

« The spirit of innovation III » Forum : Innovation Networks, Tacoma, Washington, USA, May 14-16 2008

The innovation gap and the performance gap in the service economies: a problem for public policy

DRAFT

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Summary:

This work is devoted to an analysis of the innovation-performance relationship in contemporary developed economies. It reveals a double « gap » relating to innovation and performance. The « innovation gap » reflects the difference between what traditional innovation indicators (R&D, patents) capture, and the reality of innovation produced in an economy. As for the « performance gap », this measures the difference between performance assessed by traditional economic tools (mainly productivity and growth) and hidden performance, invisible to these tools. These two « gaps » blur the innovation-performance relationship. They are behind a certain number of paradoxes which this study intends to explain, and they lead one to question the legitimacy of some public policies which support innovation.

Key words : innovation, services, productivity, performance, growth, public policy.

Introduction

Whether at micro or macroeconomic level, the main purpose of innovation is to increase economic performance. In economies now largely dominated by services, an analysis of this relationship reveals a paradox that a British government agency (NESTA, 2006) describes as an « innovation gap ». The innovation gap measures the difference between what traditional innovation indicators perceive, and the reality of innovation produced in an economy. In the British case, this has been expressed in the last decade by the observation that a relatively weak innovativeness (compared to other countries) causes relatively high economic performance. This gap is explained in particular by the fact that a significant part of innovation in services (in particular its non-technological forms) escapes measurement using traditional tools (for example R&D, patents). This argument is not new, as it has been at the heart of economic literature on innovation in services for about 15 years (Gallouj, 1994, 2002; Sundbo, 1998; Metcalfe and Miles, 2000).

However, in a services economy, the problem is not only in the definition and measurement of innovation. It also lies in the definition and measurement of performance. One can thus identify a second « gap », that we propose to call « performance gap ». The performance gap

measures the difference between performance assessed by traditional economic tools (mainly productivity and growth) and hidden performance, invisible to these tools (performance in terms of sustainable development, from the socio-economic and ecological viewpoint).

The existence of these two gaps means that post-industrial economies are more innovative and more successful (effective) than traditional assessments suggest (or at least that the sources of innovation and performance exploited are more numerous than generally imagined). But this double gap also helps to blur the relationship between innovation and performance, and to question the legitimacy of some public policies that support innovation.

This article is based on two research issues that we have explored separately, from a theoretical, empirical and methodological viewpoint: the issue of innovation in services (Gallouj and Weinstein, 1997; Gallouj, 1994, 2002; Gallouj et al. 2008) and that of productivity and performance in this same sector (Djellal and Gallouj, 2007, 2008). We would here like to put these studies in perspective, in order to discuss the question of the relationship between innovation and performance (theoretically at this stage).

The aim of this article, then, is firstly to explain the innovation gap in the light of studies devoted to innovation in services (section 1). We will then explain the performance gap, which tends to widen in economies which are dominated by intangible, relational and cognitive products, and which are concerned with a desire for sustainable development (section 2). Section 3 is devoted to an analysis of the innovation-performance relationship. We will see that the two gaps identified blur this relationship, and that they are the source of a certain number of paradoxes (in particular a new productivity paradox which expresses the idea that *there is R&D and innovation everywhere, except in productivity statistics*), which has to be accounted for. These gaps also lead one to question the limits of certain public policies that support innovation.

1. Innovation gap: invisible innovation

The innovation gap is a characteristic that is common to all contemporary developed economies. It expresses the observation that innovation efforts have been under-estimated. The explanation lies in the fact that post-industrial economies (of quality, of knowledge, of information), produce many more innovations than are accounted for by traditional definitions and measuring tools. The problem derives from the fact that in these (post-industrial) economies, innovation is perceived according to industrialist and technologist definitions, and measured using industrial indicators. These include indicators for R&D expenditure, the number of patents... We can therefore formulate the hypothesis that the more economies are tertiarised, (this is the case in Great Britain), the wider the innovation gap. This first section is devoted to a discussion on the different characteristics of this gap. Indeed one notes, firstly, that it is certainly closely linked to service activities (§ 1.1), but that it transcends sectoral borders (§ 1.2). We then note that its scope (or the perception of this) is sensitive to a certain number of variables (§1.3): the « services » profile of the economy under consideration; the actors concerned; the manner of addressing the innovation effort (output or input approach).

1.1 The innovation gap and services

The question of innovation in the services has long been almost exclusively associated with that of technological innovation. This idea of innovation, which prevails in the manufacturing industry, links innovation to the production of material artefacts. This is the reason why we

have described it as *technologist* or *industrialist* (Gallouj, 1994, 1998), which others have subsequently expressed by the term « *assimilation* » (Coombs and Miles, 2000). In the services sector, the assimilationist perspective is coupled with a *subordination* perspective (Djellal and Gallouj 1999, 2001). In fact, innovation is seen from the viewpoint of the adoption of technical systems and generally not from the viewpoint of their production. In other words, the services sector adopts technical systems that are produced in the really innovative and dynamic sector that is the manufacturing industry.

It is this dominant technologist concept of innovation in services that causes a significant share of the gap. Indeed, it does not take account of numerous efforts at innovation undertaken in the services, which escape the traditional analytical tools.

The first research strategy implemented to fill the innovation gap opened by the assimilationist perspective, and to allow identification of the forgotten or hidden innovation forms, is the perspective that we have also characterized elsewhere as *service-oriented* (Gallouj, 1994, 1998), but that one could call a *differentiation* or *demarcation* perspective. This research program firstly emphasizes the specificities of the nature of innovation.

