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*Swedish work environment research in a historical perspective*

*Carin Håkansta*

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## Preface

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## Table of contents

1. Introduction	1
2. Theoretical framework	2
2.1. Historical institutionalism	3
2.2. Principal agent theory	6
3. Method and materials	8
3.1. Empirical material	8
3.2. Periodic system of global research policy trends	10
3.3. Analysis	11
4. Swedish work environment research and science policy	12
4.1. The post-war period: Science as motor of progress	12
4.2. The radical period: Science as problem solver	16
4.3. Science as strategic opportunity	23
4.4. The 21st century	29
4.5. Summary	36
5. Swedish work environment research in the context of science paradigms and institutions	37
5.1. Emergence of "science as motor of progress"	38
5.2. Shift from "motor of progress" to "problem solver"	39
5.3. Shift from "problem solver" to "strategic opportunity"	41
5.4. The current situation	43
5.5. Summary	46
6. Concluding discussion	47
Sammanfattning	51
Summary	52
List of references	53



## 1. Introduction

Swedish work environment research holds a strong position internationally, as demonstrated in a bibliometric study from 2007 (Wegman et al, 2007). According to this study, which was made in connection to an international evaluation, articles published in 2001-2005 with at least one Swedish author accounted for about 8% of the world production of published articles in the areas of occupational health and ergonomics. When set against population size<sup>1</sup>, the results showed that Sweden ranked number 2 in the world in occupational health and number 1 in the world in ergonomics.

Despite the apparent scientific strength of the field, concerns have been raised about the future of the field. Wegman et al (2007) considered the age structure of research leadership worrying, as most research leaders were approaching retirement. They also argued that decreasing levels of available research funding for open-call researcher-initiated projects could threaten innovation and sustainability of the area. The 2007 closure of the National Institute for Working Life, one of Sweden's main employers of work environment researchers, further reduced the levels of research funding to the area, as pointed out by Albin et al (2009) and Rolfer et al (2012).

This raises several questions. How and why did a small country like Sweden reach the international forefront in work environment research? Why are levels of funding receding? Why are there concerns about the future of the area? The purpose of this study is to describe the development of Swedish work environment research. It is a historical analysis with specific focus on two sets of actors. The first set is found in the labour policy arena: the government and the employers' and workers' organisations, also known as the social partners. These actors represent the "demand side" of work environment research because of the usefulness of scientific findings in negotiations for e.g. better working conditions or threshold values for regulation. The social partners have been instrumental in lifting the issue of work safety since the early 1940s (Thörnquist, 2001) and as lobbyists and funders to work related science (Lennerlöf, 2008; Glimell, 1997; Giertz, 1981, 2008), psychosocial research (Theorell, 2007; Levi, 2002) and behavioural work environment research (Gustafsson & Kjellberg, 1983). In the early 1970s, major strikes with demands for better working conditions contributed to a number of government initiatives to improve the work environment, including legislation and increased levels of research funding.

The second set of actors selected for the study is found in the science policy arena: the government, public research funding organisations and researchers at institutes and universities. These actors could be said to represent different segments of the "supply side" of research since they include the persons carrying out

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<sup>1</sup> Relative contribution of articles with a Swedish author expressed by average number of articles per year per 1 million articles.

research as well as the actors deciding what type of research to be funded and where research should be carried out.

Both the labour market and science policy arena are influenced by national as well as international developments. In the case of science policy developments, Elzinga & Jamison (1995) argue that the Swedish government to a large extent have followed these trends, which would explain why Swedish science policy has undergone rather large shifts. During the 1970s, 1980s and 1990s, Swedish science policy was characterized by a bias towards user-driven, applied research, also called “sectorial research” (Persson, 2001; Premfors, 1986; Benner 2008, 2001).

The purpose of this study is to add understanding of processes and actors that have formed the field of work environment research in Sweden. Since it builds on a combination of two sets of actors in the labour policy and science policy arenas, it was considered necessary to combine approaches from different scientific traditions to operationalize the study: working life research and science and technology studies. Earlier studies on the history of work environment research have been written by work environment scientists, with few if any references to science policy (i.e. Levi, 2002; Skerfving, 2007). On the other hand, studies on Swedish science policy (e.g. Premfors, 1986; Benner, 2008) have paid little attention to work environment research. The multidisciplinary approach used here is inspired by two schools of thought: historical institutionalism and principal-agent theory. The analysed material includes policy documents, monographs, articles and interviews.

The set-up of the article is as follows. Section 2 and 3 describe the theoretical underpinnings and methodological aspects. Section 4 presents the historical development of Swedish work environment research from the 1940s until 2013. Section 5 places the historical development of the field in relation to historical institutionalism and principal agent theory. The 6<sup>th</sup> and last section presents the conclusions.

## 2. Theoretical framework

Any research area is different today compared to ten or fifty years ago. Since the purpose of science is to explore the unexplored, this is as it should be. Furthermore, research problems considered important enough to spend money and effort on differ by world region and time periods. They also depend on factors such as financial and political situations, norms and traditions. Many areas of research are dependent on funding from the government. In order to understand the development of those research areas it is useful to study the national public science system. This system consists of the research performing organisations, the research funding organisations and the national science policy. According to a book on authority relations in the sciences by Whitley et al (2010), comparisons of key characteristics of national public science systems are vital if



we want to understand how governance changes could potentially affect research: *In particular, it is important to identify the different roles of state agencies, employing organizations, and scientific elites, the stratification of academic institutions and the nature of research funding arrangements, as well as changes in these, in different types of PSS [Public Science Systems].* (Whitley et al 2010: p. 6)

## **2.1. Historical institutionalism**

The first leg of the theoretical framework is historical institutionalism, according to which institutions are used to detect patterns of social, political and economic behaviour related to change over time. Institutions are defined as “formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity or political economy” (Hall & Taylor, 1996: p. 938).

