

# THE STATE AND THE TRANSNATIONAL BUSINESS NETWORKS

## GOVERNMENTAL DREAMS ABOUT INNOVATION

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### ABSTRACT

*'Current economic and social challenges are enormous and often global in nature. Innovation can help accelerate the recovery and put countries back on a path to sustainable – and greener – growth.'* (Ministerial report on the OECD Innovation strategy, May 2010)

Innovations that can make new and old companies prosper, invest, employ, and hereby contribute to tax incomes and to a nations' growth – through solutions that at the same time can solve problems related to a nations' economic, environmental and social issues. In short, this is the contemporary political demand list on innovation. With the current societal challenges in mind, the governmental expectation on what companies, supported by national innovation policy, can contribute with is undoubtedly high. The contemporary innovation policy is also resting firmly on the assumption of a business landscape which is close to how it is depicted in innovation policy. Empirical studies of innovation, among others the research carried out in the IMP setting, indicates that the business landscape is network like, where related material and immaterial have a strong impact on content and effect of any renewal attempt. What do then these network-like characteristics of the business landscape mean for attempts to boost innovation?

The aim of this paper is to outline:

- A) The underlying assumptions about innovation that the contemporary governmental commission rests upon.
- B) The underlying assumption about innovation given that the business landscape is supposed to be characterised by interdependencies.
- C) Opportunities for public policy to support the industrial renewal given that the ambition is to contribute to the policy investing nations' significant, stable contributions to transnational supplier and/or user networks.

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## INTRODUCTION: THE POLICY PRACTITIONERS DILEMMA

*'Today the world's societies face severe economic and challenges.[...] Innovation is thus essential if countries and firms are to recover from the economic downturn and thrive in today's highly competitive and connected global economy. It is a powerful engine for development and for addressing social and global challenges. And it holds the key, both in advanced and emerging economies, to employment generation and enhanced productivity growth through knowledge creation and its subsequent application and diffusion. (Ministerial report on the OECD Innovation strategy, May 2010, pp. 1-2)*

Innovations that can make new and old companies prosper, invest, employ, and hereby contribute to tax incomes and to a nations' growth – through solutions that at the same time can solve problems related to a nations' economic, environmental and social issues. In short, this is the contemporary political demand list on innovation. With the current societal challenges in mind, the governmental expectation on what companies contribute with, supported by national innovation policy, is undoubtedly high. The contemporary innovation policy is also resting firmly on the assumption of a business landscape which is close to how it is depicted in innovation policy. On the other hand, empirical studies of innovation, among others the research carried out in the IMP setting, indicates that the business landscape is network like, where related material and immaterial have a strong impact on content and effect of any renewal attempt. What do then these network-like characteristics of the business landscape mean for attempts to boost innovation?

The background of this paper is the frustration of some European policy practitioners over the contemporary governmental innovation policy commission. In short, the policy practitioners' dilemma concerned how to reach national effects of policy investments –when the business landscape they were facing was characterized by interdependent, transnational business networks.

Per the policy commissioners<sup>2</sup>, the policy practitioners' actions were supposed to boost 'research and technological development' (RTD), which would then result in innovation and industrial renewal – with economic and social benefits within the investing nation or region. But when the policy practitioners were working with implementation of this policy they got problems. The companies and the research milieu they faced daily were involved in business networks that had a strong impact on the direction of the innovation journey – and which furthermore definitely did not stop at any national, regional or local community borders.

The best scenario, which was sketched by the governmental commission, was that the policy practitioners' actions in terms of research and technological support would lead to innovation, new or renewed companies, increased investments, employment, tax income and growth. It was essentially taken for granted that these benefits would occur within the borders of the community that made the policy investments.

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<sup>2</sup> Policy commissioners' is in this paper the governmental bodies that address what policy practitioners are assumed to implement. Behind a policy commissioner in terms of a specific policy agency influence are thus both national and transnational politicians and experts.

The worst scenario, which was absent in the governmental commission but present in the policy practitioners' daily work experiences, was that the main costs were divided among actors within the community that made the policy investment, while the main economic benefits were divided among actors outside of these borders.

In the early 2000s some policy practitioners involved in projects related to the EU commissions' initiative 'European Innovation Scoreboard' began discussing their frustration with the governmental commission on innovation policy. Not that they objected to the similar general commission they were exposed to: facilitate for research and technological development processes that can lead to innovation. Contrariwise, they shared the basic idea expressed through the governmental commission they were given: that innovation can make new and old companies prosper, invest, employ, and contribute to a 'greener' society, tax incomes and to a nations' growth. Instead, their main objection concerned how likely it was that the politically sanctioned innovation 'recipe' would result in the expected benefits. (Waluszewski, 2011)

First, the policy practitioners, almost regardless of where in Europe their policy agencies were located, were exposed to a similar political interpretation of where to find the main sources of innovation – in academic and other public research. This meant that support of 'RTD', or 'Research and Technological Development' became a prioritized task for the policy practitioner. Second, they were also exposed to the implicit assumption that such policy actions should result in economic benefits *within* the borders of the community that made the policy investment. The policy practitioners meant that they were squeezed between two rather different views of innovations: On one hand, they had to cope with a governmental commission saying that supporting certain kinds of research and technological development processes would lead to innovation, industrial renewal and growth within the policy investing nation. On the other hand, in their practical work they were faced with both research milieux and companies that were embedded into complex patterns of interdependencies to counterparts that very often were located outside the borders of the policy investing nation. (Waluszewski, 2011)

With a number of similar 'place-related' dilemmas at hand, and with some policy practitioners at Swedish Vinnova in the forefront<sup>3</sup>, a policy development project abbreviated GLOVAL, 'Global Value Chains as an Emerging Challenge for National and European Research and Technological Development Policies', was formulated. The 'policy practitioners' dilemma' was formulated as following:

*'[...] the research and technological development may be done in Germany, product design in the USA and India, sub assembly manufacture in Sweden and Korea, and final assembly in China – and all of that on behalf of a multinational enterprise whose majority of capital is held by Middle Eastern investors.'*  
(GLOVAL, proposal 234608 Version of 09/Dec/2008, p. 6)

In 2008 the GLOVAL project got funding from the European Union's Seventh Framework Program. The funding included external research on policy investments in a transnational business landscape which the author of this paper has been responsible for. This paper is based on the outcome of this research, presented by Waluszewski, 2011.

