

ServPPIN

The Contribution of Public and Private Services to
European Growth and Welfare, and the Role of Public-
Private Innovation Networks.

Servppin Final Publishable Summary Report

Rubalcaba L., Windrum P., Gallouj F., Di Meglio, G., Pyka, A., Sundbo J.,
Webber M.

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1- Executive Summary.

ServPPIN is a research project focusing on the role of public and private services in growth and welfare and the particular role of public-private innovation networks (PPINs). Service public-private innovation networks (ServPPINs) are a new phenomenon across the EU. These collaborative alliances between public and private sector organisations bring together and develop complementarities and synergies between the different types of knowledge, technologies, competences, and services that each partner specialises in.

The main objectives of the project were to identify the linkages between services, economic and social growth, and to understand the contribution of service innovations in the current economy and society, as well as any differences that may exist between the public and private sectors. This requires an understanding how public-private sector interactions function in the context of services, and how they can be better managed by private and public sector policy-makers to increase performance and welfare. It also requires an understanding of the characteristics of public-private service networks that induce innovation, and therefore growth, employment and welfare.

The theoretical and empirical fieldwork has involved cross-country and cross-sector empirical analysis. To define the service innovation and service public-private innovation networks concept, and to guide the interface between theory and empirical research, the project has developed an analytical framework for studying multi-institutional networks. The empirical research has followed a three-pronged approach at macro-, meso- and micro- economic levels including case studies covering the major service sectors of health, transport, tourism and knowledge intensive services.

The key findings of the project are:

1. Services are essential sources for growth which provide new value-added. There are different patterns of services development across the enlarged EU, and the variety of service economies models are embedded in diverse social and institutional models in Europe.
2. Service innovation is a way to improve both competitiveness and welfare. Europe shows both innovation gaps and performance gaps that cannot be addressed through the use of technological innovation only: non-technological innovation, organisational innovation and open and social innovation are also essential modes of innovation.
3. ServPPINs provide an opportunity to improve innovation in services, both economic and social innovation. Policy intervention may increase the contribution of ServPPINs to growth and welfare in the following way:
 - By strengthening service-specific innovation and innovation capabilities of firms, users and other agents.
 - By facilitating co-operation and networks involving service and social innovation.
 - By empowering the public sector and the third sector for co-operation.

4. ServPPINs represent a new mode of creating innovative types of services that otherwise would not be possible in the context of New Public Management approaches that have come to dominate the public sector in recent years.

A key set of policy implications follow: ServPPINs can be promoted through a mix of existing R&D policies, innovation policies, public procurement, regional policies, competition policies and employment & skills policies, among others. But these need to be reoriented to facilitate the creation and the growth of ServPPINs.

2- Summary Description of Project Context and Objectives.

Services are the dominant economic sector in modern economies and are a crucial component of competitiveness strategy and welfare in Europe. In the past, public and private services have been studied in isolation from one another. At best this is misleading. At worst it produces a false understanding of the drivers, dynamics, and impact of services. The ServPPIN project aims to overcome this gap and to go beyond these dichotomies, studying the contribution of services to growth and welfare from the perspective of the complementarities between public and private services. In particular, it focuses on service innovation and on public-private innovation networks (PPINs) because these are an important organizational mode for developing, producing, and delivering new and improved services. PPINs allow the merging and sharing of dispersed knowledge among participants as well as sharing the risk of financial engagement in uncertain innovation processes work; establishing and enhancing complementarities and synergies between public and private organizations. This summary aims at integrating the main theoretical and empirical findings of the project. The emphasis is put on the theoretical review work and the insights gained in the context of the different levels of empirical work.

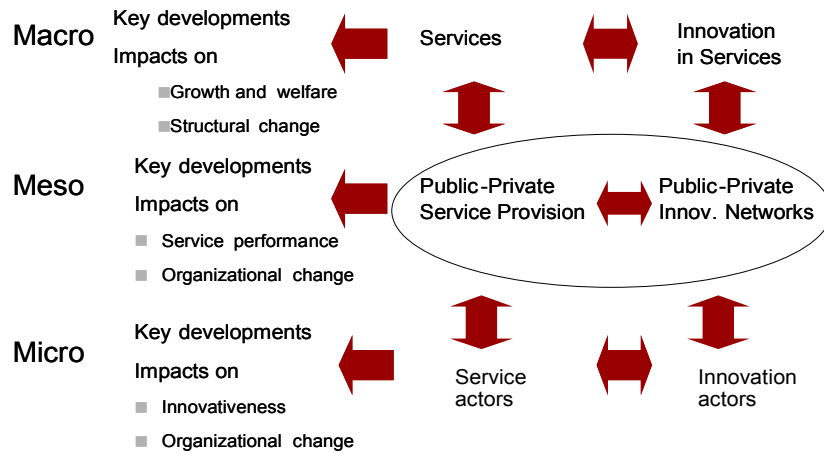
Research focus of ServPPIN project

Understanding the role and impact of public-private services is a major research undertaking. On the one hand, it requires a broad approach to capture the full scope of public-private service interactions and their impact. On the other hand, it must drill down into the specifics of public-private innovation networks in order to understand the micro dynamics, drivers and success factors of individual networks. In order to achieve this requirement for breadth in scope and detailed in focus, the ServPPIN project conducts research on three interrelated areas:

1. An assessment of the impact of public and private services on economic growth and social welfare with a special emphasis on the role of services innovation.
2. An investigation into how public-private sector interactions work and the particular role played by ServPPINs in the creation of new knowledge and services.
3. An investigation into the key characteristics of ServPPINs that successfully innovate and have a high impact on growth, employment and welfare.

Understanding all three areas is of utmost importance if they are to be better managed by private and public sector policy-makers in order to increase performance and welfare. As Figure 1 show, this involves an integrative analysis at the macro, meso and micro levels.

Figure 1. Macro, meso, micro levels of analysis in ServPPIN project



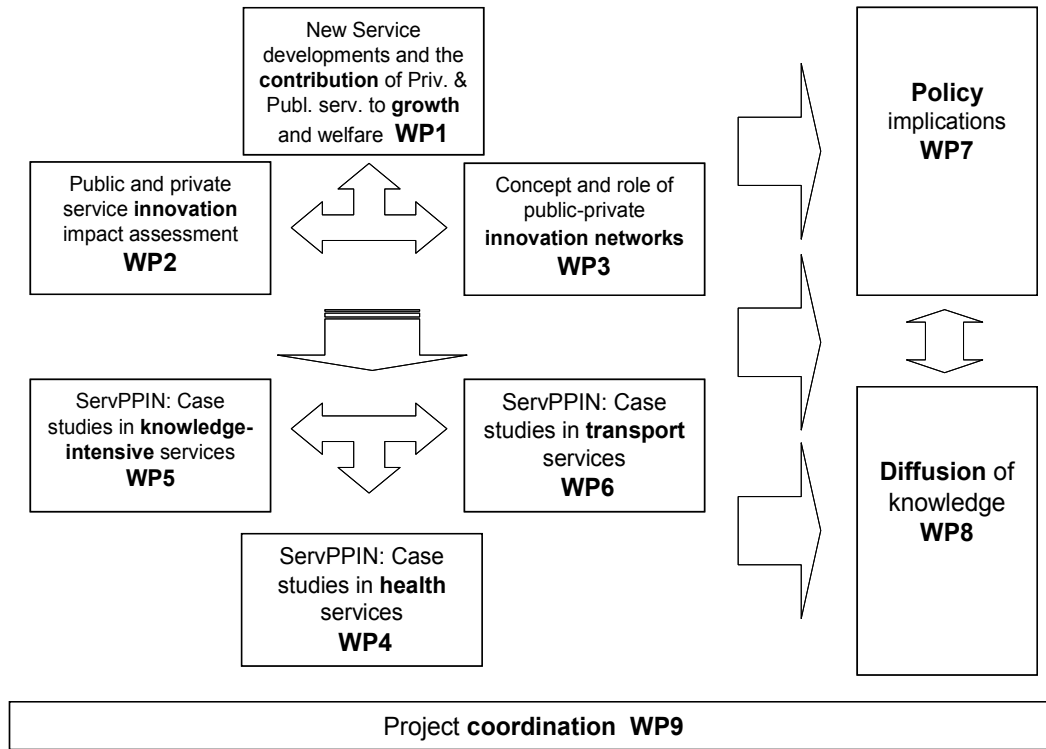
Research approach

To address the different levels of analysis, the project undertakes new theoretical, empirical and field work that is cross-country and cross-sector. In order to define the ServPPIN concept, and to guide the interface between theory and empirical research, the project has created an analytical framework for studying multi-institutional networks. The empirical research has followed a three-pronged approach:

- Large scale statistical analysis of public and private services in growth and welfare at the macroeconomic level;
- Statistical analysis of the contributions of service innovation and service public-private innovation networks (ServPPINs) to performance, growth and welfare at the meso and sectoral level; and,
- Development of case studies covering major service types (health, knowledge intensive services and tourism, and transport).

The project is organised around 9 working packages (WPs), as shown by Figure 2, applying their research at macro, meso and micro levels. In particular, the WPs 1, 2 and 3 focus on the present and the future most relevant aspects of the service economy, service innovation and networks analysis. WPs 4, 5 and 6 brings the analysis at a more specific level, undertaking case studies on public-private innovation networks in the field of health, knowledge-intensive and tourism, and transport services. WPs 7, 8 and 9 are the tools by which the work of elaboration of policy implication, diffusion of knowledge and management of the project is planned and realized respectively.

Figure 2. Organization of the ServPPIN Project



ServPPIN uses a number of different methodological approaches, from theory to applied research, from single disciplinary perspectives to multidisciplinary ones (that integrate economics with regional and political sciences as well as socioeconomics and management sciences), from analyses based on statistical and econometric approaches to case studies and social network analysis. Each work package uses those methodological approaches that are best suited to different tasks at hand.

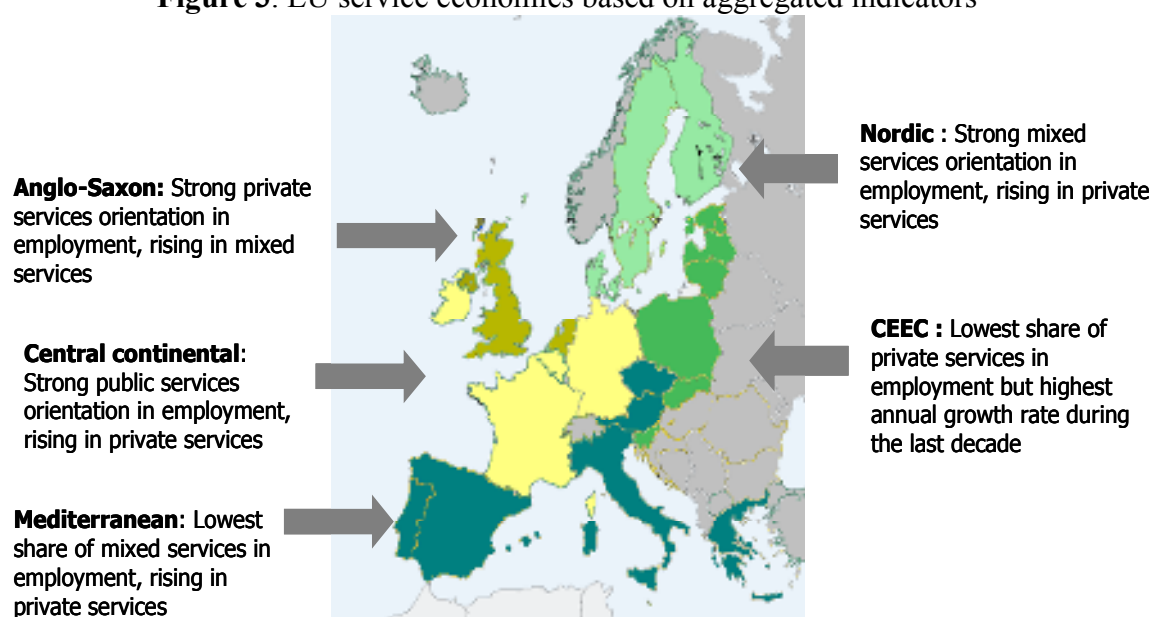
3- Description of the Main S&T Results.

