Twin Brothers in Marshallian Thought: Knowledge and Organization

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> The new age gives ever increasing opportunities to the business man to strengthen his enterprise in making good use of information, which is generally accessible … the multitudinous knowledge, which modern resources place at the disposal of the who seek them rightly (Alfred Marshall, Industry and Trade, 1919, 360-61).

Introduction

As many authors, especially the Austrian School, have highlighted, knowledge or information is placed at the center of the production process. The roots of this idea in the history of economic thought are ancient, but Menger is habitually designated as the pioneer. Nevertheless, many others – such as Loasby (1989) or O'Brien (1984)– have emphasized that we are able to find in the writings of Alfred Marshall the first intuitions of how Knowledge and Organization are born and grow interdependently within businesses. His ideas went unnoticed for almost sixty years after his death, perhaps because knowledge cannot be measured the same way as costs or profits. This was a consequence of the prevalent role of neoclassical tradition in the development of economics.

In recent decades, both the number and importance of industrial clusters has grown tremendously. Silicon Valley is the most prominent example, but there are many such 'technological parks' being created and growing rapidly all over the world. They are formed on the principle that by coupling technological researchers together with innovative businesses in the same physical space, with both groups working at the forefront of technology, networks of easy access feed-back are created, which facilitate and encourage new improvements in their fields.

More than one hundred years ago, Marshall wrote a detailed description of what he called "industrial districts" –a model which has served as the conceptual seed of these contemporary 'technological parks.' This concept is intimately linked to the presence of an "industrial atmosphere", as Marshall himself described, declaring that "the leadership in a special industry, which a district derives from an industrial atmosphere, such as that of Sheffield and Solingen, has shown more vitality in view of the incessant changes of technique" (1919, p.287).

Lately, authors such as Bellandi (1989), Reisman (1990) and Casson (1995), among others, have commented upon the novelty of Marshall's insight. David A. Harper (1996) explores change from another point of view; using the method described by Marshall, he applies the ideas of K. Popper to the question of decision making, an activity which businessmen are forced to practice in an atmosphere of uncertainty.

We examine Marshall´s ideas on business organization and the generation of information by businesses. A close reading of his *Principles* and *Industry and Trade* allows to extricate the interrelation between these themes and the way Marshall links them. The paper touches on a number of topics, including Marshall's rejection of Walrasian general equilibrium, internal organization of business, cooperation between firms, problems with the notion of perfect information and price competition, and the historical appearance of marketing in the late nineteenth and early twentieth century.

The scheme we follow in this paper begins (1) by analyzing the role of knowledge in economics. We continue showing the way in which he explains the inside (2) and outside (3) creation of knowledge in the firm. Section 4 addresses one of the consequences of this connected growth: the rejection of the commercial secret. This lead us (5) to its inter-connection with the organizational aspects. The business-men's practical use of this amount of information takes up Section 6. In the next one (7) we analyze the joint-role of Marketing and Knowledge in the economic world. Finally, we conclude in Section 8 with a summary of the paper.

What is new here is the way on understanding of this range of topics can be organized under the concepts of Knowledge and Organization, as well as a suggestion of the historical context of Marshall's work distinct from logical context emphasized in neoclassical readings.

In this process of inter-related growth, Marshall finds that there exists a progressive advance, in that each new phase benefits from the acquisitions made in the previous ones: the internal organization of the business contributes a useful volume of internal data; the organization of entrepreneurs in the same sector gives them access to a common pool of knowledge; and information from clients and suppliers improves the external organization of the business.

1. The Role of Knowledge in Economics

The business environment is constantly changing, but more important than the changes themselves is the entrepreneur's perception of them. In order to develop realistic strategies he needs detailed knowledge of the reality of the business and its environment, significant information about the business's activities, and ideas in which he can base his actions. Lack of information makes the real problems of the business immediately imperceptible and consequently the entrepreneur designs inadequate performance plans.

In this process, the businessman clearly acts in two phases: he identifies the relevant problems and formulates a strategy which leads to their resolution. In identifying the problems it is vital to consider changes in taste and to detect real-time consumer expectations. Solutions will always have a subjective character, according to available information; each person has access to different ones, and even when two entrepreneurs have the same information, they can draw distinct conclusions. Marshall stressed the idea that the tendency to variation –biological in origin– always makes different the paths run by two persons, although they share the same starting and finishing points: "even in the same place and the same trade no two persons pursuing the same aims will adopt exactly the same routes" (1961, p.355)

The person capable of synthesizing and contrasting information from different sources is able to make more appropriate judgments. Appropriate information activates the principle of comparative advantages as applied to businessmen: persons with different qualities will gravitate to different businesses. Knowledge and Organization in the firm appear closely related. "Capital consists in a great part of knowledge and organization" (Marshall, 1961, p.138). He recognizes that this information, disseminated throughout the economic world, is partly the 'private property' of those entrepreneurs who were able to gather and assemble into a coherent whole its disparate elements and partly 'public property', available for everyone. He is thinking, when speaking of this second category of knowledge, of official economic statistics and of data available through both the general press and specialist journals (Marshall, 1961, pp. 492-3).