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<sup>3</sup> Göran Yström and Bengt Johansson at Vinnova were two of the initial organizers behind the GLOVAL project.

## RESEARCH AIM AND RESEARCH DESIGN

The aim of this paper, which takes the experiences made in the GLOVAL project as starting point (thoroughly presented in Waluszewski, 2011) is to outline:

- A) The underlying assumptions about innovation that the contemporary governmental commission rests upon.
- B) The underlying assumption about innovation given that the business landscape is supposed to be characterised by interdependencies.
- C) Opportunities for public policy to support the industrial renewal given that the ambition is to contribute to the policy investing nations' significant, stable contributions to transnational supplier and/or user networks.

The data of used in the paper is based on three types of sources:

- 1) The author took part in GLOVAL workshops and project meetings as a participating researcher in order to get a deeper understanding of the policy practitioners' experiences of the governmental commission they are exposed to, particularly their practical experiences of the ability to link research and technological development support to business development and renewal within the policy investing communities.
- 2) OECD and EU innovation policy documents, GLOVAL policy agency documents, as well as research about the content and effect of contemporary science and innovation policy.
- 3) Empirical based, process oriented research on innovation in a business landscape characterized by interdependencies that stretch across company and organizational borders, across space and time, with the work carried out in the IMP setting as main source.

In order to fulfil the last aim a matrix was developed (Waluszewski, 2011) which can be used to outline renewal opportunities given a network-like business landscape. The matrix, which will be discussed in the last chapter, is based on the ARA-model (Håkansson, Johanson, 1992, Håkansson, Snehota, 1995) and on a distinction of the three different types of economic logics that characterizes the innovation journey, presented in Håkansson, Waluszewski, 2007b.

## BUT DOES NOT THE GOVERNMENTAL COMMISSION REST ON A SYSTEMIC APPROACH?

The first impression of the governmental commission on innovation policy does however not support the policy practitioners' complaints about a lack of awareness of the systemic features of the business world. Contrariwise, policy documents presented by OECD<sup>4</sup> and EU<sup>5</sup> that address the issue of policy action; i.e. support to research and technological development to reach innovation, explicitly express an awareness of a 'globally' connected business world. This is mainly expressed through emphasizing the importance of cooperation among different kinds of stakeholders, such as public authorities, users, regulators, industry, consumers and 'poles of excellence' (Lundvall, 2005, Eklund, 2007, Elzinga 2004, Håkansson et al, 2009).

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<sup>4</sup> See e.g. [http://www.oecd.org/department/0,3355,en\\_2649\\_34273\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/department/0,3355,en_2649_34273_1_1_1_1_1,00.html)

<sup>5</sup> See e.g. [http://ec.europa.eu/enterprise/policies/innovation/future-policy/index\\_en.htm](http://ec.europa.eu/enterprise/policies/innovation/future-policy/index_en.htm)

The commission to the policy practitioners is certainly not only influenced by OECD and EU advice but is complemented by national political agendas where a number of different issues are added. However, the practitioners experience that the politically sanctioned tasks given to their respective policy agencies are rather similar, and above all are rather similar to what's stated in OECD and EU policy documents, has also been observed by researchers. (Elzinga, 2004, Eklund, 2007, Elzinga and Jamison, 1995, Lundvall & Borrás, 2005) Under a surface of individual nations' policy agendas there is, argue Elzinga and Jamison (1995), an overall international convergence, where OECD's policy advice has been an important source of inspiration. Or, to use Lundvall & Borrás' (2005, p. 602) wording: OECD has 'played a unique role among international organizations in the diffusion of ideas about innovation policy'.

Interestingly enough, the systemic aspects of innovation can be regarded as a common denominator in contemporary OECD and EU policy documents. Organized interaction and network-building among different kinds of 'stakeholders' is appointed a key policy action. As it is expressed in the 2010 OECD innovation policy agenda:

*'Innovation today encompasses much more than research and development (R&D), although R&D remains vitally important. Innovation rarely occurs in isolation; it is a highly interactive process of collaboration across a growing and diverse network of stakeholders, institutions and users.'*<sup>6</sup>

But how is it possible that an innovation policy that underlines the systemic aspects of innovation, by policy practitioners is understood as neglecting exactly the same thing? Let us take a closer look at how the systemic aspect of innovation is expressed.

#### THE '1990s POLICY DOCTRINE'

*'We are mainly supporting research. We can hardly support renewal processes that are initiated by companies and carried out among companies anymore, even if we can identify significant industrial and economic benefits of such processes for the policy investing community.'*

The quotation above is one of the GLOVAL project policy practitioners' complaints concerning what the contemporary innovation policy has meant for policy in practice. The idea that innovation and industrial renewal have a direct and distinct source in research and technological development *outside* business is also one of the cornerstones in what has been labelled the '1990s science and innovation policy doctrine'. (Elzinga, 2004; Elzinga & Jamison, 1995, Eklund, 2007, Högselius, 2010) The '1990s doctrine' does not only launch the idea that university and other research is a critical and most often underutilized source of innovation. It also stresses that a successful 'marriage' between science and industry spurs innovation and industrial renewal, and that such a marriage can be arranged through policy action. The foundation is the belief that new areas of research, and, more importantly, new areas of commercialization of research, can be created through policy organized interaction among science and industry. (Slaughter & Leslie, 1997, Nowotny, Scott & Gibbons, 2001, Edquist, 2005, Lundvall & Borrás, 2005, Widmalm, 2008, Benner & Sörlin, 2008)

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<sup>6</sup> <http://www.oecd.org/dataoecd/51/28/45326349.pdf> p. 2.

