Privatization of advisory services and the quality of evidence produced for farmers

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Abstract

This paper aims at better understanding the consequences of the privatization of extension services on the quality of the knowledge produced for and with the farmers. The originality of the study is that it does not focus on the front-office dimension of the services (the direct interactions between farmers and advisers), but rather on the back-office one (R&D investments in field and experimental trials, scientific watch, training, etc.). In that respect, we combined two analytical frameworks: i) the advances of service economics, which allow to better understand the strategies of private firms of extension services; ii) the debates derived from evidence-based policy approaches in public decision, which make it possible to assess the different types and levels of evidence that support the content of the advice. The analysis is based on field investigations in France (Ain), Germany (Brandenburg) and the Netherlands (Zeeland). It consisted in qualitative interviews (n=16 firms) with the managers of three types of service suppliers to farmers specialized in arable farming: private consultancy cabinets, input suppliers, and software suppliers. We could identify three logics of performance: "a service" logic associated with private consultancy cabinets, an "industrial" logic characterizing software suppliers, and a logic of segmentation implemented by input suppliers. A more specific inquiry related to knowledge about food safety showed the consequences of these logics beyond individual concerns of farmers. It demonstrates that the withdrawal of the state from the funding and management of extension may lower the level of evidence produced for the farmers, by substituting expertise to controlled trials and observations, and by giving a more and more important role to private investments related to upstream industries.

1. Introduction

The aim of this article is to discuss the consequences of the privatization of agricultural advisory services on the reliability of knowledge produced to combine productivity objectives with food safety objectives at farm level. Advisory services are always caught in a dialectic between, on the one hand, the need to contextualize knowledge in order to solve particular problems (whether technical, organizational, strategic, etc.) and, on the other, the necessity to build upon codified and validated knowledge (Gadrey 1994; Gallouj 2002; Toivonen, 2004). This tension is found in the classical distinction between front-office and back-office activities (Chase 1979). Front-office work is performed in the beneficiary's presence and allows for the co-construction of the demand and/or the co-production of the response. Back-office work takes place out of the direct interactions with beneficiaries and allows for the standardization of the service and for capitalizing on existing knowledge. It consists of activities such as scientific watch, training of advisers, accumulating technical references (through experimentation and R&D), etc.

This contextualization/standardization dialectic is also at work in the agricultural sector. The regulatory and technological standards framing farmers' work are becoming increasingly complex. They are generating a need not only for overall advice for the technical and economic management of farms, but also for the production of ad hoc solutions to adapt the evolution of production systems to the particular conditions of each farm. However, the economic feasibility of the changes that farmers need to make also depends on the reliability of the knowledge on which advisory services are based. In a sector where production costs are very high, it is often preferable to validate the effectiveness and/or assess the risks associated with a new technology. But these validations and assessments also have a cost. It is therefore necessary to examine the nature and quality of the investments made at the interface between advisory services and applied research, to produce the "evidence" that will be used to back up farmers' technical decisions.

These new needs for knowledge have been recognized within the very public policies that impose new standards on agriculture. The European Common Agricultural Policy (CAP) provides an illustration. In parallel with the fact that direct subsidies granted under the first pillar is contingent on the farmer complying with regulatory standards (mainly environmental and sanitary), the Commission has compelled its member states to set up "Farm Advisory Systems" (FAS)1. The aim of these FAS is to ensure that farmers receive information and knowledge concerning their farms' conformity with European standards.

At the same time, both policy-makers (European Commission 2011) and academics (Leeuwis 2000, Nagel et al. 2002, Laurent et al. 2006) are witnessing the disengagement of national states from the funding and management of advisory services, and the negative consequences that this is having. Sociological studies have pointed out the need to link up the different public- and private-sector actors involved in agricultural knowledge systems (Klerkx and Leeuwis 2008). But a blind spot remains: that of the strategies of the new private actors of agricultural extension, and the consequences that these strategies have on the modes of accumulation of knowledge. Given the profitability constraints weighing on these businesses, is there a risk of a quantitative and qualitative reduction of investments in back-office activities that may make it possible to validate agricultural innovations which are more respectful of food safety?