The starting point for Marshall is the Smithian analysis of the division of labor's consequences, one of which is the growth of information available within the economic circuits in which it develops its activity. The main source of this knowledge is the laborer: the greater the number of laborers collaborating in the production of a specific merchandise, the more knowledge is created. That is the reason Book IV begins by introducing the well-known "fourth agent of production," the Organization. This set of technical and human elements that he brings together under the label "organization" is more efficient if the knowledge produces a constant feedback.

"Knowledge is our most powerful engine of production; it enables us to subdue Nature and force her to satisfy our wants" (1961, p.138), asserts Marshall in a paragraph not included until 1898. The late attention to these questions could be the result of his contacts with Menger and other members of the Austrian School, who situate information as the cornerstone of their entire economic system. From this date on, he devotes much attention to the importance and the implications of information managed by the entrepreneur, the effects of organization on the development and use of knowledge.

The contrary opinion is held by Loasby (1991a, pp.39-40), who thinks that 'there is no evidence that Marshall's identification of knowledge as "our most powerful engine of production" was derived from Menger'. The stress on human capacity for improving seems to be very Austrian but no ved from Menger'. The stress on human capacity for improving seems to be very Austrian but no less Victorian. The argument is that the Austrians study the consecutive channels for the use of this information, but the English are the authors who analyze the conditions under which it is created. Marshall would have used 'this connecting principle to impose order on his investigations into manufacturing technology and business management'. I disagree with the idea that 'it is a construct imposed on those investigations.'

There is no doubt, as Loasby appropriately indicates, that 'the twin themes of the Book (*Principles*: IV) are the effects of the growth of knowledge on the organization and the costs of production and the effects of the organization of production on the growth of knowledge.' Marshall employs both blades of a pair of scissors at the same time to study a portion of economic questions. In this understanding, he outpaces his predecessors in economic science, which had not taken into account this element: "the older economists took little account of the fact that the human faculties (among them, the knowledge) are as important a means of production as any other kind of capital" (Marshall, 1961, p.229).

This mutual influence between organization and knowledge has been little valued within the models of general equilibrium which for years have dominated economic thought and, paradoxically, were in themselves a clear example of the effects that the organization of the economic theory of production had on the growth of economic information. "The change that has been made in the point of view of Economics by the present generation … is due to the discovery that man himself is in a great measure a creature of circumstances and changes with them … and the growth of knowledge and earnestness have recently made" (Pigou, 1925, pp.153-154). In modern terms, Marshall could have been classified as an institutionalist.

In Marshallian economics, the role of information is vital. "None of these methods can be safely used without wide knowledge … We must have access to a vast mass of facts which we can, so to speak, cross-examine, balancing them against one another and interpreting them" (Pigou, 1925, p.168). As a consequence, he seems to yearn for a world of complete knowledge and he laments that the lack of such world is the principal problem the entrepreneur must confront: "but they may be made much more trustworthy than they are at the present, if they can be based on statistical measures" (Marshall, 1961, pp.491-2).

This information takes two forms: what is occurring within the business and the exterior conditions of the marketplace. In the first form, the small industrialist perhaps has the advantage over against the greater costs of big business ("the master's eye is everywhere"). Regarding external information –the progress of industries and markets–, the small industrialist is at a disadvantage. He requires information to exercise effective leadership over his subordinates, clients and competitors. The popular refrain says it all: 'information is power.'

2. Information within the firm

Business can be considered as a complex institutional arrangement for creating, filtering, evaluating and making sense of information. From this huge amount, the entrepreneur must determine exactly what information is significant for the proper running of the business. Not all facts have the same value. The businessman thus uses the information he possesses to experiment with products and productive processes, not only in response to demand but by way of anticipating it.

Elbaum and Lazonick (1984, p.573) state that 'how these firms structured production depended very much on the prospects for selling their output. Contrary to typical textbook theory, Britain's competitive firms did not as a rule assumes that the market could absorb all the output they might produce at a given price'. They produced a few items in anticipation of demand. Almost all production was made at the request of major distributors. That Marshall's first form of organization has a resemblance to and is an approximate equivalent of Darwinian variation.

Concepts taken from the theory of evolution influenced greatly English scientific environment at the end of nineteenth century, especially in economics. The business world was included in this tendency. "The tendency to variation is a chief cause of progress" (Marshall, 1961, p.355), and this is what is expected of efficient institutions. I agree with Loasby (1991b, p.124) when he explains that dominant economic theories from 1900 onwards, based on the postulates of perfect competition, were poor instruments for business analysis: 'perfect competition is inefficient because it requires homogeneity; evolutionary efficiency, by contrast, requires the firms in an industry to be somewhat different … in order to generate novelty in both process and product'.

Perfect competition avoids the role of firms and entrepreneurs. If knowledge is free and everyone can have access to it, the role of the entrepreneur within his enterprise is irrelevant. What happens within the business has no importance, or does not differ from what occurs in the marketplace, which is the true determiner of economic activity. Apart from his function as manager, to the entrepreneur alone falls the task of listening attentively to market signals, to adjust his offers to a fixed demand. Knowledge is also a fixed quantity; the system creates no new information.

