

What Do Firms Learn? Production, Distribution and the Division of Labour

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I. Introduction

The aim of this paper is to investigate the relation between the learning processes of firms and their industrial specialisation. Its point of departure is recent research in the theory of the firm – namely the capabilities (or competence) based approach - which has stressed how codified and tacit knowledge jointly account for the existence of differences in individual and organisational capabilities within and among firms. Following this approach, the variety of capabilities accounts for inter- and infra-firm division of labour so that specialisation would seem to be an almost natural outcome.

The above approach raises a range of issues, which will be discussed in the sections that follow. First, despite the many insights that the approach has provided, there still are some problems in defining and appropriately accounting for the origin of capabilities as well as in understanding the key features of the division of labour. Capabilities are often assumed to exist *a priori* or they are claimed to be part of an ongoing, yet not adequately outlined process. As for the division of labour, it is treated as a technical issue rather than as a strategic variable. The paper contends that this approach is unsatisfactory and it stresses how capabilities and the division of labour are related to the strategy pursued by a firm's management.

A related set of issues focuses on the function that capabilities and the division of labour are supposed to have. In so far as management purposefully seeks them, it is reasonable to believe that they are created and chosen in relation to the goal management pursues. In this perspective what this goal is turns out to be a key issue. The paper contends that, although profit is the general goal, there are at least three ways – sub-goals - to achieve it. The first one consists in identifying the best way to compete with other firms on the market: what to produce, what pricing policy to apply, etc.. The second and third way consist in identifying the best way to organise those activities that will eventually bring a good to the market, i.e. coordination within the firm and coordination within the value chain.

The paper argues that the strategies of single firms may be defined in terms of the attention they devote to each one of these fields of action: the market for the product, the activities within the firm,

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the relations within the value chain. In particular, the choice of the strategy to follow is claimed to depend on the types of problems each field of action raises. These relate to the creation of value added and to its distribution.

The choice of a strategy leads a firm's management to focus its cognitive efforts on those issues that are specific to that strategy, at the expense of other issues. In this sense, the cognitive institutions of the firm are shaped by the strategy it follows. This implies that the capabilities available in the future and the set of potential strategies that the firm's management will eventually be able to choose depend on what the firm seeks today. Owing to interdependence among firms – which depends both on productive links and on common cognitive frameworks – it is reasonable to believe that this may generate common patterns of specialisation within industries and even among the industries of a country.

The paper is organised as follows. I begin by discussing the role that evolutionary theorists assign to capabilities and to the division of labour as key elements in the cognitive processes of firms (section II). I point to a few unresolved issues and stress that they depend on the scarce importance assigned to firm specific strategies. I therefore outline what seem to be the distinctive features of a managerial strategy and the key elements of the learning processes that such a strategy requires, both within and out of the firm's boundaries (section III). This allows a more in depth understanding of the relation between capabilities, division of labour and the strategy of the firm. Thus, in section IV I point out how the goals pursued by management on the three fields of action mentioned above lead to distinct types of division of labour. This, in turn, favours specific learning processes and the creation of specific capabilities, which act upon the subsequent pattern of specialisation of the firm. Infra- and inter-industry links account for the possible extension of the same pattern of specialisation to an economic region as a whole.

II. Capabilities and the division of labour

1. Whence capabilities?

In a famous paper Richardson defined capabilities as “knowledge, experience and skills” (Richardson 1972/1990: 231). He acknowledged that “The notion of capability is somewhat vague, but no more so perhaps than that of, say, liquidity and, I believe, no less useful.” (*ibid.*). Although the notion has been elaborated upon by subsequent research, it does remain “somewhat vague”¹. The reason is that, much like in the case of liquidity, there is something in it that is irreducible to a

¹ Carlsson and Eliasson remark: “competence which is difficult to articulate at the individual level may not be recognized or even recognizable in a different environment or organizational structure operating under a different set of assumptions or rules. Research on business competence thus borders on the unsearchable.” (Carlsson and Eliasson 1994: 694).

regularity. Capabilities are what is required to solve problems as they arise. Depending on the nature of the problem, a solution may be sought by resorting to logical deduction or to heuristics, to “know that” or to “know how”, to tacit knowledge or to codified knowledge. Independently of how it is sought, a solution to a problem implies a learning process. Thus, the difficulties in appropriately defining capabilities presumably arise because of the manifold nature of problem-solving activities (Dosi, Egidi 1991). In this section I will elaborate on this issue by arguing that capabilities co-evolve with those activities by means of the division of labour.

We do know that each individual has distinct knowledge, experience and skills (Minsky 1985). This means that his/her capabilities differ from those that others have. Furthermore, bounded rationality and incomplete and scattered information imply that no single individual can solve all problems. A single problem may be too large to tackle by a single individual, so that it has to be split up into sub-problems each one of which will be assigned to distinct individuals.

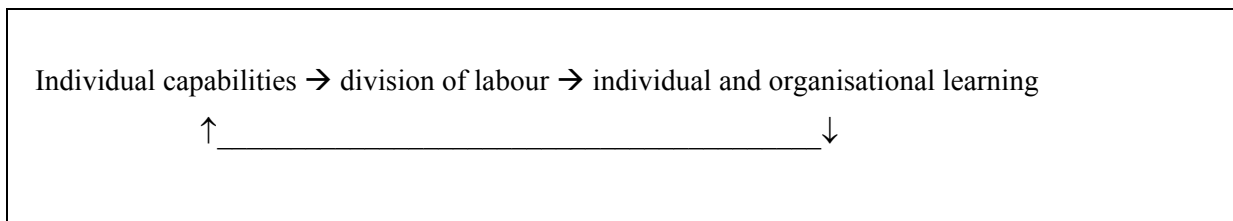
The nature of the problems agents have to cope with varies. They may consist in executing a detailed procedure², in learning how to do something, in learning how to learn. A learning process generally occurs even when the most trivial tasks are carried out. When Adam Smith stressed the importance of the division of labour, he focused on how specialisation in pin manufacturing would favour the identification, and possible introduction, of improvements in fairly trivial tasks.