“Path dependency” is a central concept in historical institutionalism as it helps explain why the same operative force does not produce the same result everywhere. The theory suggests that contextual factors inherited from the past play a role in pushing historical development along different “paths” (Hall & Taylor, 1996). The implicit and explicit norms and rules in society change very slowly because of their inherent path dependency (March & Olsen, 1989).

A central theme in all new institutionalist schools is power relations (Rhodes et al, 2006; Hall & Taylor, 1996). Another common theme is the question what effect institutions have on the behaviour of individuals. Different new institutionalist schools have different answers to the questions; broadly speaking they take either a “calculus approach” or a “cultural approach” (Rhodes et al, 2006). The “calculus approach” assumes that there are rational actors whose behaviour is shaped by expectations created by institutions. The “cultural approach” puts more emphasis on established routines and familiar patterns than on the individual as utility maximizer.

Historical institutionalism was chosen for the theoretical framework because it combines the calculus with the cultural approach. This eclecticism fits nicely since this analysis covers the norms and traditions affecting Swedish science and labour market policy, as well as the deliberate choices made by policy makers and researchers.

The two institutions in focus in this study are the “Swedish model” the specific norms and rules that unite much of the academic community, here called “academic culture”. Both are further elaborated upon in the sub-sections below.

### *2.1.1. The Swedish model*

The definition of the Swedish model has been debated at length. In a narrow sense the model relates to the history of relations between the workers’ and employers’ organisations (the social partners), the agreements building on the social peace accord of 1938, the “Saltsjöbaden Agreement”, relatively few conflicts and a wage policy based on solidarity. In a broader sense the model refers to the welfare

society based on full employment and social policy measures which emerged before the Second World War, producing the compromise between capitalism and socialism by some called “the Middle Way” (Magnusson & Ottosson, 2012). According to some, the Swedish model is not unique but a variation of a Nordic model that refers to the economic and social models of all the Scandinavian countries, combining extensive public welfare provisions with individualism, or as a middle ground between capitalism and socialism (Esping-Andersen, 1990).

In this study the Swedish model is defined as an institution that has evolved from both sides of the Swedish model described above: social partner relations and the welfare society.

In comparison to most countries, the social partners in Sweden have enjoyed a relatively strong and autonomous (from the Government) position based on a spirit of compromise and collaboration (Forsberg, 2000). In a book on the regulation of workplace risks, Walters et al (2011) argue that the “Swedish model”, e.g. the co-operative labour market relations that prevailed in Sweden from the 1940s, was crucial to an “enlightenment strategy” that changed norms related to the work environment in Sweden as well as other Nordic countries; hence its importance to the development of work environment research. The rising popularity of neo-liberalism in economic policy making since the 1990s, although less extensive in Sweden than in many other countries, has nevertheless eroded the Swedish model. As a consequence, challenges have arisen to the “enlightenment strategy” that was the foundation of today’s effective occupational health and safety management (Ibid).

In this study the influence of the social partners is in focus, particularly in their formal roles in public sector policy making in the 20<sup>th</sup> century - also called corporatism or corporativism. Forsberg (2000) argues that the Swedish model is characterised by corporativism in two ways: 1) the tripartite relationship between state, capital and labour, so-called “administrative corporativism”, and 2) the bipartite institutions between the social partners without the direct collaboration of the government, so-called “labour market corporativism”. In the trilateral arrangements of administrative corporativism, representatives of the social partners became legitimate participants in institutions of importance to the labour market.

For many decades, especially between the 1940s and the 1980s, this meant that the social partners enjoyed considerable influence in the processes of formulation as well as implementation of administrative and policy decisions. Labour market corporativism includes bipartite agreements such as central salary negotiations and social funds and insurances that complement the government run welfare systems. Even though the state does not actively participate in these arrangements, it plays an important role as supporter or stumbling block to the establishment of bipartite organisations or agreements (Forsberg, 2000).

Corporativism has been studied by historians, economists, sociologists and political scientists. According to the economist Andreas Bergh (2008), corporativism is one of four phenomena in the Swedish economy that is usually included in discussions about the Swedish model. The four phenomena are: 1)

The mixed economy consisting of a market economy with strong elements of regulation without being a planned economy; 2) Corporativism, according to which the social partners are involved in salary negotiations, preparations for political decision making and in functions related to government organisations; 3) The logic of Swedish labour market policies, also called the “Rehn-Meidner model”; and 4) Welfare policies based on all-inclusive welfare services, such as social insurance, schools and childcare, financed by high taxes. In sociology, studies of corporativism look at how it creates social integration or levels the balance of power in a society (Forsberg, 2000). In political science, corporatist theory is contrasted to pluralist theory, according to which many organisations take part in politics without having formal power to design or implement policy (Cawson, 1986).

It has been suggested that Sweden is one of the most corporatist countries in the world (Lijphart, 1999). Nevertheless, this article departs from the common assumption that Sweden has experienced a substantial weakening, or “decorporatisation”, since the 1980s (Micheletti, 1994; Öberg, 1997; Rothstein & Bergström, 1999). The process of decorporatisation occurred simultaneously with the weakening of the Swedish model in the 1980s and 1990s. Central salary negotiations were replaced with local negotiations and individual salary formation, and in 1991 the central employers’ organisation withdrew from all governing boards of government organisations. However, despite numerous changes to the Swedish model, the social partners have retained a degree of influence at national as well as EU level via government appointed advisory groups, EU-level policy making groups and in the administration of the Swedish Social Fund (Forsberg, 2000).

This study will look at the influence of the Swedish model in policy making and implementation and how this has affected work environment research in different historic periods.