To answer this question, we draw primarily on the theory of service economics, which enables us to understand the management models of private advisory services, from the point of view of the performance logics underpinning them (Gadrey, 1996; Gallouj et al. 1999; Djellal and Gallouj, 2008). Evidence-informed decision (Nutley 2003), that is, evidence that serves to back up the actors' decisions (Laurent et al. 2009), is used to analyze the consequences of performance logics on the production of knowledge and the validation of innovation in the agricultural sector.

We have also chosen a case study illustrating new issues of food safety: the European law relative to the levels of the mycotoxin deoxynivalenol (DON) in cereals. The DON standard, settled to secure consumers' health, can have significant economic consequences and cause a substantial part of a farmer's crop to be excluded from the market. Thus, being able to benefit from adequate agronomic advice about this topic is an important issue for farmers; and farm advisers have to ensure the production of relevant and reliable knowledge so that effective technical solutions can be found to avoid cereal crop contamination by the fusaria producing the DON mycotoxin. Our aim is to understand what the consequences of private extension suppliers' strategies are on their back-office investments aimed at dealing with this food safety issue.

After presenting the theoretical framework built for the analysis of private advisory services' performance (Section 2), we describe our methodology and particularly our choice in terms of type of

[1] Regulations (CE) N° 1782/2003 and (CE) N° 73/2009

extension firms surveyed (Section 3). We then present the performance logics of these firms (Section 4), before discussing their consequences in terms of the quality of the evidence that they produce back-office (Section 5).

2. Conceptual framework

From the end of the 1980s, a general tendency towards state withdrawal from the funding and management of extension services started to appear on a national scale, initiated in the UK and the Netherlands. This may have stemmed from a drive to reduce public expenditures; but was also based on an economic doctrine that posits that commercializing advisory services would make those services more effective as more demand-driven (Knutson 1986). In this context, the advisory organizations spawned by agricultural policies gradually made way to a variety of new actors: farmers' cooperatives, consulting firms, suppliers of agronomic software, etc. The injunctions to privatize were based essentially on theoretical and micro-economic considerations (Dinar 1996), without questioning the more global consequences of the strategies adopted by these various private actors. The principles underpinning a new mode of functioning thus introduced has to be based on the distinction between back-office and front-office tasks. It demands a sound grasp of these two types of activity and the relations between the two can be considered in terms through the fundamental question of performance. Based on the theories of the economy of services, we have designed a framework for the analysis of the diversity of performance logics orienting the activities of the agricultural advisers who emerged from this privatization trend.

In other words, the analysis of the variety of service production models (Noyelle and Stanback 1988) cannot be dissociated from that of their performance. This reflection on the nature and social construction of performance is at the heart of a number of recent studies on services (Gadrey 1996, Gallouj 1999, Gallouj et al. 1999, Djellal and Gallouj 2008). These studies have developed a plural framework of analysis for the production of services, based on the identification of different registers of justification of the construction of performance. Drawing freely on the work of Boltanski and Thévenot (1991), they consider "that services […] can be defined according to different criteria of justification: industrial (volumes, traffic, productivity, etc.), market (turnover, margins), civic (equity, justice, etc.), domestic (quality of personal relations), reputation (renown, image, etc.), creativity or inspiration" (Gallouj 1999). This framework has been tested in many market and non-market services, including postal services (Gallouj et al. 1999), insurance companies (Gadrey 1996), etc. We have drawn our inspiration from this approach in the creation of a framework for the analysis of agricultural advisory services articulated around four types of performance: financial, technical, relational, and innovation

Table 1. The four performance registers

Performance register	**Description**
1. TECHNICAL	- reduction of the rate of dysfunctions - performance (number of farmers per adviser)
2. RELATIONAL	- annual turnover of beneficiaries - time spent by the advisers with each farmer
3. INNOVATION	- investment in R&D (experiments, databases, scientific watch, training) - improving the integration of knowledge into services (new tools and methods)
4. FINANCIAL	- service provider's profit strategy

The "**financial register**" relates to the profitability of advisory services. The agricultural sector has witnessed the emergence of a diversity of advisory service providers developing an offer without any public financial support. This has raised questions not only on how available resources are used for advisory services but also on the selection of a range of market services intended for farmers. The aim here is therefore to understand the reasoning behind the strategy of ensuring the profitability of private extension firms.