Any given division of labour assigns a set of tasks to individuals who presumably have the capabilities to carry them out. In so doing, it defines the sub-problems each individual will have to cope with, thus also the boundaries of the environment he/she will have to focus on. This entails that each individual knows only a part of what is required to solve the problem while the team as a whole has the knowledge required for the solution (Egidi 1992, Nelson, Winter 1982). The division of labour is, in this sense, the link between individual and organisational capabilities. In a more dynamic perspective, the above boundaries define the knowledge required to carry out the task but also guidelines for future learning processes³. Consequently, individual capabilities at any given moment result from the evolution of original individual capabilities and the nature of that evolution depends on the learning potential that the division of labour assigned to each individual. Organisational capabilities reflect these circumstances. The feedback process outlined is summarised by figure 1.

² Apparently the execution of a procedure requires no problem solving because a rigid routine has been set up already. Understanding instructions and applying them, however, remains a problem that the agent needs to solve, even though a great many other people may have already solved it before (Egidi 1992).

³ It is therefore possible to extend Egidi’s remark whereby “the conjectural division of problem solving is a process which gives rise to a division of knowledge” (Egidi 1992: 166) to the division of labour in general.

Fig. 1 - The division of labour and learning



The key role that the division of labour plays in this context requires a more detailed discussion of who determines it and on what grounds. The “who” issue clearly requires an assessment of co-ordination. I introduce this topic in the sub-section that follows. The circumstances that lead to the choice of a specific division of labour and the agents involved will be discussed subsequently.

2. Coordination and the division of labour

By definition, the division of labour implies complementarity between activities. In turn, complementarity requires some sort of co-ordination. Richardson (1972/1990) investigated distinct forms of co-ordination – direction, co-operation and market transactions – in relation to the technical characteristics of activities, namely similarity and the degree of complementarity. In particular, he argued that activities are “similar” when they require the same capabilities; they are “closely complementary” when they belong to different phases of a given production process so that they require *ex ante* interaction between the parties involved. Consequently, capabilities have to be shared either when activities are similar or when they are dissimilar but they interlock tightly. The conclusion this leads us to is clearly pointed out by Langlois and Foss: “Richardson’s insight is a simple but extremely profound one. For it suggests that – as a quite general matter – capabilities are determinants of the boundaries of the firm” (Langlois, Foss 1999: 209).

The above conclusion raises a range of important issues. First, is it exhaustive? Since capabilities that allow for technical boundaries to be drawn may not be profitable, it is appropriate to refer to a bundle of capabilities that are consistent with an expected rate of profit. The capabilities in this bundle determine what Teece (1988) names “core business”⁴. However, as Dosi, Teece and Winter (1992) and Dosi (1994) argue, a given set of core capabilities may be compatible with different boundaries. While a minimum bundle of capabilities is required for a firm to exist, the bundle that actually exists within a firm may well be larger, including a range of additional capabilities which favour complementary activities. Under these circumstances it is not clear that “capabilities are determinants of the

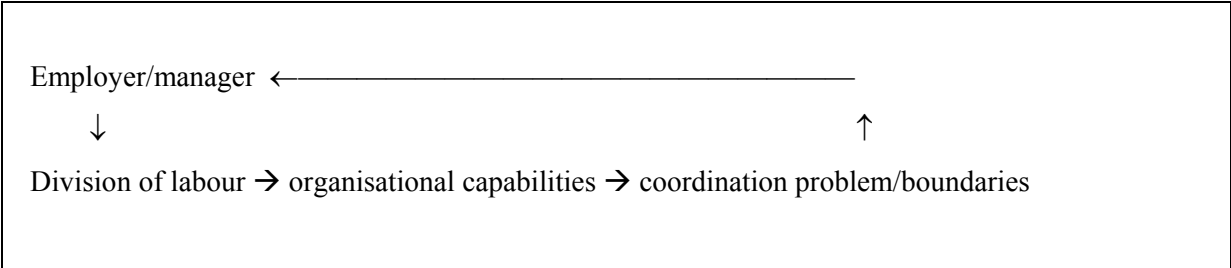
⁴ “(A) set of production/manufacturing activities are typically implied by a particular research focus, a firm’s ‘core business’ (...) by which is meant the set of competences which define its distinctive advantage” (Teece 1988: 265).

boundaries of the firm”. Core capabilities are more likely to be mere constraints. At the very least some co-determinants must be identified. This is precisely what Dosi, Teece and Winter (1992) do. We shall return to them shortly.

The second issue concerns the causal relation between capabilities and coordination. The claim that coordination (the boundaries of the firm) depends on capabilities needs to be qualified. If capabilities are assumed to be exogenous, the claim is consistent. While this may be the case, to some extent, for individual capabilities, it is not when organisational capabilities are taken into account. The latter result from a division of labour within organisations/firms which, in turn, arises only if and when the coordination problem is solved, i.e. when the boundaries of the firms are appropriately defined.

A more appropriate way to explain the relation between capabilities and coordination is to assume the following recursive process. Consider an initial situation where employers resort to individual capabilities and determine a division of labour within their firms. This situation allows organisational capabilities to arise. The next step is that all capabilities, both individual and organisational, determine a reassessment of the coordination problem. The (new) boundaries of the firms that follow that solution and the capabilities available allow a new division of labour to be determined. The process is depicted in Figure 2. What it suggests is that boundaries are determinants of the capabilities of the firm just as “capabilities are determinants of the boundaries of the firm”.

Fig. 2 - Coordination and organisational capabilities



The account Dosi, Teece and Winter (1992) provide of “coherent” boundaries seems to imply the existence of such a recursive process. Furthermore, they explain what determines the boundaries of firms by introducing a range of co-determinants of the firm’s learning process: path-dependence, the technological environment, selection, etc.. What they do not seem to be concerned with is what employers/managers pursue, thus the degrees of freedom that firms have and how these may affect the process depicted in Figure 2. Strategy apparently consists in passive adaptation to the requirements of a given external environment rather than in a set of actions that aim at changing that environment and the requirements it produces. This restrictive view of strategy is criticised by R. Nelson who comments⁵: “Absent a reasonably coherent and accepted strategy ... (t)here is no real guidance

⁵ Nelson’s comment refers to an earlier version of Dosi, Teece and Winter (1992).

regarding the capabilities a firm needs to protect, enhance, or add in order to be effective in the next round of innovative competition.” (Nelson 1991: 69)⁶.

