Elements for a knowledge-based theory of the firm:
towards a dual theory of the firm

Patrick Llerena
BETA, University of Strasbourg

DIMETIC  April 12th, 2010
Introduction

- Need for an analytical complement to the theory of the firm in order to integrate knowledge base of the firm and its dynamics

- An evolutionary theory of the firm is certainly one of the possible candidates but needs to be (at least partially) reconsidered (or completed)


Structure of the presentation:

- the historical debate: Smith and Babbage
- the implication for an knowledge based approach to the firm: the dual governance structure of firm
- the role of ‘entrepreneurs’ as viewed by Knight, Schumpeter, Winter and Loasby
- the role of entrepreneur re-considered: the « knowledge-based entrepreneur »
The historical ‘debate’

- **Adam Smith**: The division of labour leads to division of knowledge. The development of skills is more a consequence than a cause of the division of labour, in particular through learning by doing mechanisms. The division of labour entails a process of learning by doing, that contributes to increase skills and expertise and thus to enhance the accumulation of specialized knowledge. (affiliated authors: Loasby (1998), Egidi/Ricottlili (1997), Brown/Duguid (1998), Pavitt (1998)…)

- **Charles Babbage**: The division of knowledge drives the division of labour.
  “the division of labour must itself be founded on the division of skills”. (Marshall 1961, 265 quoted in Hodgson 1993, 412).
  (affiliated authors: Rosenberg (1982), Brusoni,Prencipe,Pavitt (2001), Pavitt (2002), Raffaelli (2003)…)
The Smithean view

- Progressive specialisation of work induces progressive specialised knowledge through learning by doing

- Conditions:
  - Pre-existing division of labor, to be coordinated, to produce given (or even changing) artefacts

- Consequences:
  - Functional division of labor within the firm (Chandler)
  - Routines are then the ‘memory‘ of organisations, truces to handle divergence of interests and conflicts…
  - Focus is on the ‘activities’ and their coordinations…
The implications of the hypothesis « the division of labour precedes the division of knowledge » on the theory of the firm

- *Transactions* will drive *competences* and define the *boundaries* of the firm.

- The explanation of networking, partnering, alliances, acquisitions, of a given firm will mostly rely on strategical considerations related to the processing of information, to the level of transaction costs...

- It supports the existence and the need of a ‘manager’ in the firm (a ‘principal’).
Why relevant for the evolutionary perspectives…

**Nelson stresses (1994):**

"A firm can be understood in terms of hierarchy of practised organisational routines, which define lower order organisational skills and how these skills are co-ordinated and higher order decision procedures for choosing what is to be done at the lower level".
The Babbageian view

- Differences in skills and of “mental labour“ precedes the division of labor and is also subject to learning and specialisation
  
  “the master manufacturer by dividing the work to be executed into different processes, each requiring different degrees of skill or of force, can purchase exactly that precise quantity of both which is necessary for each process…“ (Babbage, 1832, p.175)
  
  “Seen from this perspective, the great virtue of the division of labor is that it permits an “unbundling“ of labor skills, and allows the employer to pay for each separate labor process no more than the market value of the lower capabilities commensurate with such work“ (Rosenberg, 1982)

- Conditions:
  Competences / skills pre-exist, with the required variety ie division of knowledge pre-exist

- Consequences:
  - The division of knowledge does not necessary match the division of labor
  ie the organisation/coordination of dispersed knowledge is not necessary overlapping the organisation/coordination of activities
  - focus is more on the coordination of learning processes than of activities
  - Babbageian view may be interesting in a economy driven by the evolution of knowledge, and the existence of 'dynamic capabilities, creation of new options, coping with high uncertainty etc…
Implications on the theory of the firm

The fundamental difference of two main alternative theories of the firm are based on this different views

- The traditional contractual approach (neoclassical, or transaction based) where the firm is a bundle of contracts understood as mechanisms for aligning incentives, i.e. ‘firm as information processor’

- The knowledge based vision where the firm is seen as a structure that helps parties to ‘assemble’, ‘coordinate’, align knowledge and expectations of actors, i.e. ‘firm as a knowledge processor’
The firm as a processor of information

- The main traditional theories of the firm (neoclassical, theory of teams, agency theory, Coasian theory, Simonian vision of the firm, transaction-cost theory) share a common vision of treating the firm as a *processor of information*, in a context of *allocation of resources*.