Marshall distances himself from this posture relative to the business's internal information. He thinks that the big economic problem is not making better use of what one already has but exchanging it for something better; not optimizing what is given already, but redefining it. For this reason, business appears to be an organization that helps to improve information. Accordingly, the first requirement of the entrepreneur is "a thorough knowledge of things in his own trade" (Marshall, 1961, p.297), which things provide the basis from which he can innovate. As the person responsible for the entrepreneurial structure, the entrepreneur must create adequate channels to prevent information from going to ruin.

Such a process is related to the size of the firm. "The small manufacturer has a number of advantages. These include not only a detailed knowledge of processes and resource use within the firm, but also the ability to recognize and utilize managerial talent amongst employees" (Marshall, 1961, p.284). 'The large (joint stock) firm has to substitute other (resource-using) devices to gain some knowledge of what is going on within the firm. These include cost accountancy and "scientific management" in the utilization of which a learning process occurs' (O'Brien, 1984, pp.26-7).

Marshall amply develops (Marshall, 1919, pp.350-94; 1961, pp.278-90, 303) the argument that the attainable level of knowledge is nothing statistical. Competitive pressure causes internal information to grow over time. More than a brake, it is a stimulus that obligates the entrepreneur to undertake creative work, and not simply to repeat what others have already done. He must create new information. Marshall supposes, moreover, an internal economy insofar as reduces transaction costs: "the small employer remains at a great disadvantage in getting information and in making experiments … for external economies are constantly growing in importance relative to internal in all matters of trade-knowledge" (1961, p.284). Marshall supposes that the business's external economies were growing more rapidly than its internal ones.

The principal asset of an entrepreneur consists in his entrepreneurial ability and his capacity to create profits. Within the enterprise, this capital crystallizes in the internal organization that he is capable of creating. A great part of organizational capacity is a reflection of the information that has been obtained, and, at the same time, is the crucible for the development of future knowledge. 'In Marshall's theory of economic evolution, random mutation is replaced by human initiative and creativity … the firm is an institution for combining relevant knowledge in a way which encourages the generation of new knowledge' (Loasby, 1991a, p.127). 'Each firm', he continues, 'to be successful, must operate within an imperfectly-specified contract'.

The entrepreneur's task includes a continuous search for information. Since resources, reasons our economist, are not assigned without information costs, knowledge plays a central role in relation to both the internal situation of the enterprise and the marketplace.

Casson (1990, p.XIX) shows that 'transaction costs in internal markets make it easier for the entrepreneur to exploit the information himself rather than to license it'. Marshall understands the enterprise as an instrument to gather and exploit information for a "development of intentions made by the workers, with the cooperation of the employers" (1919, p.644). 'Good internal communications within the firm allow it to function as an open-learning system, whereby the public good properties of information are exploited to allow all employees to draw their own inferences from information collected by the firm… Free access to this information allows everyone to take entrepreneurial decisions effectively, wherever they have the authority and the confidence to do so' (Casson, 1990, p.XX). In this sense, it makes sense to speak of 'industrial districts'.

'The ability of the firm to reduce transaction costs depends not only on the ability of management to make good decisions, but also on the organization structure created to assist the decision-making process' (Niman, 1991, p.162). But the entrepreneur must also have the ability to build and run a successful organization; and "to have a power of interesting them in the business and of getting them to trust him, so as to bring out whatever enterprise and power of origination there is in them" (Marshall, 1961, pp.297-8). For him, the question is not so much whether the entrepreneur is able to maximize a given objective function as whether the enterprise's organizational structure inhibits the entrepreneur's capacity to recognize and use relevant information. This is not the current conventional manner of focusing the problem. Although Marshall does not specify which forms of organization help the growth of knowledge, it s one of the central problems of the big businesses coming into being in Victorian England.

Despite all the effort expended on the problem, there is little data as to how entrepreneurs of the Victorian-Edwardian era acquired and used their knowledge about business. "For, indeed, the progress of knowledge in economics as elsewhere has shown that nature's facts are more diverse and more complex as used to be thought" (Pigou, 1925, p.297). Marshall shows in several passages that a mediocre level of attention to information could be the cause of relative business decline at the end of the century. There was growing mass production but entrepreneurs depended more and more upon wholesalers for distribution. Businesses oriented themselves towards production, allowing sales departments to descend to a position of secondary importance. Goods were produced with little anticipation of demand, since businesses were at the orders of wholesalers and distributors. Information could lose its importance to the entrepreneur from the moment they imposed both conditions and products.

3. Information acquired outside the firm

The "second form of organization" emerges when the businessmen of a specific district begin to cooperate. They create in this manner "business networks" whose stability resides in large part in their own economic stability. Coase's alternative mechanism of hierarchy and market come into play. The competition shows precisely which forms of networking are really efficient.