A third and related issue concerns the role the division of labour plays. Teece’s notion of core competences entails a hierarchy of capabilities in terms of a firm’s competitiveness. At a higher degree of abstraction Egidi argues that the “process of problem solving by division into independent sub-problems seems to suggest that the existence of hierarchies in organizations may be intrinsic to the method of solving problems” (Egidi 1992: 168). Since the relevant hierarchy, in Egidi’s framework, is the outcome of a problem-solving activity, the capabilities of the agent who decomposes the main problem presumably lie at the top. What remains to be assessed is how the rest of the hierarchy is arranged. A reasonable answer is that, in so far as it determines tasks and routines and that it affects the learning processes of the individuals involved, it may be taken for granted only if there is no choice between alternative types of division of labour. However, this is not the general case. As Egidi (1992) argues, “it should be emphasised that there is usually more than one way of decomposing a problem, and that there are therefore an equal number of possible hierarchies”. In other terms, different types of division of labour are possible. Under these circumstances, the division of labour turns out to be a co-determinant of – rather than a mere technological constraint to - the boundaries of the firm. An inquiry into what determines the choice among different types of division of labour is therefore necessary. It implies the discussion of three issues. The first one is who decides what activities to carry out, what capabilities are required and how they need to be arranged according to a specific division of labour. The second issue is what rationale underlies these decisions. The third issue is whether and how distinct capabilities and activities are likely to be consistent with that rationale.

In a decentralised economy decisions about what activity to carry out are taken by single firms. Thus, as far as the first issue is concerned, I assume that the specific agent who decides is a firm’s management. In particular, I conceive of management as the (collective) agent who: conjectures an appropriate decomposition of a broadly defined economic problem (e.g. making profits); identifies the capabilities to cope with each sub-problem, and; combines them in order to achieve a solution. In order to focus on the specific issues I pointed out above, I will assume no conflicts exist within the management of a firm⁷.

⁶ The degrees of freedom Nelson posits in his definition are denied in the rather deterministic statement Teece makes with regard to the same issue: “Except by entering the market for corporate control, profit seeking firms have limited abilities to change products and technologies.” (Teece 1988: 266). Similarly, Teece and Pisano argue “The strategic posture of a firm is determined not only by its learning processes and by the coherence of its internal and external processes and incentives, but also by its location at any point in time with respect to its business assets.” (Teece, Pisano: 201).

⁷ I will also leave out of my discussion possible conflicts between ownership and management.

In the section that follows I will focus on the second and third issues. In particular, I will discuss the rationale underlying the decisions of management in terms of the goal it pursues. I will then turn to the unifying theme of managerial strategy by referring to the notion of a business conception.

III. Capabilities and knowledge creation

1. Profits, management and capabilities

In order to understand what underlies the behaviour of a firm's management, it is important to identify the goal the latter pursues. In the above section I pointed out that capabilities may be hierarchically arranged in terms of the goals pursued and I mentioned two possible goals. The first one concerns problem-solving. Its generality is such that it may be applied to basically any kind of problem, economic or not. Precisely because it is so general, there is a risk that any inconsistency between, say, technical and economic problems may be missed or inadequately appreciated. The second goal, on the contrary, is competitiveness. It is much more specific, so much so that it need not even be the prime goal a firm pursues: the claim that profitability is impossible without competitiveness may be open to debate whereas it is fairly clear that competitiveness would be pointless if it did not achieve profitability.

Following a widespread tradition that goes back to Marx, Veblen, Shumpeter and Keynes I assume that the main goal management pursues – thus the main problem it has to face - is (money) profitability. Profits may be made in a variety of ways and production of real output is only one of them⁸. As I shall contend in sections III and IV, this implies that not all the parties involved in the profit-seeking process need gain from it. In some instances such a process may resemble a zero-sum or even a negative-sum game.

Management has to decompose the profit goal/problem into a range of sub-goals/problems which may be further decomposed into second, third, etc., order sub-goals/problems. Each department or individual involved in this problem-solving hierarchical arrangement will end up pursuing the solution to a specific sub-problem. Depending on the priorities assigned, thus to what problems are in the higher tiers of the hierarchy, a specific intra-firm and inter-firm division of labour of labour will ensue.

Leaving aside the influence of external factors, three elements are crucial in the choice of the appropriate division of labour. The first one is cost effectiveness: assuming a given type of product, unit costs will depend on how production is organised. At any given moment this may be viewed as a problem of static efficiency. As Leijonhufvud points out, however, these elements should be viewed in terms of an evolutionary process. Drawing on Smith and Marx, he stresses that: “As one subdivides the process of production vertically into a greater and greater number of simpler and simpler tasks,

⁸ “The business man's place in the economy of nature is to ‘make money’, not to produce goods.” (Veblen 1919/1964: 92).

some of these tasks become so simple that a *machine* could do them.” Leijonhufvud (1986: 215; emphasis in the original). Thus, the enactment of a division of labour eventually determines a reshuffling or reassessment of the capabilities required by the firm.

The second element, which also draws on Adam Smith, is that the choice of the division of labour must take into account is how it affects subsequent learning. The relative importance assigned to a capability by a given division of labour implies that it will be greatly resorted to and that learning specifically associated to its use will be enhanced (Levitt, March 1988; Loasby 1991, 1999). Consequently, the division of labour, by determining a specific hierarchy among capabilities, affects the nature and the availability of future capabilities. It determines the weight each single capability has in the learning process depicted by Figure 1⁹.

This leads us to the third element: bargaining power. The existence of hierarchies in the capabilities used implies that a relatively more important capability increases the influence of the agent who possesses it (Marglin 1976). While this may lead to an efficient outcome – in terms of the sub-goal pursued – it may also determine what is commonly known as an incentive problem, i.e. an inefficient outcome in terms of the main goal (Leijonhufvud 1986). Their actual availability and the related hold-up problems may eventually lead to a reassessment of the coordination issue, as in Figure 2.

