not so far	Yes (central dimension of analysis)
6. Unit(s) of analysis	- strategies - allocation of information - allocation of property rights	Transactions	- elementary 'bits' of knowledge - routines and other elementary behavioural traits
7. Non-economic dimensions of organisations	Not as original dimensions	No	Power, trust, identity-building, etc.