The role of public and private services in European economies

Over the last decades, economic growth, wealth creation and the composition and structure of employment have been affected by the expansion of the tertiary activities which have grown within a ‘servindustrial’ society where interrelations between goods and services are of primary importance (Rubalcaba, 2007, Rubalcaba and Di Meglio, 2009; Maroto, 2009). Moreover, contemporary service economies are facing several challenges as regards the sources of structural change (Savona and Lorentz, 2009), the patterns of transition economies (Burger and Stare, 2010; Palócz and Oblath, 2010), environmental issues (Djellal and Gallouj, 2009a; Desmarchelier and Gallouj, 2010; Gadrey 2009a), social considerations (Gadrey, 2009b), gender and job quality topics (Iglesias-Fernández et al., 2010; Dueñas-Fernández et al., 2010) and the internationalization of service activities (Visintin, 2009).

The ever-increasing and dynamic role of services in modern societies has led to increasing levels of interaction between public and private services, and to the development of mixed forms (Rubalcaba and Di Meglio, 2009). Beyond PPP there is a variety of organisational arrangements for services provision in which both the public sector and private agents (private firms, non-profit organizations, and voluntary associations of citizens) may cooperate and interact (Di Meglio, 2010). In this framework, ServPPINs have emerged as an important organisational mode between public and private sector organisations. These collaborative alliances bring together and develop complementarities and synergies between the different knowledge, competences, and services that each partner specialises in. ServPPINs are a new phenomenon; one which is now being observed across the EU. This phenomenon differs to previous trends, such as the privatisation and outsourcing of public service provision, and contractual public-private partnerships (PPPs) in which service delivery or the financing of infrastructure is undertaken by private sector businesses. Understanding the drivers, barriers and dynamics of ServPPINs within a broader macro context in which services and innovation in services play a central role is a major task undertaken by this research project.

Figure 3. EU service economies based on aggregated indicators



Source: Di Meglio, Pyka and Rubalcaba (2010).

At present, the dominant trend across the enlarged EU is towards the increasing participation of private services in total employment, although a diverse macro and meso mapping of service economies can also be found (Di Meglio et al., 2010a). Within Europe, there are five service economy models: Anglo-Saxon, Nordic, Continental, Mediterranean and Central Eastern European (Figure 3). This classification is strongly correlated with classifications based on welfare state systems and systems of capitalism. In this way, the main orientation of the varieties of service economies identified is closely connected to the diversity of social models, as well as to differences in the institutional organization of production. The variety of service economies in the EU can be explained on the basis of the different roles played by factors such as the state, social and demographical changes, labour market institutions and EU15 membership (Di

Meglio et al., 2010b). In particular, previous historical developments matter when explaining the dynamics of services employment growth across the enlarged EU (Stare and Jaklič, 2010).

Private and public services have made significant contributions to aggregated value-added, employment and productivity growth in the EU in recent years (Maroto 2010a and 2010b). However, their impacts should also be assessed beyond the input/output relationship, on the basis of a multidimensional approach that takes outcomes and quality aspects into account (Di Meglio et al., 2009 and 2010c). Outputs relate to the immediate impact of a service provision. Outcomes refer to its effects in the medium to long term; influenced by external factors such as lifestyle or socio-economic background.

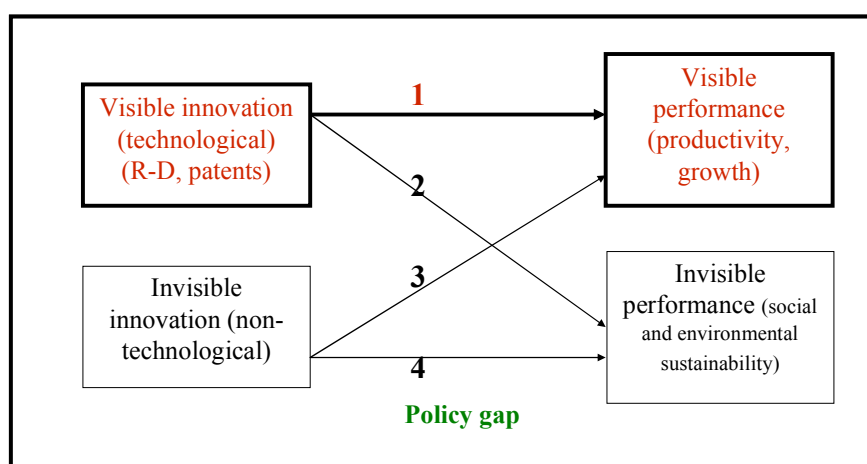
The future trends in the development of the service economy in Europe have been traced through with the study of the drivers of change of services, the analysis of their mega drivers and the set of foresight scenarios for particular activities such as wholesale and retail trade and knowledge-intensive services (Gallouj et al, 2011).

Public and private service innovation and impact assessment

In modern service economies, a problem lies in the definition and measurement not only of performance but also of innovation (Djellal and Gallouj, 2009b). One can identify a “performance gap”, which measures the difference between the reality of performance in an economy and the performance assessed by traditional economic indicators of R&D and patents, and by the technologist definitions of innovation.

In modern service economies, a problem lies in the definition and measurement not only of performance but also of innovation (Djellal and Gallouj, 2009b). One can identify an “innovation gap”, which measures the difference between the reality of innovation activities undertaken in a given economy and the innovation assessed by traditional economic indicators of R&D and patents, and by the technologist definitions of innovation. These gaps on innovation and performance blur the innovation-performance relationship (Figure 4). In order to carry out their diagnosis, public policies generally favour the relationship, which links visible innovation (mainly technological innovation: which is based on R&D and which gives rise to patents) to visible performance (growth, productivity), whereas other relationships involving invisible innovation and invisible performance should be taken into account.

Figure 4. Innovation gap, performance gap and policy gap in the service economies

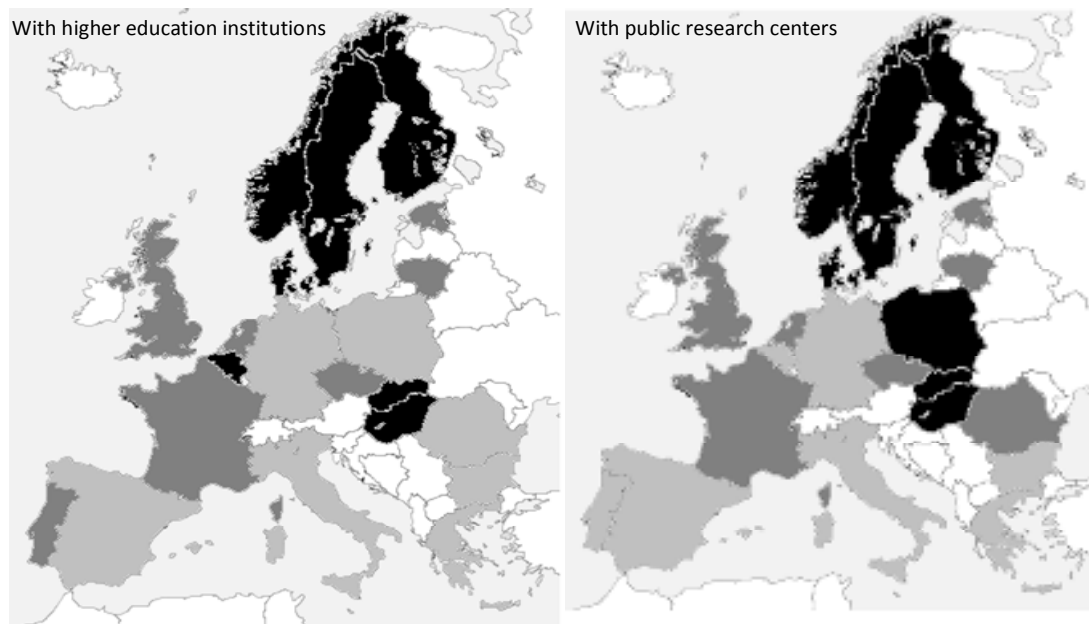


Source: Djellal and Gallouj F (2009b)

It is clear that the argument that services lag behind manufacturing is no longer sustainable. Services are very active in terms of innovation in all developed countries, particularly some categories such as knowledge intensive services. Furthermore, it cannot justifiably be argued that innovation occurs only when a novelty is embodied in a technical system. Non-technological or intangible innovations (i.e. new intangible products, organizational and marketing innovations) play an important role in both manufacturing and service industries. They may be identified not only in knowledge intensive services (KIBS, banks, insurance firms), but also in services that are often considered to be less noble or less knowledge intensive (transport, cleaning, elderly care, tourism) and in public services (Langergaard and Scheuer, 2009) as well. Even though market and organizational innovation have been recently included in the Oslo Manual, progress is still needed as regards the coverage of non-technological product innovation, non-technological process innovation, ad hoc and tailor-made innovation, social innovation, innovation in public services, and innovation in complex packages called new formulas or new concepts.

Our research identifies cooperation and interaction between public and private organizations in service innovation. The main external sources of information used by private sector innovators are: clients, suppliers and competitors (Fuglsang, 2010a and 2010b; Gallego, 2010; Savona and Musolesi, 2010; Windrum et al., 2010). According to recent surveys conducted in EU (CIS), universities and public research laboratories are the sources of information which receive the lowest scores. However, it should be noted that conference and scientific journals receive high rank scores, which means that business respondents may have indirect relationships with academic bodies. The research has also stressed (Battisti et al., 2011) that although the importance of external sources like public-private cooperation is recognised, there is no evidence at EU level of a new paradigm based on the open innovation wave.

Figure 5. Enterprise engaging in cooperation arrangements with public entities, country averages



Source: CIS4 database, Eurostat

In modern economies in which the boundaries between goods and services are blurring, service innovation is best addressed by a synthesis perspective (Gallouj and Savona, 2009; Gallouj, 2010; Windrum, 2007) that provides a common analytical framework for both manufacturing and services, and for both technological and non-technological forms of innovation (Gallouj and Toivonen, 2009; Windrum, 2009, Rubalcaba et al, 2010a). Instead, an assimilation perspective is, to some extent, still prevailing. This simply applies to services concepts and models that were originally developed to describe R&D in manufacturing sectors. The dominance of this perspective becomes clear when it comes to public policies. Public policies for innovation suffer from a double bias: they are manufacturing biased as well as Science and Technology (ST) biased. They tend to focus on public research and manufacturing sectors (particular high technology sectors) in order to promote technological innovation (based on scientific and technical R&D activities and patents appropriation); and to favour scientific and technological training.

