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Introduction

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By the end of the twentieth century, developed economies have been characterized in multiple ways: information economies, knowledge economies, post-industrial economies, and recently "new economies". But from a factual standpoint, nothing is as massively evident as the strong and continuous growth, for decades, of the share of services in employment and in GDP (in nominal terms). Now, although economists and social scientists have produced for a long time remarkable works on these activities, on the explanations of their growth, and on the new related economic and social challenges, one can say that the relative weight of the researches on services is still lagging behind the relative weight of services in economic practices.

Among the main research topics concerning services, there are those of their productivity (and more generally of their performances) and that of the innovation in services and through services. These two questions are obviously connected, if one admits that medium-term and long-term economic performances are strongly linked to the dynamism of innovation. This double issue is at the center of the present book, stemming from an international conference held in Lille and Roubaix (France) in June 2000 and attended by most of the leading researchers on these topics.

All the authors of this book have a long research experience on services, both theoretical and empirical. Their strong empirical knowledge of these activities leads most of them to diagnose the existence of a gap, often very marked, between the stylized facts that they display, and the traditional economic tools intended to interpret these facts. Productivity in services is a puzzle in many so-called "stagnant services", where existing data, provided by

national accountants, show little or no increase in productivity, while closer empirical observations and case studies show an impressive dynamism of these sectors, comparable to the dynamism of manufacturing sectors. How to reconcile these two opposite views? Several arguments have been put forward, but none seems to account for such a “cognitive gap”. This is why the hypothesis of a mismeasurement and “misconceptualization” of many service outputs should not be rejected.

It is not our contention that the main economic tools (growth, productivity, or the substitution of capital to labor, among others) currently used for such purposes should be abandoned, far from it. A large part of the actual measurement methods can possibly be improved, especially in the vast field of service quality assessment. But one has to ask whether this type of “incremental” improvement will be sufficient to grasp efficiency and quality gains in sectors such as health, education, social and care services, finance and insurance, and even retailing and eating and drinking places. More “radical” conceptual innovations are likely to be needed. This book provides some clues for both types of innovations regarding the economic performances of services.

The same holds true with innovation in services and through services. No doubt, a lot of existing theories and concepts are extremely powerful to understand part of the innovation processes in services. For example neoschumpeterian theories which take into account in a certain extent, the diversity of technological trajectories in services, But also neoclassical approaches (Baumol, this volume).

But at the same time, most of the existing conceptualizations (and the corresponding measurement methods, classifications used in national surveys, etc.) remain more or less industrialist and “technology-biased”. They fail to integrate certain essential dimensions of innovations in services.

Just as they are considered to only reach weak productivity levels, so services are often said to be incapable of innovating or to confine themselves to adopting technological innovations originating in manufacturing industry. A conception of this kind can cause serious difficulties in an economy dominated by services, since it precludes serious thought (particularly on the part of the public authorities) about ways

of energising an area of activity of great importance for the future of firms, industries and nations.

These misconceptions have their origins in the manufacturing and technological bias of our analytical apparatus. In standard neo-classical economics, the question of innovation is perceived through the concept of the production function and is limited to process innovation (as incorporated into technical equipment). From this perspective, it is but a short step to reduce innovation in services to the mere adoption of technical equipment produced by the only supposed driving force capable of innovation in the economy, i.e. manufacturing industry. Thus the main body of literature implicitly or explicitly related to innovation in services focuses on the following generic theme : the spread and the impact of the new (informational) paradigm on services.

Recent economic analyses (based on evolutionary and neo-Schumpeterian approaches), which are more sensitive to the characteristics of the “black box” of the firm, i.e. to learning phenomena and the mediums through which they are enacted (routines) and to the tacit and idiosyncratic aspects of technologies, and more inclined to accept a broader definition of innovation, have not succeeded in ridding themselves of this technological bias. In such analyses, services are generally dominated by the suppliers of their technical equipment.

This general conception of the technological and adopted nature of innovation in services has certain corollaries that it is important to emphasise. Services are, allegedly, as unacquainted with R&D as they are with innovation, despite the large number of engineers and managers now employed in service industries. And the proof is that national and international indicators of R&D and innovation (the Frascati and Oslo manuals, for example) almost completely ignore service specificities.

As we shall see, the five chapters devoted to innovation in services go beyond this technological bias, while basing upon various theoretical perspectives (neoclassical, neoschumpeterian). These chapters not only focus on service innovation specificities, but two of them (chapters 10 and 11) also reverse the subordinate relationship between manufacturing and services as far as they focus on the active role played by knowledge

intensive services in their clients' innovation process (including those in manufacturing industry). William Baumol's chapter goes even further in the rehabilitation of services as far as it recalls that R-D is a prominent service activity.