Along these lines, Casson and Paniccia (1995, p.26) have brought to completion a novel comparative model of industrial districts in Northern Italy and South Wales, based upon Marshallian premises. In this work they show that the local networking of the Marshallian industrial district is well adapted to the fashion-oriented sector of the textile industry. Not by chance Marshall poses as example "trades connected with furniture and dress" (1961, p.396) when he explains that discrimination in prices is an adequate way of understanding those districts, although this does not imply 'that the mere existence of a district that is heavily industrialised does not qualify the place as an "industrial district" in the Marshallian sense'.

Cooperation leads to the creation of what Loasby calls 'invisible colleges', in which there is a free communication of ideas which encourages investigation. On this point Marshall appears to yearn for a world of perfect information in which the commercial secret should be eliminated. The process of improving information, by means of this process, will probably be organized more efficiently with "each new knowledge being the offspring of others that went before, and the parent of many that follow" (Marshall, 1919, p.206).

That second form of organization encourages invention and innovation. Everyone would take notice that the concentration of business capacities is an advantage for everyone: "each profits from the ideas of his neighbors: each is stimulated by contact with those who are doing new experiments; and each successful innovation begins to spread" (Marshall, 1919, p.53). A mechanism of conjecture, verification and criticism appears. This interaction between entrepreneurs favors the creation of new techniques, since "if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas" (1961, p.271).

Marshall finds himself swept along by his unshakable confidence in the benefits of progress and in the humanitarian capacity of men to share all scientific advances. This supposes that access to new technologies would have zero-cost for the business man. But he knew only too well the effects that the 'Second Industrial Revolution' was producing in the entire industrialized world.

There is abundant evidence that the lack of collaboration amongst entrepreneurs could have been a grave problem for England at that time. This is perhaps what Marshall wishes to highlight when he affirms that "it has indeed sometimes been charged with being responsible for an unreasoning disinclination, which is occasionally found among certain classes of British business men, to unite their efforts in tasks … to large for a single business; the adage "an Englishman's home is his castle" represents a side of national character" (1919, p.583). There is a progressively negative tone in the capacity of entrepreneurs to create free knowledge areas.

There were various factors that showed the valuable character of information as externality, as, among others, the improvement in communications amongst the isle. Marshall's insistence in the necessity for improvement in the character of English entrepreneurs takes notes of the necessity to cooperate so that external competition –from American and German businesses– would not overtake a great part of the English market, as in fact happened. Marshall directs his counsels in the first place to small businessmen, whom he considers the sinew of English business: "newspapers, and trade and technical publications are bringing him much of the knowledge he wants" (1961, p.284).

Diversity in the activities of businesses of a given geographic zone is a strong incentive for the growth of knowledge. As far as "the tendency to variation is a chief cause of progress; and the abler are the undertakers in any trade the greater will be this tendency," the organization amongst various entrepreneurs in the same sector clearly favors knowledge, due to natural heterogeneity within the group: "each man's actions are influenced by his special opportunities and resources, as well as by his temperament and his associations " (Marshall, 1961, p.335).

Marshall sees variety in business as a constant source of mutual enrichment: "of two retail dealers one will have a large capital locked up in stock and the other will spend more on advertisements and other means of building up the immaterial capital of a profitable trade connection … and even in the same place and the same trade no two persons pursuing the same aims will adopt exactly the same routes" (1961, p.355). He maintains this point of view although the vision of the industrial world as a community in which information is shared is not congruent with the role that the dominant economic liberalism attributed to the market and to the competition, which leads to differentiation in businesses.

4. The Commercial Secret

What is congruent is Marshall's rejection of the commercial secret. He affirms as an advantage for the entrepreneur "that the secrecy of business is on the whole diminishing, and that the most important improvements in method seldom remain secret for long after they have passed from the experimental stage" (1961, p.285); there is a "new facility for the free interchange of ideas between distant places" (1961, p.273). He criticizes those entrepreneurs who guard information about the market, holding them responsible for a "lack of imagination" (1919, p.583); he considers that this is a vestige of less civilized times, when men hid information as dogs hide recently found bones.

Marshall's interest in improving studies directly aimed at entrepreneurs had, among other objectives, the elimination of these shackles in the world of business. Marshall was confident that business education was the most effective method for inculcating in this social class some of the characteristics he considered indispensable: economic chivalry, sense of duty, alertness (1961, pp.719-22). The reason is that "many of these experiments are made by students in the pursuit of knowledge for its own sake, and are promptly published in the general interest" (Marshall, 1961, p.285). This he considered immoral, because it limits others' opportunities in the market (Moss, 1992, p.8). But he did not attain an harmonious integration between his moralism and his desire for free action in the market.

Marshall's liberal reformist sentiments about free access to commercial information are seen clearly when he assures that "there is every reason to hope that the progress of trade morality will continue aided … by a diminution of trade secrecy and by increased publicity in every form; and thus collective and democratic forms of business management may be able to extend themselves safely" (1961, p.303). In *Industry and Trade* he praises the new industrial conglomerates which were being created in those years because "they work with old rivals for the common good of the country" (1919, p.101). But if information has such a low cost, incentives to direct funds towards investigation are eliminated.