This specificity of nature can be approached in a deductive manner. Indeed, the theoretical characteristics of services (in particular, their intangibility, their interactivity, etc.) are ideal-types, which allow one to formulate a certain number of hypotheses on the specificities of innovation in the services. Thus, the vague and "dynamic" nature of the output entails a blurring of the boundaries between the different common analytical categories (product, process, organization), problems in counting, problems in evaluating the economic impacts of innovation. It facilitates imitation. Likewise the interactive (or co-produced) character of service has consequences for the nature of innovation and its modes of organization and appropriation.

But, of course, this specificity is above all addressed in an inductive manner. Empirical studies are becoming more numerous, these seek to emphasize the particular forms of innovation, which elude traditional (assimilation) perspectives. A certain number of theoretical studies have emerged which put forward local theories (that is, adapted to certain sectors of service) or which question existing sectoral taxonomies. The first studies devoted to the specificity of the nature of innovation in services concerned a particular category of services (considered to be the most representative of the specificities of these activities), that is, knowledge intensive business services (KIBS). Thus, in the case of consultancy, Gadrey and Gallouj (1998) renounce the product/process typology to put forward an innovation typology which takes account of the cognitive nature of these activities, which are defined as machines for handling knowledge to produce knowledge. They thus distinguish three forms of innovation: *ad hoc* innovation (co-construction with the customer of a new solution to a problem), a *new expertise field* innovation (detecting an emergent field of knowledge and providing consultancy in this field), *formalization* innovation (the implementation of methods aimed at making the service less vague). The methodology favored in this case is the qualitative survey.

These empirical studies of a qualitative nature were firstly extended by implementing quantitative surveys aimed at quantifying these, once the particular forms of innovation were recognized. In contrast to *subordinated* surveys implemented in assimilationist approaches, these new surveys, concerned with identification and measuring specific forms of innovation in the services, have been designated as *autonomous* surveys (Djellal and Gallouj, 1999).

But these typological studies have above all been revitalized by the proliferation of areas of empirical investigation. We have therefore left the area of pure services and knowledge intensive services (consultancy, banks, insurance firms), to take an interest in the specificities of innovation in services that are often considered to be less noble or less knowledge intensive (transport, cleaning, elderly care). It would be boring and pointless to explain the many ad hoc typologies outlined in the different activities. What should be retained from these studies is that the non-technological forms of innovation, which generally escape traditional tools, are identified everywhere.

Other particular services activities have been the subject of typological studies, from the viewpoint of a differentiation perspective. These are complex services, inasmuch as they combine a considerable number of other elementary services. Tourism is an interesting example of this. As Caccomo and Solonadrasana (2001) analyze, (cf. also Sundbo et al, 2007), the whole problem in analyzing innovation in this activity depends on the fact that the tourist good is a composite good, on the one hand linking complex goods which are defined as temporal sequences of market goods and services (transport, accommodation, catering, attractions and visits), and, on the other hand, public goods and services (natural heritage and natural sites, transport and signaling infrastructure, tourist offices).

Over and above the increase in ad hoc empirical typologies, seeking innovation specificities we can emphasize the existence of a reduced number of local theories of innovation. They concern a perspective of differentiation to the extent that they are characteristic of a given sector, whose particular behavior they analyze.

Thus large scale retailing is a sector which, particularly in the area of management sciences, has a number of "local" theories of innovation. This is the case, for example, of the accordion theories (Hollander, 1966) or the wheel of retailing (Mc Nair, 1958), which considers innovation in shop formats, like the succession of simplified systems (hard discount) and bourgeoisified systems (rich in services). C. Gallouj (2007) examines these different theories (in particular the theories of cycles) and highlights their inability to take account of the diversity of forms of innovation. He therefore explores, in a detailed way, the multiplicity of forms of innovation in retail distribution, showing that if the introduction, even the production, of technical systems is important here, they do not exhaust the potential for innovation in this kind of activity, far from it.

The financial services also have certain theoretical models that can be considered as local theories of innovation. This is the case with approaches in terms of characteristics, which represent every financial product as a vector of characteristics of service, and innovation as the addition of new characteristics or the improvement of existing characteristics (Niehans, 1983; Desai and Low, 1987).

1.2 The innovation gap beyond services

This under-estimation of innovation not only concerns the services. In other sectors as well, certain innovation efforts escape traditional definitions and assessments, thereby helping to fuel the innovation gap. The general explanation for this phenomenon is the growing increase in power of the service dimension in all economic activities, and the trend towards blurring the borders between goods and services. NICTs (as a technical system shared between manufacturing and services) contribute to this « blurring » (Broussolle, 2001).

In recent years, studies showing a certain natural convergence (integration) between goods and services have become more numerous. Indeed, service or information are the main components of many goods. A certain number of research activities have therefore been devoted to identifying and measuring the informational or service value of goods, whether industrial goods, for example automobiles (Lenfle and Midler, 2003), or agricultural goods (Muller, 1991; Le Roy, 1997; Nahon and Nefussi, 2002).

Moreover, numerous other studies have emphasised the transition from an economy of production and consumption of goods to an economy of production and consumption of hybrid solutions or packages. This means that goods and services are less and less sold and consumed independently, but are increasingly sold as solutions, systems, complexes, or functions. This mode of the integrating perspective is favoured by the works of Bressand and Nicolaïdis (1988), which identify a shift from an economy of products to an economy of functions, the works of Furrer (1997), which emphasise « services around products » (services provided as complements to tangible products), or the works of Barcet and Bonamy (1999), which analyse goods and services in terms of « usage rights » or « credence rights ».

Thus, in view of the evolution of the nature of the activity, numerous « non- technological » innovations, which are implemented in manufacturing or in agriculture, also elude measurement. In the case of manufacturing industry, for example, there are many service innovations around product, whether in pre-sales, at-sales, after-sales services or in independent of sales services¹ (Mathieu, 2001; Vandermerwe and Rada, 1988; Davies, 2004)). In the case of agriculture, one can quote examples of the many innovative modes of rural tourism.