A Detailed Summary of the Book

Traditional measures of productivity growth show very low gains made by service industries since 1979 in the United States. However, other indices of "technological activity" show that service industries have actually been more technologically active than goods producing industries over this period. In chapter 1, Edward Wolff investigates different indicators of technological activity among goods producers and services. For example, services have invested much more heavily in computerization than goods-producing industries (about triple since 1977). The educational attainment of the work force and other skill indices are greater in services than goods producers over this period. Moreover, the degree of change in the occupational composition of employment has been almost as great among service industries as in goods industries since 1970.

The upshot of the chapter is that so-called stagnant services, as portrayed in the standard cost-disease model, are *not* technologically inert. Though these industries show up with close to zero productivity growth, they are very active and have undergone major change over time by other technological indices. Indeed, by some of the indices (mean skills, mean schooling, share of knowledge workers, investment in OCA, and age of capital) these sectors are more technologically active than goods producers or progressive services.

Is the poorer productivity performance of services in recent years due to the fact that its output is becoming increasingly more difficult to measure? This could be a substantial part of the explanation. The distinguishing features of service industries in the post-1980 period are both its high rate of computerization and its high degree of employment restructuring. It is likely that both are associated with a more heterogeneous output. The high degree of computerization found in finance, for example, has been responsible for the creation of a

bewildering array of new financial products. The same appears to characterize the insurance industry and business services. Likewise, the fact that the degree of employment restructuring increased substantially between the 1970s and 1980s might be associated with an increasing variety of service products. It is possible that the more heterogeneous output has made service output harder to measure over time, and thus the low productivity growth of services after 1980 is a measurement problem.

But there are two other possible explanations. The first of these might reflect the high adjustment costs associated with the introduction of new technology. According to this line of argument, productivity growth of the so-called stagnant services should increase to more normal levels in the future as the IT revolution is realized.

The second explanation is that service providers are now able to use this new technology to expand profits in other ways besides augmenting productivity. In particular, services may be employing IT for product differentiation rather than productivity enhancement. If this is the case, then the low productivity growth measured for the stagnant services might persist into the indefinite future.

In chapter 2, Jean Gadrey shows that serious measurement problems stem from conceptual issues regarding the definition of “output” in many “stagnant” services. This chapter is a summarized version of the conclusions of a research carried out between 1989 and 1992 in close cooperation with Thierry Noyelle and Thomas Stanback (Columbia University). This research concerned a comparison between France and the United States about productivity in services. The question was as follows: is it true that in the United States the productivity in services is weaker and that productivity gains are lower than in France, and can this explain that job creations are massive in the American service sector, and modest in France? This interpretation was very widespread in the early 90s, and it is still put forward today. According to Gadrey, this explanation is, for the main part, an illusion, and the main answers to the question are of conceptual and methodological nature. Furthermore, by showing the limits of the traditional concepts in the case of an international comparison, one

also obtains useful indications to interpret, in each country, the so-called " productivity paradox " .

In most services the U.S. appears to have a real technological and organizational advance. Not all service technological characteristics are lagging behind in France. But, in most of the comparisons undertaken, the gap is significant. How is it possible to reconcile the undoubted technological and organizational U.S. leadership in many services with its very poor productivity records? Gadrey's answers to this paradox can be summarized in two major points:

A- First point: the functional approach to service activities

Most service industries can be analyzed, in terms of "production function", as a combination of three sets of functions: the informational functions, the functions of material logistics, and, the direct service functions, associated with the face-to-face contact with clients, with care and assistance to customers, advice and so on.

What appears in the case of the U.S. service industries, as compared with their French counterparts, is a noticeable higher level of efficiency in the first two fields (those where most advanced technologies can be introduced) and a greater amount of direct service provided, with relatively more people employed to fulfill this third category of functions. Thus, if one uses, as it is generally the case, traditional output measurement (e.g.: amount of goods sold in retailing, number of people admitted in hospital, possibly with a complexity index, ton x kilometers in air transportation, premiums or losses incurred at constant dollars in insurance, etc.), that does not take account of the amount of direct service produced, one is likely to conclude that the overall efficiency of labor is relatively poor in the U.S.