A number of sources of inspiration can be traced to the ‘1990s science and innovation policy doctrine’. There are changes in the business landscape, where company specialization and outsourcing gave rise to a new and increasing number of *visible* alliances and partnerships across company, organizational and national borders. (Elzinga, 2004, Håkansson et al, 2009) Then there are some changes which all can be related to ‘a more neo-liberal climate’ and increased reliance on ‘market forces’ instead of governmental involvement in technological and industrial development. (Håkansson et al, 2009, Högselius, 2010) A first is EU legislation based on neo-liberal market theory which does not allow individual member states to ‘favour’ domestic companies, for example as acting as supporting customers for new technologies. (Högselius, 2010, Edquist, Hommen, Tsipouri, eds, 2000) A second, related change is the introduction of the so-called ‘New Public Management’, aimed at transforming the public sector to cost-efficiency. ‘New public management’ has forced universities and other public research milieux to produce measurable accounts for their financing governments showing that they are ‘productive’ for society and the economy. (Bleiklie, 1998, Olson, Sahlin-Andersson, 2005, Nowotny et al 2005) Finally, theoretical approaches on innovation and growth, with the common denominator that they are all close to the general market theory, has been an important source of inspiration. (Slaughter & Leslie, 1997, Waluszewski, 2004, Håkansson et al, 2009) In the next section we will take a short look at the basic assumptions of some approaches that are frequently referred to, as well as how they have been embedded into the governmental commission to policy practitioners.

#### *Traces from the ‘National Innovation System approach’*

The contemporary governmental commission of policy practitioners has borrowed ideas concerning how policy actions can be organized to spur innovation, industrial renewal and growth from the ‘National Innovation System’ approach.<sup>7</sup> This approach, with Freeman (1982), Lundvall (1988, 1992) and Nelson (1993) in the forefront, stresses how a nation can be considered in terms of its ‘national innovation system’, i.e. all the factors that are behind the development, diffusion and use of innovations (Edquist, 2005). An innovation system has, as Edquist (2005, p. 182) underlines, ‘a function, i.e. it is performing or achieving something’. This main function is ‘to pursue innovation processes, i.e. to develop, diffuse and use innovations’ (Edquist, 2005, p. 182).

The ‘National Innovation System’ approach is referred to in many OECD and EU reports – and the idea that it is possible to outline and reinforce ‘national innovation system’ has been turned into something of a general policy action within the EU as well as within individual member states. The latter has inspired a number of measures, for example, the development of quantitative indicators of national innovation systems and advice on how to build general innovation systems as well as such for different industrial sectors. The core of this advice concerns how scientific and other new knowledge can actively be taken out of its ‘isolated’ existence at universities and other public knowledge producing units to contribute to innovation, industrial renewal and growth.

Whether the political interpretation of the ‘National Innovation System’ approach is appropriate has been discussed among scholars behind it. Some scholars stress that the use of the approach has been more in terms of a ‘label’ of governmental innovation commissions than as an analytical tool. (Edquist, 2005, p. 192) There are also National Innovation System scholars who have questioned the political interpretation that academic research is a key node

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<sup>7</sup> The ‘National Innovation System’ approach is also named ‘System of Innovation’ approach.

for commercial exploitation in a national innovation system, or, as Eklund (2007, p. 89) puts it, ‘objected to this discursive marriage between innovation and university research.’

#### *Traces from the ‘Triple Helix’ approach*

Another theoretical approach that has intervened in the contemporary commission of policy practitioners is ‘Triple Helix’, with the sociologists Etzkowitz and Leyersdorff (2000) in the forefront. ‘Triple Helix’ is a model of how the state, the academic knowledge producing setting and industry can benefit from an organized interaction among them as groups. In the ‘Triple Helix’ model the university is at the heart of innovation: ‘An entrepreneurial university is the generative principle in the development of a triple helix of university-industry-government’. (Etzkowitz, 2004, p. 69) Along with an ‘entrepreneurial university’ the so-called ‘network drivers’, private business actors who attempt to increase their ‘competitiveness in the market’, are in focus. Through an organized interaction among university-industry-government the ‘network drivers’ act as ‘stage keys’ and create ‘spiral movements’ that ‘lift’ the dynamic to new levels. (Etzkowitz & Leyersdorff, 2000) The authors do not go into exactly how these ‘spiral movements’ work or how the interactions contribute to transforming scientific contributions to innovations. Instead it is based on the supposition that it is possible to create a direct transfer of academic research results to industry through a governmentally organized interaction, where the government engages in creating links among academia and industry. (Etzkowitz & Leyersdorff, 2000, Etzkowitz, 2004)

Perhaps the great promises of the ‘Triple Helix’ model can explain its rapid entrance into the governmental innovation commission of policy practitioners. What the model explicitly says is that university research is an important but underutilized source of innovation. Furthermore, it also sees an interaction among university and industry as smooth and free from contradictions. What is absent in the ‘Triple Helix’ model is the conflicting interests and different rationalities among universities, businesses and society. (Håkansson & Waluszewski, eds, 2007) Instead, the model explains, as Elzinga (2004, p. 286) puts it, ‘innovativeness as a product of coalition building’. Thus, it is taken for granted that all parties – universities, industry and government – will benefit from the organization of network-like structures among them, as well as society as a whole.

#### *Traces from the ‘Cluster’ approach*

A third theoretical school that, along with ‘National Innovation System’ and ‘Triple Helix’, has had an impact on the innovation policy commission of policy practitioners is the so called ‘Cluster’ approach. (Malmberg, Maskell, 2002) Compared to these, the advocates of Clusters represent a more heterogeneous approach. Here we encounter such different schools as business strategist Michael Porter’s Cluster approach, the research into Industrial Districts and the Inter-Organizational studies of Social Networks (Porter, 1990, Lorenzoni & Baden Fuller 1995, Powell, 1998). In contradiction to the ‘National Innovation System’ and the ‘Triple Helix’ approaches the ‘Cluster’ scholars emphasize that a geographically defined innovative business region does not need to be based on direct use of research.<sup>8</sup> The actors who populate the cluster are considered independent and the connections providing the greatest viability for development are not the direct collaborations but the indirect ones characterized by competition or rivalry. Together with the knowledge that ‘spills over’ from indirect connections, both the efficiency and the growth of new solutions are stimulated. What the

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<sup>8</sup> The most influential definition of a cluster is formulated by Michael Porter: ‘A cluster of independent and informally linked companies and institutions represents a robust organizational form that offers advantages in efficiency, effectiveness and flexibility’ (1998, p. 80).