- The behaviour of the firm is seen in terms of an optimal information-processing response to signals from the external environment ("from the outside in")

- Co-ordination principles are reduced to bilateral contracts (contractual vision of the firm viewed as a ‘nexus’ of contracts) to achieve co-ordination through appropriate incentive schemes that align self interested individual action with common organizational goals.

- The firm is conceived as a governance structure to solve the problem of misaligned incentives resulting from imperfect information.
The firm as a processor of knowledge

- The firm is conceived as an institution where competences (coherent sets of routines and skills) are used in an efficient way (“from the inside out”) in a context of creation of resources, where the rare factor is limited attention.

- Competences are continuously built, shaped, maintained, and protected, through a cumulative and strategic process that relies intensively on the management of knowledge (which focuses on the ways, for a given firm, knowledge is acquired, produced, absorbed, memorised, shared and transferred).

- Some competences are seen as strategic (‘core competences’) constituting the main sources of competitiveness, the results of a selection process both within and external to the firm.
<table>
<thead>
<tr>
<th>Information processor</th>
<th>Knowledge processor</th>
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<tbody>
<tr>
<td>Creating and re-aligning incentives</td>
<td>Helping to align their knowledge and expectations</td>
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<tr>
<td>Set of contracts</td>
<td>Coordination of competence</td>
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<tr>
<td>Transaction oriented</td>
<td>Routines</td>
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<tr>
<td>Allocation of resources</td>
<td>Creation of resources</td>
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<tr>
<td>Limited rationality</td>
<td>Limited attention (focus)</td>
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But …

…“Organisations is about theory of formal organisations, systems of coordinated action among individuals and groups whose preferences, information, interests or knowledge differ’

(March, Simon, 1993)
Elements for a theory of the firm are:

- Cognitive mechanisms
- Incentive mechanisms
- Coordination mechanisms

And efficiency comes from the coherence of the 3 mechanisms
Coherence of organisational mechanisms

- Incentive and cognitive
- Incentive and coordination
- Cognition and coordination
Incentive and cognitive

What are the incentive mechanisms which are effective in promoting which kind of learning?

- Timing of selection and its balance with the intensity of the selection forces
- Internal incentive mechanisms and interrelated elements of a modern organisation
- Division of labor and the role of market and organisational incentive mechanisms in promoting it
- Rules-to-be-interpreted versus rules-to-be-executed
- ‘Learning the incentives’
- Routines as a « truce in conflicts » (Nelson-Winter, 1982)

The notion of governance reconsidered
Incentive and coordination

- In a dynamic learning context, P/A incentives schemes are not satisfactory: ‘Unresolved diversity concerning preferences and objectives is conducive to higher performance in a distributed environment with learning’ (March)
- Reappraisal of the role of managers/entrepreneurs
  - contribute to shape cognitive frames and socially shared patterns
  - Orient learning processes by focusing attention on some of them
  - Select core-competences
- Learning differ according to hierarchical levels
Cognition and coordination

- Process of generation and modification of common knowledge (fed by decentralised learning) has to undergo some form of centralisation => tension between forces which keep the coherence and forces promoting decentralised learning

Organisational structure and relevent competences reconsidered
### Some mapping ...

<table>
<thead>
<tr>
<th>FIRMS AS: INFORMATION PROCESSOR</th>
<th>Cognitive Mechanisms</th>
<th>Incentive Mechanisms</th>
<th>Coordination Mechanisms</th>
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<td>Principal-Agent</td>
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<td>Team theory</td>
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<td>Transaction cost</td>
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<td>Simon</td>
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<th>KNOWLEDGE PROCESSOR</th>
<th>Cognitive Mechanisms</th>
<th>Incentive Mechanisms</th>
<th>Coordination Mechanisms</th>
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<tr>
<td>Competence-based theory</td>
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<td>Modern Organisation theory</td>
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<td>Evolutionary theory</td>
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Why does this debate matter for the evolutionary theory of the firm?