Since decisions concerning capabilities and the division of labour affect relations among the parties involved, a key issue is whether their consistency with management’s main goal is possible and how it may be achieved. U. Witt’s (1998) notion of a business conception may be of some help in this regard. In Witt’s view a business conception provides the rationale for the strategy that the firm has to follow. It also provides an interpretative framework to all individuals in the firm so that they may assess the consistency between what they are learning and what is required at the general level¹⁰. Management does not just inform workers about what is going on. By providing them with a shared cognitive frame it teaches them to look at things from a specific perspective. This frame isolates that part of the environment that is deemed relevant and identifies the priorities according to which that part of the

⁹ This will presumably affect what Iansiti and Clark define as “technology integration”, i.e. “the capacity to link the evolving base of technical knowledge (...) to the existing base of capability within the organisation.” (Iansiti, Clark 1994: 570). The relevance of the issue is stressed, with special reference to large firms based in OECD countries, by Pavitt who states that “... lack of technological knowledge is rarely the cause of innovation failure ... The main problems arise in organisation” (Pavitt 1998: 434-435) and subsequently argues that “This can best be understood if more attention is paid to what Adam Smith said about the division of labour, and less to what Schumpeter said about creative destruction.” (*ibid.*: 435).

¹⁰ “[A] business conception has the features of a cognitive frame. It helps to interpret the current events in the perspective of the firm’s overall orientation and associates appropriate actions with the conceived state of affairs.” (Witt 1998: 166-167).

environment has to be analysed. In other terms, by involving workers in its business conception, management provides them with a common “cognitive context”¹¹.

Workers must share both the main goal – profit - and the specific strategy of the firm. They must be involved rather than kept under control. Contrary to new institutionalist emphasis on governance and asymmetrical information, what is at issue, here, is knowledge - a cognitive frame – not information. The creation of a general consensus cannot be achieved “on the basis of a mere instruction process or by devising organizational and administrative routines. It is socialization in informal communication processes within the firm that is crucial for inducing people to adopt those conceptions.” (Witt, 1998: 167)¹².

Witt’s approach deals with a theme central to industrial organisation theory – relations within firms – but from a knowledge-centred perspective. Workers do not only need to have specific skills, they must share a business conception. This means that when, following Richardson, we refer to capabilities as “knowledge, experience and skills”, there is more to knowledge than just a specific type of skill: a cognitive frame is also involved¹³.

Given the importance that knowledge has in defining the nature of capabilities, the sub-section that follows will elaborate on this concept. I will then return to the issue of involvement and discuss a few problems that Witt’s approach overlooks.

2. Capabilities and knowledge

A worker’s (or a department’s) capability is not just any collection of “knowledge, experience and skills”. That collection must be relevant to the business conception and it also has to be functionally oriented, i.e. it must enable the agent to identify, and cope with, the specific problems that the pursuit of management’s strategy raises. As for the capability of an entrepreneur, it does not merely consist in the ability to match exogenous competitiveness requirements with the capabilities that are available at some given moment. Rather, it consists in the ability to conceive a cognitive image that will functionally orient the capabilities of the firm.

¹¹ “We use the term context for its meaning in the phrase, ‘the meaning of information depends on context’” (Imai 1990: 188). An analogy is possible with a research programme or a scientific paradigm (Loasby 1991) but the role of codified and systematized knowledge and analytical rigour in a knowledge context is obviously less important.

¹² Asymmetrical information may well be relevant, but this occurs when management - the entrepreneur, in Witt’s terms - fails to involve the workers.

¹³ This issue is accentuated by the fact that “(t)he key characteristic of detailed management control is increasingly bounded and impaired as a result of the growing complexity of the production process.” (Hodgson 1999: 197).

Capabilities include, in this perspective, a broad notion of knowledge, defined as a structured belief system about the way things are and the way things should be (Stein 1997)¹⁴. Emphasis is, here, on beliefs about “the way things should be”. It is this feature of knowledge – a perspective, which in our case includes the main goal of the firm, profitability, as well as a range of sub-goals that are deemed functional to the former - that the business conception and the individuals working in the firm must share¹⁵. Both in the case of the worker and in the case of management, capabilities involve learning how to use previous knowledge - about how things are - in order to obtain what is believed things should be. In this sense, learning does not consist in adding newly processed information to a pre-existing stock of knowledge; it is the process whereby previous knowledge is viewed in a new perspective¹⁶. Knowledge in a community includes various belief systems, i.e. various outlooks on reality and on how things should be. Only part of this knowledge is required to achieve a business goal: this is why a business conception need not be intuitive to workers.

Three aspects of this manifold nature of knowledge should be outlined. The first one is *relevance*. Some skills may be useless (irrelevant) in terms of the goal pursued: a caring parent may wish to learn about the best possible way to bring up a child but this may be of little help to a firm’s activities when, say, lathing is required. The second one is *orientation*. Although a skill may be appropriate, it may be inadequately used (misoriented): a researcher with an academic background may be proficient but his/her previous experience may make him/her incapable of complying with the relatively more stringent time constraints that an R&D department has.

The third aspect of knowledge is *consistency*: some of its elements may or may not conflict with others. A very important case consists in conflicting (inconsistent) goals associated to the absence of a shared view as to what the common good is¹⁷. This may be determined by a *misperception* of a superior common interest, as when knowledge of what is best for a single individual or a single department apparently conflicts with what is best for the company as a whole. Such a situation may occur either because the agent who pursues the local goal is not capable of understanding the firm’s overall goals or because he/she was not appropriately involved by management and did not fully understand that a convergence of interests is possible.

An inconsistency of greater significance occurs when a common good is not identified and is believed not to exist. This *value inconsistency* may occur when knowledge as an overall view of life conflicts with the specific knowledge required by a firm’s activity. The pursuit of local goals, contrary to the above example of misperception, may be determined by the intentional refusal to subsume one’s

¹⁴ The definitions adopted here do not coincide with those provided by Stein (1997) but, in my view, they are consistent with the overall framework he adopts.

¹⁵ Obviously this implies that a great deal of beliefs on “how things are” must be shared as well.

¹⁶ From this point of view cognitive structures co-evolve with the strategies pursued (Nooteboom 2000).

¹⁷ Such an inconsistency may occur both at the individual level (Sen 1982, Hirschman 1984) and at the level of an organisation (March, Simon 1958; Loasby 1991).

personal interests to the organisation's interests. Similarly, on grounds of social equity, workers may claim a proportion of value added which contrasts with the profit goal underlying their employer's business conception¹⁸.