‘Cluster’ approaches have in common is the assumption that it is primarily competition or collaboration within geographically defined networks that foster development. Although the Cluster scholars’ original attempt was to analyze the content and function of geographically defined clusters, it has been embedded into the commission of policy practitioners as a tool to possibly build clusters. (Saxenian, 1994, Lorenzoni & Baden-Fuller, 1995, Malmberg & Maskell, 2002)

*Systemic features addressed – but only on an aggregated ‘group’ level*

Whether agreed upon by the researchers behind the National Innovation System, Triple Helix and Cluster approaches or not, these are some of the schools of thought that have been mixed into a blend of a governmental commission to policy practitioners, that stresses the ideas that a) research is a direct main source of innovation, b) through policy orchestration, which can intervene in the direction of research but not in the commercial utilization of knowledge, it is possible to affect both the commercial relevance of research and its exploitation in innovation and c) this orchestration will create national economic benefits. Besides being very clear about the sources of innovation the governmental commission to policy practitioners is also distinct in terms of how the systemic aspects of innovation are considered.

First, as discussed above, the most important *source* of potential innovations is seen in non-business knowledge development, mainly in university and institute research, but also in other parts of the public sector. Second, the most important *means* of embedding new knowledge stemming from research based or other public sources in business and innovations is seen in *transfer*, through adaptations of research due to the anticipated need of industry, and through organized collaborations among research and industry. Third, in the business world, the processes occurring *within independent but global companies* are treated as most important for reaching innovation. The innovative processes within companies are assumed to, as mentioned above, be supportable by policy measures that facilitate the transfer of knowledge from universities and other public knowledge providers to companies. Hence, companies are assumed to independently acquire knowledge through external parties and to exchange it in the market:

Thus, although the governmental commission of policy practitioners stresses the systemic features of innovation, it is mainly made on an abstract ‘group level’. The focus is on the processes going on between a) *non-business knowledge producers as a group*, b) *policy/transfer organizations as a group* and c) *companies as a group*. Interdependencies and interactions within these groups are simplified away.

The high level of abstraction and the focus on the systemic aspects between the groups ‘science’, ‘government’ and ‘industry’ works fine as a foundation for a governmental innovation policy commission to policy practitioners: It makes it possible to identify some important ‘nodes’ in ‘science’ and ‘industry’ in *beforehand*, which can be connected to industry through ‘governments’ policy commission. However, when broken down to a) national and regional programmes for innovation support and b) evaluation criteria through which policy practitioners can analyze the expected outcome of RTD applications, there is a lack of awareness of and tools to outline how transnational interdependencies intervene in the ability to create national benefits.

*Others have complained*

It is not only policy practitioners who have criticized the ‘1990s policy doctrine’. Main objections were addressed by empirical oriented researchers in the social sciences and



humanities concerned with a) what will happen with company's long term technological and industrial development when they have to engage in direct use of science in order to qualify for policy support, and when individual EU member states abdicates from their role as long-term supporters of technological and industrial development, and b) what will happen with the content and direction of academic and other public research when this is organized in a direction assumed to make it a 'servant of innovation'.<sup>9</sup> In this paper we will take the first question as starting point for the discussion of how policy can act to support industrial renewal in a way which is beneficial both for companies and for the community behind the public funded financed policy support.

## RENEWAL IN A NETWORK-LIKE BUSINESS LANDSCAPE

It is interesting to note that along with an increasing number of governmentally produced documents stressing that academic and other public research is an under-utilized direct source of innovation, researchers representing such disciplines as economic history, business studies, history of technology, history of science, sociology, anthropology and, last but not least; the IMP setting, have continued to present studies witnessing about another pattern. (See e.g. Rosenberg, 1982, 1994, Latour, 1986, Håkansson, ed., 1987, Basalla, 1988, Fridlund, 199, Sturgeon, 2000, Grandin, Widmalm & Wormbs, eds, 2004, Nowotny et al, 2005, Håkansson & Waluszewski, eds., 2007, Hoholm, 2009, Waluszewski et al, 2009, Ingemansson, 2010)

A first common observation in these studies is that the most important direct source of industrial renewal is established business relationships. This does not mean that research is an unimportant source of knowledge – but it is in general indirect, mediated through people, which makes the main contributions from academic research to business 'largely indirect and roundabout' (Pavitt, 2004, p. 120). This means that the relationships among academic research results and the commercial utilization of these mainly is an affair which stretches over time and space in ways which makes it hidden for others than those direct involved. And once academic research results are utilized in new commercial solutions; i.e. when they are embedded into large scale production and widespread commercial use, the original academic contributions might be so old, so recombined and utilized in such a different way compared to when they were developed in an academic research setting, that it might not even be possible to distinguish their academic origin. Furthermore, that anything new has proved to be useful or even successful in an academic research setting is no guarantee whatsoever that it should be commercially useful in industry. In the latter setting, the commercial usefulness of something new is determined by what benefits it can create on all the organizational and technological investments already made whether or not it is considered as breakthrough science. (Håkansson & Waluszewski, 2007a) As Ingemansson (2010, p. 173) illustrates the different logics of academia and business:

*'[...] scientific and economic significance are not two sides of the same coin – they are not even values within the same currency'.*

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<sup>9</sup> Since Slaughter & Leslie in 1997 drew attention to what they labelled as 'academic capitalism', an intense debate, above all articulated by researchers engaged in the Science and Technology Studies (S & TS) field, has been going on concerning the future of the long-term, faculty driven university research. One common criticism concerned what will happen with the content and direction research which societal and economic effects cannot outline beforehand, when governments increasingly are seeing university and other public research as sources that, through sufficient management, can be utilized as suppliers of potential innovations and as 'growth engines'. (Slaughter & Leslie, 1997, Jasanoff, 2004, Grandin, Widmalm & Wormbs, eds, 2004, Nowotny et al, 2005, Waluszewski 2009, Hasselberg, 2009)