- How and where routines emerge? (see Cohendet, Llerena, ICC, 2003)
  From organisations to knowing communities (epistemic - of practices…) as coordination mechanisms, as locus for interactions about knowledge.
  The emergence of new routines could then be explained by two main factors:
  1) by the functioning of some community (ex: an epistemic community) aiming at producing new knowledge.
  2) or/and the « vision » of an entrepreneur (‘business conception’, Witt 98) according to his representation of the domain of competence of the firm.

- The boundaries of the firm: the dual governance structure of the firm (Cohendet, Llerena, 2001, 2005)

- What is the role of the entrepreneur? (see Cohendet, Llerena, Marengo 2000, Cohendet, Llerena 2006)
The dual governance structure of the firm

- **Hypothesis**: The firm manages simultaneously competences/dispersed knowledge and transactions, but it does so according to a lexicographic order (due to limited attention). This order is linked to the Babbagian view presented earlier.

- **First**, the firm focuses its limited attention and chooses the domain of its competences, giving priority to the process of *creation of resources*.
  - The firm’s domain of competences is not considered to be tradable on the market: activities belonging to the domain of competences are ‘disconnected’ from the transactional make-or-buy trade-off.
  - Two subsets of the domain of competences can be distinguished: 1) the zone of “core competences” (what the firm knows how to do well and better than the other), and 2) the zone of “competences” (what the firm knows how to do well).

- **Second**, the firm selects according to the transactional criteria, the domain of “currents activities”, the “periphery” (driven by a process of allocation of resources).

As a result, for example, the division of knowledge (i.e., the knowledge encapsulated into the firm) may not correspond to the division of labor (i.e., the activities organised into the boundaries of the firm). The former one has to deal with the existence and development of dynamic capabilities, the latter with cost efficiency.
The dual firm and its frontier

- **The domain of competences**
  2) *The « competence » zone:* Networks to access complementary forms of knowledge held by other firms.

- **The « periphery » (the transactional domain)**
  - All activities are submitted to « a make or buy » trade-off as suggested by the transaction cost theory.
Dual Firm: An illustration

Ref: Amesse, Cohendet, Research Policy, 2001
Dual Firm: The case of Nortel

Ref: Amesse, Cohendet, Research Policy, 2001
The role of the ‘entrepreneur’

- Distinction between ‘mere managers’ and entrepreneurs (Schumpeter, 1911-34; Winter, 1967)
  - managers: ‘…the function of superintendence in itself constitutes no essential economic distinction’ (p.20)
  - Entrepreneurs: are ‘…carrying out new combinations’

- Uncertainty (Knight, 1921) (and disequilibrium or out of equilibrium) is intrinsic to entrepreneurship
  ‘it is doubtful whether intelligence’ itself would exist in such a situation (without uncertainty)’ (Knight, 1921, p. 268)

- ‘Intelligence and entrepreneurship are both responses to uncertainty’ (Loasby, 2004)

=> i.e. the entrepreneur and the theory of the firm have to be ‘knowledge-based’
The role of the entrepreneur

Indeterminacy of the theories of the firm

- 'Exploration' and exploitation' indeterminacy and/or the combination of operational routines and innovative routines
- Locus in terms of division of knowledge
- The limits of the firm
- Indeterminacy in speed of evolution: discrepancies between the speed of evolution of the external environment and the internal cognitive processes
Reappraisal of the role of managers/entrepreneurs

Entrepreneurs…

- …contribute to shape cognitive frames and socially shared patterns
- …orient learning processes by focusing attention on some of them
- …select core-competences
Entrepreneurial capabilities encapsulated in the governance level of the firm

**Characteristic of the entrepreneurial capabilities:**

- First, as a specific “*asset*”: the “dynamic capabilities”, i.e. the ability to manage strategically the adaptation, the integration and the re-configuration of internal and external organizational structure.

- Secondly, as an *active interface* between the internal and external environments of the firm,

- Thirdly, the *vision or the business conception*, which is a primary entrepreneurial input (Witt, 1998, p.162) will impact the organization of the firm itself.

=> In charge of the implementation of the ‘division of knowledge’

*The ‘knowledge-based entrepreneur’ becomes then the upper layer of the ‘mental labor’ in Babbage terms, i.e. framing the interpretation and the division of knowledge*
Thank you!