Marshall finds many advantages in the rapid diffusion of information in the economic world: it permits access by persons of lower levels of society to new economic possibilities; it alleviates poverty; it eliminates monopolistic practices, increasing national wealth. Commercial secret is a source of losses for the society: "what each gains by his secrecy is less than what he might gain by a liberal policy of give and take with his associates" (Marshall, 1961, p.583). And he places public opinion, in relation to the increasingly greater diffusion of information, "with the constant tendency of what has been regarded as private and personal issues to become public and national" (Pigou, 1925, p.285). He considers as very positive this displacement of information from the private to the public realm.

This is one of the keys in which he shows himself contrary to new applications of State functions "in branches of production which need ceaseless creation and initiative. It is to be regarded as *prime facie* antisocial, because it retards the growth of that knowledge and those ideas which are incomparably the most important form of collective wealth" (Pigou, 1925, p.339). Marshall reflects time and again over the distinction which he establishes in the beginning of Book IV between private and public knowledge and organization. The contrast is evident: "while Governments are being thus urged in the name of collectivism to an anti-social destruction of the springs of knowledge, a public engineering venture can often make a brave show" (Pigou, 1925, pp.338-9).

Thus knowledge is not a fixed quantity which, while within the system, does not grow: it is simply distributed in different manners according to each phase of economic activity. This is the great difference with the Walrasian system of static equilibrium, which does not create new knowledge but has as its effect something similar to that of a fan within a closed room, capable only of recirculating air already present.

5. Information and Organization

Marshall posits his third form of organization in a very 'modern' way, because he integrates in the framework of this knowledge a great part of the social fabric surrounding the business. A network of information and transmission of ideas unites the entrepreneur to his suppliers and clients. In this manner the business's external organisation is improved and innovation is incented. It is a weft of commercial, social and technical agreements which unites the entrepreneur even with his rivals, whose innovations give him both incentive and information.

Marshall's insistence in the theme of the complementarity between information and the business's "external organization" has hardly been subsequently developed. The high degree of productivity which was being praised in these newly-formed industrial districts drew the attention of our economist, who intuited some of the potential benefits of this revolution in the industrial organization of his epoch. This did not impede him from detecting the danger of degenerating into a mutually reinforced immobilism. As Loasby shows (1991a, p.81), this part of Marshall's analysis has been taken up by Porter. But studies such as those by 'Williamson ignore Marshall's emphasis on the importance of a thorough knowledge of one's trade… his firms are little more than a portfolio of production functions under expert financial management'.

Learning from the problems posed by clients and suppliers has some present transaction costs which reduce those in the future and show the way which innovation must follow. 'Nelson and Winter's analysis of organizational routines is thoroughly Marshallian' in its recognition of the "external trade connections" (Marshall, 1961, pp.458, 377), 'which embody knowledge and offer a basis for new experiments' (Loasby, 1989, p.56).

Once again Marshall establishes a distinction, according to the size of the businesses. Because the entrepreneur "must have the power of forecasting the broad movements of production and consumption" (1961, p.297), big businesses find themselves in an advantageous position to observe market conditions, because of the great quantity of commercial contacts which help them in the acquisition of information (Marshall, 1961, pp.278-83). Size conditions the amplitude of the external connections a business can develop.Thus he recommends some type of alliance amongst the smallest businesses in order to share this knowledge.

Marshall takes into account other factors which facilitate the growth of knowledge, such as the facility of geographic mobility of high level managers, because "a shifting of places enables the more powerful and original minds to find full scope for their energies and to rise to important positions" (1961, p.197n). The relative role and importance of immigrants in entirety of Victorian English business is a myth in need of revision. But the advantages of the recently arrived in perceiving and adopting new ideas is a familiar theme in studies of economic growth. In the England of the second half of the nineteenth century the Quakers were especially active, capable as they were of maintaining an extensive network of communications which would cover the entire country. In an epoch in which capital markets where still little organized, they were able to gather funds dispersed throughout the country in order to finance their investments.

The management of information is key in business activity: "the new age gives ever increasing opportunities to the business man to strengthen his enterprise in making good use of information, which is generally accessible, but yet cannot be turned into account without some mental effort; and if he does not avail himself of them, he must make way for more alert competitors … who have learnt how to turn to account the multitudinous knowledge, which modern resources place at the disposal of those who seek them rightly" (Marshall, 1919, pp.360-1). Knowledge is situated in the heart of the productive process, although this idea has not been appreciated until very recently, presumably because knowledge cannot be measured as can be costs and profits. Marshall was conscious of knowledge's importance. Nowadays these ideas fit in well with the modern concept of human capital.

6. Management of Information

The fundamental question is not so much the collection of information as the selection of what is most relevant for business objectives. Nowadays we understand the question well when we observe the bombardment of information to which we are subjected. The problem was quite different a hundred years ago. If we pay heed to Marshall, Victorian entrepreneurs were incapable of completing the fundamental task of adequately administrating the volume of information derived from the business's internal and external organization.