Furthermore, IMP and related empirical based research on business renewal and innovation addresses a specific objection to the contemporary innovation policy commission's great trust in the markets' ability to transform direct non-business research results to innovations which solve both societal and industry problems. Given an interdependent, network-like business landscape, material and immaterial investments in place will affect if and how anything new will be embedded in the business landscape – regardless of what economic or societal effects it is assumed to have when considered in itself. Thus, insights which some decades ago was common knowledge seems to have faded away in contemporary innovation policy; that technological and industrial development occurs in long term interaction, and that strong, long-term oriented actors on the supplier and user side have a crucial role in mobilizing support and direction of this process where the heavy costs appears long before economic benefits. (Håkansson et al, 2009, Lundin, Stenlås, Gribbe eds, 2010, Grandin, Widmalm, Wormbs, 2004, eds.) What these empirical based research experiences further underlines is that governmental actors often has been involved in creation support and direction of interactive innovation processes; for example in terms of purchaser of civil or military technology. Both in the US and in Europe, specific user-supplier interfaces developed in order to be beneficial for both industry and society emerged through a heavy state engagement – more or less visible or hidden in the background. (Hughes, 1994, Fridlund, 1999, Sörlin, 2004, Trischler & Weinberger, 2005, Malerba, 2002, Håkansson, ed, 1987, Håkansson et al, 2009, Lundin, Stenlås, Gribbe eds 2010) However, the interpretation made in the 1990s policy doctrine, the role of the state and governmental actors has, as Högselius (2010, p. 271) puts it, changed from being a 'competent buyer' to become much more 'indirect, abstract and nebulous' with activities as creating a 'good business climate' in the forefront. A heavy reliance on the market has emerged: 'With the good conditions in place, the free market is then expected to do the rest' ...]' (Högselius, 2010, p. 271)

### *Opportunities and hindrances*

Given that the business landscape is characterised by transnational interdependencies, what opportunities and hindrances is then any attempt to boost innovation; policy or business initiated, facing?

A main experience made in the IMP setting (Håkansson, ed, 1987, Laage-Hellman, 1987, Lundgren, 1994, Baraldi et al, 2006, Waluszewski, 2006, Håkansson, Waluszewski, 2007a, Waluszewski et al, 2009, Ingemansson, 2010, Hoholm, 2009) is that the journey behind the use, supply and development of something new, typically goes back and forth in relation to material and immaterial investments in place, where the main costs of the innovation journey do not necessarily appear at the time or at the same place as the main benefits.

From a national policy perspective such an innovation pattern is not necessarily a problem. If the long and 'muddling-through' like process, where investments in development respectively investments in the embedding of new solutions in a large scale supplying and producing setting are made within the same nation, and if the end-product is met by the emergence of widespread use, this will certainly be beneficial for the community that made policy investments to support these processes. From a national policy perspective, the great problem appears when the main public funded investments in are made within the borders of one nation, and the main economic and social benefits appear outside these borders.

However, a main observation made in empirical based research is just that interdependencies and business relationships stretch across regional and national borders. Coping with

interdependencies in practise means that a number of measures are undertaken; in close interaction with specific counterparts on the supplier and user sides. Over time these interactions and adaptations create imprints on both the human and material resources involved – in a way that will affect the content and direction of any attempt to create change, the space dimension included.<sup>10</sup> This the basic observation made in the IMP setting, and it is also a phenomenon that over the last decades has challenged researchers from a wide variety of disciplines. (Håkansson et al., 1982, Piore & Sabel, 1984, Rosenberg, 1982, 1994, Gudeman, 2001, van de Ven et al., 1999, Ford et al, 2003, Baraldi et al, 2006, Håkansson et al., 2009) Thus, each company's economic benefits appears to depend on how it can be utilized by counterparts on its supplying and using side, including what the company can add to the technological and organizational interdependencies into which these counterparts are already embedded. (Ford et al, 2003, Håkansson et al., 2009)

One important consequence of a business landscape with the above described characteristics is that no potential innovation; regardless if developed in a business setting or transferred from a knowledge producing setting, ever meet a claimless demand. Any attempt to create change will always have wanted or unwanted side effects for a number of direct and indirect counterparts on the supplier and user side. The effects will be distributed among related companies and their technological and organizational solutions, i.e. among directly and indirectly related interfaces, over time and space. Thus, these largely indirect effects can both support and kill an innovation journey, depending on what it will add to the others that it affects. This means that effects from public innovation support can 'gravitate' from – but also to – companies and places. Furthermore, it means that potential innovations can be transformed into solutions of quite different characteristics and effects than thought of initially. (Håkansson et al, 2009).

For anyone who wants to create change in the business landscape, whether a company, a government, or a policy practitioner working under a governmental commission, the empirical based picture that anything new never will meet a claimless demand, but an intricate pattern of investments in place, might sound both pessimistic and deterministic. However, the empirical based picture also witnesses a business landscape under constant development. This means that established paths can always give rise to new crossroads as long as the new gets embedded into some change processes and gets direct interfaces with at least some existing resources on a supplier and user side. This also implies that the only general means to create change in an interdependent business landscape is interaction. For anyone that wants to support the embedding of something new in a large scale commercial supply and use of anything new it is necessary to get involved with directly or indirectly affected counterparts on the supplying and using sides. (Håkansson & Waluszewski, 2007b)

## COPING WITH THE DIFFERENT ECONOMIC LOGICS OF 'USE', 'SUPPLY' AND 'DEVELOPMENT'

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<sup>10</sup> In traditional market thinking the market is assumed to be characterized by independency. This is due to that economic resources exchanged are considered as homogeneous. This means that only necessary information the actors on the market need is the price of the resources. The problem of translating 'knowledge' to a homogeneity assumption has been solved with the assumption that the generation of knowledge is something that takes place *outside the economic world*, to be automatically absorbed by the economic actors when manifested in new economic resources (Wilk, 1996). However, as soon as the development and use of resources is treated as an integral part of the business world, the homogeneity assumption has to be replaced by a heterogeneity assumption; i.e. the value of resources is created in combinations, and is unknowable in advance. The business landscape becomes characterized of interdependencies, which companies through interaction are assumed to try to benefit from. (Penrose, 1959, Ståhl, Waluszewski, 2007)

If anything new never meets a claimless demand, but patterns of existing investments related and adapted on a day-to-day-basis among specific companies and organizations, across many different types of community borders, then within what types of settings does the new have to get a 'life'? Based on their different kinds of economic logics, at least three types of related empirical settings can be outlined, where anything new must be embedded if it will result in a large and widespread commercial supply and use. This means that there are both opportunities and drawbacks in three different settings that have to be tackled in order for an innovation journey to succeed. (Håkansson & Waluszewski, 2007b)

#### *The need for benefits in a user setting*

If anything new ever will become a successful innovation; i.e. contribute to 'black figures' for those engaged in its supply and development, (and not end up as a short term 'bubble'; i.e. a firm investing, employing, purchasing, producing and delivering only as long as it has access to venture capital that can carry its costs) the end product has to be valuable within a commercial *using setting*, i.e. an environment consisting of using companies, organizations and/or consumers. (Håkansson, Waluszewski, 2007b)

