INVESTIGATING THE GAP: INTERDEPENDENT, GLOBAL BUSINESS NETWORKS VERSUS NATIONAL POLICY MEANS

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Summary

A substantial gap can be identified between the means the policy practitioner has and the characteristics of the existing business landscape. The contemporary business landscape is characterised by specific trans-national interdependencies among firms while the dominating policy instruments are general and national. In this paper we will describe this gap in order to formulate a basis for how it should be investigated and for how a new, empirical based policy should be outlined.

1. Interdependencies – a common denominator of the contemporary business landscape

The contemporary economic crisis has made one of the most striking, but hitherto rather hidden aspects of the business landscape very clear: the technological and commercial interdependencies that stretches across company, regional and national borders. Regardless what deal between a customer and seller that never come to being due to the contemporary crisis; the purchasing of houses, flats, furniture, cloths, cars or motorcycles, the direct effect is only the tip of the ice block. If a customer cannot afford to buy one of the above mentioned end-products, it will certainly affect the company it cancelled its deal with. However, in the contemporary business landscape it is no exception that the company the end-consumer is making a deal with is responsible for only about 10-20 percent of the total product cost. The main part of an end-product is supplied by others. (Håkansson et al, 2009) These others are in general not dealt with through an autonomous market exchange, but through intense interactions. (Piore & Sable1988, Lundvall 1988, Powell 1998, Ford et al, 2003) Behind a direct buyer-seller interface a number of related suppliers, sub-suppliers and complementary firms can be identified. Over time and over space these have developed, adapted and invested in relation to some specific end-products and their using settings. Both resources; for example production facilities, products, organisational capabilities, organisational relationships, and activities like production processes, logistics, services, etc are getting imprints of these interaction processes.

For example, behind the direct interface between a producer and user of magazine papers, the demand from one of the latter's most important customer, the advertising agencies, have had a number of effects on the suppliers side. In order to create a paper with excellent printing and picture qualities, a number of related interfaces have been adapted across company borders, stretching from how the spruce wood used as raw material should be harvested, to how the insert of electricity should be used in the refining processes over to the design of the paper process. (Håkansson & Waluszewski, 2002) The interdependencies related to a producer-user interface affect the two companies involved in an extensive way (von Hippel 1988, 1998) but do also include direct and indirect related resources and activities preceded by different companies related to the parties on both sides of the interface (Baraldi & Strömsten 2006, Bocconcelli & Håkansson 2008, Awaleh 2008). To continue with the magazine paper example, when interfaces related to producing and using of magazine and newsprint paper where adapted to an increased insert of post-consumer waste – as a result of tougher environmental demands both from governments, NGO's and consumers – this had an impact also on interfaces related to timber products. An increased use of post-consumer waste meant a decreased use of fresh wood fibre – and the traditional balance of using different parts of a tree in sawmill and paper mill respectively was disturbed. (ibid) Another example of how interdependencies stretch across buyer-seller interfaces is presented by the contemporary crisis in the car industry. An eventually close down of a car producer in Sweden will not only affect this company and the suppler and sub-supplier related to the production and use of its end-product. If the car producer is closed down, several of its subs-suppliers will lose one of their main customers. The question is even if they survive how much the loss of this specific customer will affect their volume and thereby their efficiency. This will in turn affect their other customers in terms of a higher cost level. The close down of a major producer – as with a major bank – will in this way affect a large number of related companies and it will take time before the network has adapted to the new situation. If the producer closed down is important enough the network might become so hurt that it never can recover. (Håkansson, Waluszewski, 2002)

Thus, over time the interactions concerning how to combine resources and how to link activities creates strong technological and organisational interdependencies among direct and indirect related companies. Firstly, these interdependencies are specific; i.e. they concern specific combinations of resources and linking of activities. Secondly, these interdependencies are stretching across several places; i.e. across regions and nations. Since it is within buyer-seller interfaces that value is created, these interdependencies can be illustrated by using a "chain" metaphor, for example "global value chains" which today is used by EU-policy practitioners. However, since the value is dependent on

not only what is going on within interfaces direct and indirect related to the production and use of a certain end-product; i.e. in the “value chain” but also on how these are related to other producer-user interfaces, in the network metaphor appear as more relevant to catch this basic characteristic of the contemporary business landscape. (See e.g. Håkansson & Persson 2007, Gadde & Araujo 2007)