The "**technical register**" relates to efficiency as conceived of in industry. It corresponds to an organization's ability to meet its objectives, that is, to advise farmers on new practices, in the most cost-effective way. Here, the performance evaluation criterion is the technical "yield" of the work (for which productivity is the most obvious indicator). Quantitatively, this yield can be expressed as the number of clients or advisory service deliveries treated by each consultant (that is, the consultant's individual performance). But this yield is meaningful here only if, qualitatively, it allows for a change of farming practices.

Personalization of the supply is at the heart of the "**relational register**". This is an essential condition for ensuring that the knowledge produced matches the farmers' particular situations. It may be necessary to co-produce contextualized knowledge for the beneficiary, by incorporating certain tacit knowledge linked to the farmers' and the advisors' specific expertise. Two corresponding performance indicators are a low rate of client turnover, reflecting client loyalty and relations of trust, and the personalization of the service offer, for example in terms of time spent with each client.

In the case of agricultural advice, the "**register of innovation**" relates to the capability of renewing the scientific knowledge and information available to the advisors. This implies investments in experimentation campaigns to validate knowledge scientifically. It also implies the construction of databases based on observation and the implementation of procedures for pooling experiences collected from farmers, etc.

These four performance registers cannot be conceived of independently of one another. Positive or negative interactions exist between them. For example, the technical register of performance (the number of operations performed by a consultant in front-office) may clash with the register of relational production based on the personalization of services (number of hours spent with each farmer, for example). Likewise, the financial and innovation registers may correspond to antagonistic performance criteria. In the financial register, the aim is to create a standardized and diversified offer, while limiting the immobilization of capital in order to maintain a high level of reactivity in the face of market uncertainties. In the register of innovation, on the other hand, medium-term immobilization of capital in intangible investments – notably R&D – is indispensable to produce new generic knowledge.

Our objective in using this framework of products and performances is not to compare different service providers in relation to each register listed above. Instead, we wish to understand how each type of service provider resolves the contradictions between the different registers, or uses the synergies between them to conceive and achieve the performance of its activity according to specific constraints and objectives. Ultimately, this approach should enable us to verify whether, in the field of agricultural advisory services, new models for the production of services appear and, if so, to determine the consequences that this has on the production and use of knowledge mobilized to support these services.

3. Methodology: surveys on three types of private service provider

For our case study we chose the agricultural advisory services developed to enable cereal farmers to reconcile the objectives of productivity with those of sanitary quality (in the case of the DON mycotoxin). Our main methodological choice consisted in selecting the categories of advisory organisations that we then surveyed. To get round the problem of local specificities and to test the generic aspect of the models identified, we ran surveys in three different geographic areas of Europe

(the Ain Department in France, the Zeland Province in the Netherlands, and the Brandebourg Land in Germany). These are all regions characterized by intense cereal production and by significant levels of state withdrawal from agricultural advisory services. One of the difficulties lay in the fact that we had very few data on the local supply of extension services. Our surveys gradually revealed that the agricultural advisory services offered by private organisations were limited to three types of provider in the case of cereal production: consultancy firms, firms based on the use of modelling software, and agricultural suppliers (cooperatives or wholesalers). We carried out the surveys on almost all the private organisations (n=16) in the three regions, which employ close to 40 advisers in Ain, 53 in Zeland, and 53 in Brandebourg (Table 2). These three organizations also represent three different aspects of the privatization of agricultural advisory services.