Policy should move towards the integration perspective and promote invisible innovation. It is thus necessary to emphasize policies which also favour non-technological forms of innovation and R&D. It is also necessary to support services innovations (and more generally invisible innovations) within manufacturing and agricultural sectors. Public policies should also support (in the education system) the development of specific skills needed for non-technological innovation. All services are concerned by these innovation policies, but some sectors appear to be more concerned than others (KIBS, proximity services or public services).

On the concept and role of public-private innovation networks

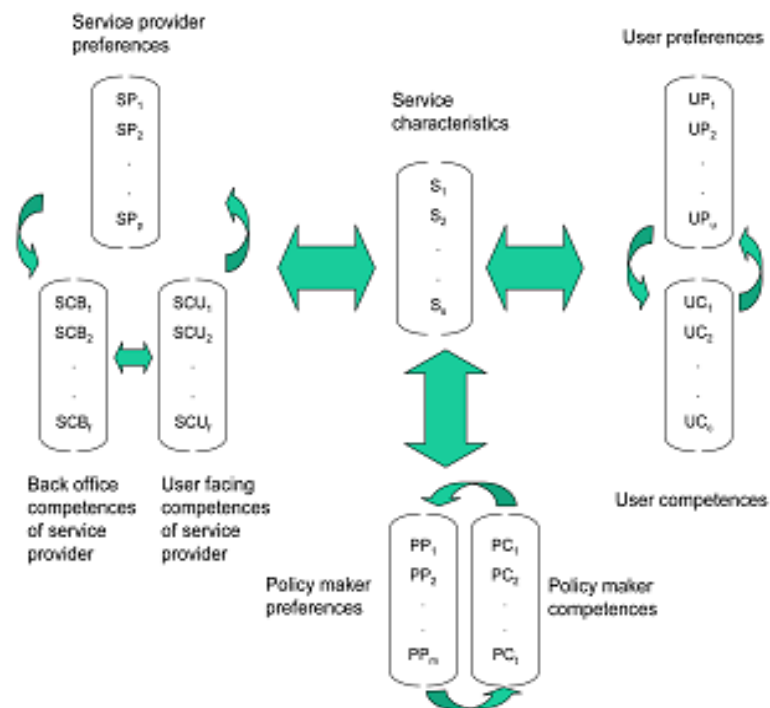
Our project focuses on innovation networks containing private and public organizations in the service industries - ServPPINs. ServPPINs are means for coordinating innovation cooperation between public agents, private and third sector businesses. They bring together and develop complementarities and synergies amongst public and private agents in services. The innovative services which they produce promote structural and technological change in other sectors of the economy, which impact upon growth and welfare. ServPPINs are an extremely heterogeneous with regards to their members, their objectives, and the organization of the network and dynamics.

So far there has been no theoretical alertness to ServPPINs in mainstream economics. Developing an economic theory of ServPPINs demands an eclectic approach that combines fields of innovation networks in industrial economics (a private market perspective) with new public management concepts to innovation networks, in order to reflect the role and rationale of public actors (public perspective). The synthesis approach in service economics has a close affinity to the theory of industrial dynamics that we draw upon to identify the effects of innovation networks as well as the role of learning within networks.

In addition, network theories provide an useful analytical approach to describe ServPPINs. They provide an abstract representation of networks, acknowledge for heterogeneity of actors and their different roles in the network. They allow for a description of network architectures and dynamics as well as comparison of different networks.

The ServPPINs which we have studied in our case studies are anything but constant and stable formations. They are continuously changing over time, at different stages of knowledge and market development. Clearly, ServPPINs are complicated constructs which are composed of heterogeneous actors interacting in various domains, and their complex formations change structure and nature over time. In order to capture this high degree of actor heterogeneity, and the complex interactions between them, we developed a multi-agent framework based on the multi-characteristic approach of demand theory (Figure 6). To acknowledge for the complex dynamics, the theory of industry life cycles have been developed further to a theory of innovation network life cycles.

Figure 6. Multi-agent framework for understanding the success and failure of ServPPINs



Source: Windrum (2009)

A taxonomy of ServPPINs applying social network analysis has been built in order to derive policy conclusions which may differ substantially from more conventional ones because of the uncertain character of innovation, the focus on processes instead of equilibrium and the heterogeneous character of involved agents. ServPPINs are inevitably confronted with true uncertainty which is a constitutional element of innovation. If innovation processes are treated realistically, they are no longer to be envisaged as optimization processes but as a cultural evolutionary process. This has strong consequences for innovation policy since policy designs to intervene in ServPPINs cannot be exclusively based on repairing market failures. Instead of pursuing a static social optimum, innovation policy needs a process-orientation which is in line with the systemic and evolutionary approaches in innovation economics and advises a rationale for innovation policy which focuses on the avoidance of bottlenecks. Innovation policy has to be designed and evaluated according to the ability to avoid evolutionary inefficiencies whenever possible. As evolutionary inefficiencies we define situations which clearly restrict potentials for future development, such as:

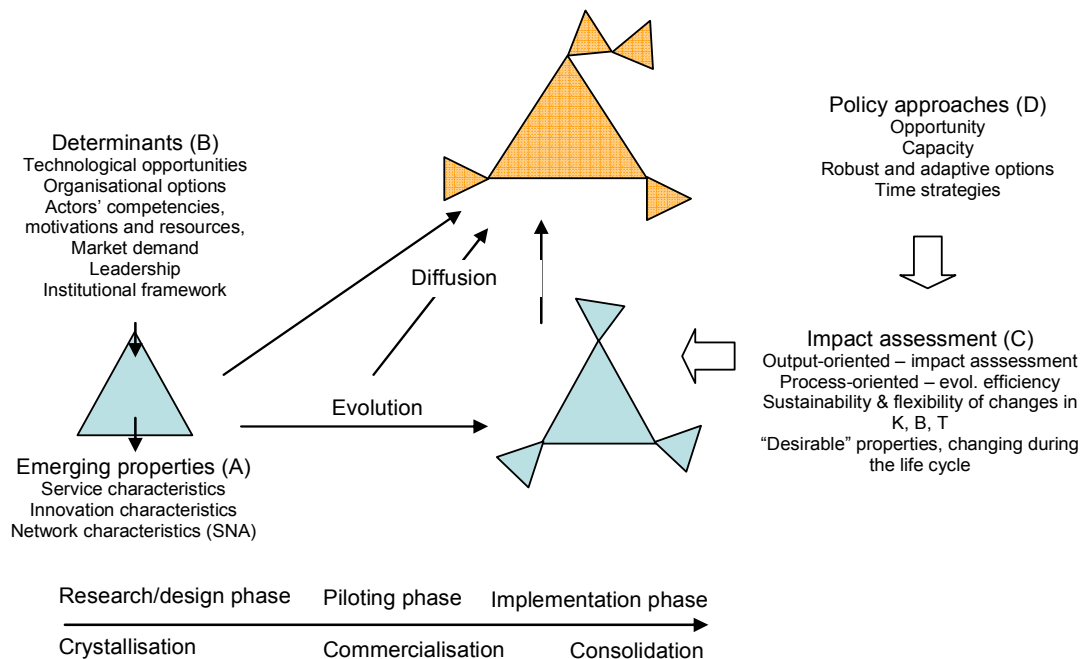
- Exploration inefficiencies (e.g. an economy biased towards applied research);
- Exploitation inefficiencies (e.g. low research intensity caused by the not-invented-here syndrome, missing absorptive capacities, or shortage of adequate competences in labour force, etc.);
- Balance inefficiencies (e.g. lock-in effects, too early rejection of promising knowledge, too late exit from exhausted knowledge);
- Network inefficiencies (e.g. missing and/or malfunctioning links among actors participating in the innovation process, too large size of the network).

In particular, network inefficiencies are identified as promising targets for policy intervention. The creation, the growth and the closure of ServPPINs can be influenced by innovation policy instruments. Public actors themselves can enter innovation networks and play important roles as network facilitators or network triggers in order to correct for the above mentioned evolutionary inefficiencies through, for instance, the advance of knowledge transfer between basic and applied research by strengthening university-industry-linkages. But policy cannot restrict itself to the initiation and creation of such networks but has to accompany them in a pro-active way, influencing their composition, development and structure wherever necessary or desirable.

Lessons from case studies

Case studies provide a micro-perspective on the emergence of innovation networks over their life cycles and can give insight into drivers, actor configurations and critical events of their evolution over time. In 2008/2009, the project teams studied approximately 40 cases in the following services sectors: health, knowledge-intensive services and tourism, and transport. The case studies were carried out in seven different countries. A common research framework was developed for the selection and implementation of the case studies (Weber, Windrum and Sundbo, 2008). Another major feature of the project has been the development of a common set of Operational Research Questions for all case studies (Green, 2008).

Figure 7. Blocks of research questions within the ServPPIN case studies



Source: Weber, Windrum, and Sundbo (2008).

Case studies of ServPPINs in health

A set of 16 case studies carried out in WP4 have yielded a set of important insights and stylised facts about ServPPINs in the health sector. First, innovation networks fall into two general categories: invention networks and diffusion networks. The two are not necessarily the same in membership or key drivers/barriers. The majority of case studies in WP4 were invention networks. These are organisational networks, not social networks. They are alliances between public, private and third sector organisations and – importantly - typically contain a small number of these organisations (between 2 and 5). These are goal orientated networks. They typically come together to develop a particular research project and, once completed, may well disband. One should therefore not mistake the ending of a ServPPIN as an indicator of a network failure. It may well be that the diffusion process requires a different set of institutional arrangements in different European countries. For example, diffusion may require enactment in law, or be embodied in the minimum specification of services by health insurance companies.

Second, these invention networks are professional networks. A striking feature is the absence of end users (i.e. patients) in the health case studies. This is despite the fact that health policies in many of the countries which we studied have been encouraging greater direct patient participation in health. It is also striking given the growing academic and policy literature on the importance of user engagement in innovation. This does not appear to affect the functioning of our health ServPPINs, or be a critical factor affecting success or failure of their innovations. It may be that health practitioners' knowledge of patients' clinical needs and long-standing interactions with patients, plus the trialling of innovations and the advocacy role played by Third Sector partners in these ServPPINs may explain this.

The third important finding is the key role which third sector organisations play in the construction, management and leadership of health sector ServPPINs. Around half of the case studied involved a third sector organization. These are very diverse organizations, ranging from charities to not-for-profit businesses to NGOs. This level of participation was unexpected. Just as unexpected was the leadership role which these organizations take. Where present, the third sector organization was invariably the leading organization in the invention network.

Fourth, while innovation networks are different to social networks, prior social and business contacts do have a role to play in the selection of members. There is evidence that ServPPIN partners have prior experience knowledge of one another, either as organisations or through personal ties. Partners in one ServPPIN project may subsequently meet up in another project.

Fifth, our research highlights the importance of the composition of members belonging to a ServPPINs. There needs to be complementarities between the competences of partner organisations, and with regards to access to finance and other resources. Further, commensurability and non-rivalry is found to be a key factor where more than one partner is from the private sector or third sector.