1.3 Some variables that influence the innovation gap

As we emphasised in the introduction, the innovation gap depends on the scope of « problematic » activities. It is, therefore, correlated with the level of tertiarisation of the economy, tertiarisation that is defined not only as an evolution of the share of the tertiary sector, but also, more generally, as an evolution in the service content of activities, beyond the tertiary sector. But qualitative variables also affect this gap (or the perception of this). Here we refer to three of these.

a) Insofar as certain service activities are more innovative than others, the sectoral distribution of services in an economy has an impact on the scope of the gap. The innovation gap is both vertical and horizontal, one could say. Thus we could assume that an economy characterised by a higher proportion of KIBS than another will be more affected by the gap. Indeed, amongst the services, the KIBS are not only the most innovative, but they contribute to innovation carried out by their customers. But in the two cases (own and induced innovation), the non-technological (invisibles) forms occupy a key position (Djellal and Gallouj, 1999). It would thus be interesting, from the innovation viewpoint, to identify the different worlds of services, by being inspired by the work carried out by Gadrey (2005). Depending on the distribution of services in an economy, one would therefore be able to identify the more or less innovative profiles of service societies (and in which the gap would be more or less pronounced).

¹ These are services that are independent of the product and the production process, for example, child care, sporting and recreational services,...

b) Awareness of the scope of the gap varies according to the actors concerned (managers, public authorities, social science researchers). Indeed, firms' actors often (always) are very aware of the importance of their activities for adapting and changing, even if they do not always call them innovation. Academic works have a lower degree of awareness and are often subject to analytical inertia. The latter are, nevertheless, ahead of international statistical institutions and the public authorities. An analysis of bibliographical references would not find it difficult to measure the temporal gaps between suggestions made by the theoretical literature and taking these into account in national or international measuring institutions, and in public policies. The different revisions of OECD manuals mentioned in the following paragraph bear witness to this to some extent.

c) Efforts have been made in recent years to reduce the innovation gap. But these efforts were more concerned with the reduction in the (innovation) *output* gap than with that of the (innovation) *input* gap.

Empirical studies carried out in the last few years (cf. § 1.1) have contributed towards making people aware of the extent of « invisible » innovation (using traditional tools) in services. Thus, typological studies have been undertaken on different service activities (consultancy, financial services, hospitals, retailing, transport, etc.), aimed, one way or another, at exploiting, in the definition of innovation, the Schumpeterian opening tradition. Some of these concerns have been included in successive revisions of the OECD Oslo Manual (manual of innovation indicators).

Thus, in its 1992 edition, the Oslo Manual (1992) only covers *technological* process and product innovation. Applying its guidelines in a certain number of surveys devoted to the services encounters numerous difficulties, notably that of the distinction between product and process innovation. This leads to a systematic under-estimation of innovation in services, particularly when it is not directly linked to a material technology. The Manual that was revised in 1997 shows obvious concerns on integrating services into the surveys, but in the end it retains restrictive and technologist definitions of innovation in services. Taking account for services is finally expressed by three main amendments: the introduction of a paragraph which indicates that the term product is used to refer to both goods and services, a warning against the difficulty, in certain cases, of distinguishing product innovations from process innovations, and the introduction of a box giving examples of innovation in the services. Finally, in its latest version (2005), which still has very reduced empirical applications, as well as *product* and *process* innovations², the Manual distinguishes *marketing* innovation and *organisational* innovation.

Thus, successive Community Innovation Surveys (CIS) have been opened up to an increasingly large number of services and to certain « non-technological » forms of innovation. The output gap has tended to reduce, but progress still remains to be achieved, particularly in the area of social innovation (Dandurand, 2005; Harrisson et al., 2008) and in certain forms of frequent ad hoc and tailor-made innovation, in particular in the area of knowledge intensive services (consultancy, some aspects of financial services). But this improved recognition of the diverse forms of innovation increases the difficulty of the problem of innovation appropriation regimes. The inadequacy of measuring innovation by

² The term « technological » has been dropped.

patent is increased as the « intangible » forms of innovation are integrated. The gap is then reduced on one side, but widens on the other.

On the other hand, regarding innovation inputs, the specificities of services are still insufficiently taken into account. Contrary to the Oslo Manual, which was able to gradually integrate the non-technological dimensions of innovation (in particular organisational), the latest version of Frascati Manual (2002) continues to be characterised by a technician and scientist bias. But R&D activities in services often have a composite character, mixing aspects of sciences and technologies, social sciences, organisational engineering, etc. (Djellal et al. 2003). The last but one dimension mentioned is not sufficiently taken into account, and the last is not considered at all, which contributes towards digging the input gap.

2. Performance gap: hidden (or missing) performance

A country's performance is generally measured by the growth rate of its GDP, which is considered to be closely linked to productivity gains. The NESTA analysis (2006), mentioned in the introduction, is based on this definition of performance, thus considering that the second variable of the innovation-performance relationship does not pose (too much of a) problem. But this is far from being the case. Indeed, economic performance, as well, raises serious problems of definition and measurement, and one can also identify hidden performances here. These hidden performances are also linked to the service nature of activities. Contemporary developed economies are therefore not only faced with an « innovation gap », but also a « performance gap ».

Critical analyses of concepts of productivity and growth are often dealt with in similar terms, insofar as, in the two cases, it is the nature of the product which is mainly at stake. The terms of this critical debate can be divided into two groups of arguments, one concerned with errors of measurement and the other, more fundamentally, with its conceptual invalidity (Gadrey, 1996 ; Djellal and Gallouj, 2008). The first set of arguments calls into question the results of studies and suggest corrections; the second challenges the concept itself and suggests it should be abandoned.