This does not imply that he is thinking of a world of complete information. He knows perfectly well that "a perfect market is a district, small or large, in which there are many buyers and many sellers all so keenly on the alert and so well acquainted with one another's affairs that the price of a commodity is always practically the same for the whole district" (Marshall, 1961, p.112).

Some doubts remain when we read that "there is no means of ascertaining exactly what prices are paid in many transactions" (Marshall, 1961, p.112). The entrepreneur does not know how the others in his own branch of business are acting: is he confusing an economy of full information with one which exists in reality? The famous "business community" seems to evaporate.

But Marshall knows that the entrepreneur always acts with imperfect knowledge. "Manchester warehousemen give themselves to studying the movements of fashion, the markets of raw materials, the general state of trade, of the money market and of politics" (1961, p.295). Only then do they decide which products they will manufacture.

The attribution to the Marshallian entrepreneur of moving in a world of full information without costs is related to the simplified model of perfect competition developed by Pigou and to the use later economists made of the clause *ceteris paribus* with respect to full information, with a view toward facilitating the resolution of problems. "Perfect competition requires a perfect knowledge of the state of the market … it would be an altogether unreasonable assumption … The older economists often seemed to imply that they did assume perfect knowledge" (Marshall, 1961, pp.540-1).

The reality is change, which means that there is no perfect knowledge: "but we cannot foresee the future perfectly. The unexpected may happen; and the existing tendencies may be modified before they have had time to accomplish what appears now to be their full and complete work. The fact the general conditions of life are not stationary is the source of many of the difficulties that are met with in applying economic doctrines to practical problems" (Marshall, 1961, p.347). The business horizon changes radically if we accept the neoclassical idea of full information.

During the Conference for Industrial Remuneration (1885, p.181), Marshall speaks of the causes which have negatively influenced salaries and employment, and he considers that they are "connected with the lack of knowledge" and proposes new investigations by economists in short term fluctuations and the development of economic prospects for "formulating prognostics about the future of commerce, which would help industrial employment become more stable and continuous". In affirming a certain predictive character for economic science, he is advancing some of the basic postulates of Milton Friedman's methodology.

Nevertheless, time is 'absolutely continuous' and supposes change: mathematical models of positions of inertia are deceptive guides for drawing us closer to a changing reality. Predictability is difficult in these circumstances: "the future of an economic tendency is more difficult of prediction; because it will be governed by conditions which have not yet come into sight" (Marshall, 1919, pp.537-8). The entrepreneur must use the system of trial and error: intuitions, speculations are his weapons: "we cannot foresee the future, the unexpected can happen" (1919, p.289). He must guess the direction of the market in order to adapt himself to it but also to transform the way in which he moves (Reisman, 1990, p.410). Marshall reserves his praises for those who are behind this change.

The management of information within these industrial districts presupposes that the entrepreneur believes himself to have superior judgment and to manage complex problems better than other persons: "judgments of ordinary people must be inferior to those which an able businessman forms, by the aid of instincts based on long experience with regard to his own business" (Marshall, 1961, p.491). It is paradoxical that this talent which makes the business man superior is based in the least 'human' part of the person, that is, in the person's instincts. This concept connects with the idea of purely natural rationality which is shared by neoclassical authors, an idea continued to our own time by authors such as Hayek.

This was the mode of thought in the Victorian epoch and Marshall's ample knowledge of the business world did nothing but confirm such presumption. No one can assure that business judgments are superior to those of other persons, but they believe they have relevant information possessed by no one else: they think "that the supply of anything is likely to run short… and buys it on the assumption that his judgment is right" (Marshall, 1919, p.253). This is the same manner in which act "ill-informed speculators who generally suppose themselves to be basing their action on the most recent news" (1919, p.264). The lack of "economic chivalry" on the part of speculators converts them into a danger for the stability of these communities of knowledge.

For Marshall the conclusion is that "no one can have first-hand knowledge of any considerable part of the conditions and other facts relevant to any issue … a business man is generally the best and often the only authority on those transactions for which he is directly responsible" (1919, p.679). But he ends up concluding that his conclusions are less trustworthy to the extent that the business increases in size. Once again size is a basic element of analysis, but now the advantage is with small businesses, in which is less common the activity of such speculators.

The field of search for information appears delimited by entrepreneur's level of expectations. Marshall was the first author to show that expectations govern economic actions, although he considers them only when it is supposed that they are approximately correct. The entrepreneur tries to form a rational picture of the costs and benefits of different options, by means of intuiting what will happen in the future; despite this attempt he must always make a choice between alternative risks, which is inherent to his function: "to take a risk inherent to a function" (Marshall, 1919, p.270). The entrepreneur can in some way anticipate the course of the economy as well as the income earned for each production factor, the entrepreneurial profit.

Expectations are much more powerful than the facts. Entrepreneurs "are governed by their expectations of demand" (Marshall, 1961, p.374). Perhaps he could have made better use of one of the two principles he relates –information and organization– to structure his own analysis of expectations: the recognition that information is subject to a continual process of conjecture and criticism invalidates the idea that rational expectations can be based in correct models.