Sixth, the role of public and private entrepreneurs has highlighted as a key success factor. Entrepreneurs need to hold key positions within their own organisations. This enables them to ensure long term commitment of resources and the support needed to

develop the ServPPIN innovations. Furthermore, entrepreneurs need to be able to understand the different contexts and backgrounds of their partners in order to overcome the so-called ‘binary divide’ between public and private sectors. Actually, this supposed divide is really not in evidence in health. Many key participants have moved between public and private sector organizations within health, and have personal contacts in a range of public, private and third sector organizations.

Trust is a distinguishing feature of the health ServPPINs. In only around half of the case studies are formal contracts drawn up between partners. In part this reflects good understandings of partners and previous connections between key members. It is also due to the non-rivalrous composition of the members. Each member has different needs and interests. One may be interested in the commercial exploitation of the innovation, while another gains from the clinical benefits of using the innovation in practice.

Enrolling practitioners: a key factor determining the take up and diffusion of the innovation is the ability to enrol medical practitioners (doctors and nurses in hospitals and/or family doctors and practice nurses). Networks benefit strongly from having a prestigious medical practitioner or representative group within their membership.

External factors: external as well as internal factors can affect the innovative success of a ServPPIN, although it is noticeable that external factors are not cited as frequently. The two most noted external triggers of innovation are (1) structural reorganisation – where policy makers shift responsibility for service provision from one organisation to another, policy forces change to the internal structure of an organisation, and (2) funding incentives.

Case studies of ServPPINs in knowledge intensive services and tourism

16 case studies of ServPPINs were carried in knowledge intensive services and tourism. Once again, a great diversity of public-private networks (top-down/bottom-up; initiated by public, private or semi-public organizations) were identified. Table 1 summarizes key factors affecting the establishment and success of these networks (cf. Sundbo 2010).

Table 1. ServPPINs in knowledge intensive services and tourism

Case	Initiative T=Top-down B=Bottom-up	Initiator PU=Public PR=Private SP=Semi-public	Crucial factor E=Individual entrepreneur O=Organisation
Megaflex DK	B	PR	E
New Vocational Education and Training Programmes DK	B	PR	O
Fruit festival DK	B	PR	E
Local tourism development DK	T	PU	O
Etourgune ES	T	SP	O
Segur ES	T (B)	PR	O
Knowledge-diffusion program ES	T	SP	O
Training program ES	T	PU	O
Allergie Alpin AU	B	SP	E

Serfaus-Fiss-Ladis AU	T	SP	E
Farmstar FR	B	SP	O
Geowine FR	T	PU	E
Galileo Masters FR	T	PU	O
Sophia FR	B	PU	O
Golden Thread SL	B	PR	O
Venture Factory SL	B	PU	E
Bank of Tourism Potential SL	T	PU	E
ECDL training SL	T	PU	E/O

Innovative success in ServPPINs can be stimulated following top-down public action as well as by bottom-up enterprise. When a network is initiated by a public organisation, it tends to go through a life cycle of three stages: 1) prototype- industry, 2) commercialisation and entrepreneurial activities, 3) consolidation and organization growth. A different life cycle is also found: from ad hoc entrepreneurial -mainly driven by a particular focus and time frame- to permanent learning networks -expectations on the networks are not so limited in time and objectives-.

As in health, third sector organisations and semi-public institutions are found to play a key role in the construction, management, and leadership of knowledge intensive services and tourism ServPPINs. In some networks, private sector businesses are crucial for the maintaining of the network and innovative success. The case studies also highlight the importance of entrepreneurs in both public and private sector organizations (Sundbo 2009). With regards to composition, inter-firm competition and membership of large companies' with powerful positions can create imbalances within the network and hamper cooperation.

The social aspects of the network are important and may play a role in innovative success. The networks are also a place for social interaction and the building of social relations outside the innovation purpose. Social relations may pave the way to future collaboration relationships.

The case studies have identified a new type of service innovation that can be added to the ones that are normally referred to (product, process, organisation, market and business model). This is educational or pedagogical innovation. In several cases where the KIS was an education service, the product innovation has been new forms of education and learning (also see García-Goñi and Windrum, 2011 on diabetes education).

Several arguments may suggest that public-private networks are more successful in developing service innovation than pure public sector or private sector: (1) complementary assets between public and private actors, (2) flexibility, (3) more business-relevant and efficient public research and (4) increased learning capacity.

Key drivers of innovation within knowledge intensive services and tourism ServPPINs are: (1) External events (technology, market demands, market threats, quality problems, knowledge complementarity); (2) Personal and social factors (entrepreneurs, basis in local community, etc); (3) Public or semi-public institutions (public programmes, public regulations, public institution support, semi-public coordination). All these drivers

(internal and external) are important and have been found in different combinations in the case studies.

Important barriers to innovation are: (1) Network competence problems (capacity, lack of complementary competence, lack of ability to utilise a competence of the other partner, lack of orientation towards open innovation, entrepreneurial exit, time factor); (2) Public-private differences (trust, rigidity in the public sector, interest conflict, different cultures, unbalance between firms (large firms dominating), firms too small, lack of local community support); (3) Appropriability problems (knowledge services intangible, short-term profit perspective in private firms); (4) External factors (capacity of adaptation to new technology, lack of skills, lack of venture capital, economic cycles). In the case studies, the main barriers found lay within the network and in the parties themselves. Thus, the internal ones count for much more than the external ones.

Policy needs to acknowledge that networks matter. Public-private service innovation networks operate successfully within knowledge services and in the tourist sector, and should be supported. Public effort in the form of awareness campaigns, committees, incitement institutions, opening the resources of research institutions and funding leads to establishment of networks and innovation. Public effort can also be important in the late stage where the networks should be more institutionalised and managed in order to continue. Effort made at all levels – national, regional, local and EU – matters.

Moreover, policy should support the function of KIS networks. Public-private innovation networks as open platforms for innovation and public economic support to different stakeholders – institutional actors, business actors or individuals – that enter the innovation processes can be a good combination, particularly in tourism. The political system and the firms participating in the network should be aware that innovation processes in public-private networks take time.

Still, there are political barriers to ServPPINs. Ideology still plays a role and may prevent public-private networking. Often, barriers to successful innovation in public-private innovation networks are at the local level. Municipalities and communities must change their attitude towards ServPPINs.

Case studies of ServPPINs in transport

A set of 12 case studies were conducted on transport ServPPINs. In contrast to health and tourism, most of these ServPPINs involve many organizations. This reflects the scale of the service innovations and their operations – many cases were concerned with the integration of several transport modes in order to change the mobility behaviour of populations (often in large regions) towards more environmentally friendly transport modes. In the majority of cases, the network comprised more than 10 partners. Also, most of the cases were initiated by top-down actions taken by the public sector, and a public sector organization was a central coordinator (Table 2). Public institutions are decisive for the success and sustainability of ServPPINs – principally by being the key partners on the demand-side who provide funding, who define important institutional and regulatory conditions, and who leverage cooperation with other partners. Often they

trigger the launch of a ServPPIN and play the role of ‘carrier organisations’ and central network nodes.

Table 2. ServPPINs in transport case studies

Title	Country	Period	Type of Innovation	Type of network
SIS – Real Time Traffic Information Services, Display and Management System in Oslo	NO	2005-2009	Systemic service Innovation	Top-down, large
Establishment of Battery Charging Points for Electric Vehicles in Oslo	NO	2007-2009	Technology-mediated service innovation	Top-down, large
Flexus – Electronic Ticket System for Electric Vehicles in Oslo	NO	2006-2009	Systemic service Innovation	Top-down, medium
Organisational Experimentation and Innovation by a Public Transport Provider : Blending Skills and Cultures*	UK	2007-2008	Organisational innovation	Top-down, medium
Creation and Implementation of ‘Delivery Partnering’ Arrangements in the Context of a Public Transport Improvement Programme*	UK	2007-2009	Organisational innovation	Top-down, medium
ITS Vienna Region – A Dynamic Intermodal Traffic Information Service for Vienna Region	AT	2003-2009	Systemic service Innovation	Top-down, large
Compano – An Information and Agency Service for Arranging Car Pooling	AT	2005-2008	Systemic service innovation	Bottom-up, medium
DoRIS – Danube River Information Service	AT	2002-2008	Systemic service Innovation	Top-down, medium
Joint Development of an Integrated Information System in a Bus Company	HU	2002-2008	Systemic service Innovation	Top-down, small
VIATIC – Innovation Mobility Support Services*	FR	2005-2008	Technology-mediated service innovation	Top-down, small
Nord Logistique Internet Site and Services *	FR	2004-2007	Technology-mediated service innovation	Bottom-up, medium
DÉTRACE Démonstrateur de Tracabilité Ferroviaire Européen	FR	2005-2008	Systemic service Innovation	Top-down, medium,

In contrast to health and tourism, participants are predominantly public and private sector organizations. Public research organisations and third sector organisations (non-profit environmental and interest organisations) have limited participation. Furthermore, there is very marginal involvement of final users (i.e. citizens who use public transport). A key success factor for transport ServPPINs is the definition of a joint business case in which every partner is aware of its role, contribution, and benefits. This includes a clear and simple model for the distribution of intellectual property rights and financial benefits, to avoid conflicts of interest and problems of appropriability.

In most cases, the main driver for the development of innovative transport services is a “public mission”: i.e. the intention to improve the quality and efficiency of public transport. Other drivers are technological developments, economic and social drivers and environmental concerns. Furthermore, New Public Management (NMP) and public procurement processes have stimulated various types of public-private participation schemes for providing public services. However, in none of the case studies we have analysed have customer demands triggered the development of new types of transport services.

As in health and tourism, individual entrepreneurs – in public and private sector organizations - are essential for success. Entrepreneurship is not solely found in the private sector. It is also found – and just as important to - public and third sector organisations. This is particularly so where the public sector is assigned sufficient

autonomy and the organisational culture is supportive to initiative taking and development. In several cases, it was crucial that public sector entrepreneurs took a strong lead role in the creation of the network. Later, the lead role may be given over to one or more entrepreneurs from the private sector.

A strong leadership, at the strategic and the operational level, proves to be essential to balance the interests of all partners in the network. In several successful cases the existence of double leadership can be found, with one dealing with external entrepreneurship functions in the political environment and another one with internal project lead.

As in the other case studies, compatibility and commensurability of partners is a crucial success factor, as is trust, personal links, and prior acquaintance. The cooperation between public and private organisations tends to require an opening up of organisational boundaries and the willingness to enter into a process of mutual learning, thus requiring an open organisational culture on both sides. The integration of specialised organisations and experts with high reputation, expertise and international contacts is central for the successful definition and implementation of the new services. However, large specialized firms may easily come to dominate the network, and this creates imbalances that can hamper cooperation. The development of transport ServPPINs induced several organizational changes in public administration. Collaboration with private companies introduces more target-oriented practices which seem to have improved working disciplines significantly.

External factors may also affect the innovative success of a ServPPIN. The main external triggers of innovation that were identified are: (1) public funding or other forms of financial support to innovative networks, with public R&D funding being particularly important in early phases of network evolution, (2) political concerns and interest, public regulations and new laws, as well as reliable public demand for the new types of services, which revealed to be crucial for the wider uptake of the innovation.

ServPPINs were not only successful in developing service innovations; the public-private character presented specific advantages for that purpose. Although it cannot be decisively concluded that these networks were more successful than either a pure public organisation or private service firms would have been, several arguments may support the view that these new types of services would not have come into being with setting up a ServPPIN, not the least for the following reasons: (1) complementary assets, (2) benefits to the partners, (3) flexibility and increased learning capacity.