B- Second point: the conceptual approach to services output

The core idea can be grasped from one question, stemming from one of the five case studies undertaken by Gadrey and his colleagues: in the supermarket industry, do we get the same output when, for the same basket of goods bought, we get our purchases bagged, home delivered if needed, sometimes carried to our car; when we have fifty percent more varieties of offerings (stock keeping units) to choose among; when opening hours per week are twice as high; when there exists a customer assistance counter; when more scanning systems save

our time at the checkout counter; and, finally, when, besides this identical basket, we have the possibility of buying hot take-out food and other kinds of prepared food (e.g. from salad bars)? What the French-U.S. comparison shows is that more people are employed in the U.S. typical supermarket, for roughly the same volume of goods traded, not on account of a lower "productivity", but essentially because the U.S. supermarket output is very different, insofar as output is analyzed as a combination of services associated with the trade of goods, and not simply with the volume of goods themselves (the usual method based on sales at constant prices).

And, what is more, if such a (more complex) service-based approach is used, it can be shown that, during the eighties, the average U.S. supermarket has clearly increased its performances in terms of quality and quantity of services delivered, leading to a decrease of its "productivity" (according to traditional measures), while its French counterpart was rather improving "productivity" by containing its service component and developing the "self-service" and large scale strategy pioneered in the U.S., during the fifties, sixties, and early seventies. This example indicates the orientation: in a service economy, we need to revisit deeply the traditional output concepts and measurement methods and we need to evaluate the significance of a rising level of service provided.

In the last part of this chapter, Jean Gadrey show that improved and more complex procedures might be used in order to provide better estimates of efficiency changes in services. This implies, in most cases, to introduce the main variables neglected in the traditional approaches: service complexity, intensity, and outcomes.

In chapter 3, Bernard Chane Kune and Nanno Mulder provide an international comparison about productivity in the transportation sector, with a focus on total factor productivity (TFP). Indeed, the efficiency of service providers is often approximated by labor productivity. This partial measure is seen as a proxy of overall efficiency as services are supposed to use relatively little capital. However, in many services such as transport, capital is a major production factor. To judge the overall efficiency of these services, labor productivity measures should therefore be complemented by measures of capital and total

factor productivity. For France, capital productivity and TFP could not be estimated so far at the sectoral level of transport, as no capital input estimates were available. This chapter aims to fill this gap by providing new detailed estimates of capital input in French transport from 1970 onwards. These data are used in combination with series on output and labor input to estimate productivity. Finally, the French performance is compared with that of Germany, the United Kingdom and the United States.

In contrast to many other studies on productivity, the contribution of capital to production is *not* measured by the value of the stock of assets but by the volume of services rendered by this stock (also referred to as the Jorgenson approach). Capital services are measured by the product of the volume of capital, approximated by the net capital stock, times its user cost. The latter is estimated by the sum of depreciation, the real interest rate and capital gains. The net stocks of transport equipment in air and maritime transport are measured by administrative records. The stock of other assets is estimated by the perpetual inventory method, which sums several years of capital formation and deducts assets that reached the end of their service life. Detailed series were compiled of investment and discards in eight different parts of transport, showing for each a breakdown into infrastructure, transport equipment, and other machinery and equipment.

In the second part of the chapter productivity results are presented. Total factor productivity is estimated using the Törnqvist discrete approximation to the Divisia index. The variance of productivity patterns across transport sectors is not unique for France, as is illustrated by a comparison with Germany, the United Kingdom and the United States. Overall productivity gains in the Germany and the United Kingdom were similar to those in France. The three European countries outperformed the USA. At the sectoral level, it turns out that air transport is the industry with the largest capital gains in all countries. The USA is the only country with large productivity gains in railways. France outperformed other countries in terms of productivity growth in air and maritime transport. In the other industries, French productivity growth was below that of the other countries.

In chapter 4, Pascal Petit

In Chapter 5, Jacques De Bandt and Ludovic Dibiaggio deal with the so-called “ learning ” economy as a source of conceptual difficulties, needing new theoretical categories as far as performances are concerned. At least in developed countries, productive systems have been undergoing, since the beginning of the 70’s, deep and wide-ranging changes. Of particular importance, among these changes, has been the growth of activities related to information (computers and software, information systems and related activities) and, particularly in the 80’s, the development of R&D activities and systems of innovation.

This chapter puts the emphasis on a set of new phenomena and realities, of which it can be shown that they cannot be handled within the framework of the old industrial paradigm. A new paradigm is required, referring essentially to the role of knowledge in production and value creation. At the core of this analysis is the capacity to produce knowledge as a response to specific questions (or problems, needs...) where the question, in turn, is a source of knowledge creation. Distinctions have to be made between different types of knowledge with various degrees of complexity and between different forms of organization of productive systems.