It may be worth emphasising that the main consequence of knowledge inconsistency within a firm does not lie in the potential outcome of the conflict, e.g. lower profit than expected, or in the greater importance that informational asymmetries - moral hazard - may have. It consists in the absence of a common strategic view. If some or all of the workers use a cognitive frame that is not compatible with the one provided by management, cognitive dissonance may ensue, leading to a potential collapse of the firm as an organisation (Loasby 1999).

In the light of the above features of knowledge it is possible to delve into how management shapes the learning process within a firm. Assuming a business conception and a corresponding strategy exist, three types of purposeful action are possible so far. *Capability selection* occurs when an employer selects (hires) those individuals whose capabilities are potentially functional to the company's strategy. *Capability shaping* occurs by involving the workers of a firm in the business conception. *Internal knowledge selection* consists in selecting the knowledge that results from the ongoing learning process within the firm: misoriented knowledge has to be reoriented, relevant knowledge has to be enhanced, irrelevant knowledge has to be neutralised and inconsistent knowledge has to be discarded or somehow neutralised.

The three types of action focus on the staff's learning process. However the firm is also involved in the learning processes of agents who are not part of the organisation. Typically, a firm produces an output that it has to sell. It therefore has to figure out what it has to produce and what requirements must be fulfilled. It also has to allow its potential customers to understand and appreciate what it produces. This process, which Iansiti and Clark (1994) define as "customer integration", implies "mutual adaptation between the organization and its market (...) and mutual learning between producers and customers." (Iansiti, Clark 1994: 570).

Firms provide goods and services that have to be identified, interpreted and valued by customers. Just as in the case of a firm's workers, the knowledge customers have may include elements that - with regard to the goals a company is pursuing - are irrelevant, misoriented or inconsistent. Irrelevance means distraction, i.e. that potential customers may buy something else simply because the product did not catch their attention; misorientation means that the products may not be adequately assessed and appreciated because customers believe they need something else; inconsistency means that customers believe there is some reason why they should not buy those products¹⁹.

¹⁸ This latter kind of inconsistency generally leads to what March and Simon (1958) define as "bargaining" and "political" conflicts within an organisation.

¹⁹ The reason may concern the product itself (as when the consumption of alcoholic drinks is deemed immoral or unhealthy), the production process underlying it (e.g. when it leads to pollution) or the firm's business conception (as when a company resorts to child labour).

Potential customers compare what they believe they need (their preferences) with what they believe is available on the market. They do so on the basis of their idiosyncratic knowledge. Each individual presumably has distinct needs – which are represented in his/her needs space - and perceives what is available on the market – the goods space - in a different way, owing to the information he/she has and the cognitive frames he/she interprets it with. *A priori* it is therefore unlikely that a product is capable of meeting all the requirements set by an individual, let alone those set by all potential customers.

A firm tries to produce goods that match the preferences of its potential customers. To this end, it tries to identify potential customers, i.e. agents who are likely to be interested in the product it can (potentially) supply. In other terms, it depicts a range of needs its product can satisfy. This activity we may call *preference selection*. In general, however, the knowledge underlying the beliefs of the customers may not fully conform to the cognitive image of the entrepreneur. A business conception must take into account this possible divergence between cognitive frames, as well as the existence of cognitive processes that may change the beliefs of its potential customers. Just as one of the tasks of management is to provide all those who work in the firm with a common outlook of what needs to be done, the firm as a whole must provide all of its potential customers with a common outlook of what it can do for them. It does so by providing them with a cognitive frame regarding the needs space, the goods space and their mutual relations. In other terms, the firm must not merely adapt to but, rather, shape its market (e.g. through advertising): this activity we may call *preference shaping*. It consists in providing the knowledge context wherefrom those preferences are likely to be formed.

The manifold nature of knowledge implies that both workers within the firm and customers outside of the firm may pursue goals, which do not conform to those of the entrepreneur's business conception. A business strategy must therefore select existing knowledge and provide appropriate guidelines to learning processes. This is what the creation of a knowledge context consists in. The key issue, here, is that, owing to bounded rationality, a knowledge context can hardly be all encompassing. Thus it is appropriate to distinguish between an internal and an external knowledge context, according to the specific learning requirements that management attributes to workers and customers respectively. There is a parallel between these requirements but this does not imply that they converge: they may well be inconsistent, as I shall argue in the sub-section that follows.

Before we move on, it may be appropriate to briefly mention how the above discussion relates to interaction within the value chain. Leaving aside the case where productive links are so loose that firms are substantially independent of each other, let us consider two opposite cases. When a firm has a dominant role in the value chain, it has to identify what requirements the final product must meet, independently of who actually manufactures it. It is reasonable to believe that it has to provide a business conception to all of the firms involved. Under these circumstances, independently of ownership, it treats them just as if they were single departments or workers. The other case is one where a firm has no bargaining power whatsoever. Thus, it has to adapt to the business conceptions of the companies it deals with, much like the department or the single worker of a company. In general,

when these extreme cases do not occur, the business conceptions of the single firms may be mutually inconsistent. A range of possible outcomes is therefore possible, depending on whether one of the business conception prevails over the others or a common conception eventually emerges. The upshot is that a parallel may be traced between intra-firm relations and inter-firm relations within the value chain. This issue will be discussed in greater detail in section IV.

3. Knowledge creation

Part 1 of Section III stressed that the cognitive context provided by management must be consistent with the overall profit goal of the firm. Part 2 of Section III pointed out what this requirement implies for the learning processes of workers, customers and client firms. Let us now return to Witt's notion of a business conception. A key feature of his approach is that management can provide a cognitive frame only through involvement. In the light of our discussion so far, this view is not satisfactory in that it neglects how capabilities arise.

Independently of a management's efforts to involve workers, two circumstances may prevent them from learning according to the business conception. First, "misperception" may easily occur when the cognitive frame provided by the management is not related to what a worker does. A problem/goal is usually identified in so far as it falls within the range of problems/goals one usually tackles. When the range of assigned tasks is narrow, the problems a worker is able to appreciate are very specific. As the range becomes more extensive, the degree of generality of the problems may rise as well. Thus, the tasks assigned to someone provide him/her with a specific standpoint. From that standpoint, the firm's general goals may be too abstract in relation to those of the single department or of the single individual. In other terms, when a worker is only expected to execute a menial procedure, it is most likely that he/she will not be able to appreciate the subtleties of a new technology. This is a case where "workers do not know enough". Skills are that part of capabilities which is strictly associated to assigned tasks. If the division of labour does not provide a worker with the skills to identify extensive ameliorations, a business conception may be of little help.