2.1 The measurement error and correction argument

These measurement errors have been spectacularly highlighted by some recent studies. In the USA, for example, the Boskin Commission Report (1996) confirmed that the consumer price index had been seriously overestimated and that productivity gains and growth had consequently been underestimated. It goes without saying that all the economic policies and scenarios developed on the basis of these erroneous data are problematic; if not actually doomed to failure, they are subject at the very least to considerable uncertainty.

The measurement errors can be explained by factors that are exogenous or endogenous to the indicators used; these factors may of course be combined.

In a given socio-economic environment (in which the exogenous factors are stable), the endogenous factors are linked to the characteristics of the indicators used and to the difficulty of compiling (reliable) data, particularly on services. The numerous technical difficulties encountered in defining and measuring output, input etc. and the difficulties of aggregating data (especially but not solely in services) give rise to measurement errors. These problems

are the reason why there is such a diversity of techniques for measuring output volumes and productivity, particularly in national accounts. They also cast doubt on some international comparisons. Thus it would seem, for example, that the choices made by various countries in respect of the base year adopted, calculation of the price index and the adjustments required to take account of variations in quality give rise to not insignificant differences in the values for national growth rates (Eurostat, 2001). These differences become problematic, for example, in the context of the ‘stability and growth pact’ adopted by the European Council in July 1997, which requires member states to keep their public deficit below 3% of GDP. These are fundamental problems in economic and monetary policy that spurred the European Commission to draw up a ‘Handbook on Price and Volume Measures in National Accounts’ (Eurostat, 2001). The doubts raised here relate to the methods and conventions used in the calculations and not the indicator itself. The raising of these doubts has led to the adaptation and harmonisation of the statistical tools used and to the correction of the measurement errors.

The exogenous factors, for their part, concern the fundamental changes affecting contemporary economies, which are causing chronic difficulties for the indicators used to measure productivity. To put it very simply, we are dealing here with the transition from a Fordist to a post-Fordist economy based on high-quality production and knowledge. The indicators in use are rapidly being rendered obsolete by the dynamic of contemporary economies (extremely rapid changes in quality, principle of permanent innovation).

These exogenous factors are important sources of measurement errors. The difficulties of constructing indicators are becoming real headaches in “quality” and knowledge economies. Consequently, all the stops have to be pulled out in order to find technical solutions and to correct the habitual errors. However, these exogenous factors also sometimes cast doubt on the conceptual validity of the notion of productivity.

2.2 The (total or partial) conceptual invalidity of the notion of productivity and its abandonment

In some situations, the concept of productivity quite simply loses its validity. No amount of technical adjustments can resolve this problem. The only solution is to stop using this concept in order to evaluate the performance of an individual, a team or an organisation. At microeconomic level, such a situation may arise 1) in areas characterised by considerable informational asymmetries where moral hazard comes into play. This is the case, for example, with certain support functions, such as maintenance and IT development, and with intellectual planning and control functions; 2) in areas characterised by strong service relations (particularly social and civic relations). In these various areas, service quality and productivity may become contradictory objectives. The customer or user qualitative structure has effects on the nature of the service provided and on productivity.

In reality, several different cases can be identified.

1) In the first, the concept of productivity has no meaning, since it is irrelevant to the main issues at stake, which lie elsewhere (creativity, quality of solution, etc.). This applies to the wind quintet concert suggested by Baumol, as well as to all forms of artistic creation, etc.

2) In the second case, the concept of productivity does not necessarily lose all its validity but no longer retains its position of supremacy. This might be described as a partial invalidation. This case reflects the difficulties that arise when the industrial concept of productivity comes

up against what is known as the information or knowledge economy or society. The knowledge society is, after all, characterised by a sharp increase in the cognitive content of economic activities (knowledge being not only their input but their output as well) and by a proliferation of service relationships between providers and clients. The problem this raises is how to measure the productivity of social relations, on the one hand, and of knowledge, on the other. Now in such an economy (which Karpik calls a “quality economy”), the quantities or volumes of output and prices matter less than their long-term useful effects, otherwise known as outcomes. A lawyer’s productivity is of no significance if it ends in judgements that are unfavourable to his clients, that of a doctor is of little importance compared with the results of the treatment provided and a researcher’s productivity means nothing unless it is compared with the quality of the results obtained. In all these cases, in which the outcome is subject to considerable uncertainty (where there is a high level of informational asymmetry), the mechanisms that produce trust are more important than any measurement of output or productivity. The (partial) conceptual invalidity argument now applies to many more economic activities than the total invalidity one. After all, the knowledge society seems to be a universal phenomenon. It manifests itself not only in services but also in manufacturing industry, where there has been an increase in service activities that has been described as an ‘intensification of the symbolic activities and social interactions implied by the productive process’ (Perret, 1995). Although this partial conceptual invalidity argument may apply to very diverse activities, it particularly affects knowledge-intensive service activities.

3) A third case is that in which the concept of productivity could possibly be meaningful if the environmental variables could be taken into account. In other words, the concept loses its validity when applied to inter-organisational comparisons and benchmarking exercises. However, it could retain its validity if comparable organisations were to be compared or if environmental variables were taken into account (although in doing so we would be replacing measurement by productivity with a multi-criteria evaluation process).

2.3 The need for a multi-criteria evaluation

Nevertheless, nobody is suggesting that the criterion of productivity (or, at the macroeconomic level, the closely associated one of growth) should be abandoned completely. The usual recommendation is to abandon the absolute power (whether on the theoretical or operational level) of a single ratio (productivity or growth) and replace it with a pluralist and flexible evaluation system (in which simply abandoning the concept of productivity would, under certain circumstances, be a possible, albeit extreme option).