### *2.1.2. Academic culture*

The second institution in focus in this study is called “academic culture”. Just like “the Swedish model”, this is a concept without an official definition. What is meant by the concept in this study is a set of norms or culture existing in “academia” which defends the autonomy of the scientific community and resists the intrusion of other actors than scientists into the realms of science production or research agenda setting. Ziman (2000) argues that the culture of academic science, which he calls “the legend”, consists of shared traditions and ideas concerning the definition and execution of what should be considered “good” or “relevant” science. Defenders of “the Legend” tend to refer to the Mertonian norms CUDOS<sup>2</sup>, which were established in reaction to government planning of

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<sup>2</sup> CUDOS is a collection of principles that should guide good scientific research. According to the CUDOS principles, the scientific ethos should be governed by Communalism, Universalism,

science in communist states during the Cold War. Proponents for a modernisation of this view argue for more interactive forms of science production. One example is the theory of Mode 2 knowledge production, which according to Gibbons et al (1994) is context-driven, problem-focused and interdisciplinary. Mode 2 is a reaction to what Gibbons et al perceived as the isolation of science from the interests of society (Mode 1) constructed in order to justify scientific autonomy. Another theory suggesting a departure from “the Legend” is Triple Helix. According to Etzkowitz (2005, 2008) Triple Helix is the proximity between the nation state, academia and industry that is needed for innovation and development of new technology and knowledge transfer to occur. Ziman (2000) argues that criticism against science should not be met by a blind defense of “the Legend” but rather of a more open attitude of scientists towards stakeholders outside of the scientific community. What Ziman calls “Post-academic science” is similar to Mode 2 knowledge production, i.e. problem-driven, interdisciplinary research.

In the history of work environment research, academic culture is important because of resistance from actors in the research community, the research councils and in politics to problem-oriented science and the inclusion of non-scientist stakeholders in the production of science and decisions on research funding. Scientists defending “the Legend” have been able to exert resistance via their positions on the governing boards of research councils and in their role as reviewers in the peer review process.

## **2.2. Principal agent theory**

The second leg of the theoretical framework is principal agent theory. The origin of this theory is rational choice and transaction cost theory (e.g. Coleman, 1990). Briefly it argues that that in a given economic relationship, one actor (the principal) would hire another actor (the agent) to perform the task. The benefit of the arrangement is reduced transaction costs for the principal.

Rational choice could be considered contradictory to institutional theory since the first places the emphasis on the actor and the second on the environment. However, as explained in section 2.1.1, historical institutionalism embraces both the “calculus approach”, which can be compared with rational choice, and the “cultural approach”, which can be compared with institutionalism. The two might thus be considered compatible.

Scientists in the tradition of science and technology studies have used principal-agent theory to conceptualise the relationship between science and society since the 1990s (Braun & Guston 2003; Guston 2000; Braun 2003). In particular the model has been used to analyse funding agencies (Braun & Guston, 2013). In this study a trilateral model is used which is based on principal-agent theory. In this model, the government is the principal, research funding organisations are boundary organisations and researchers play the role of actors. The model facilitates the

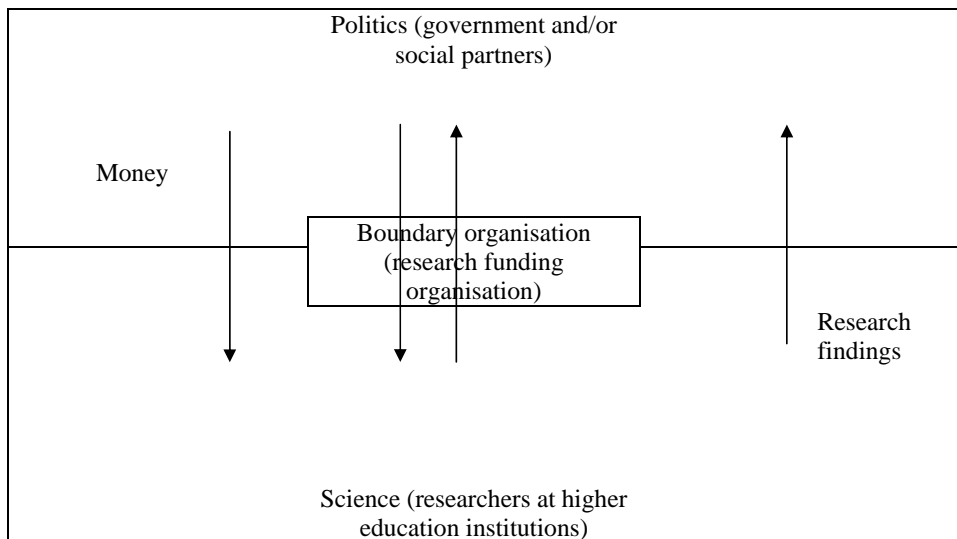
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Disinterestedness, Originality and Skepticism. The origin of CUDOS is the Mertonian norms, introduced in 1942 by Robert K Merton.

analysis of power relations between the government, funding agencies and researchers. According to van der Meulen (2003), the purpose of research councils is to bridge the gap between government policy and scientific performance,

In this study, as illustrated in Figure 1, the principal consists of the government and/or the social partners. Boundary organisations consist of research funding agencies of importance to work environment research. The agent consists of researchers active at higher educational institutions such as universities, university colleges and institutes. Arrows in the figure going in the direction from the principal (politics) towards science (researchers) indicate money flowing from the government in the form of research funding, either directly as block funding or via the research funding organisations. Arrows going from science towards politics indicate research results or knowledge flowing from the research community to policy makers and to society at large.

Figure 1. Relationships between politics and science in a principal-agent perspective. Arrows symbolise flows of funding from principal to agent and research from agent to principle.



### 3. Method and materials

The time span selected for the article starts with the end of the Second World War and ends at the time of writing (in 2013). This is because Sweden, as indeed most countries (e.g. Edqvist 2003; Elzinga & Jamison, 1995), did not have any

clearly defined science policy before the 1940s. Furthermore, the institutionalisation of work environment research also began around this time (Skerfving et al, 2007).

Names of organisations that existed before 1970 rarely had an official translation in English. The solution to this problem has been to make as literal and simple translations as possible, adding the Swedish name in brackets.