Knowledge status depends essentially on the context of its use. Rather than simply emphasizing knowledge intensive activities, De Bandt and Dibiaggio focus on the level of commonality of the environment of knowledge re-use. Indeed, knowledge standardization - through codification or through routinization - depends on the reproduction of experimented actions or decision in similar contexts. As a consequence, introducing ICTs may of course improve knowledge standardization. But new technologies may also increase the set of problems to be solved, users' expectations and opportunities for knowledge creation.

Following this framework, the authors define a typology of contextual situations that affect the nature of the cognitive process as it is implemented. They put forward *simple*, *problem-solving* and *complex situations* as three archetypes of decision-making or learning situations. Each situation-type depends on the familiarity of the agent with the question he has to answer, the problem he has to solve or the situation in which he has to behave.

In all situations in which only “simple” knowledge has to be produced, either because the situation is simple or because it can be simplified, ICTs can perform the tasks and induce considerable efficiency gains. Some progress is equally possible in some of the “problem” situations, to the extent that certain standardization procedures are feasible. But there is simultaneously another trend, towards contextual specificity, customization, and complexity. Because of the competence requirements, complex knowledge needs essentially to be co-produced within organizational learning processes. Co-production - which is at the heart of the “service relation” – thus becomes a central aspect of the new modes of production.

In chapter 6, again, knowledge and its standardization are at stake, but from a sociological or “socio-economic” perspective. In this chapter, Emmanuel Lazega looks at the relationship between distributed knowledge and economic performance in a professional, or “collegial”, organization. He identifies a few conditions under which the pattern of knowledge flows is most productive for firms stressing quality professional services. In such organizations, the production of services for clients is difficult to routinize, professional expertise and advice cannot be easily standardized, and therefore “internal” transaction costs related to flows of resources, including knowledge, can be assumed to be a large part of total costs for the firm as a whole. The practical problem for professional services firms can be represented as reducing complexity and constructing certainties in order to learn from its own experience and provide quality advice for clients. To achieve such knowledge intensive work on a regular basis, intelligence is shared in two types of situation at least: in common work on cases or in case-related advice relationships. Saying that intelligence is “shared”, however, does not do justice to what really happens in the flows of intelligence. The important characteristic of such flows is shown to be that knowledge as a resource is efficiently distributed/allocated through two processes: selection of exchange partners who share common identities in dense subsets (social niche seeking) and concentration of the authority to know (through status competition). Some members emerge as having the authority to know, although such status is fragile. This allocation of knowledge is a micropolitical learning

process, but it is efficient too. Efficiency can be measured, it is argued, in statistical evidence concerning the relationship between crude measurements of economic performance and position in social networks related to the allocation of knowledge. An empirical study of a medium sized Northeastern U.S. corporate law firm is used for that purpose. Distributed knowledge is measured through two types of networks: a network of co-workers with whom the “Whole Picture” of the case is shared, and the Advice network within the firm. Members’ individual performance data (hourly rates, number of hours worked, fees brought in) are analyzed as an effect of position in this network. Dependence of economic performance on the overall pattern of ties in the two networks is established. This suggests that proxy measurements -based on social network analysis- of productivity are possible in knowledge-intensive organizations, a thorny issue in contemporary economics.

Chapter 7 is devoted to research and development. William Baumol recalls us that R-D is a service activity and that it is likely to be the king of services and of the economy as a whole as far as it has major effects on income levels and competitiveness of firms and nations. The leadership of R-D means services are no longer laggards in our economies, but conversely, leaders.

More precisely, Baumol’s paper deals with two closely linked issues : 1) the effect of R-D on productivity growth and 2) the reverse effect of productivity growth on R-D. Connecting these two previous effects and relying on an extended version of the well known “cost-disease model”, it builds a feed back model between R-D and growth. This feed-back relation is an addition to endogenous innovation models. It goes beyond them as far as it tries to take into account the historical dimension. It also tries to make more explicit the endogenous determination of innovation.

The first issue (the effect of R-D on productivity growth) is a well known one in the literature. Basing upon Outon theorem, Baumol shows that the growth of overall productivity generated by R-D is likely to be greater than might have normally been expected.

There are more troubles with the second issue (the effect of productivity growth on R-D) and these troubles are linked to the cost-disease of services that are “asymptotically stagnant”. Indeed R-D belong to such a group of services, which means that its productivity growth is behind the rest of the economy.

In chapter 8, Ian Miles draws a survey of services innovation studies. Different steps are identified in the evolution of these studies.

1) Services were for a long time neglected. They initially represented a negligible economic area. What was important at the beginning of political economy was agriculture and manufacturing.