- *Consulting firms* are emblematic of the commercialization of advisory services, and have often been described as a more efficient form of advisory service (Knutson 1986). We analyze how, in the absence of any public funding whatsoever, these firms define the performance of consulting activities for farmers and financed entirely by farmers. These farms are small SMEs, the biggest employing respectively 18 and 35 consultants in Zeland and Brandebourg Other firms are owned by individual consultants.

- *The suppliers of software*: there are few of these suppliers but they commercialize services based on radical innovations: software based on agricultural models, and ICTs.

- *Farmers' cooperatives and wholesalers* combine consulting services with the sale of inputs or the purchase of agricultural products, and occupy a central position in the agricultural advisory service offer. In each of the three regions studied they have teams of advisers who form a category of unavoidable service providers and have contact with large numbers of farmers. Their advisory services are either financed from the sale of inputs to farmers or integrated into the purchase price of products collected from the farm.

Table 2. Presentation of private advisory service providers that were surveyed

Private consulting firms that were surveyed		Ain			Zelande			Brandebourg		
		Number of firms	Number of front-office advisers	Number of clients	Number of firms	Number of front-office advisers	Number of clients	Number of firms	Number of front-office advisers	Number of clients
Suppliers of inputs	Cooperatives	1	25	3500	1	23	3000	1	5	600
	Wholesalers	1	12	1000	1	9	1100	1	12	1400
Consultants		1	1	60	1	18	500	4	35	1000
Software suppliers		2	2	300	1	3	1500	1	1	100

Our surveys were administered to the general managers or technical department heads of these organizations. We used a semi-structured questionnaire designed to collect data on: i) the service provider and its source of financing; ii) the nature of the services offered; iii) the nature of relations with clients; and iv) the modalities of updating of the knowledge within the organization (investments and back-office activities).

4. Results: three performance logics

The surveys enabled us to identify three performance logics.

4.1. Consulting firms and servuction logic for the production of services

The income of consultancy cabinets is essentially derived from individual and direct invoicing of the services delivered to farmers. As the number of farms is declining, the profitability of these firms depends on their ability to secure client loyalty. Their strategy is therefore to offer a high degree of flexibility and customization of their offer. The relational register of justification is thus placed at the heart of their performance logic. Moreover, the individual productivity expected from the consultants is a direct way of controlling expenditures on salaries. As a result, a secondary role is granted to performance in terms of technical justification. In particular, the consultants' technical quantitative performance is relatively low, with 25 to 35 farmers per consultant (Table 3). These particular conditions of profitability have another consequence: the firms tend to prefer front-office activities, to the detriment of back-office investments and activities. For example, these firms do not have staff specifically devoted to R&D. Nor do they invest resources in conducting (or commissioning) experiments (in local experimental stations, in networks of farms, etc.) that would make it possible to produce technical reference frameworks. To obtain such data and knowledge, these companies are entirely dependent on their relations -mostly informal- with outside partners: public or para-state research organizations, as well as upstream industries. It is essential for them to recruit highly-qualified employees who are specialized in specific areas (soil sciences, pest management...), and who are also expected to build networks through which a technology watch can be carried out at a low cost.

Table 3 Servuction performance logic of a consulting firm (Zélande)

Register of performance	Description
Technical register	- approximately 25 farmers / adviser - no measurement of the rate of dysfunctions
Financial register	- profitability at around 5%
Relational register	- very low client turnover (<5%) - flexible contracts that guarantee a minimal presence of the adviser on the farm (10 visits of at least one hour each) - diversification of the offer (services intended to optimize the production systems, to improve the management of information on the farm, to analyze the quality of production, etc.)
Register of innovation	- renewal of knowledge exclusively through training activities - 0% invested in R&D activities (experimentation, etc.) - 10% of the work invested in scientific watch and training

For these commercial service firms, it is the link between the relational and financial registers that guides the construction of the performance, to the detriment of the technical and innovation registers. Performance is thus considered in financial terms and in terms of inter-individual relations of work and trust as sources of loyalty. We can thus talk of a servuction logic, in so far as it is the co-production of

value at the inter-individual level that allows for the development of the activity (Zarifian and Gadrey 2002, Langeard and Eiglier 1986). The mobilization of resources and activities is driven by front-office work.