Business networks have without doubt both dark and bright sides. Regardless if the interdependencies in the business landscape are defined as chains or networks they are not equipped with any self-regulating mechanism (in contrast to how the market is assumed to work). Let us first consider some bright sides of this: When the end-product sells, the benefits are distributed through the network among related firms across company, regional and national borders. When the producer of an end-product is aware of both efficiency and innovation issues, it will also encourage its suppliers and sub-suppliers to engage in these. IKEA have for example in relation to just one of its many products, the table “Lack”, engaged suppliers, sub-suppliers and complementary firm to be more efficient and innovative over the last two decades. In the mid 1980s IKEA took the decision to never take more than SEK 100 crowns for the smallest Lack table – which in practise meant to be forced into a continuous product development project. Over two decades more than 100 development projects concerning Lack have been carried out, involving more than 20 companies in different countries. The insert material has changed from solid wood and plastic over to board in combination with honey combed paper. All these processes have been hidden for the end-consumer – a Lack bought today look the same as a Lack bought in the 1980s. These intense development processes have certainly had advantages for IKEA – but several of the sub-suppliers underline that without the innovation and efficiency demands they have been exposed to through IKEA, they would probably not been in business. (Baraldi & Waluszewski, 2007).

If we continue with the dark sides of networks, a first type appears when an end-product is facing a crisis. Then also the negative effects will also be distributed among interrelated firms. When, for example, American consumers do not buy from GM and Ford anymore the local Swedish press soon reveals which companies, located at what places, that is embedded into these business networks. A crisis in Detroit can be shown to have close links to a component producer in a small city in the western part of Sweden.

A second type of dark sides of network is related to the power of investments in place. As illustrated above, networks have some powerful forces; they give innovation and efficiency processes their directions. However, this also means that the main network forces will be in favour of the main part of the established structure of resource combinations and activity structures. Thus, network forces will always favour those who have the ability to mobilize resources – own or others. For those who

want to create or support new technologies and/or new businesses it is certainly necessary to consider how to handle this "economic conservatism" of business networks. (Håkansson et al, 2009)
Last but not least, a major problem is that the network structure is non-transparent. (Hasselberg, 2003, Waluszewski, 2006) It is only those being highly involved within a network that has knowledge about important interdependencies. It means that any new-comer always will make costly mistakes before becoming an efficient part of the network. A network can never be understood from the outside.

2. Policy practitioners exposed to challenges

The contemporary business landscape is without doubt exposing industrial policy practitioners with some great challenges – due to that the landscape is rugged. (Van de Ven et al 1999) Firstly, the interdependences that stretches across company, technology and trans-national borders are seldom clear for outsiders, not even for all companies related to these – until a crisis have appeared. All traditional company accounting and information system are developed in relation to the borders of the firm, while the knowledge of the interaction processes going on between firms are scattered among people involved in these processes – in different companies and at different levels. Thus, the content and function of these interaction processes are seldom captured in formal company documents. Secondly, whether a RTD policy measure will be beneficial or not is neither determined by the quality of a potential innovation in itself, nor by the effect is has on a focal producer-user interface. Regardless of how much a potential innovation is appreciated by a particular producer and user, its economic benefits will not be determined by one neither by these two in isolation, but also due to what effect it will have on direct and indirect related interfaces on the supplier and user side. This leads to a third challenge that policy practitioners are exposed to; how to catch and measure indirect effects across several company borders.