Abandoning the absolutism of productivity (and of growth) is justified by a number of arguments, outlined above, that cast doubt on the validity of the concept in certain situations. Regardless of the activity in question, indeed, productivity is always inaccurately estimated (although to varying degrees depending on the activity). It suffers from chronic mismeasurement. However, there are other arguments that also cast doubt on the absolutism of productivity (and of growth) and militate in favour of a pluralist approach.

1) Thus, in a given economic activity, performance is not an objective category but rather is considered in different, even contradictory terms depending on the actors concerned (individuals, firms, political authorities). The subjective nature of performance, which certainly applies to tangible goods, is particularly pronounced in the case of the ‘goods’ produced by the information and knowledge economy, which are based on intangible, abstract and socially constructed factors of production.

2) Account also has to be taken of the perverse effects of certain goals or targets. For example, at both the macro and microeconomic level, the drive for growth and productivity generates negative externalities. It may give rise to certain social or environmental costs (stress and other health problems, on the one hand, environmental degradation, on the other) that are not taken into account in estimates of growth and productivity (Jex, 1998; Karasek and Theorell, 1990; Lowe, 2003). At the microeconomic level, the frequently criticised link between overly aggressive productivity strategies and a deterioration in quality is well known. In the administration of justice, attempts to rationalise processes (reduction in time taken to deal with cases) are acceptable only if they can be achieved without detriment to the rights of the accused. A productivist approach could sow the seeds for wrongful convictions, for example by generating excessive pressure to obtain confessions.

3) More generally, the level of production of goods and services is not the only indicator of a society's well-being. Nor is it necessarily the best one. Alternative macroeconomic indicators of development are now being developed, which could be adapted for use at the level of firms and organisations (for a survey, cf. Gadrey and Jany, 2007). One of the best-known of these indicators is probably Osberg and Sharp's index of economic well-being, which is made up of variables associated with the following four components of economic well-being: consumption flows, capital accumulation, inequality and poverty and economic insecurity. Others include the Index of National Social Health developed by the Fordham Institute as an alternative to GDP and various indicators of sustainable well-being (ISEW, Index of Sustainable Economic Welfare).

4) For other activities (particularly at the intra-organisational level), comparisons of productivity are unfair, counter-productive and discouraging for the units in question. This is because they carry out their activities in environments that may differ considerably from each other, making mechanical comparisons very difficult. This applies, for example, to comparisons of post offices or schools located in very different socio-economic environments.

5) In certain cases, finally, the concept of productivity loses its validity or, without losing its relevance entirely, becomes insignificant compared with other aspects of performance. Thus the productivity (technical efficiency) of health and social services is a secondary issue comparing with outcomes as essential as containing outbreaks of serious epidemics for examples.

2.4 A multi-criteria framework for evaluating output and performance

We hypothesise that the various purposes or 'outputs' of service activities can be linked to different 'worlds' (that is sets of outputs or of concepts of outputs and criteria for evaluating those outputs). Drawing freely on the work of Boltanski and Thévenot (1991), it is suggested that services can be defined and evaluated on the basis of different sets of justificatory criteria, which equate to the following six worlds:

- the industrial and technical world, the outputs of which are described and estimated mainly in terms of volumes, flows and technical operations;
- the market and financial world, the 'output' of which is envisaged in terms of value and monetary and financial transactions;

- the relational or domestic world, which values interpersonal relations, empathy and relationships of trust built up over time and regards the quality of relationships as a key factor in estimation of the 'output';
- the civic world, which is characterised by social relations based on a concern for equal treatment, fairness and justice;
- the world of innovation (the world of creativity or inspiration);
- the world of reputation (the world of brand image).

Table 1 illustrates this framework, which does justice to the multiplicity of service 'products' or 'outputs' by combining space-time analysis with symbolic space.

This digression on product diversity is intended to highlight what is our primary concern here, namely the diversity of performance. After all, if the 'generic outputs' are different, and given that *performance is defined as the improvement in the 'positions' or 'operating efficiency' relative to the various outputs*, it is not difficult (at least in theory) to accept the existence of a plurality of (generic) performances associated with (generic) outputs considered in their two facets ('volume' and quality).

Just as with outputs, therefore, several types of performance can be identified, depending on the 'families' of criteria adopted for the purposes of definition and valuation: industrial and technical performance (in which the main criteria are volumes and flows), market and financial performance (in which the emphasis is on monetary and financial operations), relational performance (in terms of inter-personal ties), civic performance (in terms of equality, fairness and justice), innovation performance (in terms of the planning and implementation of innovative projects) and reputation performance (in terms of brand image).

The question of performance can also be considered in terms of the time frame of the evaluation (short term, long term) or even from the point of view adopted in making the evaluation (the user's or the service provider's).

Contrary to certain prejudices, civic, relational, reputational and innovation performance are not immune to all forms of quantification. True, it may seem paradoxical, for example, to consider social or civic relations (which are generally associated with disinterested attitudes or the gift/counter-gift principle) in terms of performance (a notion with strong technical and commercial connotations). The intention is not of course to measure relationship intensities, particularly since sociologists have drawn attention to the composite nature of the service relationship, which is regarded as a locus for the verbal exchange of technical and market information and signs of civility and mutual esteem (Goffman, 1968). On the other hand, there is no reason why the length of time spent in the relationship or even, once the content has been examined, the quantity of relations of each type cannot be measured. Thus improvements in (internal or external) customer satisfaction indicators and reductions in user turnover can be regarded as indicators of relational performance, while the evolution of the production and share of social quasi-benefits make it possible to some extent to monitor the evolution of civic performance. Similarly, the rate of (incremental) innovations introduced and the resolution rate for problems encountered during the test phase of an innovative project or even the share of solutions codified (routinised) and transferred to a generalised application can serve as indicators of innovation performance.