### 3.1. Empirical material

The primary sources used in the study consist of government documents from the 1930s until 2013 and interviews carried out between 2010 and 2013. Among the government documents, research policy bills<sup>3</sup> were a key source of information on Swedish research policy. Another source were government instructions to research institutes and research funding organisations, which describe how these organisations operated and what kind of changes were introduced. Government official investigations<sup>4</sup> (so-called SOUs) on science policy in general and on work environment research in particular provided information on what government has considered important questions as well as useful research findings. An examination of parliamentary debates and correspondence to and from government regarding policy changes and work environment research would have further added to the study but was not included due to the long historical span. It was considered reasonable to assume that the bills, which are established through a lengthy process involving several ministries and approved by parliament, give a fair representation of definitions, opinions, strategies and questions of that time. Changes in the government organisation instructions are the concrete outcome of policy change. The official investigations are often indicators of a problem or on-going debate and tend to be instigated before government decides on policy change, making them useful indicators of change.

In total 21 semi-structured interviews were carried out and transcribed between 2010 and 2013. All but one of the interviewed persons were active or retired scientists engaged in work related research. They were selected to represent both sexes as well as different academic disciplines, seniority and geographical locations. Out of the 13 active researchers interviewed, seven were Associate Professors and six were professors. They were active at Gothenburg University, Stockholm University, Luleå Technical University, Karlstad University, Lund University, KTH Royal Institute of Technology and the Labour Movement Archives and Library. Nine of the interviewees were women and four were men. The 8 not active researchers interviewed included three who had worked in leading positions in research institutes as well as one Director General of a research council and one ex-member of a research council board.

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<sup>3</sup> Since the 1970s, government has presented research bills containing the priorities and budget for the next four year-period. The twelfth research bill, "Research and Innovation" (Forskning och Innovation 2012/13:30), was presented in October 2012.

<sup>4</sup> *Statens offentliga utredningar* (SOU), "Swedish Government Official Reports", is the official series of reports of committees appointed by the Swedish Government for the analysis of issues in anticipation of a proposed legislation.

The core questions of the interviews were: 1) What, in your opinion, is working life research? 2) Which factors and processes form the area of working life research now and previously? Follow-up questions included historical change in the definition of the research field and how actors and processes affected the area previously compared to now. All interviews were recorded and transcribed.

An additional 25 interviews were done by the author in 2011 for a Government investigation on the needs and preconditions for a knowledge centre in the area of occupational health (SOU 2011:60). The persons interviewed were representatives of trade unions, employers' organisations and other stakeholders. Even though these interviews were not directly related to the questions of this study, answers from the interviewees often deviated from the topic and provided opportunities to discuss the relationship between the scientists and stakeholders in the work environment area.

Since the interviewees rarely remembered pre-1970, the analysis of this period is based on government documents, such as bills and instructions, and secondary sources, such as previous literature on the topic and government investigations. For the 1970s and onwards, interviews serve as complementary information to written sources. In most cases the interviews confirmed data from official documents and previous analyses but they also added information not included, such as the relationships between different disciplines and between researchers employed by universities and institutes respectively. Information from the interviews referred to with sentences like "the general opinion of the interviewees were...". In some cases quotes from the interviews have been used to illustrate a specific point or to give an example of points made by several of the interviewees.

Secondary sources include books and articles on Swedish research policy in general and work environment research in particular, as well as memoirs written by persons involved in the development of the field.

### **3.2. Periodic system of global research policy trends**

Section four and five are presented according to a historic periodization based on science policy paradigms. Edqvist (2003) argues that the emergence and development of Swedish science policy and research councils to a great extent followed the same pattern as the US, Australia and other European countries. Ruivo (1994), who inspired Edqvist, found similarities not only between the science policies of different nations but also that they were guided by the advice emanating from the OECD. Inspired by Thomas Kuhn's concept of paradigms, Ruivo presented three international science policy paradigms regarding the purpose of research, how research should be done, the public funding system and relations between science and society:

1. "Science as a motor of progress" dominated the post-World War period and was characterized by the linear model<sup>5</sup>, a trust in the scientific

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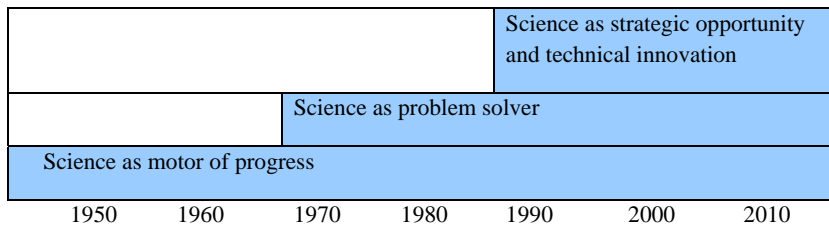
<sup>5</sup> The linear model is one of the first conceptual frameworks developed for understanding the relationship between research and the economy. According to this model, innovation starts

community to take the lead – so-called “science push”, and the creation of large expensive science projects – so-called “big science”. To a large extent, research funding took place through specialized organisations such as research councils.

2. “Science as a problem solver” emerged in the years towards the end of the 1960s. The view on science was still characterized the linear model, but political radicalisation and reduction in the public finances in general caused policy to change. Science policy now became more geared towards perceived needs in the society, so-called “demand pull”. In this period more funding was channelled towards applied research directed at economic growth, health, environmental issues etc.
3. “Science as a source of strategic opportunity” became prominent in the 1980s/1990s and was characterized by regionalisation in and between countries, the globalisation of production and research and the move from the linear model to a variety of actors, institutions and processes. Emphasis came to lie on strategic basic, interdisciplinary and collaborative research related to strategic opportunities and long-term needs of knowledge as well as demands for effective management of resources, foresights, evaluations and international indicators.

Edqvist (2003) developed Ruivo’s model with a cumulative aspect, introducing a model of overlapping “layers” parallel to and competing with each other during different historical phases (see Figure 2).