4.2 Software suppliers and the industrial logic of service production

The performance logic of firms that commercialize agricultural modelling software is radically different. Their profitability depends on their ability to sell a maximum of software to a diversified clientele by mobilizing a minimum of technicians for maintenance and customer relations. This principle of profitability has consequences on the other performance registers. First, the register of technical justification is obviously central for these firms. Their profitability increases with the number of clients that each adviser can deal with. It is therefore not surprising that their technical "yield" is far greater than that of the consulting firms, with up to 400 farmers per adviser in the case of one of the Dutch firms (Table 4). On the other hand, the relational dimension is very limited, as the reduction of personnel front-office costs is a major objective for these companies. Various strategies may be implemented for this purpose: use of ICTs for the remote maintenance of software, creation of peer networks among the users to provide this function, etc. This standardization is particularly important in so far as it frees up time for back-office work. It enables a scientific watch for updating and upgrading the scientific agronomic model that supports the software sold to farmers.

Table 4 Performance logic of a firm commercializing software (Zeland)

Register of performance	**Description**
Technical register	- approximately 415 farmers / adviser - no measurement of the ratio of dysfunctions
Financial register	- data on profitability not disclosed
Relational register	- low client turnover (< 10%) - software sold with flexibility in the module chosen by the farmer - one visit / year / farmer + hotline
Innovation register	- R&D activities based on formal and especially informal collaboration with the researchers - analyses of research results through intense scientific watch - validation of the models in a very limited number of experiments - over 30% of the work in back-office activities

These firms thus apply an "industrial" logic of production and performance (Levitt 1976) – what Djellal and Gallouj call a logic of assimilation, as opposed to the servuction logic which is a logic of differentiation (Djellal and Gallouj, 2010). This industrial logic is based on investments in R&D activities to develop services based on the use of agricultural-agronomic interactive software. It gives priority to the register of technical performance and to a linear organization of innovation of the service (specialized back-office work), to the detriment of the relational register. This firm's performance depends on its ability to substitute back-office work and capital for front-office work.

4.3 Agricultural cooperatives, wholesalers and the logic of segmentation of services

The advisory services of wholsalers or cooperatives that supply and buy from farmers are primarily financed either by the sale of inputs to farmers or by incorporating the cost of these services into the purchase price of the products collected. In these firms, controlling the profitability of advisory services requires that, for each category of farmer, the expenditure be adjusted to a proportion of the turnover (sale of inputs and/or collection of products). In the register of "technical" performance, the productivity

of this type of service provider is about half-way between that of the consulting firms and that of the software suppliers; for example, there are 130 farmers per adviser for the Zeland cooperative (Table 5). This does not mean that all the farmers benefit from a service offer with medium intensity between, on the one hand, the highly personalized offer of the consulting firms and, on the other, the offer of the software suppliers where interpersonal interaction is reduced as far as possible. The performance is rather guided by a segmentation of the beneficiary public, combined with a standardization of the services supplied for each "segment" of clientele. The input suppliers' offer is often presented in the form of various "packs" designed for different types of farmer, which combine a commercial offer (e.g. supply of seed, fertilizers, phytosanitary products) with an offer of advice, defined in terms of both relational intensity (e.g. number of visits) and content.

Table 5 Perfomance logic of a cooperative supplying inputs (Zeland)

Performance register	**Description**
Technical register	- 130 farmers / adviser - no measurement of the rate of dysfunctions
Financial register	- data on profitability not disclosed
Relational register	- low farmer turnover (between 10 and 20%) - standardization and segmentation of the offer front-office, depending on the volume of inputs or of cereals traded between the farmer and the economic organization
Innovation register	- dependence at 75% with regard to outside investments (primarily by the agri-industry) for the production and validation of references - development of new service tools and products proposed together with packs of technical solutions that include the sale of inputs

In front-office work, various procedures are implemented to adjust the time spent by consultants with each farmer category. But these adjustments also concern back-office activities. The back-office investments are preferentially oriented towards advisory services for those categories of farms which are the most important for the commercial activities (for instance biggest farms or farms with contracts with downstream industry for high-quality products). The performance strategy implemented by this category of service provider is close to what Djellal and Gallouj (2010) call an integrating strategy.