2.1 Transfer – a key European policy action

What kind of governmental policy expectations is then the Swedish/European policy practitioners exposed to? What view of the contemporary business landscape is outlined in official policy government and what key issues are identified? Furthermore, what support and instruments is policy practitioners supplied with? When business development and economic growth is considered from the EU policy perspective the question of how to deal with RTD issues in a business landscape characterised by global interdependencies is more or less neglected. (Eklund, 2007) The focus is instead on how to create competitive processes among what is assumed to be independent firms within certain regions and/or nations. The most important policy issue outlined is how to create *transfer* of potential innovations from knowledge producers to companies within a certain region

and/or nation (compare also Nelson 1993). Furthermore, the most important source of innovations is not considered to be established producer-user relationships and related interfaces, but scientific knowledge production. For example, when the European Council presented the report "More Research and Innovation - Investing for Growth and Employment" (COM, 2005, 488) it "singled out *knowledge and innovation for growth* as one of three main areas for action". Knowledge transfer was identified as the "key obstacle to overcome"; between Public Research Organisations, particularly universities, and industry. The key measure is to adopt "EU guidelines to improve research collaboration and knowledge transfer between Public Research Organisations and industry**".** The same understanding can be traced in the Swedish governments' policy, which is almost a blue-copy of the EU's industrial policy (Eklund, 2007). For example, when the Swedish Government during the autumn of 2008 presented the bill "A Boost to Research and Innovation" including an initiative to increase the business use of research results, the key issue outlined was to identify research that was ascribed excellence in the academic evaluation system, and to transfer this to the business sector: "The Bill proposes that teachers in universities and other higher education institutions should inform their employers of patentable results. This will step up the commercialisation and utilisation of research results."

Behind the targeted policy actions several contributions from social science can be identified. Some of the most well-known models suggesting why and how university-business co-operation could be supported are Triple Helix and Innovation System. (Eklund, 2007) What these models have in common is the basic supposition that it is possible to identify some important "nodes" in science and business respectively and design a system which will promote the transfer of tangible and intangible resources, and thus stimulate innovations and economic growth. Thus, what these models also have in common is that they have assumed away a complication that Utterback and Abernathy (1975, p. 644) warned against already three decades ago. Utterback and Abernathy's empirical experience was that innovation processes involves both process and product modifications and "must be dealt with as a system." (Ibid, p. 644) The authors underlined that the expectation on what innovations stemming from new scientific results or new techniques can contribute with can be very high. However, as soon these types of innovations are considered in relation to investments already in place, the expectations in general have to be modified. "Unfortunately, the pay-off required to justify the cost of change is large while the potential benefits are often marginal." (Utterback and Abernathy (1975, p. 644).

3. Recognising the specific science-business transfer difficulty

Utterback and Abernathy's experiences are also similar to what has been observed in studies of science-business transfer carried out in the IMP Industrial network setting, which this project is starting out from (see e.g. Waluszewski, 2004, Baraldi & Strömsten 2006, Gressetvold & Torvatn 2006, Harrison, Waluszewski, 2008, Bengtsson & Håkansson 2008, Waluszewski et al, 2009).

The complicated processes that are behind the introducing new technology in the business setting is well recognised – even if development representatives, producers and users over time already have developed close relationships and know each others specific technologies, possibilities and constrains well. Regardless how familiar these parties are to each other, anything new will meet an thoroughly elaborated structure of physical and organizational, tangible and intangible resources (Håkansson et al, 2009) or what Abernathy and Uterback (1975) refers to as "investments in place".

However, when new solutions stem from science the difficulties to embed these in business producer-user interfaces tend to be even larger. What is characteristic for the academic knowledge production is that in order to be rewarded with epithet like "excellent" and/or "cutting-edge" science, the new knowledge has to be recognised as unique and at least in some aspect radically different as compared to the existing scientific knowledge base. (Waluszewski, Håkansson, 2007) But if uniqueness is a prerequisite for knowledge to be rewarded in the academic world, this feature has no value in itself when knowledge is going to be embedded in the business setting. In the business setting it is never a particular kind of knowledge in itself that creates value, but what effects it can create on other resources. Thus, in this setting uniqueness can even be a drawback. The more certain new knowledge differs from already existing resources, the more difficult to combine it with them; i.e., the more difficult to find ways to create economic benefits. For example, when a new technology for reading short DNA strings was developed at KTH, Stockholm, this was considered as a great scientific breakthrough. The method labelled Pyrosequencing was rewarded with publications in high ranked journals and with several academic prices. When Pyrosequencing was transferred to the business setting it also was considered as a radical improvement of the reading of short DNA strings, both in terms of robustness and efficiency. While the established method was complicated and stretched over three work-days, the Pyrosequencing method could be carried out within a few hours. Thus, from a technological point of view Pyrosequencing was a great advantage for its producing company (with the same name), which also was rewarded by IVA as the entrepreneur of the year 2001. For its customer it created benefits not only in terms of increased efficiency, but also as a "second opinion" relation to established standards. However, despite that the Pyrosequencing technology was highly appreciated by its academic developers and by its business producer and users, it never became a commercial success. The customers saw the advantages of the method – but