Table 1: A multi-criteria framework for analysing service output and performance

	Industrial and technical world	Market and financial world	Relational or domestic world	Civic world	Innovation world	Reputational world
Direct output (short term)						
<i>Performance relative to direct output</i>						
Indirect output (long term)						
<i>Performance relative to indirect output</i>						

Table 1 depicts twelve different concepts of performance, which may mutually reinforce each other or, conversely, contradict each other, or at least may do so once a certain threshold has been crossed. For example, an increase in technical performance may give rise to an increase in market performance. It is likely, therefore, that an increase in the number of accounts opened per employee in a bank will be accompanied by an increase in net banking income per employee. Similarly, an improvement in relational performance (manifested, for example, in an increase in the customer retention rate) may have a positive influence on market performance. These different types of performance may also be negatively linked, since individual pairs of them may clash with each other. For example, a good civic performance (high rate of social quasi-benefits) may lead to a deterioration in a competitiveness or productivity (technical performance) indicator.

Overall, at the micro level as at the macro-economic level, defining and measuring performance pose serious problems, and these result in a performance gap. These problems, as with those linked to the innovation gap, should be regarded with care when drawing up public policies.

3. The double gap, the innovation-performance relationship and public policies

In a service economy, the definition and measurement of innovation, as performance, raises numerous difficulties, as we have just observed. They are the cause, not only of an innovation gap, but also of a performance gap. We will now compare these two gaps and, at the theoretical level, examine their consequences on the fundamental relationship between innovation and performance and at the operational level, their implications in terms of public policies.

The fundamental hypothesis of the analysis is that innovation efforts in a post-industrial economy are always under-estimated. A consensus now seems to have been established on this point, as an increasing number of theoretical and empirical works bear witness but also, and particularly, the many revisions of the OECD official manuals (cf. section 1). The specificities of innovation in services are recognised, even if the inertia of our analytical tools and technical difficulties can prevent them from being taken into account, for example in surveys. On the other hand, a consensus on the nature, scope and challenges of the performance gap is far from being achieved. It is true that performance, considered from the

viewpoint of productivity and growth, has always been at the heart of all economic theories, whatever they are, old or new, orthodox or heterodox. It is therefore subject to a major effect of cognitive irreversibility.

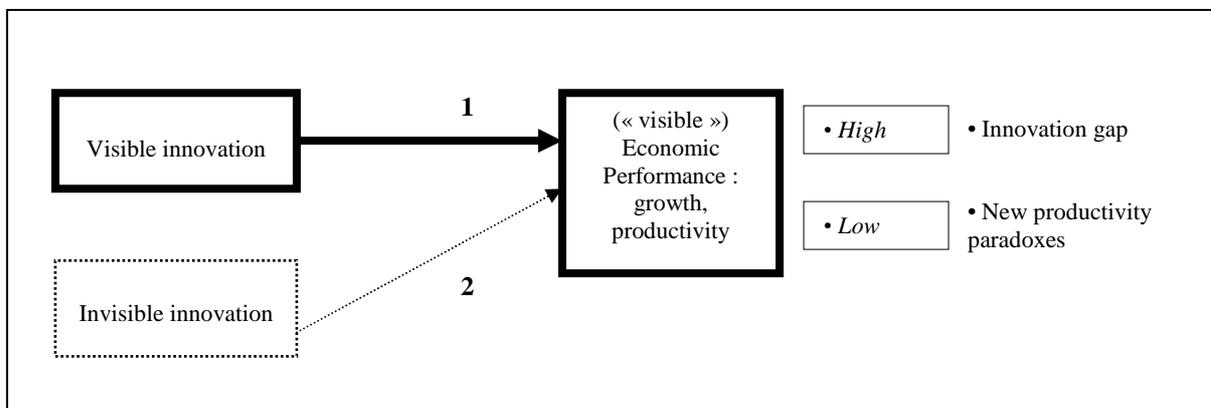
In view of these differences in the perceptions of gaps, it is necessary to consider several possible scenarios, to examine the consequences of these on the innovation-performance relationship, all other things being equal. The first case (the most frequent) is that in which one believes that performance is defined satisfactorily by productivity and growth. Public policies supporting innovation are based on this canonical scenario. The second case is where one assumes that the performance is badly defined (and under-estimated), in other words that there is a performance gap. We will examine these two scenarios, as well as their consequences for public policy.

3.1 Performance is (considered to be) well defined

National and international policies supporting innovation (as, also, the economic theories that inspire them) are based on this hypothesis, according to which performance can be reduced to growth (and to productivity). The discussion and possible theoretical or operational problems only therefore concern the innovation variable. For a given innovation effort, this hypothesis allows one to consider two interesting scenarios, which differ depending on the levels of performance achieved.

The first scenario is that which corresponds to a high economic performance for a given (visible) innovation effort. This scenario wrongly leads to the impression being given of a high output of a country's visible innovation effort, while in fact part of the performance is explained by invisible innovation. In the case of Great Britain, for example, NESTA (2006) observes a high economic performance in the last decade for a lower level of innovation than in other countries. For example, R&D per capita expenditure in Great Britain is two times lower than in Sweden and in Finland. It is lower than in France or in Germany. The number of patents per inhabitant is much higher in Germany, Japan and the United States than in Great Britain. The explanation of this paradox lies in the British innovation gap. In fact, part of the performance can be explained by the invisible innovation effort carried out in particular (but not exclusively) in the services sectors.