The impacts of ServPPINs investigated are difficult to disentangle from other factors of influence. However, they tended to have a positive influence on the quality of public transport, and also on the reputation of the research partners and the business opportunities for the private partners. In several cases, a wider uptake of the innovations in question could be observed - for instance, by expanding from the national to the European level, or by exploiting the innovation commercially on national or international markets.

Policy aspects of ServPPINs

ServPPINs can contribute to the development of the service economy in Europe, because they are capable of performing some specific tasks in the innovation process: they can utilize complementarities and synergies between heterogeneous partners in the process of knowledge creation; they facilitate the match between technology and demand by involving consumers, NGOs, etc.; they help translate social preferences not reflected by market prices into demand; they account for the growing complexity of many contexts and technologies; they support systemic innovations and transformations that require the involvement of a large number of heterogeneous partners.

However, due to their particular characteristics, innovation in services and the emergence of ServPPINs may be hampered by market failures or allocative inefficiencies and systemic failures or evolutionary inefficiencies. The former comprise private underinvestment in innovation because of externalities, asymmetric information and incomplete credit markets, market power failure due to lack of competition, economies of scale/resource immobility, etc. The collaborative element of ServPPINs makes policy rationales that relate to systemic failures and evolutionary inefficiencies arguments (e.g. capability failures, sub-optimal lock-ins by implementing actors, infrastructure failure, lack of supportive institutions, network inefficiencies) particularly relevant for this study (Pyka, 2010, Rubalcaba et al, 2010b).

The results of the project suggest three broad areas of possible policy intervention to overcome market and systemic failures and increase the contribution of ServPPINs to growth and welfare:

1. Strengthening service-specific innovation and innovation capabilities of firms, users and other agents.

- Adapting innovation policies to the needs of services. Public policies for innovation are biased towards innovation in manufacturing and towards science-based and technological innovation. Policies need to deal with the special characteristics of some types of services innovation including support for non-technological forms of innovation. It is also necessary to support services innovations (and more generally non-technological innovations) within manufacturing industries. Public policies should also support the development of specific skills needed for non-technological innovation via the education system.
- Funding. A lack of finance is an important barrier to network development. Policy could support the emergence of ServPPINs and service innovation in general by becoming aware of the 'double bias' and change funding practices in favour of service innovation.
- Awareness and training. Policy could foster the emergence of ServPPINs by raising awareness for management competencies needed for their development thus providing potential actors from inside the public administration but also from firms with the necessary skills to succeed. Moreover, public policies should also support the training of qualified personnel for service innovation in general.
- Intellectual property rights and standards. Policy can raise awareness for IPR issues and help to regulate commercialisation at the beginning of a ServPPIN. Policies to foster standardisation in services could also facilitate the emergence

of ServPPINs. Standards are particularly important in health, transport and IT-related ServPPINs.

2. Facilitating co-operation and networks involving service and social innovation. There are two different ways for policy to influence ServPPINs and reduce network inefficiencies:

- To act as a member or leader of a ServPPIN. The pro-active role of a public network leader turns out to be a very important determinant of success in some cases. Hence, the extent to which ‘public entrepreneurship’ can unfold is a matter of the degree of autonomy of civil servants, which, in turn, depends on the organisational and political cultures in place in various countries.
- To establish conducive framework conditions and targeted support measures. Public policy may enhance interactions by directing funding to networks, rather to individual firms. It could also support match-making and help in the identification of potential co-operation partners. In addition, programmes that foster research co-operation can be regarded as measures to build up trust that facilitates future network formation.

3. Empowering the public sector and the third sector for co-operation: the role of civil society. The results of the project highlight a need for change in the public sector:

- ServPPINs require increased flexibility from public sector organisations, in organisational as well as in contractual terms. Public sector entrepreneurs as well as private and third sector entrepreneurs may be the driving force behind network evolution. New organisational models for public and semi-public actors are also an issue that needs further research.
- Policy should also help administrations to link to science. One way to do this is more scientific training for the administration.
- Public sector should introduce (private) incentives into public services for the development of ServPPINs and public-private co-operation.
- Policy should take the specific role of civil society, end users and the third sector into account in the promotion of ServPPINs and various modes of cooperation between public and private sectors should be exploited.

The rationales for policy intervention are likely to change over the life cycle of a ServPPIN. In the start-up phase, funding, building and mobilizing innovation networks may be the main functions whereas in later stages, the goal moves to professionalize the ServPPIN and support the emergence of a dominant design with standard-setting regulation, and procurement and other demand side instruments.

To sum-up, policy intervention for further development of ServPPINs may touch various areas:

- R&D policies. These include joint participation of public and private partners, the promotion of engagement in R&D activities vs. diffusion of knowledge, and projects for further research on services, public-private interactions, innovation networks and social innovation.
- Innovation policies. These include support to public-private innovative networks beyond PPP, and support through service innovation, clusters, and innovative industrial policies.

- Public procurement. These include promotion of innovation and quality, and promotion of networking between public and private organizations.
- Standards in services as instruments for public-private cooperation.
- Employment and skills for social and service innovation.
- Regional policies for innovation.
- Impacts on other policies. This includes horizontal policy of internal market and competition, and vertical policy in health, transport, tourism, and other service sectors.

Policy-makers need to take into account that heterogeneity across EU countries, service sectors and innovation actors' matters.

Conclusions, future research agenda, and key-policy messages

The ServPPIN project has examined key developments and impacts of public-private services provision and of public-private innovation networks in services (ServPPINs) at three levels of analysis: macro, meso and micro. At macro level the main outcomes of the project are related to new service developments, service innovation and the contribution to growth and welfare. The project studies the stylized facts on public, private and mixed services; their similarities and dissimilarities across the enlarged EU; the challenges of the EU service economy; the explanatory factors of services growth and assesses efficiency and more generally the performance of services.

At present, the ever-increasing and dynamic role of services in modern societies has led to increasing levels of interaction between public and private services and to the development of mixed forms. Moreover, across the enlarged EU, the dominant trend is towards an increasing participation of private services in total employment, even if a great deal of diversity can be observed in terms of macro and meso patterns of service economies which is closely related to the different social and institutional models in European countries. Furthermore, the diversity of service economies in the EU can be explained on the basis of the different roles played by factors such as the state, social changes, labour market institutions and previous developments in the evolution of public, private and mixed services. ServPPIN has also proven that although private and public services have made significant contributions to aggregated growth in the EU in recent years, their impacts should also be assessed on the basis of a multidimensional approach which takes into account outcomes and quality aspects.

In addition, the project addresses the different dimensions of public and private service innovation and examines the impacts of innovation on productivity, growth and employment. Services, particularly knowledge-based ones, are very active in terms of innovation in all developed countries. Besides technological innovations, non-technological or intangible forms of innovations play an important role in services despite not being comprehensively captured by statistics yet. Along with the problems

related to the measurement of innovation, lies another one concerning performance. Thus, an innovation and a performance 'gap' are identified in contemporary advanced service economies. ServPPIN aligns with the demarcation perspective of innovation in services, also studying service innovation specificities in the field of public services. Public and private innovation networks can be considered related to the 'open innovation' models and 'social innovations' which have the particularities of being cooperative, interactive and not always formalized and programmed.

At meso level the main outcomes relate to theory developments under multi-institutional frameworks, the concept of innovation network life cycle and the study of the role played by evolutionary inefficiencies in the networks. The application of social network analysis allows acknowledging for the heterogeneity of actors in the network and their different roles. From this focus on networks, we derive a new rationale of innovation policy that can be summarized under 'avoiding evolutionary inefficiencies'. This approach seeks to avoid situations which hamper economic development. Such network inefficiencies concern the amount of existing links among the relevant actors, the size of the network, its structure, and the different roles that the individual actors play within the network. In this perspective, the structures and dynamics of innovation networks become the focus of attention as well as the starting point of action in innovation policy.

At micro level, ServPPIN followed a case study approach. In 2008/2009, the project teams carried out 40 case studies in seven different countries in the following sectors: transport; health services and in knowledge-intensive services and tourism. Case studies provide a micro-perspective on the emergence of innovation networks over their life cycle and give insight as regards drivers, actor configurations, impacts and critical events of their evolution over time. The key role played by the third sector and both public and private entrepreneurship in many PPINs is stressed which is also closely connected with the growing importance of social innovation.

The empirical results of the project highlight the importance of cooperation and interaction between public and private organizations and third sector organizations in developing and delivering innovative services. ServPPINs enable potential complementarities and synergies to be explored and exploited in areas such as credibility, dissemination, speeding up the process of agenda setting and decision making, more comprehensive view of the problems, legitimacy, resources, efficiency, flexibility, public research more efficient, learning capacity and knowledge transfer. ServPPINs are mainly organizational networks, professional and goal oriented combining social as well as commercial interests. While the borderline with social innovations may be a fluent one, ServPPINs tend to involve a significant commercial perspective, and associated to it strong interest in the realization of cost-effective and marketable solutions..

The success of service innovation networks can be derived from four main interrelated sources:

1. *The role of promoters and drivers* - both internal and external - of ServPPINs is essential. Success factors require the definition and implementation of a joint business case, trust -fundamental in many of the case studies analyzed-, a good entrepreneurial fit, flexible structures, use of inputs from benchmarking exercises, and pro-innovation entrepreneurship

and culture. Finance also play a role as well as the establishment of the right strategy between bottom-up or top-bottom set up that may vary depending on the particular service innovation to be developed and the institutional context.

2. *The integration of a particular individual innovation network within a wider systemic and social network;* a constellation that is reflected in the role of the role of third sector, the integration in local community, and the different facilitators from institutions such as universities or public and policy administrations and, in general, society through social innovation networks. The multi-agent framework for service innovation has been tested and can be considered as an appropriate platform that captures how different agents and interact to make a network innovative and successful. In many regards, successful ServPPINs can be considered as the outcome of successful social innovations that become consolidated in a small, professional and goal-oriented form.
3. *The ability to overcome or circumvent barriers to ServPPINs* in areas such as the rigidity of public administrations, the mistrust and expectations mismatch, the existence of different interests and incentive systems, the problem of free riders and asymmetric information, networking competences and, in some cases, mainly knowledge-oriented services, appropriability problems.
4. *The reduction of evolutionary inefficiencies in the course of the life cycle of ServPPINs* where networks are confronted with the risk of not being efficient enough to adapt to the changing phases of their life and the different external and internal elements that can drastically affect their development, their expected functioning and impact and even their own nature and composition.

Moreover, the promotion of ServPPINs may be based on the enhancement and application of a full range of policies such as: R&D policies, innovation policies, public procurement, standards, regional policies, as well as other policy areas concerning employment & skills, internal market, competition, health, transport, tourism, etc. In this sense, service-oriented innovation policy is not necessarily aimed at specific individual's service sector: in contrast, it can be seen as a predominantly horizontal policy that requires a high degree of sensitivity to innovation in the sectoral policy domains. ServPPIN policies thus cut across sectors, based on the approach that promoting service innovations should be considered a systemic task that is useful for any kind of economic activity, thus implying that the development of public-private innovative networks should be encouraged across a broad spectrum of policies.

The value-added of this project is not limited to previous findings and conclusions but to the new research opportunities that have emerged as the work has been carried out. From the large range of topics considered, new research opportunities arise in the following fields:

- In the area of services economics, more research is needed at the technical and conceptual level on several areas such as: the assessment of performance and welfare, the internationalisation of services, the role played by services and

service innovation in environmental and sustainable development issues, the diverse skills requirements which are essential to the growth of services and on services-related policies topics.