In a user setting, a dominating economic question is how to utilize established products and product systems as efficiently as possible. Thus, for anything new to become an innovation it has to, directly or indirectly, be embedded into a commercial product and/or service that has widespread use. This means that the new needs to have to get interfaces to a large number of already existing products and services in a user setting. Hence, existing investments in products and services are crucial for any potential innovation's ability to succeed. This can explain why the embedding in a user setting is the 'Achilles heel' of the innovation journey; only a few of all new products and services survive this process. (Håkansson, Waluszewski, 2007b, Tidd et al, 1997, von Hippel, 2007, van de Ven et al 1999)

This implies that one of the most critical parts of the innovation process is very hard to reach from the supplier side. A number of users must find it economically beneficial to engage in the creation of user applications. This might include an identification of what adaptations of related product systems already in use are necessary in order to embed the new solution, as well as a mobilization of the suppliers and users behind them. Thus, for anything new to gain widespread use, interfaces between the new and a number of existing investments, in a supplier and a user network, have to be created. The more others than those directly related to the use of the new can take advantage of it, the larger the possibility that it will reach widespread use and become an innovation. Consequently, whether any new product, service or process will ever will reach substantial use is largely determined by whether it will clash with or create new benefits to established material and immaterial investments in the user setting, and by how much economic and political support can be mobilized. (Håkansson, Waluszewski, 2007b, Bijker, 1987; Gudeman, 2001, Yates, 2009)

#### *The need for benefits in a supplying setting*

The difficult step from a potential to a realized innovation, is not only dependent on what benefits the new can contribute in a using setting, but also in a supplying setting. Below we will take a closer look at what challenges the scaling up and embedding of something in a supplier setting implies. (Håkansson, Waluszewski, 2007b)

In a supplier setting, a dominating economic question is how to utilize established facility systems (i.e. investments in place responsible for production, logistics, distribution, marketing, services, etc.) as efficiently as possible. For any new solution to be industrialized,

i.e. to be embedded into a number of related companies responsible for all types of human and physical resources necessary for taking it into a regular supply, it has to be beneficial for the main part of these existing investments. Thus, when something new is going to be embedded into a supplying network, it has to be 'locked' in terms of a new product, process and/or service. As discussed above, in the contemporary highly specialized business landscape, the trial-and-error like process of locking a new solution into a product, process and/or service, and embed it into a supplying network, will never be an affair of one single company, but an issue carried out among a number of related companies. Much of the end product will be supplied by others, not just the launching company, and how the end product will be locked will largely be defined by what others can supply, given that the new also has to add to their existing investments. What costs and benefits this can create will consequently have a great impact on whether a new solution will ever be locked in terms of a commercial product taken up into a large scale supply. (Gadde & Håkansson, 2001, Ford, 2001)

Hence, a critical question for those who struggle with getting a new solution embedded into a network responsible for its large scale production and supply is what adaptations are required by others, and furthermore, how much support for these investments can be mobilized. The more existing investments can be utilized without larger adaptations, the higher the efficiency. Consequently, whether any new product, service or process will ever be embedded into a large scale production is largely determined by whether it will clash with or create new benefits for existing related investments.

#### *Developing settings characterized by search for new functions*

Regardless of how great a success something new seems; in an academic or business developing setting, it is not until it has been embedded into networks responsible for its large scale supply and use that it becomes an innovation. And regardless of the type of *developing setting* within which a new solution emerges, this will create imprints on the new. Earlier investments in human resources, such as knowledge, skills, routines and experiences, and in physical resources, such as equipment, tools, and methods, will create imprints on the new functionality. If the developing setting is very close to established supplier and user networks, if it for example consists of companies' R&D units and/or industry related research institutes, the new solution will probably emerge in close relation to human and physical investments made in these settings, as well as in relation to problems and opportunities of the supplier and user networks. If the developing setting has only vague connections to future commercial supplier and user networks, if, for example, it consists of academic research milieu, developing a new solution will carry fewer imprints of earlier investments in supplier and user settings. However, there will always be some kind of influence from business, for example in terms of a company's supply of research equipment and methods. (Håkansson, Waluszewski, 2007b, Galison, 1997)

When anything new is going to be embedded into commercial supply and use, it is never a solution in itself that creates benefits, but what effects it can create in combination with current human and physical investments. This means that uniqueness from a short term economic perspective most often is a drawback. The more a new solution differs from related investments, the more difficult it is to combine, i.e., the more difficult to find ways to create economic benefits. Even if a new solution can be regarded as an excellent scientific contribution in the academic setting where it was developed, and even if it seems to correspond to a specific demand, there is no guarantee that it will be possible to embed in commercial supplier and user networks where it has to interface with a number of investments (Håkansson, Waluszewski, 2007b, Hoholm 2009, Ingemansson, 2010).

### *The need for rethinking governmental innovation policy*

If we accept that the business landscape is characterized by interdependencies, i.e. that it has network-like characteristics which stretches across national borders, and that the outcome of any research and technological development process, in order to contribute to innovation, has to find a ‘life’ in three related networks that are characterized by different economic logics, the contemporary governmental requirement on direct measureable economic and societal benefits within the borders of the investing community appears limiting. If the network characteristics of the business landscape are simplified away, neither innovation hindrances nor opportunities will be taken into consideration. Thus, given that a main characteristic of the business landscape is interdependencies stretching across company and spatial borders, there is a need for rethinking the innovation policy commission. In the next section a suggestion for a reformulation is presented.

### RETHINKING INNOVATION POLICY

Is the political commission given to the policy practitioners a ‘mission impossible’, given a transnationally interdependent or network-like business landscape? Can policy supported development projects be designed and executed in ways that not only make their costs but also significant societal and economic benefits appear within the investing country? If we take seriously the governmental ambition to reach national economic benefits through innovation policy, as well as the characteristics of an interdependent business landscape, then the agenda for how to reach this needs to be reframed.