Figure 1: The innovation gap and the innovation-performance relationship

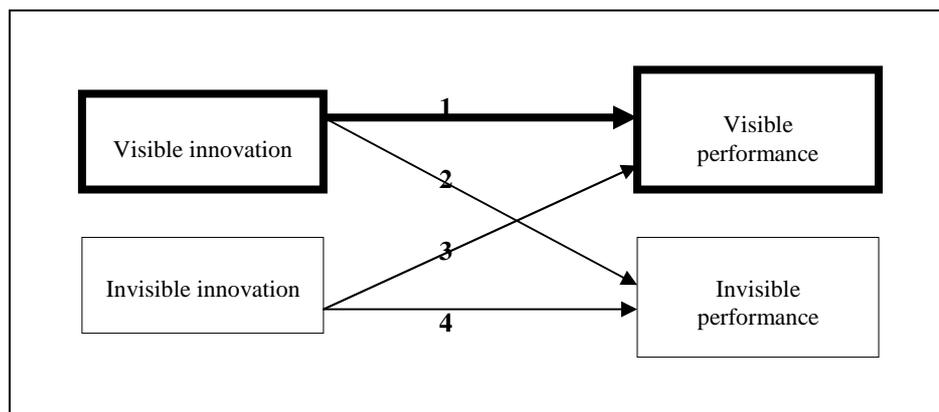


The second scenario is that which corresponds to a weak economic performance (growth) for a given innovation effort. In fact the situation is then still more unfavourable than it appears (and it will be necessary to draw conclusions in terms of public innovation policies), since the level of real innovation is higher than the measures considered indicate. Invisible innovation efforts combined with visible efforts are not effective. Therefore, to paraphrase the Solow paradox, we can here formulate a new productivity paradox: *there is innovation everywhere (including invisible innovation) except in performance statistics*. The NESTA report (2006) does not take account of this second scenario, which does not correspond to the British situation during the period covered. On the other hand, it is possible that it illustrates the French situation. This new paradox of productivity can take a particular form if one considers innovation from the restrictive viewpoint of R&D input. Indeed, the concept of R&D as defined in the Frascati Manual is not adapted to services (cf. § 1.3). If we accept an improved definition of this, (such as that which we proposed previously), one can infer from this that R&D efforts in services are under-estimated, and that therefore *there is R&D everywhere (including in services) except in the statistics of productivity and growth*.

3.2 The performance is badly defined

As we have previously emphasised, a certain number of recent studies question the dictatorship of productivity, of GDP and growth, by considering that they are neither the only, nor the best indicators of the economic performance of a country. Thus, just as there is invisible innovation, so there would be invisible performance. This invisible performance mainly concerns the field of socio-economic and ecological sustainability. It expresses concerns in terms of human development, social cohesion, equality, equity, environmental protection, outcomes rather than outputs. This second hypothesis is not taken into account by the NESTA (2006) analyses, whereas it can change the economic diagnosis and lead to important consequences for public policy.

Figure 2: Innovation gap, performance gap and innovation-performance relationship



This question of taking into account invisible performance is at the heart of a certain number of works focused on international comparisons, which are not concerned with the question of innovation and the innovation-performance link. This is the case, for example, of works devoted to international comparisons of the levels of wellbeing and development. These works identify the sometimes dramatic differences between GDP growth and the evolution of other indicators, in particular human development and social progress indicators (for an survey, cf. Gadrey and Jany-Catrice, 2007). These kinds of comparisons often emphasise the

superiority (from this viewpoint of alternative « growth ») of the Scandinavian socio-economic models, compared to the Anglo-Saxon models. Here we are interested in the role of innovation in this performance, and notably in the (theoretical) consequences (on the analysis of the innovation-performance relationship) of taking this new gap into account.

Thus visible innovation certainly leads to visible performance (relationship 1), but it can also result in an invisible performance with regard to socio-civic and ecological sustainability (relationship 2). Technological innovation can indeed also be a source of social, civic and ecological benefits, and certain technological trajectories are more guided than others by the choices of socio-economic or ecological sustainability. The informational paradigm, for example, is often considered, not only as a source of economic growth, but also as a source of socio-economic and ecological sustainability. Insofar as the ICTs are considered to be weak MIP³ technologies, it may be thought that they favour sustainability and that, more generally, the information society is congruent with sustainable development. We can quote more precise examples of this relationship between ICT and sustainable performance: the substitution of the videoconference for business travel; the introduction of new ways of working (for example teleworking). The ICTs also operate in other dimensions of sustainability (in particular social). They thus allow the public authorities to be challenged and to rapidly mobilise citizens. Apart from the informational paradigm, technological innovation, whatever it is, can produce a more or less significant environmental or social benefit, beyond traditional growth. Within these material technologies, then, one can distinguish *environmental technologies* and *social technologies*. For example, technological innovations responding to the problems of the elderly (domestic robots, smart home, electronic surveillance...) represent a powerful innovation trajectory in ageing service societies (Djellal et al., 2006).

Relationship 3, which links invisible innovation to visible performance, means that the non-technological forms of innovation are also a source of growth (visible performance). It is the reason (when invisible innovation efforts are significant) for the incorrect interpretation of the innovation-performance relationship (mentioned previously), which takes account of high growth for a relatively weak innovation effort.

Relationship 4, finally, which links invisible innovation to invisible performance, assumes a favoured relationship between non-technological innovation and invisible performance. There seems to be a strong correlation between the invisible component of innovation and the invisible component of performance. Indeed proximity services, for example, (in particular when they are implemented by non-profit-making organisations and public services, in particular local services), are the setting for significant social innovation activity, which escapes traditional indicators, whereas their role in the resolution of social problems is fundamental. More generally, if one considers performance from the viewpoint of sustainability, one notes that, although they are not dramatic, many non-technological, and particularly social, innovations, play a significant role in this. There are many examples of non-technological (invisible) innovations which contribute towards sustainable performance and which cover all kinds of services. Amongst others, we can mention certain forms of sustainable tourism, the many innovative initiatives in the field of care of the elderly, childhood, social integration, and in the financial field, micro-credits to respond to the problem of banking exclusion, government subsidised loans to encourage firms to invest in environmentally-friendly equipments. We can also mention local authorities developing

³ The MIPS indicator (Material Intensity Per Service Unit) measures the degree of utilisation of natural non renewable resources to produce a good or a service.

services “one-stop shop” for people in difficulty. The innovations produced by knowledge intensive business services (KIBS) often come under « environment friendly » and sustainable trajectories, particularly when it concerns *ad hoc* solutions provided by consultants to environmental or social problems, investment in new areas of expertise (for example, environmental law, social law, advice on sustainable development...) or methodological innovations (for example, the MIPS indicator mentioned previously).