2) Then services began to account as an important economic phenomenon (major part of employment and GDP in developed countries). But anyway the analysis of innovation studies suffered from inertia and has lagged behind the recognition of the importance of services. The major part of the studies put their emphasis on trying to explain the tertiary growth and not to better understand the meaning of innovation in services, which as a matter of fact was supposed to be very limited.

3) Barras’ model is often considered as the first attempt to build a theory of innovation in services. It shares with other models (especially evolutionary taxonomies of technological trajectories in services industries) and surveys a concept of innovation limited to technological dimension and which is formalised in OECD manuals.

4) Several studies and surveys have been carried out recently in order to go beyond this technological bias. These studies focus on service specificities both in terms of nature of innovation and of models of innovation organisation.

5) The main conclusion of Ian Miles’ chapter and the last step of the evolution of service innovation studies is that there is a tertiarisation on innovation studies. That means that while understanding service innovation issues we are likely to shed light on innovation in the whole economy far beyond the mere service sector. There are several reasons of this tertiarisation : manufacturers often have several service activities in

which they may innovate, KIBS play an important and growing role in the whole innovation system.

In Chapter 9, Maria Savona tries to test the existence of different growth models and different innovation profiles among services. Her work is based upon the Community Innovation Survey (CIS) data in Italy. It follows the taxonomic tradition opened up by Keith Pavitt in an evolutionary perspective.

The main hypothesis of Savona's model is that innovation capacity of service providers is a function of the type of client, ie of the nature of the demand (distinction between intermediate and final demand).

The factor analysis implemented identified three innovation trajectories differing according to the type of demand and the innovation intensity :

- The highly innovative/dominance of intermediate producer demand (this first profile is characterised by a high innovation intensity, its carries out a specialised market oriented R-D activity)
- The medium innovative/dominance of public demand (in this second profile public sector is the main market, innovation is produced through diversification and the innovative intensity is medium)
- The low innovative/dominance of final users (this is the less innovative profile, its describes firms serving the final demand and characterised by process/rationalisation strategies)

Chapter 10 and 11 are devoted to Knowledge-intensive business services (KIBS). KIBS can be defined as activities in which knowledge is both the input and the main output. These activities combine theoretical problems associated to two problematic fields of economic theory: service industries economics and information and knowledge economics.

Before dealing with the role of KIBS, Pim den Hertog's chapter provides, in a managerial perspective, first a theoretical model of innovation in services and second a

typology of service innovation patterns. The innovation model articulates four dimensions : new service concept, new interface, new delivery system and new technological options. This model allow to display several patterns of innovation : supplier dominated innovation, innovation within services, client-led innovation, innovation through services and paradigmatic innovations.

But the main purpose of chapter 10 is the role of KIBS in innovation systems. Three different roles are distinguished : KIBS as facilitators (they support the client in the innovation process), KIBS as carriers (they transfer an innovation from a given place to a client), KIBS as source of innovation (they play a major role in developing innovation in client firms).

The main conclusion of this chapter is that as far as they play a major role in transferring, crating and combining knowledge, KIBS should be considered as “ a second knowledge infrastructure ” by analogy with the “ public knowlege infrastructure ”, ie research and technology organisations, Higher Education Institutions.

Chapter 11 by Faïz Gallouj has two main goals. Firstly, it seeks to describe a normal service transaction in terms of the various basic modes of knowledge processing and production used by KIBS firms. The main activity of the service provider can be described as the transfer of knowledge from one or several sources to a receiver (the client considered from different analytical point of view). The term transfer denotes the various interventions of the KIBS provider in the different dimensions of knowledge : its (physical) circulation, its nature (tacit versus codified knowledge), its scope (general versus specific or localised knowledge) and its structure (association, dissociation of knowledge). However, the quality of the previous interventions of the KIBS providers also heavily depends on qualities of the sources and the receivers.

Secondly, the chapter seeks to establish the links and boundaries between a normal transaction of this kind and innovation. Two difficulties have to be overcome here. Firstly, the same knowledge processing basic mechanisms are mobilised both in innovation projects and in normal service transactions. But this shouldn't lead to

conclude that all KIBS transactions constitute innovations. Secondly, It is necessary but difficult to distinguish innovation in KIBS from innovation through the use of KIBS, ie the contribution of KIBS providers to innovation in their client organisations. Indeed both forms of innovation draw on the same organisational memory and feed back in the same memory. Moreover, the highly interactive nature of many knowledge intensive business services confuses the ownership regimes of certain forms of innovation.