Figure 2. Historical phases of research policy: used as periodic system in the analysis (adapted from Edqvist, 2003)



### 3.3. Analysis

Results presented in section 5 make references to the theoretical framework presented in section 2, i.e. the influence of the Swedish model and academic culture on work environment research and Swedish science policy in a principal-agent perspective. The principal-agent relationship is used in the analysis to detect problems and contradictions between policy makers and researchers that

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with basic research, followed by applied research and development, and ends with production and diffusion.



can explain shifts from one historical period to another. Typically, four problems occur (Braun, 2003) that may lead to policy change:

1. getting scientists to do what politics wants (problem of responsiveness);
2. being sure that they choose the best scientists (problem of adverse selection);
3. being sure scientists do their best to solve problems and tasks delegated to them (moral hazard); and
4. knowing what to do (problem of decision-making and priority-setting).

## 4. Swedish work environment research and science policy

This section is divided into the three historical periods described in section 3.2 as well as a fourth period which presents the present situations since the year 2001. For each historical period, the development of science policy, the main sources of research funding and the main structure of work environment research are presented.

### 4.1. The post-war period: Science as motor of progress

As elaborated upon in section 3.3, the decades after the Second World War were characterised by great optimism in the role of science in social and economic progress. Most OECD countries, including Sweden, began to include science as an element in national policy making (Edqvist, 2003; Elzinga & Jamison, 1995).

Two ideologies that were influential to the emergence of work related science in the 19<sup>th</sup> and 20<sup>th</sup> centuries were: 1) scientific management, or “Taylorism”, and 2) hygienism, the idea of a clean body and environment in order to promote health. Both emerged in connection to problems emerging due to industrialisation in Europe and North America, causing people to move from the countryside to the cities and working conditions to change. In Sweden, the ideas of improved hygiene in the population led to the establishment of a national institute for public health, which housed a department dedicated to occupational hygiene, as well as the emergence of occupational hygiene as an academic discipline (Sundin, 2005; Thörnquist, 2005). Scientific management came to Sweden via the US and later Germany. It influenced the development of behavioural sciences including personnel administration, work psychology, organisation research and human relations (Lennerlöf, 2008; Giertz 1981, 2008; Glimell, 1997).

#### 4.1.1 Science policy

Before the Second World War, Sweden had no centralised science policy system and the level of public research funding was low. In the mid-1930s, government funding to research amounted only to a few million Swedish Crowns (the value of two million SEK in 1935 corresponds to about 60 million SEK in 2013), dedicated to a few research institutions (Premfors, 1986). In the 1940s this changed. In the period of five years, the Swedish government established a system of research councils and increased public spending on university research. Initially the government’s interest was geared towards social progress rather than academic progress. Consequently, the first research councils established were a technical research council (in 1942) and research councils for medicine and agriculture (in 1944). The decision to set up a council for natural sciences in 1945, the first dedicated to basic science, was viewed with scepticism by many researchers, who feared interference from the government (Premfors, 1986: p. 13).

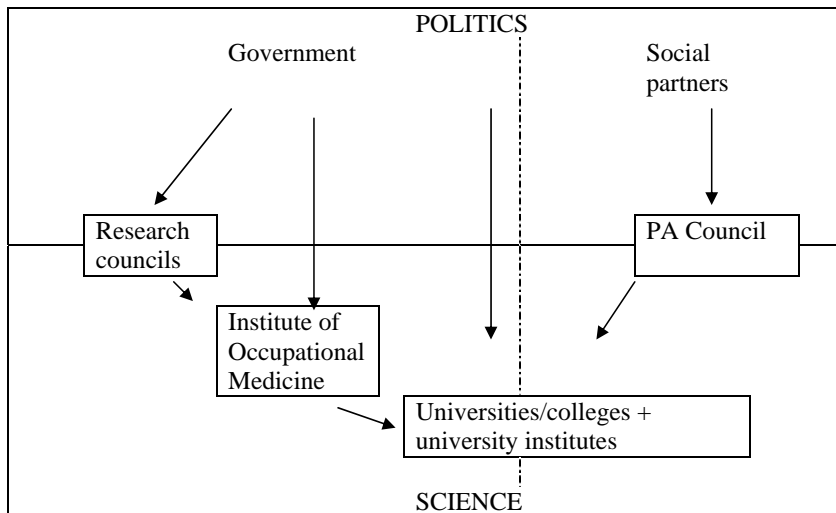
Public support to research was primarily geared towards the universities and not to institutes. This tendency will be elaborated upon later in this article.

#### 4.1.2 Funding

Government research funding to the area of work environment was scarce before the 1960s (Skerfving et al, 2007: p.9). Nevertheless, small groups of researchers contributed to the development of the area. One of them was the department of occupational hygiene at the National Institute for Public Health.

Next to government funding to institutes and clinics (see below), an important source of funding during this period came from the employers. Starting in 1952, the Swedish Confederation of Employers (SAF) provided research funding via the Personnel Administrative Council (the PA Council). However, whereas the government funded occupational medicine, focussing on relations between illnesses and work, the PA Council funded research in personnel administration and psychology, inspired by the Human Relations School. The PA Council could be considered the first “boundary organisation” of importance to work environment research, funding applied research, mainly in psychology, pedagogy, sociology and (until 1966) physiology. Furthermore, it provided a platform for researchers to meet (Gustafsson & Kjellberg, 1983; Lennerlöf 2008: p. 21). Figure 3 illustrates the relationship between the most important organisations in the area of work environment research from a principal-agent perspective.

Figure 3. Working life research end 1960s in a principal-agent perspective: main funding and research organisations (arrows = research funding).<sup>6</sup>



Decision making in the PA Council was influenced by the Swedish Model. In addition to the chair of the council, who was a SAF-representative, it consisted of representatives from trade unions and the government. Within the council, a

<sup>6</sup> It is not correct to say that the social partners financed the PA Council, only the employers did, but both social partners were involved in the decision making process of the organisation.

science branch was established with a scientific advisory group consisting of prominent researchers. Most funding went to colleges and universities but the council also financed a professorship at the Stockholm School of Economics and another at the Institute of Work Physiology. In the 1960s this changed as more researchers began to work for the PA Council. They received an increasing share of the financial support, especially after 1967 when a research department was set up. The purpose of the research department was to create an overview and establish contacts with national and international research (Lennerlöf, 2008: p. 60). Despite increasing levels of funding from SAF, the research department grew to such an extent that most research after 1967 was financed from other sources (Gustafsson & Kjellberg, 1983: p. 32).<sup>7</sup>

#### 4.1.3 Research

Research into classical work environment issues began in the 1930s and 1940s in hospital clinics, the National Institute of Public health (*Statens institut för folkhälsa*) and, to some extent, at the universities. The first clinics dealing with work environment research were established in the 1940s, when a “generator gas clinic” was established in Stockholm, treating drivers with damage from carbon monoxide exposure. An occupational medicine clinic and an outpatient clinic were also founded in Stockholm. In the 1950s, another occupational medicine clinic was established in Lund and in the late 1960s yet another in Örebro.