Instead of starting out from the assumption that direct transfer of knowledge from non-business to business is a smooth way to boost innovation processes within the borders of the of the nation that made the policy investments, the problems need to be reformulated. If the business landscape is network-like, then it is not neutral, but directs economic activities in a way which favour the main part of existing investments. Thus, if the business landscape has network-like characteristics, the governmental policy cannot rely on that a knowledge transfer will result in the innovations and industrial development needed to solve certain identified economic, societal and environmental problems. Two critical questions are instead how to:

- I) Utilize the efficiency and innovativeness of networks forces.
- II) Create counter forces against the non-democratic and economically conservative forces of a transnational business networks.

Thus, given that the business landscape is characterized by transnational interdependencies, a relevant starting point for the first question would be to ask a) how governmental policy can act in order to support the renewal of resources available within the nation in a way that makes them into the policy investing nations’ contribution to specific transnational innovation forces and transnational supplier and user networks.<sup>11</sup> Along with this reformulation goes the second question, the requirement on governmental policy commissioners to consider b) what types of transnational innovation forces, involving what supplier and user networks, that policy investment should be used to relate to – as support or hindrance. Should any

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<sup>11</sup> To what types of global innovation forces and global supplier/producer user networks should policy investments be used to relate national/regional economic resources? Should any opportunity for a nation/region to become an important part of a global supplier/user network be supported? Or should only attempts to become a part of supplier/user networks that are acceptable for environmental, political, democratic reasons be supported? These are important political questions to consider, which, however, goes outside of the aim of this report.

opportunity for companies to deliver important contributions to transnational supplier and/or user networks be supported? Or should only projects be supported that are acceptable for environmental, political, and/or democratic reasons? Thus, given a network-like business landscape, a key question for policy actions can be formulated:

*What public policy measures are needed to renew resources available within the investing nation if the ambition is to make them to significant, stable contributions to transnational supplier and/or user networks?*

With such a point of departure, the policy practitioners should be allowed to expand the perspective, from direct effects assumed to be created by a focal company and/or project, to network effects that are likely to occur within and outside the policy investing nation.

However, if governmental policy has the ambition to renew and relate resources available within national borders to transnational supplier and/or user networks, an analytical framework is needed that is based on the assumption of an interdependent business landscape, which allows an analysis of indirect effects, and especially of ‘place opportunities’. For smaller nations in particular, a critical question is how to get not only the main cost, but also benefits to appear within their national borders. Given a network-like business landscape, there is a great risk that benefits may ‘gravitate’ to other locations than intended, i.e. that outcomes of smaller countries’ research and technological development investments become ad hoc input to transnational supplier and user networks. Thus, a relevant governmental policy question concerns *how to make the outcome of public funding supported projects to become a particular place’s stable contribution to transnational supplier and/or user networks.*

The basic demand on such an analytical framework is that it can provide the policy practitioners with the ability to investigate the direct interfaces, and the main indirect interfaces, on the supplier as well as on the user side, which the project is thought to affect or needs to create. What main developers, what main suppliers and what main users – their relationships included – are thought to be affected by the project? What does this mean for the space dimension? In the next section we will discuss how such an analysis can be made and how space related opportunities can be identified.

*Opportunities to renew national using, supplying and developing networks*

The analysis below is based on the ARA model (Håkansson & Johansson, 1992; Håkansson & Snehota, 1995, Håkansson et al, 2009), which makes it possible to analyse the content and effects of the three important ‘network layers’: activity links, resource ties and actor bonds, and on the distinction of three ‘economic logics’ which anything new has to be embedded in order to become an innovation (Håkansson, Waluszewski, 2007b)

The basic foundation of the ARA-model is the assumption that interdependencies are dealt with through business relationships. The content and effect of these business relationships are analysed in terms of actor bonds, resource ties and activity links – which are assumed to have consequences that go beyond the specific relationship in which they arise. Thus, the model builds on the assumption that each of these three layers are inter-connected and each affects and is affected by the constellation of resources, pattern of activities and web of actors in the wider network. (Håkansson et al 2009) Activity links may limit or facilitate resource adaptations over time and space, resource ties may limit or favour the possibility of activity co-ordination over time and space, and actor bonds may open up the possibility of developing activity links and resource ties over time and space. This implies that through the ARA model

it is possible to take account of both direct and indirect interdependencies in the business landscape. Furthermore, the ARA-model makes it possible to investigate these different layers separately, or in different combinations. It can for example be utilized in order to investigate if some main resource ties, stretching across certain non-business and/or business organizations and over certain places, also are dealt with through equivalent actor bonds. (Håkansson et al., 2009)

In the discussion of opportunities for policy practitioners to affect the resources ties, activities links and actor bonds, the model is used as following:

- a) *Innovative forces* are reflected through an analysis of how *resources* are developed and combined within and across companies, within and across national borders.
- b) *Efficiency forces* are reflected through analysis of how *activities* are performed and linked within and across companies, within and across national borders.
- c) *Balancing of efficiency and innovation forces* is reflected through analysis of how *actors* are related and how actor bonds are developed within and across companies, within and across national borders.

Below we will take a closer look at how the ARA model can be used to increase the awareness of what opportunities policy can work with given a network-like business landscape.

#### *Opportunities to renew resources, activities and actors*

A first question to outline is what *resources* that are involved in and/or affected by a policy supported project and what could be added? Here it is important to consider both what combinations of human and physical resources are already involved in the project, and what could be added. For example, are the resources that are involved in the policy supported project representing mainly a non-business developing setting, or are there also other resources, *representing a national supplying respectively using setting* involved in the renewal work? What resources need to be involved, renewed or developed?

A second question concerns what *activities* that are already involved in and/or affected by the policy supported project and what could be added? Are the activities involved in the renewal work representing mainly an academic developing setting, or are other activities, *representing a national supplying and using setting also involved*? What activities need to be involved, renewed or developed?

A third question concerns what *actors* that are already involved in and/or affected by the project and what could be added? Are the actors utilized in the RTD work representing mainly an academic developing setting, or are actors *representing a national supplying and using setting also utilized in the renewal work*? What actors need to be mobilized in the renewal work?