- Services business emerging themes areas are related to new service business models, servitization (service functions in manufacturing firms), services engineering and the formalization of services science.
- The area of service innovation has a potential for many research topics: service innovation in the context of the growing trend towards open and user-driven models of innovation; the transformative power of service innovation in value-added chain and global systemic values; service innovation in public procurement; measures and qualitative assessment of service, organizational and non-technological innovation and skills and competences for service innovation; employee-based service innovation and, finally, service innovation and welfare and the role of quality in addressing societal needs.
- A particularly promising area of interest is the one dealing with social innovation where a clear linkage with service innovation is produced. This is particularly the case of the following research topics: the role of civil society in public-private networks; social innovation in specific services sectors or activities; linkages between social innovation and service innovation; the interrelations between service innovation, social innovation and welfare and the role of service quality and accessibility in addressing societal needs; and the disruptive changes in consumers' behaviour as drivers of service and social innovation.

The ServPPIN project provides a platform on which to develop a deeper understanding of services, innovation, including social innovation, and public- private innovation networks in the enlarged EU. It has already shed light on key issues and, at the same time, paved the way for further important and timely research into the topic.

The key messages for policy-makers, businesses, trade unions and civil society actors can be summarised as follows;

- Services are essential sources for growth in modern economies. They provide new value-added to any economic activity. However, there are different ways of services development and the different service economies models are related to diverse social and institutional models in Europe.
 - Service innovation is a way to improve both competitiveness and welfare. Europe presents both innovation gaps and performance gaps which lead to policy gaps. These gaps that cannot be addressed through the use of (and the support to) technological innovation alone: non-technological innovation, organisational innovation and open and social innovation as well as new performance indicators are essential to fill the different gaps.
- ServPPINs are a new phenomenon that differs from previous trends, such as the privatisation and outsourcing of public service provision, and contractual public-private partnerships (PPPs). ServPPINs are collaborative alliances between public and private sector organisations; alliances which bring together and develop complementarities and synergies between the different knowledge, competences, and services that each partner specialises in. Synergies between private and public services should be promoted to reinforce complementarities

and positive impacts. Moreover, the ‘Third Sector’ organisations (charities, non-government organisations NGOs, labour market organisations, not-for-profit businesses) can be key players in ServPPINs what wider the room for social innovation.

- Public-private networks provide an opportunity to improve innovation in services, both economic and social innovation: There is a need to go beyond the traditional funding or tax-deduction schemes. The results of the project suggest three broad areas of possible policy intervention to overcome market and systemic failures, reduce evolutionary inefficiencies and increase the contribution of ServPPINs to growth and welfare: the strengthening service-specific innovation and innovation capabilities of firms, users and other agents; facilitating co-operation and networks involving service and social innovation, and empowering the public sector and the third sector for co-operation.

Following these policy implications, the promotion of ServPPINs can be based on the enhancement of related-policies such as: R&D policies (joint participation of public & private partners, promotion of engagement in R&D activities, projects for further research on services, public-private interactions, innovation networks and social innovation), innovation policies (support to public-private innovative networks), support to service innovation, clusters and innovative industrial policies, public procurement, (promotion of innovation and quality, promotion of networking between public and private), standards in services as instruments for public-private cooperation, regional policies for innovation and other policy areas can be involved as well (employment & skills, internal market, competition, health, transport, tourism, etc.).

4- Potential impact and the main dissemination activities and exploitation of results.

Strategic impact

ServPPIN has been a research project created to make real and novel contributions to service-related research and, at the same time, respond to the objectives of the Commission working programme and the expected impacts pointed out in Area 8.1.2. Before moving on to explain the specific impacts of the research project, brief reference should be made to the links between ServPPIN and the related topic and area in the Commission Framework Programme 7.

ServPPIN in the EU Commission Framework Programme 7

The project matched clearly the topic addressed by the call. First, ServPPIN was situated firmly within the context of area 8.1.2 “Structural changes in the European knowledge economy”, where services and innovation are the essential topics for structural change within the knowledge economy. The new services economy has two main characteristics, first, the dominance of services in a service-industrial context, where services do not grow to the detriment of other economic activities, but complement industrial and socio-economic development (Rubalcaba and Di Meglio, 2009; Maroto, 2009), and second, the increasing role of information and knowledge in

the performance of economic systems where services, often through service innovations, play a catalytic role on growth and welfare (Di Meglio et al. 2010a). In this context, ServPPIN researched how public and private services are agents and receivers of structural change, and how they face the knowledge challenge by the ways of service innovations and, in particular, by the new collaborative agreements and networks emerging from the public-private interactions.

Another aspect of the structural changes analyzed in ServPPIN was the evolution in the composition between public and private services (Di Meglio, 2010). Most recent trends in Europe indicate a shift from public services to private services or mix public-private services, due to a variety of factors, such as budgetary constraints of public finance, competitive pressures from globalization, or consumer requirements for more and better quality of services provided in cooperation with the private sector. This change is particularly acute in the transition economies where the role and contribution of services in the overall economy is still at its nascent phase (Burger and Stare, 2010; Palócz and Oblath, 2010). In this context, ServPPIN addressed a key issue since optimal balances of public and private services and the role of service innovation were analysed providing new insights in the way that public and private sectors can work together and lead to economic and social gains.

In addition to its relevance to the overall objectives of thematic area in the Call., ServPPIN addressed the main points indicated in the services-related topic (SHH-2007-1.2.2) “The implications of developments in the service economy for the European economy”. This topic explains that “the aim is to understand and assess the future evolution of the implications of developments in the service economy for the European economy in general, and competitiveness, growth, productivity, employment and welfare in particular.” ServPPIN addressed key developments of the services economy, such as the emergence of knowledge-intensive services (Di Meglio et al 2010a), the relatively low productivity growth in many services (Maroto, 2010a and 2010b), the sources of structural change (Savona and Lorentz, 2009), environmental issues (Djellal and Gallouj, 2009a; Gadrey 2009a, Desmarchelier and Gallouj, 2010), social considerations (Gadrey, 2009b), gender and job quality topics (Iglesias-Fernández et al., 2010; Dueñas-Fernández et al., 2010) and the internationalization and competitiveness of service activities (Visintin, 2009; Visintin et al. 2010), the role of service innovation and impacts of service technological and non-technological change, the need for modernizing public services, the existence of mixed public-private services and the place of public-private interactions, partnerships and networks as new ways of service provision and complement public and private (Di Meglio, 2010).

These new developments were addressed within a completely new and improved context – the interaction between private and public services. This is the most general case, whereas previous research has been based on the assumption that private and public services exist in isolation of one another. To this end, ServPPIN examined linkages between services, innovation and their economic impacts, at macro-, meso- and micro- economic levels. For this purpose three types of approaches – at the macroeconomic, the network and the firm level - were combined in complementing one another. In this way ServPPIN precisely addressed the topic description: to “address and assess the interactions between the dissemination of knowledge, service innovation, technical and organizational change and the evolving roles of consumers in generating productivity growth and performance in the public and private sectors”. Regarding

international trade in services, ServPPIN explored these issues in the context of networks, established at the international level and therefore, forming instruments to analyse international trade, competitiveness and the internal market for services (Visintin et al, 2010).

As suggested in the topic description, ServPPIN covered different categories of services, “including knowledge-intensive services, business services, social services, environmental services, personal services, and the ways in which their structures, economic and social contributions are affected by regulatory, institutional frameworks and cultural conditions in European countries and regions.” The first two working packages on this project implemented a cross-sectoral analysis covering these and other services activities across a wide number of countries (EU or OECD), while working packages 3-6, including case studies, analysed selected but representative sectors enabling the creation of a comprehensive view on public and private services. The cross-national comparative dimension was obviously very important in this project. Our goal had been to try and identify various service development models, their comparative efficiency and the different roles played by ServPPIN in them. The selection of countries represented in the consortium provided a wide representation of different framework, cultural and policy conditions all over Europe.

Impacts at scientific level

The main findings of ServPPIN have already been detailed in previous sections of this report when identifying the specific contributions both in terms of theoretical developments and applied research. The following summarise the scientific impacts of this project related to economic structures and structural change by showing how ServPPIN has dealt with the particular expected impacts in the original proposal:

- *Revision of service growth factors, developments and beyond.* Factors explaining the growth of services in Europe were revised and analysed through a systematic and critical comparison between private and public services. The role played by demand and supply factors as well by other potential determinants is empirically tested. Modelling and panel data regressions for two country samples: CEECs (Stare and Jaklič, 2010) and EU27 (Di Meglio et al. 2010b). Particular emphasis was given to the understanding of the evolution of the transition old public-driven economies towards market economies, where complementarities between private and public services played roles of greater diversity (Burger and Stare, 2010; Stare and Jaklič, 2010; Palócz and Oblath; 2010). New evidence on public and private services: across major economies in the world and European countries (Rubalcaba and Di Meglio, 2009). Cross-sector and time series analysis: national accounts approach. Two-step cluster analysis of public, private and mixed services in advanced service economies at aggregated and disaggregated level (Di Meglio, et al. 2010a).
- *New impact assessment of socioeconomic changes led by services.* A new assessment of the economic impact of public, private and mix services was obtained, both in terms of economic performance indicators (e.g., competitiveness and productivity) and in terms of social and welfare indicators (e.g., employment). This was achieved by investigating for any differences and

similarities across-countries and sectors (Di Meglio et al., 2009 and 2010c, Maroto, 2010a and 2010b).

- *Enrichment of service innovation theory.* State of the art of innovation in services often distinguishes three different approaches (Gallouj, 2010, Gallouj and Savona, 2009, 2010): 1) a technologist (assimilation) approach that equates or reduces innovation in services to the introduction of technical systems (material transport and processing systems and, above all, information systems) into service firms and organizations; 2) a service-oriented (demarcation) approach that seeks to identify particularities in the nature and organization of innovation in services; 3) an integrative (synthesis) approach which, taking as its starting point the trend towards convergence and the blurring of the boundaries between goods and services, favours a similar analytical approach to innovation in both cases. ServPPIN project contributed both to the demarcation and the integrative approach. Indeed, it emphasized the specificities of innovations arising from public-private networks and it also improved the characteristics based approach of the product and of innovation through the introduction in the framework of public-private relationships (multi-agent framework), Windrum, 2009; Gallouj and Toivonen, 2009.
- *Multi-agent framework for innovation* (Windrum, 2009). One of the strongest expected scientific impact of the ServPPIN project stem from the new theoretical approach of ServPPIN that is based on three novel elements: 1) A multi-agent framework for innovation that allows for an investigation of the functions, interests and multiple-layered sets of relationships and interactions of the various actors. This provides the overarching framework in which to understand interactions between public and private sector organizations, 2) the life cycle model of public-private networks that identifies the key dimensions in which ServPPINs develop over time, and 3) A new rationale for innovation policy by avoiding evolutionary inefficiencies. By examining the interaction of public and private services, ServPPIN critically evaluated existing theories and tested existing models and analyses of services and services innovation.
- *New empirical evidence.* As explained in the previous sections of this final report, new empirical evidence was provided and, when appropriate, new original methodological approaches were used. Novel empirical evidence on the relative contribution of final and intermediate demand to structural change was based on Input-Output Structural Decomposition Analysis (Savona and Lorentz, 2009). New evidence on the public and private services transformation in the CEECs concerned convergence analysis, cluster analysis, assessment of efficiency and performance (Burger and Stare, 2010; Palócz and Oblath; 2010). A theoretical framework analysing linkages between innovation in services, entrepreneurship and sustainable development was presented (Djellal and Gallouj, 2009a). Economics of services: environmental, social and gender considerations were analysed from a theoretical and empirical perspective (Gradrey 2009a and 2009b; Iglesias-Fernández et al., 2010; Dueñas-Fernández et al., 2010). Internationalisation of services: relationships between different modes of provision based on different estimation techniques of simultaneous equations models (Visintin, 2009 and Visintin et al., 2010). ServPPIN produced a range of important and novel empirical findings that pushed understanding of

services beyond the state-of-the-art. It did this by combining econometrics, network analysis and case studies. These required the use of methods that analysed information on critical events in the evolution of networks. These critical events can include changes in consumer motivation, knowledge diffusion structures, and management of the service provision, supply and policy reforms.