In 1938, the department of occupational hygiene at the National Institute of Public Health was established under the leadership of one of the pioneers in Swedish work environment research, Professor Sven Forssman. He held the professorship from 1943 and acted as leader of the department until 1951 when he became the advisor for occupational medicine to SAF. In 1966 Forssman returned to the public sector as director of the Institute of Occupational Medicine (*Arbetsmedicinska Institutet*), which was a merger of the previous department of occupational hygiene and other smaller institutes. Table 1 below contains the most important government funded research institutes in the area of work environment health.

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<sup>7</sup> Mainly the Council for Research in the Humanities and Social Sciences (Humanistiska samhällsvetenskapliga forskningsrådet) and Riksbankens Jubileumsfond.

Table 1. Main public research institutes in traditional and organisational/psychosocial work environment health (1938-2007)

Years	Institutes for traditional work environment research	Institutes for organisational/psychosocial work environment research
1938-1965	National Institute of Public Health, Department of occupational hygiene ( <i>Statens institut för folkhälsa</i> )	
1966-1971	Institute of Occupational Medicine ( <i>Arbetsmedicinska Institutet</i> )	
1972-1986	Research dep. in National Board of Workers Protection ( <i>Arbetsarkyddstyrelsen</i> )	
1977-1989		Working Life Centre ( <i>Arbetslivscentrum</i> )
1990-1994		Institute for Working Life Research ( <i>Institutet för arbetslivsforskning</i> )
1987-1994	Work Environment Institute ( <i>Arbetsmiljöinstitutet</i> )	
1980 - 2007		National Institute for Psychosocial Factors and Health ( <i>Institutet för psykosocial medicin, IPM</i> )
1995-2007	National Institute for Working Life ( <i>Arbetslivsinstitutet</i> )	

The Institute of Occupational Medicine initially focused on the development of methods for establishing relationships between exposures at work and illnesses. The purpose was not only prevention and to obtain recognition for the discipline but also to establish which illnesses should be covered by the occupational health insurance (Glimell, 1997: p. 233). The institute collaborated with the Department of Hygiene at Karolinska Institute. At the Departments of Hygiene at Lund, Uppsala and Göteborg universities occupational health research was not included at the time, but would be later (Skerfving et al, 2007: p. 7). Important topics for research before the 1960s were work physiology, metal toxicology, chronic obstructive bronchitis (called “Rönnskär disease” after a smelter where this disease was common) and noise. In the 1960s, occupational dermatology developed and reached international top class (Skerfving et al, 2007)

Psychosocial work environment research emerged mainly from three different groups of researchers (Theorell, 2007: pp 20-21). One was a research programme into biological stress at Stockholm University. Another was the PA Council, which initially studied psychological suitability for jobs but gradually switched to psychological group processes at work and the importance of worker participation to employee health. Bertil Gardell was the internationally best known researcher connected to the PA Council. The third group was housed at the Clinical Stress Research Laboratory set up by the physician Lennart Levi and had a more medical profile than the psychological research carried out at the PA Council.

Common to all three groups was the interest in and orientation towards society, bringing issues such as alienation at work into the picture as well as stress reactions on shift work, assembly-line work and cold temperatures (Theorell, 2007).

## **4.2. The radical period: Science as problem solver**

The late 1960s and early 1970s was a period of political upheaval in Sweden and elsewhere. The political establishment was shaken by several large strikes by workers demanding better working conditions and students demanding more democracy outside as well as inside the universities. In order to strengthen the position of the workers, the Swedish government introduced new law. The Co-determination Act (*Medbestämmandelagen*, MBL 1976:580) gave trade unions the right to be informed and engaged in negotiations at work. The new work environment law (*Arbetsmiljölagen*, AML 1977:1160) included, for the first time, psychosocial health. Another change during this period was increased influence of stakeholders in the management of organisations financed by the State, including research funding agencies and research institutes. In line with the Swedish model, this also meant a strengthening of the social partners in the corporatist system that characterised the Swedish administration at the time.

### *4.2.1 Science policy*

The radicalisation of the public debate had positive consequences for work environment research. It brought issues including gender, environment and labour rights higher on the political agenda which indirectly led to more attention being given to issues related to work environment. The introduction of “science as problem solver” led to increased policy focus on applied and problem oriented research. However, there was also dissatisfaction with the public research funding system, both at the political and civil society level (Edqvist, 2003). Increasing levels of public funding had become costly to the government and the energy crisis in 1974 caused public as well as political disappointment in large “green” research programmes. In addition, an international debate inspired by the OECD, called for more government control and planning of public research funding (Edqvist, 2003).

In response to calls for centralisation of the public science system and science considered “relevant to society”, the Swedish government implemented several reforms in the late 1970s. Research councils were merged and the government introduced a system for planning the implementation of science policy. Three-yearly government bills were introduced in which the national science policy was defined as well as the priorities and budgets of research carried out or funded under each of the ministries.