even at a standard lab (New York Blood Centre) it had to be able to fit into a structure of about hundred other instruments. Thus, the customers wanted a flexible method, which could be adapted to a number of different other instruments and applications. This was impossible to fulfil for the producer, which in order to reach break-even had to stabilize a standard instrument with some few applications. After a few years in business Pyrosequencing was forced to merge with another company. In the new company Biotage the development of the Pyrosequencing method as well as sales declined. (Ingemansson & Waluszewski, 2009)

These illustrations suggest that the national technological systems (Lundvall 1992, Nelson 1993) probably are embedded into a much more complex and multifarious business landscape than has been assumed.

4. Overall research question: investigating the gap and building a typology

If we turn back to the dominating EU policy ideas, we find that these are resting on the presupposition that the business landscape is characterised by independent firms which relates to each other mainly through competition and which furthermore are spatially localised into regions/nations. A main expectation on policy practitioners is to create a transfer of potential innovations from the knowledge producer to the business setting. The question of how what is transferred is going to fit into an elaborated structure of already existing tangible and intangible business resources, stretching across company and national borders is left aside. Consequently, neither analytical tools nor policy instruments are adapted to deal with this issue.

In summary the gap consists basically of the application of a theoretical thinking that is not in accordance with some very basic empirical characteristics of the contemporary business landscape. In order to further investigate this issue we need to develop an innovation study approach that consists of two main parts.

1. A first prerequisite is to outline the main characteristics of the contemporary, global interdependent business landscape, especially the relation between innovation and the existing producer-user structure.
2. A second prerequisite is to build a typology including suggestions for what different types of spatially dispersed RTD situations that need what kind of RTD support, as well as suggestions how to catch both direct and indirect effects of RDT support

4.1. Building a typology

An important question concerns how a typology should be built, given the business landscape outlined above. A basic requirement is that the typology can be used to catch both short and long

term effects of innovation attempts in direct and indirect related interfaces. Given what we know today there seems to be a need to clearly distinguish between three major aspects of innovation processes (Håkansson & Waluszewski 2008b). Any new idea/artefact (potential innovation) has to 'survive' in three distinctively different but related empirical settings; a developing, a producing and a using setting.

a) Development of new ideas/artefacts: This situation can either take place among established producer-user relationships supported by each parties R&D units, or can occur in some more distant settings, as academia, industry R&D institutes etc. The development logic is quite separate even when these interfaces are closed but become increasingly different the more distant they become.

b) Embedding new ideas/artefacts in a producing setting: Anything new – an improved established solution or a radically new science based artefact – needs to be embedded into a producing setting in an efficient way. Something that in turn gives rise to need for new types of development endeavours. What is special with the producing setting is that existing investments among producers, suppliers and sub-suppliers have a strong impact on the production and thereby on the design of the new.

c) Embedding the new in a user setting. It is not until a direct interface has been established with some users that the benefits and drawbacks of relating the new to material and immaterial investments in place in the user setting can be outlined. Still, it is the effect the new has on its direct and indirect interfaces in the user setting that will determine its economic value.

How innovation processes appear in a developing, producing and using setting will in turn appear different due to the characteristics of the interfaces in each setting as well as the relation between these. For example, do the actors representing the developing, producing and using setting already have close relationships to each other or are they involved in distant activities? Are they representing global companies with heavy resource bases or weaker actors as new start-ups and/or small R&D units? Does the RTD process involve actors representing a developing, producing and using setting or just one or two of these? How are actors representing indirect related interfaces involved in the RTD process? *In order to become an innovation any new idea/artefact has to be embedded into all these three settings – and any approach to study different aspects of innovations must include these.*

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