In order to complement the scientific impacts mentioned above, some additional comments are introduced at this point to provide a complete overview of the set of scientific outcomes related to structural change.

Better understanding of the concept of productivity. One of the main outcomes of the WP1 has been a better understanding of the concept and development of productivity (Djellal and Gallouj, 2009c, 2010, Maroto, 2011). The question of the impacts of innovation in services on productivity (which was addressed in WP 2) cannot be envisaged without a reflection on the definition (and the relevance) and the measurement of productivity in services. According to Maroto (2011), it seems clear that the analysis regarding productivity in the services sector is the core of a rising debate in recent decades, principally regarding its definition and measurement. Indeed, the service economy and more generally the knowledge-based economy raises problems of output and volumes definitions, which this research also tackled (Gadrey, 1996; Djellal and Gallouj, 2007a). Thus, in certain situations the productivity concept seems to lose its validity. There are a lot of service industries in which what is at stake is something else than productivity, for example, creativity, quality and long-term indirect impacts or outcomes. This is the case of the well-known Baumol's horn quintet and, more generally, of artistic creation. But beyond such specific activities, this problem is also more generally raised in the knowledge society, which can be defined both as knowledge intensive and (social) relation intensive. The paradoxical problem which is raised is then that of the productivity measurement of knowledge and of social relations. In such an economy or society, output quantities, or volumes, or prices, can be considered as less important than their useful long term effects in their outcomes. For example the productivity of a lawyer has little interest if it leads to negative verdict for the client; the productivity of a doctor has less meaning in comparison with the results (for example in terms of quality adjusted life expectancy) of medical care. A major concern is produced when stagnant or slow productivity in services may slow to entire economic growth due to a major participation of services in total economy. In recent years, the so-called Baumol's disease has been submitted to criticism in some important works (see Maroto, 2011 for a revision and a state of the art of the relationships between productivity and services sector). Major revisions of this ideas has been made when inter-sectoral relationships, the role of ICT, or other measuring and conceptual factors are taken into account, so productivity is only one factor within the complex services growth (Rubalcaba, 2007). But not only theoretical improvements have been made within the ServPPIN consortium. New and more robust approaches to the measurement of productivity, growth and welfare in the services sector have been implemented. In this context, since the mid-90s the literature has debated on the negative patterns of services' productivity in European countries, in contrast to better figures in other reference areas such the United States (Maroto and Rubalcaba, 2008). Some analysis (Maroto, 2010a and 2010b) support the traditional or conventional theories, emphasizing the relative low growth of services' productivity. Nevertheless, their in-depth analysis reveals significant differences among the several services industries. The

conclusion is that services are not unproductive per se (Maroto, 2010b). Moreover, there are some services industries which highly contribute to overall economic and productivity growth (Maroto, 2010a). Finally, the results obtained through non-parametric techniques provide a new way of approaching to the concept of productivity and efficiency within services and an on-going research line for a future agenda.

Better understanding of the link between innovation and employment. The impact of innovation on employment is another example of a difficult question, that ServPPIN managed to shed light on, in terms of methodological, theoretical and empirical measurement considerations (cf. Djellal and Gallouj, 2007b). Indeed, the question of the relationship between technical change and employment is an old and fundamentally complex issue, at both theoretical and empirical levels regardless of sector. This relationship is underpinned by a multiplicity of both direct and indirect contradictory causalities. Consequently, it cannot be tackled satisfactorily through a limited number of general mechanisms or at a single level of analysis, whether micro-, meso- or macro-economic. The debates on ‘compensation theory’ give some idea of the complexity of the mechanisms at work. The web of interrelationships is made even more difficult to untangle by the fact that variables other than innovation, such as demand and institutional change, affect the growth of employment in services. It is hardly surprising, therefore, that today’s neo-Schumpeterian economics of innovation has avoided this question (with the notable exception of the studies by Freeman, Clark and Soete, 1982 and Freeman and Soete, 1987). It is even less surprising that it is generally ignored also in studies of innovation in a sector that poses many other interesting and difficult theoretical problems (particularly those raised by the definition, measurement, and modes of organization and appropriation of innovation and R&D). The ServPPIN project contributed to our knowledge of such an important and strategic issue, Evangelista and Savona, 2010).

Development of a multi-agent framework. To capture the heterogeneity of ServPPINs a multi-agent framework of ServPPINs was developed (e.g., Windrum 2009) that allows for an investigation of the functions, interests and multiple-layered sets of relationships and interactions of the various actors that might be involved in the life cycle of a ServPPIN. These actors include policy makers, public and private service providers as well as users of the services. This multi-agent framework of services innovation helps us to capture and to understand the dynamic interactions of ServPPINs. Further, the framework provides guidance on how to determine the various sources and processes of innovation, and how these interact. It can also help to measure innovation in services.

Development of a life cycle theory for ServPPIN. The industry life cycle is one of the most important theories of industrial dynamics of the past forty years (Vernon, 1966; Abernathy and Utterback, 1975; Gort and Klepper, 1982). The concept of a life cycle meanwhile has been transferred to knowledge intensive industries (Windrum and Birchenhall, 1998, 2005; Windrum, 2009), is also successfully applied to informal innovation networks (Pyka, 2000) as well as to innovation networks in biotechnology (Saviotti, 2007). The advantage of the life cycle approach is that it shows the changing characteristics of network architectures, role of actors and their behaviours at different stages in time. Applying the concept on public private innovation networks in the service industries improved considerably our understanding of the dynamics taking place in the networks driven by mutual learning processes. Finding adequate variables

and their patterns of change in time allowed the design of dynamic governance strategies for both, firm and policy actors

Development of a Taxonomy of ServPPINs. The concept of ServPPIN life cycles also constitutes one of the dimensions in the development of a taxonomy of ServPPINs that allows for the comparison of different characteristic types, and enables us to assess the respective implications as well as to derive practical recommendations for intervention. By focusing on the mode of network formation and three distinct phases of the life cycle of ServPPINs, we were able to distinguish and differentiate six different types of ServPPINs. Each of these types is characterised by certain characteristics concerning the composition and structure of the network as well as the roles played by individual actors. To capture these differences and to provide some useful guidance for the case studies we employed the method of social network analysis (SNA) that allows for the analysis of all sorts of networks (Pyka and Schön, 2011).

Development of a new innovation policy rationale. The evaluation of success and failure of policy measures focusing on the promotion of innovation is very difficult as standard tools measuring the efficiency are not applicable. Every innovation process is intrinsically confronted with true uncertainty and also innovative failure can be an important contribution to dynamic learning processes. The project developed a new rationale of innovation policy that can best be summarized under ‘avoiding evolutionary inefficiencies’. Instead of focusing on market failure this approach seeks to avoid situations which hamper the economic development. Using networks as a starting point, the aim of such a policy is to avoid network inefficiencies that stem from missing and/or malfunctioning links among economic actors participating in innovation processes and are superimposed to other evolutionary inefficiencies. In this perspective, the structures and dynamics of innovation networks become the focus of attention as well as the starting point of action in innovation policy. The concept of evolutionary efficiency does not take into account the immediate innovative performance of e.g. innovation networks but the degree of freedom of action for policy actors. The scope of political action is severely restricted by available resources and therefore policy has to be careful in designing their instruments in order not to restrict their future possibilities by commitments made in the past. The concept of evolutionary efficiency is an innovative outcome of the project that has a potential of application far beyond the ServPPIN project (Pyka and Schön 2011).

Scientific impacts of case studies. The development of the ServPPIN research project led to both theoretical and empirical progresses from the case studies analysis. ServPPIN was an interdisciplinary project that touched three distinct fields in social and economic research: public sector studies and public economics (e.g., health economics), innovation studies and the economics of innovation and the growing literature on services. Although there are already scientific contributions that connect these fields (in particular with respect to service innovation), we nevertheless achieved considerable improvements in our understanding of how service innovation in public vs. private and mixed public-private sectors work.

The case of health services can be used as an example of the outcomes from case studies. WP4 used the theory related to innovation in health services, and tested whether these theories are appropriate to describe the role of public and private organizations in the provision of health, knowledge-intensive and transport services, and the role of

public-private innovation networks. Specifically WP4 focused on a multi-agent framework in which both public and private sector organizations interact with consumers (patients) in order to provide the correct type of health services (García-Goñi and Windrum, 2011). The case studies were designed with the aim of going from the specific to the general case so that, from illness specific or country specific case studies, it obtained responses to general questions in the provision of health services and the role of public-private innovation networks. In this way, ServPPIN significantly improved current knowledge of how public and private institutions interact in development and adoption of health services innovations, and the effect of public-private interactions on service quality, and access to new/improved health services. This enabled the research to address the impact of public-private innovation networks on the quality of life of the patient population and on health expenditures. ServPPIN, through the case studies in WP4, was therefore specifically designed to address the frontier of knowledge in the theoretical literature of innovation in services and health economics (e.g. Battisti et al 2011; García-Goñi and Windrum, 2011).

Each individual case study was designed to test theoretical propositions using specific case data. The relevance of this empirical work was directed towards establishing a battery of empirical questions that addressed the following generic hypotheses,

1. Behaviour of public and private institutions. The health case studies contained a component that compares the behaviour of different health organizations, and their role in the innovation network. This will provide, from a scientific perspective, data on the impact of different policies undertaken in different health environments and national/regional settings. Similar elements were also found in the other case studies.
2. The development of illness-specific and location-specific case studies afforded the use of econometric and statistical techniques to test the different theoretical hypothesis discussed above. WP4 collected the specific data necessary to test and draw conclusions that can support policy implication in the organization of innovation networks. The empirical application identified the key characteristics and conditions necessary for efficient innovation networks – in the adoption, development, and provision of health services innovations, and in improvements in the allocation of resources such that social welfare (which depend on the composition of the innovation network in public and private institutions) was maximized.
3. The comparison of the case studies provided insights of the role of different institutions in the innovation networks and their behaviour in different countries. An important element of this comparison was the cross-sectoral comparisons.

Similar cross-disciplinary results were achieved in the case of knowledge-intensive and transport services of WP 5 and 6.