In response to calls for problem-oriented research, “sectorial research” received more funding, i.e. research with a purpose to meet the needs of different sectors of society. This was not new in Sweden. Ever since the 1940s, problem-oriented research had held a central position in areas such as defence, education and con-

struction. Nevertheless, in the 1960s it became the official doctrine of Swedish science policy and during the 1970s and 1980s funding to this type of funding increased (Stevrin, 1978; SOU 1995: 121). In the late 1970s, two of the sectorial research funding organisations (the Swedish Council for Building Research [*Statens råd för byggnadsforskning*], BFR, and the Swedish National Board for Technical Development [*Styrelsen för teknisk utveckling*], STU) were the largest sources of public funding to non-military research amounting to 15% of total public research funding (Persson, 2001, p. 24). According to one of the critics of sectorial research (Elzinga, 1985 p.202), BFR had a budget that was of equal size to that of the combined resources of the Medical research council and the Research council for humanities and social sciences combined. The expansion of sectorial research led to the development of a dual system consisting of sectorial, mainly applied, research funded by sectorial funding agencies and “traditional”, mainly basic, research at universities funded through the research councils. Furthermore, coverage of sectorial research expanded to cover all sectors and the various ministries became responsible for the share of the research budget corresponding to their sector. As suggested in the first research bill, the expansion of sectorial research in Sweden was large also in comparison with other countries: *Research connected to a sector aims to give a basis to the formulation of goals within one sector of society, to identify and analyse alternative ways of reaching the goals and to develop the methods and tool needed to reach the goals. The Swedish R&D organisation is, in international comparison, characterised by unusually extensive sectorialisation* (Prop 1978/79:119, p. 88, author’s translation).

The political discussions also included demands for the democratisation of research, i.e. that the scientific community should open up and collaborate more with other actors of society. The trade union confederations were active in these discussions and adopted their own scientific programmes by the end of the 1970s and beginning of 1980s (Premfors, 1986). The government actively supported these initiatives as illustrated by a suggestion on the first page of the research bill in 1978: *trade unions should be given more influence in decision making related to research and also to be able to take initiative to do their own research* (Prop. 1978/79:119, p.1. Author’s translation).

In 1978, the question whether research should take place in institutes or universities/colleges was discussed in parliament and it was concluded that it was a Swedish principle to locate research in the higher education system rather than in institutes because Sweden, being a small country, should use available resources as rationally as possible (SOU 1995:121). However, as pointed out in SOU 1995:121 (p. 24), other small countries, such as Norway, chose another solution.

#### 4.2.2 Funding

In 1970 the organisation of the PA Council changed with the purpose of creating a more balanced relationship between the social partners. Representatives of LO (the confederation of blue collar unions), and TCO (the confederation of white collar unions), were subsequently included on the governing board of the council. In 1971, shortage in research funding led representatives of the social partners from the managing board to approach the government. They suggested that the council should be transformed into a research institute and receive funding from the public budget. The government was positive to the idea and an official investigation was set up to look into needs and possibilities of such an institute. In 1973 the investigation resulted in a report which supported the idea of the PA Council: “Working life research in the behavioural sciences” (*Beteendevetenskaplig arbetslivsforskning*, SOU 1973:55). Despite the supportive report, the proposal to finance the PA Council from the public purse was turned down. According to the director of the PA Council, the reason was that although the government supported the idea of a working life institute, it would have been politically impossible at the time to defend public funding to an organisation led by the employers (Lennerlöf 2008: pp 61-69). Instead of a government funded institute run by the social partners, the government shouldered the role as main sponsor of work environment research. It did so in 1972 by establishing the Work Environment Fund (*Arbetsmiljöfonden*)<sup>8</sup> and, in 1977, the Working Life Centre (*Arbetslivscentrum*).

The Work Environment Fund was the second boundary organisation of major importance to work environment research. It was financed via a percentage of the payroll tax and the decision making process built on corporatist principles. Initially the mission of the Fund was to support research, training and information in the area of work environment. The government instruction to the new organisation stipulated that it should: (...) *support such research, training and education that can prevent the appearance of occupational injuries and other types of ill health related to the work environment or improve the work environment, thereby promoting health and safety in the working life* (SFS:803 author’s translation). Table 2 below gives an overview of the most important research funding organisations from the PA Council until today.

In 1977 the government instruction to the Work Environment Fund changed. From then on it funded the Working Life Centre and training and information activities supporting the implementation of the co-determination law. For various reasons, resources available to the Fund ten folded between 1976 and 1990 (Oscarsson, 1997) and it was very important to the strengthening of work environment research (Skerfving et al, 2007). The Fund financed the establishment of research teams in Sweden as well as national and international networking. In addition to the Work Environment Fund, other research funding organisations

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<sup>8</sup> This fund was originally called the Workers’ Protection Fund (*Arbetskyddsfonden*) but changed name in 1987 to the more modern name the Work Environment Fund (*Arbetsmiljöfonden*).



including foundations and research councils were more open to work environment research than during other periods. One example was the branch wise organisation of occupational healthcare, which in some cases also carried out research. In the construction sector, the “Construction Health” (*Bygghälsan*) had set up a research foundation which employed 10-12 persons to perform research and development in the sector. This foundation was mainly funded by the Construction Health but it also received money from the Swedish Council for Building Research (BFR) and others. A scientist who worked at the Working Life Centre in more than 20 years, recalls: *From 1970, the war generation [born in the 1940s] led to an explosion of people with an academic degree. Many 30 year olds, who came out as young researchers, were affected by the leftist winds or found working life an important area, regardless if you were an engineer or a psychologist, and saw that there was money around.*

The establishment of the Work Environment Fund caused the PA Council to lose its role as nation platform for researchers and major source of funding. It also meant a power shift in favour of the trade unions. The managing board of the Work Environment Fund had more trade union representatives than employer representatives and the chair of the board was nominated by the trade unions. The logic behind this imbalance was the assumption that employers had a “knowledge advantage”, which explains why the trade unions were given more influence in the decision making process related to research, training and information in the work environment area.

As illustrated in Table 2 below, the social partners selected a significant share of the board members to institutes as well as funding organisations during this period. Before 1972 and after 1995, the social partners were to varying extent also represented but it was the government that selected the persons nominated by the social partner in their own capacity.