Overall, these findings enabled us to highlight the heterogeneity of the performance logics of advisory service providers for arable crop production: a servuction logic, marked by the high level of personalization of services invoiced by private consulting firms; an industrial logic associated with firms commercializing software; and a logic of segmentation of the offer by the suppliers of inputs who combine the offer of advisory services with the sale of inputs to farmers.

5. Discussion

The new performance logics of private agricultural extension providers raise questions on the reliability of the knowledge produced to assist various types of farmers in choosing practices enabling them to combine environmental, sanitary and productivity objectives. We will now consider this issue in the case of sanitary security, by looking at the back-office investments and activities that the three different types of advisory service provider implement to integrate the problem of the DON mycotoxin into their service offer.

- In the case of private consulting firms, we have seen that the servuction performance logic leads to a decline of back-office investments. When it comes to sanitary protection, no R&D investments are made by the local consultancy cabinets. The knowledge base on which the advice draws is updated primarily via the consultants' training and expertise.

- In the case of the software suppliers, updating and enhancing the predictive quality of the agronomic models through back-office work is a key element in these firms' performance logic. Investment capacity is however limited by the size of the firm. In concrete terms, they do not have the means to invest in experiments but they do contribute to the scientific construction of databases compiled with observation data (on the levels of contamination of crops by fusaria, etc.).

- In the case of the suppliers of inputs, experiments are carried out (at experimental stations or on farms) to test the effectiveness of certain technical solutions (varieties, sowing dates, phytosanitary products). But the investments needed for these experiments are huge, and the cooperatives or wholesalers remain dependent on financial or technical contributions from the upstream industries. The objectives of R&D are moreover usually integrated into broader industrial objectives of commercialization of cereals in various market segments.

The changes induced by new performance logics thus impact directly and significantly on the nature of the knowledge produced and the way of evaluating its quality. Debate on levels of evidence enable us to grasp this more fully. Spawned by the medical sciences, evidence-based-decision approaches discuss the methods that facilitate the most judicious use possible of the scientific knowledge effectively available for decision making or evaluation. One of the key themes in such debate is the quality of the empirical evidence produced to support a decision (Cartwright 2007). Not all knowledge can claim to have an equivalent level of evidence. For example, the opinion of one person formed on the basis of the observation of an individual does not have the same status as the results of observations on a large sample of patients. An abundant literature analyzes the advantages and limitations of various systems of ranking evidence. To simplify, if we revert to the subject of agricultural advisory services, ideally the advisers and the farmers should be able to inform their reflection not only with their experience and tacit knowledge, but also with reliable and relevant evidence to meet their objectives. But in the case of efforts in respect of sanitary security, we find that new technical solutions are defused despite relatively weak evidence of effectiveness. Software producers' aim is more to emphasize evidence of causality (modelling the functioning of a farm plot) than to measure precisely the relative effectiveness of alternative technical options. In the case of consulting firms, there is a real decrease in the level of evidence produced. Expertise is gradually substituted for controlled trials or observations based on a formalization of comparisons in time and space. In this context, the main investments in R&D are made by the suppliers of inputs, who endeavour to produce evidence of effectiveness intended above all for the categories of farms that are important to their commercial activities.

Debates on evidence show the implications of the new performance logics of private advisory suppliers, which the economy of services has enabled us to identify. It highlights the extent of the investments that need to be made to produce empirical evidence of effectiveness of a high level of validity, as the production of this evidence is difficult and costly, whether in experiments in the field or through reviews of the scientific literature.

References

Boltanski L., Thévenot L. (1991). De la justification. Les économies de la grandeur. Paris, Galimar.