Second, the overall knowledge of the workers may determine what I defined above as "value inconsistency". In other terms, owing to their political, religious or ethical values, workers may choose not to comply with all the requirements that the firm's goals imply. A typical case is when they do not accept the management's views on distribution; another case may occur when workers claim better working conditions albeit at the expense of profit. Under these circumstances, workers may actually put forward a "structured belief system", which contrasts the management's business conception and puts forward alternative actions. This latter case may be one where "workers know too much" relative to the management's requirements.

Let us focus on the relevance of these two circumstances. The first one suggests that Witt's view, whereby communication is the only channel that provides workers with an appropriate knowledge

context, is misleading: the division of labour also plays an important role. Moreover, the division of labour may purposefully be chosen in order to achieve the knowledge context decided by management. Management may decompose strategy-related problems – i.e. choose tasks – in a way that will favour an appropriate learning process by the workers.

The second circumstance points to what appropriateness of knowledge means. When workers have an extensive knowledge of the activities carried out by the firm, they are more likely to be involved in the business conception and to learn to solve problems they are confronted with. Under these circumstances, if competitiveness requires widespread problem solving, it may be suitable to extend the range of tasks that workers are assigned. On the other hand, when a value inconsistency exists, the knowledge workers have may increase their bargaining power at the expense of the goals pursued by management. Under these circumstances loyalty must be reinstated. Following Simon (1997), two types of loyalty are possible: motivational and cognitive. In the first case workers rely on the management's decisions because they believe they cannot properly assess what the relevant circumstances are. In the second case, the activities they carry out force them to concentrate their learning on those very activities, thereby losing track of what is going on at a more general level. Either way, an appropriate division of labour may restrict the range of tasks single workers carry out, thus also their learning potential. This determines a shift in the balance of knowledge within the firm, thereby leading workers to accept strategies that forsake their interests.

The above discussion allows us to reassess the role and the origin of capabilities and of the division of labour in terms of the overall strategy a management pursues. The way capabilities are arranged depends on the involvement and loyalty of workers. When involvement is not possible, the division of labour must ensure the achievement of loyalty. In so doing, the division of labour affects present profitability but it also acts upon the learning processes – thus the creation of new capabilities – within the firm. The loyalty required for short run profitability may be achieved through a division of labour that is incompatible with the learning processes required for long run profitability. Consequently, competency traps²⁰ may ensue.

In the section that follows, I will point to how strategies that firms pursue in order to achieve their main goal (profit) may lead to conflicts of interest which contrast with the unifying view a business conception should provide. Under these circumstances, the division of labour may be functional to short term profitability but at the same time it may determine competency traps, which undermine long-term profitability.

²⁰ “a competency trap can occur when favourable performance with an inferior procedure leads an organisation to accumulate more experience with it, thus keeping experience with a superior procedure inadequate to make it rewarding to use.” (Levitt, March 1988: 322).

IV. The economic goals of the firm

1. Production and distribution

The previous section discussed the role of management in providing a business conception and a strategy for the firm. Within this framework a strategy was claimed to involve a range of sub-goals, which eventually ought to allow the achievement of the main goal. What needs to be assessed is whether the sub-goals are mutually consistent, thereby converging towards the main goal. The aim of what follows is to argue that inconsistencies are possible and that the outcomes they lead to may be far from desirable.

Let us consider the following identity, referred to a single firm:

$$P = \frac{P}{VA} * \frac{VA}{O} * O$$

where P is profit, VA is value added and O is output²¹. The identity may be read as follows: profit results from²²:

1. the share of profit in value added, i.e. distribution within the firm;
2. the proportion of value added over output, i.e. the degree of vertical integration of the firm;
3. sales.

What the decomposition suggests is that a firm may pursue its profit by acting on three distinct fields of action: the good's market, where producers of the same good operate; the (external) value added chain, where firms linked by upstream or downstream relations operate; the activities within the firm²³. These fields of action are interdependent but it is appropriate, in the first instance, to examine them separately.

A firm may act upon the product's market by increasing its sales (O) for any given degree of vertical integration ($\frac{VA}{O}$). Assuming the level of aggregate demand is given, a rise in sales is possible by redefining the composition of demand, at the inter- or intra-industry level²⁴.

²¹ In what follows sales are assumed to match output.

²² The aim of what follows is to understand how firms may wish to influence the above variables. These variables, however, depend on other circumstances as well. Distribution affects relative prices and sales, and output depends on aggregate demand. For simplicity's sake, however, these circumstances will be neglected.

²³ Government intervention, especially in terms of income distribution, is assumed away.

²⁴ In the first case, the firms that belong to an industry pursue a common goal: to expand the industry's market share – thus their overall value added - at the expense of other industries. In the second case a conflict arises among those same firms: given the total amount of value added in the industry, the value added of a firm may rise only at the expense of another firm. What is at stake is infra-industry distribution.

The second field of action consists in the relations the entrepreneur establishes within the firm. Given the total amount of the firm's value added, profit may be increased only by increasing the profit share ($\frac{P}{VA}$) at the expense of the value added that goes to workers. This goal may be achieved with or without the consent of the workers. The first case occurs when workers believe a superior common goal exists and may be pursued²⁵. This usually happens when workers are involved in the entrepreneur's business conception. The second case is more troublesome because it implies conflicting beliefs about the nature and/or existence of a common goal.

The third field of action consists in inter-firm relations within the value added chain. The goal, here, is to raise the firm's proportion of value added over output ($\frac{VA}{O}$). Two situations are possible. When control of the phases of production does not change, the share of value added rises if the firm's prices rise in relation to those of other firms in the value added chain. The second situation occurs when, all other things given, the firm gains access to the most profitable phases of production²⁶.