Impacts at research cooperation level

ServPPIN intended to create new channel for intensive joint research work among the 13 members of the consortium that went beyond the ServPPIN life. The communalities of interest among the member of the consortium were optimized in ServPPIN and this constituted a platform for more integrative research in the future. Besides that, the members of the consortium are active in many research areas and groups, what spread

the ServPPIN results beyond the 13 participating teams. On top of the dissemination in scientific peer-review and international high quality journals and working papers (see section 4.2 of this report); the existing relationship between team members and some other groups amplified the impacts of the research and international cooperation level. Existing linkages with groups specialized on applied economics, neo-Schumpeterian economics, regional sciences, and services, among other areas, played this role. Particular attention was given to the European Association of Services Research (RESER), where the president is member of this consortium. The RESER Council wanted to use all funded projects at EU scale to integrate more teams and more research all over Europe and at global scale too. This is part of the RESER 2007-2012 Strategy to promote the quantity and quality of service research all over the world.

Contribution to policy development

One of the main objectives of the project was to affect policy in services at national and especially at EU level. After the approval of the Directive on Services in the Internal Market in 2006 and the vast discussion that accompanied its elaboration, the need for European level Service Policies emerged strongly. Heterogeneity in regulation and differences in national policies are hampering the process of integration and the growth and welfare benefits it can bring. Policy makers of the European Union are debating the opportunity for more horizontal and vertical-sector-specific measures. ServPPIN provided outputs that can assist on advising in these directions.

ServPPIN had a specific working package (WP7) aimed to developing policy implications of the project. It brought together the implications of each working package with insights from a policy point of view: The results of the first set of work packages (WP 1-3) provide more general rationales for STI policy interventions in the service sector in general and the promotion of ServPPINs in particular, while the case studies of WP4-6 formulate guidelines for the formulation and implementation of specific policy measures and interventions in the field of public-private service innovation networks. A work inspiring this working package (Rubalcaba, 2006; Rubalcaba, et al, 2010a) proposes an analytical framework and rationale for service innovation policies and discussed the framework alternatives for policy implementation. This article presented that specific service characteristics and specific service innovation needs may require specific solutions. However, a service-oriented innovation policy is not necessarily aimed at specific individual service sectors. Moreover, it was proposed a predominantly horizontal policy, going across sectors, based on service innovation being considered as a systemic dimension useful for any kind of economic activity. This “systemic” or “integrative” approach was followed in ServPPIN and went beyond the traditional classification between assimilation, demarcation and synthesis approach for services innovation policies. Integrative approaches can lead to “menu” approach for selecting different policy actions on the base of policy priorities (den Hertog and Rubalcaba, 2010). The systemic dimension of service innovation is particularly relevant in the context of service public-private interactions, largely ignored by national and European innovation policies. ServPPIN can promote a pro-service innovation culture in policy-makers and specific actions to launch initiatives that may obtain a large economic and social impact on growth and welfare (Dachs and Wanzenböck, 2011; Rubalcaba, et al, 2010b).

A particular mention can be made to the development of new instruments to assess and boost innovative networks from a policy perspective. This is justified by the fact that innovation processes and in particular their organization in innovation networks are characterized by a high degree of complexity. Participating in an innovation network obviously is a possibility to access external knowledge sources and offers possibilities for mutual learning and cross-fertilization. Participating in innovation networks, however, causes certain risks because the potential benefits of knowledge accessible in a network cannot be evaluated ex-ante. Trust plays an important role in mutual knowledge exchange processes where free-riding behaviour of other participants cannot be excluded. The theory of innovation network life cycles developed within the project can help to improve the decisions of actors when the possibilities offered by network participation are to be likely higher than the respective risks. The identification of different network types as well as different stages in their life cycle considerably reduced the complexity and offered an improved foundation for strategic decision-making. The same improvements can be postulated for decisions of policy making aiming at a balanced governance of innovation networks during their life cycles. Conditions can be identified indicating potential successful innovation networks as well as candidates with a probability of producing not the desired results. In addition, policy benefited from the development of the evolutionary efficiency indicator. Evolutionary efficiency offered decision criteria that improve the selective choice between different policy instruments.

ServPPIN proposed a development of a dynamic efficiency measure applicable to the governance of innovation networks. The evaluation of success and failure of policy measures focusing on the promotion of innovation is very difficult as standard tools measuring the efficiency are not applicable. Every innovation process is intrinsically confronted with true uncertainty and also innovative failure can be an important contribution to dynamic learning processes. The project developed the concept of evolutionary efficiency which does not take into account the immediate innovative performance of e.g. innovation networks but the degree of freedom of action for policy actors. The scope of political action is severely restricted by available resources and therefore policy has to be careful in designing their instruments in order not to restrict their future possibilities by commitments made in the past. The concept of evolutionary efficiency is an innovative outcome of the project which has a potential of application far beyond the ServPPIN project.

Along the whole policy work in ServPPIN a particular attention was given to the EU existing policies related to services. To do this, ServPPIN followed the state of services-related policies regarding different dimensions of political intervention: capacity building in research, innovation and knowledge, regulation and framework conditions, as well as providing support for service innovations. Though, it's important to recognize that policy instruments exclusively devoted to services are rather limited. Most measures address both, manufacturing as well as service sector, but have specific programme lines favouring innovation in the service sector. They are either service-related (e.g. funding of SMEs) or have indirect implications for the service sector (e.g. employment, education or health policy). (Dachs and Wanzenböck, 2011)

ServPPIN promoted a particular screening exercise of those EU policies that may incorporate action related to the promotion of pro-innovation public-private interactions and networks (Rubalcaba and Gallego 2009, Dachs and Wanzenböck, 2011). Major

attention was given to the different DGs of the European Commission supporting R&D and innovation in services: First, DG enterprise as one of the most important actors in launching innovation policy measures and thus, promoting service innovation. Several efforts and policy initiatives are launched with a thematic and sectoral focus on service innovations. Secondly, DG research as responsible for projects and initiatives promoting R&D within the 7th Framework Programme. Third, DG Information Society which conducts initiatives specifically targeted on the ICT sector and thus addresses knowledge intensive services with ICT relation. Other EU policies were analyzed too for issues related to innovation cluster and business service actions (DG Regional Policy), public-private partnerships, competition and services of general economic interest (several DGs including DG Competition), vertical policies in specific sectors such as transport and environmental (DG Transport and Energy), implications for employment and skills issues, including gender issues (DG Employment, Social Affairs and Equal Opportunities).

Main dissemination activities

One of the main objective of the whole project was the diffusion of project results to ensure effective feedback from involved actors, and to further raise awareness on the importance of ServPPINs. The first outcome of this plan is the [ServPPIN Website](#). The platform had been operative since August 2008, six month after the entry into force of the contract. The website fulfilled two purposes: the dissemination of knowledge and results and the coordination of activities amongst the participating partners. It has been constantly updated with news and publications. The intranet has also served as a platform for communication for ServPPIN teams. In addition, ServPPIN participating partners communicated through a single mail address: servppin@servppin.com.

The project existence and objectives have been disseminated to public, private and mixed services organizations participating in PPINs through interviews performed across case studies. Also, close contacts with other R&D-projects and Thematic Networks on national and EU-levels have been maintained (e.g. RESER). In addition, an interview concerning ServPPIN aims, motivation and outcomes was made by UAH for the special issue on Service Innovation of the Turkish magazine Bilgi Cagi; a monthly magazine about innovation, technology, R&D and technology management. Moreover, an article on ServPPIN and the Socio-economic and Humanities Research was provided for Policy News Alert Service, by Scoop project. This newsletter including the article will be available on May 2011.

During the project implementation, many of the papers produced within ServPPIN have been presented by the different teams in national and EU-level conferences and seminars, such as. A complete list of these papers can be seen in Template A2 of this final report.

One major result of the diffusion plan of ServPPIN knowledge is that papers produced within the project have been already published in peer-review international journals. In this way, the main outcomes of the project are disseminated to scientific and academic communities. Many papers have been accepted for publications and several articles are still under submission. The full list of published and submitted papers composes Template A1 of this report.

One of the major step in the diffusion plan has been the organisation of the SERVPPIN meeting in collaboration with the international RESER conference under the title: Public and Private Services in the New Global Economy. The conference took place during month 20 of the project. The conference was held the 24-26th of September 2008. The target was to create a better understanding of the characteristic of the cooperation of public and private service companies in innovation activities. The international research community has shown an enormous interest in the Conference: more than 140 abstracts were submitted and more than 100 papers were presented. The aim of the conference was to increase the impact of the SERVPPIN research diffusion program. After the Conference the main conclusions has been disseminated. The best papers were selected and will be published in a special issue of SIJ forthcoming in April 2011 (Service Industries Journal).

The policy workshop held in DG Research of the European Commission, Brussels, on the 26th January 2011 was another major milestone accomplished in this period. In the meeting the highlights, key results and policy conclusions of the project were presented to policy makers; policy officers; public, private and mixed organisations and to the scientific community. The aim of the workshop was to disseminate policy implications of the project and gather interactions with Commission policy makers and other EU institutions.

An important project specific activity for making the results of the ServPPIN project available for the research community is the development of a major edited volume based on contributions from the partner institutions. A pre agreement with Edward Elgar is already set. The focus of the book is public-private interaction and policy implications. A committee composed by WP leaders will decide which ones will be part of the edited volume. The selection process will be carried out in order to guarantee high quality standards.

Furthermore, the main outcomes of the project were collected in three Policy Briefs. The aim of these documents is twofold. Firstly, they represent a synthesis of some of the main outstanding achievements of the researches carried on along the 7 research WPs. Secondly they aim at providing the most useful information from the policy makers perspective.

The project outcomes where also presented to the members of the reference group presented within the project proposal. Some of these members took place to some of the events organised by Servppin such as the Budapest conference, September 2009, or the Policy workshop of January 2011. Nevertheless the interaction with the members of the panel had been very low along the project implementation.

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List of Servppin beneficiaries

Beneficiary Number	Beneficiary name	Beneficiary short name	Country	Contact person	mail
1 (coordinator)	Universidad de Alcalá	UAH	Spain	Luis Rubalcaba	Luis.rubalcaba@uah.es
2	Austrian Research Centers Gmbh - ARC	ARC	Austria	Matthias weber	Matthias.Weber@ait.ac.at
3	University of Roskilde	RUC	Denmark	Jon Sundbo	sundbo@ruc.dk
4	University of Lille	USTL LILLE1	France	Faiz Gallouj	Faiz.Gallouj@univ-lille1.fr
5	University of Bremen ¹	Uni-HB/Uni-HO	Germany	-	-
6	Utrecht University	UU	Netherlands	Koen Frenken	k.frenken@geo.uu.nl
7	Lillehammer University College	LUC	Norway	Rolf Ronning	Rolf.Ronning@hil.no
8	University of Ljubljana	UL	Slovenia	Metka Stare	metka.stare@guest.arnes.si
9	Universidad Complutense Madrid	UCM	Spain	Manuel Garcia	mggoni@ccee.ucm.es
10	Manchester Metropolitan University	MMU	United Kingdom	Lawrence Green	L.Green@mmu.ac.uk
11	Kopint-Tárki	KOP	Hungary	Eva Palocz	palocz@kopint-tarki.hu
12	University of Hohenheim	Uni-HO	Germany	Andreas Pyka	a.pyka@uni-hohenheim.de
13	University of Nottingham	UON	United Kingdom	Paul Windrum	Paul.Windrum@nottingham.ac.uk

¹ Researchers at University of Bremen moved to the University of Hohenheim