Cartwright N. [with help from Goldfinch A and Howick J.] (2007). Evidence-based policy: Where is our theory of evidence? LSE and UCSD working paper.

Chase, R.B., 1978. Where does the customer fit in the service operation? *Harvard Business Review*, 56(6), 137-42.

CommissionEuropéenne, 2011. Impact assessment. CAP towards 2020. Annex 7: research and Innovation. Commission Staff working paper. SEC(2011) 1153 final.

Dinar, A., 1996. Extension commercialization: how much to charge for extension services. Am. J. Agric. Econ. 78, 1–12.

Djellal F., Gallouj F. (2008), Measuring and improving productivity in services: issues, strategies and challenges, Edward Elgar Publishers.

Djellal F., Gallouj F. (2010), Beyond Productivity Strategies in Services, Journal of Innovation Economics, n°5, 2010/1, p. 89-104.

Gadrey J. (1994). Relations, contrats et conventions de service. In: De Bandt J. and Gadrey J. (eds), Relations de service, marchés de service. Paris : CNRS.

Gadrey J. (1996), Services : la productivité en question, Desclée De Brouwer.

Gallouj, F., Gadrey, J., Ghillebaert, E., 1999. La construction sociale du produit financier postal. Annals of public and cooperative economics, 70(3), 417-45.

Gallouj, F. 1999. Les performances d'un centre financier. In: Gadrey, J., Gallouj, F., Blandin, O., Tertre, C. D. and Borzeix, A. (éd.), Comment mesurer la performance? La Poste,

Gallouj F. (2002a), Knowledge intensive business services: processing knowledge and producing innovation, in Gadrey J., Gallouj F. (eds), Productivity, Innovation and Knowledge in Services, Edward Elgar, p. 256-284.

Gallouj F. (2002b), Interactional innovation: a neoschumpeterian model, in Sundbo J. and Fuglsang L. (eds), Innovation as strategic reflexivity, Routledge, p. 29-56.

Klerkx, L., Leeuwis, C. (2008). Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. Food Policy, 33(3), 260-276.

Knutson, R.D., 1986. Restructuring agricultural economics extension to meet changing needs. American Journal of Agricultural Economics, 68, 1297-306.

Laurent C., Baudry J., BerrietSolliec M., et al.. (2009). Pourquoi s'intéresser à la notion d'Evidence-based policy ? Revue Tiers-monde n°200, pp. 853-873

Laurent C, Cerf M, Labarthe P, 2006. Agricultural extension services and market regulation: learning from a comparison of six EU countries. Eur J Agr Educ Ext 12 (1): 5-16

Langeard, E., Eiglier, P., 1986. Servuction, le marketing des services, McGraw-Hill, New-York.

Leeuwis, C., 2000. Learning to be sustainable, does the Dutch agrarian knowledge market fail? J. Agric. Educ. Ext. 7 (2), 79–92.

Levitt, T., 1976. The industrialization of service. Harvard Business Review, 54.

Nagel U., Heiden K., Siebert R. (2002), Public goods and privatised extension – the rocky road towards agro-environmental extension. In Rivera, W., Zijp, W. (ed.), Contracting for agricultural extension. International case studies and emerging practices. Cambridge (USA): CABI publishing

Noyelle, T., Stanback, T. 1988. Productivity in services: a valid measure of economic performance? New York Columbia University, New York.

Nutley S.M. (2003). Bridging the policy/research divide. Reflections and Lessons from the UK. Keynote paper. Facing the Future: Engaging stakeholders and citizens in developing public policy. NIG Conference. Canberra. 20p.

Toivonen, M., 2004. Expertise as business: long-term development and future prospects of knowledge-intensive business services (KIBS). PhD Thesis. Helsinki University of Technology, Department of Industrial Engineering and Management, Espoo.

Zarifian, P. and Gadrey, J. L'émergence d'un modèle de service: enjeux et réalités. Paris: éditions Liaisons, collection Entreprise et carrières, 2002.