Marshall is radically skeptical about the possibility of knowing the world of ideas but "the world in which we live … the greater the appearance of lucidity which is given to it by skillful exposition, the more mischievous it is; a man is likely to be a better economist if he trusts to his common sense and practical instincts, than if he professes to study the theory of value and is resolved to find it easy" (1961, p.368). In practice it is easier for the entrepreneur to take decisions in a sequential rhythm of tactical decisions –instead of all at once– in keeping with the generation of new information.

7. Marketing and knowledge

English commercial life of the second half of the nineteenth century assisted in the birth of the first advertising techniques. Marshall associates this new phenomenon with knowledge of consumers' tastes and needs. The business man who maximizes his income looks for ways to anticipate consumers' future necessities in the face of changing preferences and ignorance of rival's plans. "A progressive business must rouse an interest in its improved and new-fashioned products: and if they are very expensive … the marketing side of the business must be very strong" (Marshall, 1919, p.173). All things considered, he must create demand for his products.

From 1870 on production in England grew more slowly, in part due to inadequate demand, above all in exportable articles. Production underwent a change of direction; the epoch of producing foodstuffs had come to a close, and businesses had to meet the demand for quality. Exports fell and, moreover, the English market grew more slowly than those of other countries: market conditions could have been a serious obstacle to growth.

In these conditions, it is not strange that the principal effort of English businessmen was placed in product differentiation: Marshall cites the tobacco industry. Businesses found themselves obliged to contract advertising professionals in order to manage to make their products more attractive (Marshall, 1919, p.307). But Marshall goes further; he does not content himself with trailing behind demand: the goal of advertising has to be the creation of needs. "It is almost impossible for him to discharge what Roscher calls a characteristic task of the modern manufacturer, that of creating new wants by showing people something which they had never thought of having before; but which they want to have as soon as the notion is suggested to them" (Marshall, 1961, p.208). This is what H. Austin did, for example, in the automobile industry, using for the first time showcases and advertisements in the press.

Marshall is not completely convinced of the beneficial effects of business advertising and distinguishes between constructive and combative publicity. The first "includes all measures designed to draw the attention of people to opportunities for buying and selling, of which they may be willing to avail themselves" (1919, p.304). On the other hand, "advertisements which are mainly combative generally involved social waste; the lavish advertiser must deduct his expenses from the gross profits of his additional sales" (1919, p.306). For a liberal like Marshall, everything which supposes the introduction of rigidities into market mechanisms must be eliminated.

Studies conducted in numerous English businesses show the progressive professionalization of advertising activities. Due to this professsionalization, "an increasing part of the activity of a manufacturing firm is now given to marketing" (Marshall, 1919, p.170), which "is facilitated by association with others engaged in the same industry" (1919, p.511). Advertising thus can be carried in common by various enterprises of a commercial district, as long as they work in related areas. This is a romantic vision of the connection between information and marketing. But these days the idea is actually gaining ground with the new tendencies of 'shared marketing'.

It was increasingly frequent to meet persons in businesses specifically dedicated to this activity. In the same way, "academic students and professional advertising agents have united in applying modern methods of systematic and progressive analysis, observation, experiment, record, and provisional conclusion … to ascertaining the most effective forms of appeal" (Marshall, 1919, p.307). The topic for analysis is the influence of taste on advertising production costs and the proof of this is that "changes in fashion are not now products of a wayward fancy … they are deliberately planned several months before the obtain vogue" (1919, p.809). He must be thinking of the creation of demand.

Marshall makes some lucid observations about the connections between advertising and knowledge when he realizes the difficulty of assigning to each branch of a business its share of marketing expenses (Book V, VII, 2). He relates the energy and efficacy of advertising to the size of the businesses. Compared to small businesses, the large enterprise" can spend large sums on advertising by commercial travelers and in other ways … and its own goods advertise one another" (1961, p.282).

He associates information and advertising, and comes back to the theme that "the manufacturers frequently find it best to use certain of their goods as a means of advertising others; in the former class they put those good which are so uniform in character and so largely consumed that nearly all purchasers know their value very well, in the second those with regard to which purchasers think more of consulting their fancy than of buying at the lowest possible price" (Marshall, 1961, p.396).

In spite of his conviction that 'small is beautiful', he was incapable of extending this concept to business advertising, because "the advantages of large capitals in competition with capitals of smaller size are constantly increasing almost everywhere" (1919, p.249). "The larger private firms, though far superior to public departments, are yet, in proportion to their size, no less inferior to private businesses of a moderate size in that energy and resource, that restlessness and inventive power, which lead to the striking out of new paths" (Pigou, 1925, p.280). This is why he concludes "no doubt some of the forces that are working against the small producer are growing cumulatively" (Marshall, 1919, p.248).