In all three cases a distributive conflict emerges between two (groups of) parties. A successful strategy would imply that these conflicts do not come to the fore. Although this is possible, it cannot be assumed to be the general case. It is most likely that the perceived conflict will force a firm's management to focus on the best way to neutralise it. A possible response may consist in devising a division of labour that reduces the negative consequences of the conflict by creating an appropriate knowledge context. In the sub-section that follows I will discuss the implications that such a response may lead to under two opposite sets of circumstances. The aim of what follows is not to provide a full fledged model but to point out what seems to be a crucial issue: the division of labour may foster two distinct and possibly inconsistent types of capabilities: those that enhance long run competitiveness and those that enhance short run profitability.

2. Distribution and learning

Suppose that competition on the product market is very fierce and that the company's market share is likely to fall²⁷. The only way to offset the ensuing drop in profitability is to act on the two other fields of action. Let us focus on relations within the company. If value added drops and profit must

²⁵ This is the case when workers believe that higher profits are required for investment and that investment increases employment and improves the competitiveness of the firm, thus future available value added.

²⁶ The distinction provided here is only conceptual. Mergers and acquisitions may allow a firm not only to acquire the most profitable phases but also relevant resources and/or knowledge that will eventually allow favourable changes in the relative prices within the value chain.

²⁷ This is a case where the firms in the market have inconsistent business conceptions and the company under inquiry fears it may have to forsake its goals to the advantage of its competitors.

remain constant, $(\frac{P}{VA})$ must rise and the wage bill must drop. This may imply lower wages and/or higher productivity followed by – or associated to - lay offs. Alternatively, focus may be on inter-firm relations within the value chain. Here $(\frac{VA}{O})$ must rise, which requires that, given the boundaries of the firms, suppliers cut prices and/or (non final market) buyers suffer price rises²⁸.

The above strategies accentuate the underlying distributive conflict between management and the other parties involved, be they workers or firms. This is likely to prevent a common cognitive frame from being accepted by the parties. Thus, the company's management will have to focus its learning activity on the best ways to check possible reactions as well as on how to cut costs. Note that the client firms involved in such a strategy will most likely behave in a similar fashion. Given the demand constraint, they will try to maintain profitability by cutting costs. This will determine a redistribution of income among firms and between wages and profit.

Under these circumstances, relations among the parties involved recall those depicted by the new institutionalist theory: the absence of a common view increases contractual hazards so that the key issue is to devise contracts with appropriate safeguards (Williamson 2000). The real problem, however, is to achieve the bargaining power that will allow those contracts to be accepted: workers might well go on strike; client firms might look for new partners. Thus, the key strategic issue that management must tackle is that it has to prevent the parties affected by redistribution from having any critical control (knowledge) over the core activities of the firm. Subsequently, it needs to reinstate loyalty. The division of labour is a strategic variable, in this regard.

The capability to seek alternatives depends on how much the parties know. When “workers know too much”, management may assign tasks so that the core capabilities are in the hands of the management or of those who remain involved in the business conception²⁹. In a similar fashion and with the same intentions, that management may redefine the inter-firm division of labour within the value chain. Gaining access to a key resource, especially a knowledge-based one, is a typical way to devise what tasks need to be carried out within the firm and what tasks are of minor importance³⁰.

Leaving aside the macroeconomic implications of this behaviour, let us focus on the learning behaviour all this leads to. In so far as this strategy is successful, profitability is achieved in the short run. Under special circumstances – associated to the price elasticity of demand for the goods it produces - the company may even achieve price-based competitiveness. It will carve out a market niche that consists in those customers who value price more than quality.

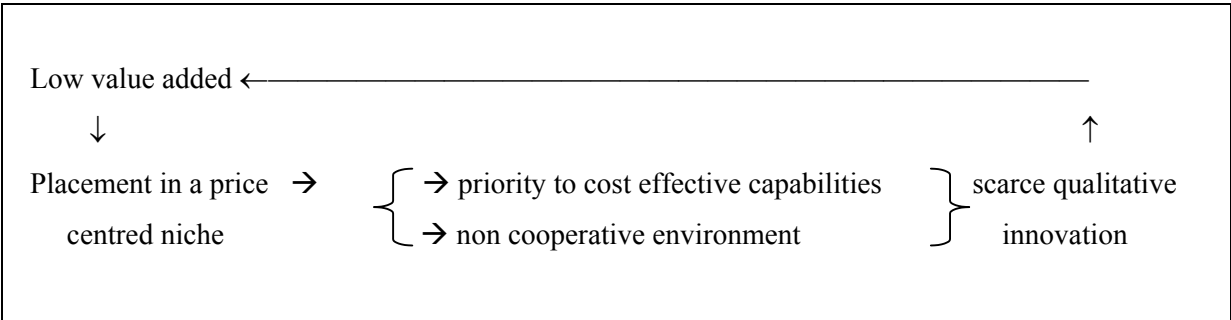
²⁸ A third strategy crosses the two fields of action. It consists in delocalising production by having former workers set up firms that will carry out some of the activities previously carried out by the company.

²⁹ Braverman (1974) stressed how this occurred under the Taylorist organisation of production.

³⁰ Some authors would speak of internalisation that aims at the creation of a competitive advantage.

Since low costs are pursued, managements will resort to the capabilities that enhance this sub-goal. Other capabilities, which would enhance quality-based competitiveness, will be relatively neglected. Furthermore, owing to the lack of cohesion these policies lead to, cooperation to improve quality is most likely to fade away. The final outcome is that the learning process depicted in Figure 1 will favour a specialisation in the market niche where prices are valued more than quality. Ultimately, since the division of labour devised to keep workers and client firms under control affects the nature of future capabilities, the consequence is that the pursuit of an appropriate bargaining power today precludes a whole range of learning processes that would enhance quality competitiveness on the product market tomorrow³¹. The process is summarised by Figure 3.

Fig. 3 – The learning process in a price competitive strategy



An alternative process is one where the market share of the company is not likely to fall in the short run and distribution within the company and in the value chain need not be acted upon. Under these circumstances it is possible to rely on a cooperative environment in these two fields of action and management can carry out a long-term strategy to foster quality competitiveness. This consists in devising products and production processes that define appropriate boundaries to the market for the products of the firm. The ideal outcome would be to establish a monopoly. A possible alternative is to create a very well defined market niche.