A deeper analysis of resources, activities and actors; in a developing, supplying and using setting, can outline weaknesses *and* opportunities for policy practitioners to influence the



content and direction of an policy supported project. <sup>12</sup>Through such analyzis (which never can be complete but more should be regarded as an ‘awareness map’) an understanding of what resources, activities and actors are involved, need to be involved and need to be created in the renewal work can be outlined. Furthermore, such analyzis will also provide a view of what role national resources will have in this process. Thus, hand in hand with the analysis of strengths and weaknesses of the policy supported project, goes the outlining of opportunities for policy practitioners to act. The analysis of renewal opportunities can also be presented as in the following matrix, based on Håkansson, Waluszewski, (2007b)

	Using Setting	Supplying Setting	Developing Setting
Resource combinations ( <i>innovation forces</i> )	<i>Renewal opportunities in relation to:</i> <b>PRODUCT SYSTEMS</b>	<i>Renewal opportunities in relation to:</i> <b>FACILITY SYSTEMS</b>	<i>Renewal opportunities in relation to:</i> <b>IDEA SYSTEMS</b>

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<sup>12</sup> Following questions can be formulated: ***What resources are – and can be – involved in the policy supported project?***

What resources that are involved in an RTD project will have a great impact on what innovation forces, in what settings, to which the renewal work can relate? Thus, a first important question to consider is: *What material and immaterial resources, representing what types of developing, supplying and using settings, at what places, are involved in the policy supported project?*

***What activities are – and can be – involved in the policy supported project?***

What activities that are involved in an RTD project will have a great impact on what efficiency forces, in what settings, to which the renewal work can relate. *Activities* can be production of material and immaterial solutions, logistics, administration, etc. Thus, a second important question to consider is: *What activities, representing what types of developing, supplying and using settings, at what places, are involved in the policy supported project?*

***What actors are – and can be – involved in the policy supported project?***

What actors that are involved in an RTD project will have a great impact on what mobilizing forces, in what settings, to which the renewal work can relate. Thus, a third important question to consider is: *What actors, representing what types of developing, supplying and using settings, at what places, are involved in the policy supported project?* This means that following, related questions have to be considered:

Activity links <i>(efficiency forces)</i>	<i>Renewal opportunities in relation to:</i> <b>USER NETWORKS</b>	<i>Renewal opportunities in relation to:</i> <b>SUPPLYING NETWORKS</b>	<i>Renewal opportunities in relation to:</i> <b>R&amp;D NETWORKS</b>
Actor bonds <i>(mobilizing forces)</i>	<i>Renewal opportunities in relation to:</i> <b>USER ACTOR BONDS</b>	<i>Renewal opportunities in relation to:</i> <b>SUPPLIER ACTOR BONDS</b>	<i>Renewal opportunities in relation to:</i> <b>R&amp;D ACTOR BONDS</b>

**Figure 1:** *Nine related but different ‘interface logics’ that can contribute to ‘diagnostics’ of forces that shape and direct the outcome of policy supported renewal projects.*

The same data concerning renewal opportunities can also be presented as in the following matrix, which highlights the links among ‘national’ networks; i.e. resources, activities and actors available within the national borders and transnational networks.

	’National’ networks	Links between ’national’ and ’transnational’ networks	’Transnational’ networks
Innovation forces	<b>Resource combinations</b>	<i>National-transnational</i> <b>Resource combinations</b>	<b>Resource combinations</b>

Efficiency forces	<b>Activity links</b>	<i>National-transnational</i> <b>Activity link</b>	<b>Activity links</b>
Balancing forces	<b>Actor bonds</b>	<i>National-transnational</i> <b>Actor bonds</b>	<b>Actor bonds</b>

**Figure 2:** *Links among ‘national’ and ‘transnational’ networks.*

If a policy practitioner can require that each applicant for policy support provide her with at least a basic awareness about and some information concerning each ‘interface logic’, she has also been provided with an emerging picture of:

- a) The idea that the policy support applications rest on and how far they have materialized, including at what places that are involved.
- b) The supplying network that is necessary for a taking the materialized idea to a large scale production and supply, including at what places it is likely that this will appear.
- c) The user network that is necessary for reaching the using volumes required for ‘black figures’ in the supplying setting, including at what places they are likely to emerge.

Thus, the policy practitioner has been provided with at least an awareness about and a discussion of three related but, in terms of both technological, economic and spatial logic rather different networks, in which anything new has to survive to become a successful innovation.

The final question for the policy practitioner to consider is what RTD processes are going to be supported, and how. Is it the application concerning projects that appear to have a good chance of being embedded in a using, producing and developing network, which to a large extent already exists within certain spatial borders, going to be prioritized? Or is it the application concerning projects that appear to meet severe difficulties in one, two or all of these settings, but are important for a democratic, environmental or other societal reason and are considered as beneficial, that will be prioritized? And if it is the latter type of processes that is prioritized; where a long-term support is necessary for supplying and using networks to emerge, is the required policy involvement compatible with the contemporary EU legislation?

#### COPING WITH LIGHT AND DARK SIDES OF BUSINESS NETWORKS

If the business landscape is network- like, with interdependencies stretching across national borders, then there is a need for a governmental innovation policy that takes both the light and dark sides of network forces into consideration.

Hence, the final conclusion of this paper is straight forward: if the business landscape is network-like, there is certainly a need for governmental policy to intervene. If networks are not neutral, but direct the innovation journey in relation to existing investments, governmental innovation policy cannot rely on creating a transfer of certain kinds of knowledge to 'the market' and trust that this will result in the innovations needed for the identified economic, societal and environmental problems. Governmental innovation policy has to act as a counterforce against the non-transparent, non-democratic and economically conservative forces of a transnational network-like business landscape.

Besides acting as a counterforce against the dark sides of networks, there are also a number of network opportunities that governmental innovation policy can help policy practitioners to support and utilize. However, if policy practitioners are going to be able to utilize network opportunities in developing, supplying and using networks, stretching across national borders, their governmental commissioners have to fulfil two main requirements: First, the policy involvement has to have *endurance*. The policy practitioners must be allowed to identify and engage in transnational network processes over time – and not only in a developing setting but also in a supplying and using setting. Second, the policy involvement must be allowed to be *spatially dispersed*. The policy practitioners must be allowed to identify and engage in transnational network processes over space; i.e. over national borders.

Thus, the policy practitioners must be supplied with a governmental commission which allows them to analyse and a) utilize the innovativeness of transnational network forces, and b) to counteract against the economic conservatism of transnational business networks. Both of these two requirements are challenging to a governmental innovation policy commission that is based on an over-developed trust in the ability to reach rapid and direct measurable effects within narrow geographical borders.

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