The advantages of big business in relation to advertising played a decisive role in the process of mergers in English industry. It was not until 1916 that Marshall added this paragraph: "the economics of highly organized buying and selling are among the chief causes of the present tendency towards the fusion of many businesses in the same industry or trade into single huge aggregates" (1961, p.282). The origin of this movement lies in the division of work and Marshall sets as an example construction contractors who direct the work of many other people, "but they themselves undertake the chief risks of the business, and control its general direction" (1961, p.294).

Marshall understands advertising as a production costs; he dedicates chapters VI and VII of *Industry and Trade* (1919, pp.296-307) to this question. The realization of cost economies in production was limited by marketing expenses in the face of inelastic demand. "The obstacle for growing its production does not reside in derivative costs but rather in the sale of goods without having to expend great quantities in marketing, which is a costly effort" (Marshall, 1919, p.543). 'The ability of the firms to realize potential cost economies varied with managerial strength which in turn varied with the life cycle of the firm' (O'Brien, 1984, p.30). "A great part of the capital invested in a business is generally spent on building up its internal organization and its external trade connections " (Marshall, 1961, p.337). The monopolist may lower his price with a view to the future development of his business, because "the demand for a thing depends in a great measure on people's familiarity with it" (1961, p.486).

Precisely the importance which he concedes to advertising is one of the most powerful arguments for not including Marshall among the defenders of the theory of general equilibrium, since, as Loasby affirms (1989, p.57), 'marketing has no place in perfect competition; imperfect competition may allow for selling costs, including advertising … but such costs are usually considered to be wasteful, and sharply contrasted with production costs'.

Marshall's point of view is noticed when he affirms that "production and marketing are parts of the single process of adjustment of supply to demand; the division between them is on lines which are seldom sharply defined: the lines vary from one class of business to another, and each is liable to modification by any large change in the resources of production, transport, or the communication of intelligence" (1919, p.181). This is a very modern focus which, although it was not followed by economists until a good deal later, for Marshall helped to explain the course of industrial development.

8. Summary

Marshall presents a model to explain how the entrepreneur generates fresh knowledge in the business world, thereby improving the organization of an industrial sector. He bases this model on the process of positive feed-back created between Knowledge and Organization. The entrepreneur does not simply develop an attitude of adaptability to his environment, but rather attempts to modify the work environment in a dynamic way.

This dynamic change is a process of growth, interrelated with progressive advances, through which each new period takes advantage of the advances made during all previous periods. Marshall explains this process on three levels: a) the business's own internal organization serves as a source of internal data; b) the organization of businesses within an "industrial district" gives each the access to a fund of "common knowledge"; and c) knowledge imparted by suppliers and consumers serves to improve the internal organization of each business.

This schema might seem to be a product of the Austrian School's influence. However, this viewpoint actually corresponds to that of the Smithian Labourer who, aided by the growing division of labour, discovers new methods of accomplishing his specific task.

The "first form of organization" is produced within the individual firm, which is seen as an institution created to evaluate and make sense out of knowledge. Marshall distances himself from the Walrasian idea of 'general equilibrium', in which firms have a passive role, responding to market indicators but not emitting market indications through their own action.

The second "form of organization" comes into existence when the entrepreneurs within a specific field begin to co-operate. This co-operation is the origin of "industrial districts", in which there is an almost free access to the information generated by the group of firms. He maintains a negative attitude towards commercial secrecy, which he considers a vestige of less civilized ages.

Finally, the third organizational structure includes all economic agents, down to the level of consumers and clients, who form a wide social network around the firm itself. The knowledge which a firm receives through this network helps it to improve its internal organization.

Marshall does not develop his model according to a sequential rhythm, one organizational factor following the other. At each instant all of these factors are operative, though each follows a distinctive rhythm of its own. Likewise, the testing ground of entrepreneurial capacity lies within the concrete individual's ability to deal with and make clever use of the information at his disposal, in order to improve and compete at the organizational level.

Marshall himself seems to be debating between a world of fully and freely available information –determined at least partly by his concept of partial equilibrium– and the world of limited information which he observes in reality. However, it will be Pigou, not Marshall, who develops the model of 'Perfect Competition' which has come down to us.

Another area of application for such "generated knowledge" within the business world is marketing. Marshall is the first to demonstrate the possibilities of linking advertising and knowledge, for the purpose of "creating new wants" among consumers. However, he was never completely certain of the beneficial effects of indiscriminate marketing, and made certain to distinguish between constructive and combative advertising. Despite his lucid insights into this phenomenon, it would be somewhat of an exaggeration to include Marshall as among the 'founding fathers' of modern advertising.

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Abstract: The development of Marshallian thought in the realm of business theory has contributed to the appearance of a new branch of economic theory: Industrial Organization, as pioneered by Stigler. This theory relies, to a large degree, on the idea that a mutually beneficial relationship is produced in the industrial environment between the creation of new information and the organizational improvement of related firms. This symbiosis between knowledge and organization is the driving principle behind the 'industrial districts' which Marshall announced a century ago, and is most recently embodied in the contemporary industrial clusters such as Silicon Valley. However, Marshall distances himself from his equilibrium model when dealing with the issues of obtaining and managing information within the firm itself, creating a weak link in his own argument.