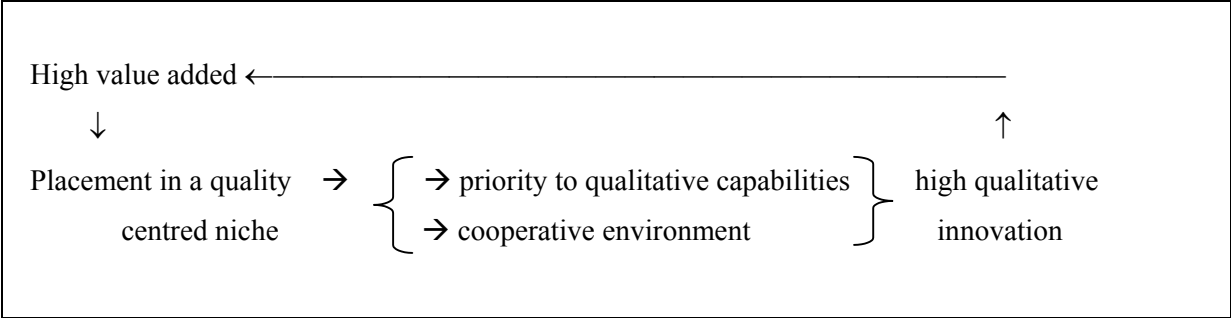
The above strategy requires the enhancement of capabilities that favour qualitative improvements. In so far as this strategy is successful, value added within the firm, and within the value chain are going to grow so that distributive tensions will not be strong and cooperation will be easier to accomplish. The ensuing learning process is depicted in Figure 4.

The two processes depicted above are characterised by self-reinforcing learning processes. Firms learn to solve the problems they need to cope with and they end up specialising in those specific activities. This occurs both within firms and among firms belonging to the same value chain.

³¹ A priori, this strategy could be just as profitable as the quality centred one. In Western economies this is less straightforward, owing to competition from the Third World and low price elasticities. Indeed, a “paradox of competition” may occur: “Intense local price competition can reduce global competitiveness, ... , by limiting the capacity of the sector to invest in its future; the result is a diminished capacity to compete against rival sectors located elsewhere” (Best 1990: 18).

Similarly, since strategies depend on the capabilities available at any given moment, they tend to be self-reinforcing as well. The nature of the competitiveness pursued - specialisation - tends to persist over time.

Fig. 4 – The learning process in a quality competitive strategy



Self-reinforcement occurs within industries as well. Interaction among firms is associated to productive links. It also depends on learning processes under uncertainty. Bounded rationality and the absence of a general solution to their problems forces economic agents to resort to “ready-made anchors of sense, ways of partitioning the space of representations, premises for decisions, and bounds within which [they] can be rational – or imaginative.” (Loasby 1999: 46). These anchors of sense derive from common patterns of behaviour but they also determine them. It is therefore most likely that firms will converge, at least to some extent, towards a common conception of competitiveness.

Another element that favours common strategies within an economic region – namely a country – is its economic policy. Consider that price- and quality- based strategies may be favoured or contrasted by the time range the firm has: in terms of expected profitability, a quality-based strategy usually requires more time than a cost based one. Although both strategies require that capabilities be identified and created, the latter may act upon existing products and processes whereas the former usually requires the identification and introduction of new products and/or processes. The conclusion is that a price-based policy is going to be more likely if the timing of returns on investment is short. A typical circumstance that may act upon this timing is the rate of interest, i.e. monetary policy. Since self-reinforcement occurs both over time and across industries, and economic policy favours a convergence in the strategies of the firms within a country, the conclusion this leads to is that persistent competitive gaps may ensue among economic regions. Specialisation may have an unpleasant flavour.

The above conclusions require a few qualifications. Two elements may weaken the feedbacks outlined. First, cost cutting and quality enhancing strategies were assumed to be mutually inconsistent. This need not always be the case, as when quality enhancing occurs on the shop floor and does not require time demanding efforts to create the appropriate capabilities and to acquire the relevant technical knowledge. Under these circumstances the creation of capabilities that favour cost competitiveness might co-exist with the creation of capabilities that favour quality competitiveness.

The second element concerns the nature of the learning process. Stein (1997) notes that *realised* learning includes both *intended* and *emergent* – or spontaneous – learning. Thus, when management determines a division of labour functional to a specific learning process, the final outcome may differ owing to emergent learning.

Two circumstances may accentuate the depicted processes, however. The first one is bounded rationality: it is easier to focus on a single goal rather than on two, possibly inconsistent, ones. The second one is the stringency of profitability: a quick rise in interest rates, for instance, is likely to turn a firm's main goal into a particularly stringent constraint, thereby forcing it to act on a quick cost stripping basis, at the expense of long-term improvements in the qualitative nature of its output (Perelman 1996).

V. Concluding remarks

Capabilities and the division of labour are strictly interrelated. They depend not only on technical circumstances but also on the need to maintain control over parties with different distributional interests within the firm and within the value chain. Control includes Witt's notion of involvement as well as Simon's notion of loyalty. It is particularly important when management pursues profit through redistributive strategies rather than through a rise in value added.

Technical and control-related circumstances are not independent of each other. When management succeeds in maintaining control of the other parties, it can focus on competitiveness in the final product market. In so far as this strategy is successful, it is easier – through the rise in value added – to prevent redistributive action, thus conflict within the firm or the value chain. This leads to a reinforcing process where control and competitiveness are mutually consistent. Conversely, when control is not achieved, the division of labour must favour a learning process that establishes loyalty. This is likely to prevent the pursuit of a more successful strategy in terms of competitiveness and value added. Under these circumstances, distribution may remain a key strategic variable and loyalty may have to be reinstated over time.

The theoretical implication of the above analysis may be appreciated by focusing on how it accounts for differing growth rates: it does not focus on circumstances that merely constrain business behaviour (North 1990) but suggests that managerial strategies play a major role in determining capabilities, learning processes and business behaviour itself. The policy implication is that the ensuing patterns of specialisation and growth can change only if the learning processes within firms are changed. Measures that focus on the immediate reactions of firms but disregard effects on learning processes may lead to undesired outcomes. Restrictive monetary policies, for instance, may favour profitability in the short run while they enhance processes such as the one depicted in Figure 3. Similar considerations may apply to policies that lay emphasis on labour flexibility and wage cutting.

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