Because of the existence of hidden performance, innovation efforts can be more effective than the measures indicate. Thus, for given innovation efforts, an apparently weak (traditional) performance can be enhanced from the viewpoint of alternative performance. Conversely, an apparently high (traditional) performance can be put into perspective, insofar as growth and productivity gains are tarnished by ecological or social damage.

3.3 The double gap: a challenge for public policies

In view of the two gaps (on innovation and performance) identified in this work, one can assume that public innovation policies are, to a certain extent, inadequate. Indeed, they rely on a partly inaccurate analysis, and consequently suggest solutions that could prove to be inappropriate.

In order to carry out their diagnosis, public policies generally favour relationship 1, which links visible innovation (mainly technological innovation: that which is based on R&D and which gives rise to patents) to visible performance (growth, productivity). Figure 2 illustrates well all the errors in analysis and the paradoxes that can follow from such a hypothesis. We can thus identify (all other things being equal), a weak innovation effort at the same time as a high (growth) performance. This is the diagnosis achieved by NESTA (2006) in Great Britain for the last decade. We can also identify an apparently higher innovation effort, which does not fulfil its promises on performance. This is the case for France in the same period. To establish a satisfactory analysis, it is necessary to take into account all the other relationships between innovation and performance (relationships 2, 3 and 4), which can contribute to different interpretations of innovation efforts and levels of performance achieved.

In view of the diagnosis established on the basis of relationship 1, the solutions recommended by the public authorities naturally consist of promoting technological innovation, that which is based on scientific and technical R&D activities and which can be appropriated by patents. These strategies mainly concern public research and the industrial sectors, in particular high technology. As regards training systems, policies will consist of favouring scientific and technological training. As the OECD (2005) emphasises, the innovation policy of member countries was mainly considered to be an extension of R&D policies. Thus, in economies that are, however, largely dominated by services, these technologist and industrialist policies have also been transposed to services. In the same way as economic analysis (cf. § 1.1), public policies of support for innovation in services are dominated by an assimilationist perspective (Rubalcaba, 2006).

The main lesson to draw from the preceding analyses in terms of public policy is that, to take into account the double gap that has been identified, the public authorities should break with their technologist orientation and try to promote invisible innovations and performances.

It is thus necessary to emphasise innovation and R&D policies that are specific to services (perspective of differentiation), in other words, policies that are not content with supporting

technological innovation and R&D, but which also favour non-technological forms of innovation and R & D. As we have emphasised in paragraph 1.2, as far as the source of the gap is not confined to services, it is also necessary to support innovations in services within the manufacturing and agricultural sectors. If it happens, this recognition of invisible innovation in public policies should also redirect priorities on education policy. Indeed, one should also support the development of the necessary skills in non-technological forms of innovation, whether this is skills that produce or which absorb these innovations. These skills do not only concern an elite, they should be disseminated to all levels of the population. This is particularly obvious with regard to social innovations that can be produced and implemented in the informal and domestic sphere (voluntary work, community organisation) as in the formal sphere (or social entrepreneurship). All services of course are concerned by these innovation policies. But some sectors appear to be more concerned than others. This is the case with the KIBS, which contribute strongly to the innovation gap, both through their own internal non-technological innovation, but also by that which they produce for their customers. This is also the case for the numerous proximity services, where many social innovations are implemented.

If one considers performance in terms of sustainable development, one again notes that it is the technologist or assimilationist perspective which dominates. Most of the public policies of induction of sustainable innovation fall within such a perspective, which consists of supporting sustainable technological innovations in different ways: funding, taxation (for example, by granting tax credits for clean technologies or which save energy), public orders, the dissemination of information... In order to favour invisible performance more, it is also necessary here to implement demarcation policies which emphasise the specificities of sustainable innovation in services and in particular social innovations, examples of which we have given previously (cf. § 3.2).

Conclusion

The relationship between innovation and performance (equated with growth) is a major economic relationship, which has been the subject of an extremely extensive literature. In post-industrial economies, the two terms of the relationship raise several problems, which have been the subject of a separate literature. In a highly tertiarised economy, service innovation partly escapes the tools of traditional economic analysis. One therefore observes an innovation gap. Performance continues to be defined in terms of growth and productivity, while other forms of assessing performance prove to be necessary. One therefore observes a performance gap.

Economic analysis and public policies favour the relationship between visible innovation (identified by traditional definitions, R&D and patents) and visible performance (equated with growth). They therefore emphasise technological innovation that is a source of growth. However, the double gap that has been identified reveals much more complex relationships, which can question the relevance of diagnoses and the validity of public policies supporting innovation. It therefore appears that these policies should adopt a demarcation perspective, which allows one to take account of and support the specific forms of innovation (in particular in services) and the most dynamic and most strategic sectors (for example, the KIBS), but also a certain number of economic sectors that are sources of social innovations (proximity services). These policies, whatever the form of innovation (technological or non-technological), should also favour less visible performance (sustainable performance). The analysis proposed in this work has tried to clarify the different relationships between

innovation and performance on a strictly theoretical level. It should be continued by a quantified assessment of relationships.

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