Table 2. Social partners' right to select representatives to the managing boards of organisations with relevance to work environment research 1952 – present

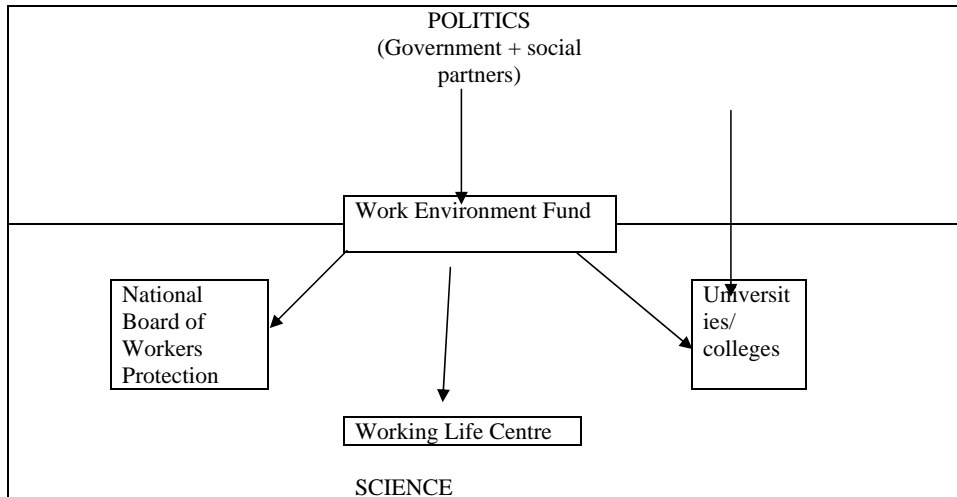
Research funding agencies	Years	Board members (N)	Members nominated by trade unions (N)	Members nominated by employers' organizations (N)	Share nominated by the social partners	Members nominated by government (N)	Members nominated by universities (N)
<b>PA Council</b> ( <i>PA-rådet</i> )	1952-1969	?	None	Yes	-	-	-
	1970-1981	?	Yes	Yes	-	-	-
<b>Workers' Protection Fund</b> ( <i>Arbetarskyddsfonden</i> )	1972-1974	9	3	3	67 %	-	-
	1975-1983	10	4	4	80%	-	-
	1984-1985	14	4	4	57%	-	-
<b>Work Environment Fund</b> ( <i>Arbetsmiljöfonden</i> )	1986-1994	15	6	6	80 %	-	-
<b>Swedish Council for Working Life Research</b> ( <i>Rådet för arbetslivsforskning, RALF</i> )	1995-2001	7	None	None	-	5 + DG	-
<b>Swedish Council for Working Life and Social Research</b> (Forskningsrådet för arbetsliv och socialvetenskap, FAS) <sup>9</sup>	2001 -	13 (incl. chair)	-	-	-	6	7
<b>AFA Insurance</b> ( <i>AFA Försäkring</i> )	2006 <sup>10</sup> -	14	10	4	100	-	-

Figure 3 below illustrates the role of the Work Environment Fund as boundary organisation between the principal (government) and the actor (scientists). Since the corporatist system allowed the social partners influence in the decision making process, the principal in the figure consists of government as well as the social partners. The work scientists (the actor), were to a large extent concentrated in the Occupational Safety and Health Agency and at the universities.

<sup>9</sup> On the 1<sup>st</sup> of July 2013 FAS changed name to Swedish Research Council for Health, Working Life and Welfare (Forte).

<sup>10</sup> The figures presented here represent the combined number of persons in the two groups that assess incoming research proposals since a reform of the system in 2006. Final funding decisions are taken in a complicated system of three different governing boards consisting of representatives from the social partners.

Figure 3. Working life research end 1970s in a principal-agent perspective: main funding and research organisations (arrows = research funding).



#### 4.2.3 Research

In 1972, the Institute of Occupational Medicine (*Arbetsmedicinska Institutet*) was transformed into a department of the organisation responsible for labour inspections: the National Board of Workers' Protection (*Arbetskyddsstyrelsen*). According to Skerfving et al et al (2007, p. 10), the proximity to the labour inspectors was an advantage to the practical relevance of the research but it also had a tendency to make research superficial. During the years of this constellation 1972-1986, the number of employees at the department doubled to 300 persons. Some of those were employed in Umeå, where a local branch of the research department was established. Other developments in the 1970s included new clinics of occupational medicine in Göteborg, Linköping and Umeå, as well as additional university departments. The expansion of research activities led to the development of new methods and instruments, a leading position in occupational epidemiology and progress in areas such as occupational cancer, asbestos, organic solvents, cardiovascular disease and occupational accidents.

Another trend during this period was a change in focus from the instrumental and measuring to the individual. However, the early stages of this shift towards individual health became politically sensitive. In 1969, Folksam, an insurance company with close ties to the trade union movement, together with the PA Council launched a campaign called "Mental health – action towards increased understanding and belonging at work" (*Mental hälsa – en aktion för ökad förståelse och samhörighet i arbetslivet*). The campaign caused a lively debate due to the perceived underlying assumption of the campaign that it was the work-

ers that should adjust rather than the work environment and the employers. A critical book was published: "The art of breaking people" (*Konsten att dressera människor*, Christiansson et al, 1969), in which researchers working for the PA Council were on a leash by the employers. The book also criticised the campaign for spreading what the authors perceived as a false view of the harmonious relationship between the social partners and the idea that problem solving always entails employees adapting themselves. The attack came as a shock for the researchers (Lennerlöf, 2008). One of the leading work psychologists, Bertil Gardell, replied to the critical book in an article in the Journal of the Swedish Medical Association (*Läkartidningen*, 1969, p. 5105-5112, author's translation): *A group of Marxist psychologists and psychiatrists have delivered a frontal attack on Swedish work science (...) The accusation is as same as always: Scientists are all bought servants in the duty of capitalism. The purpose of our work is perceived to be to support the existing power structure.*

Nevertheless, despite the conflict during the 1970s, the social partners and the government grew increasingly interested in the improvement of working conditions and the psychosocial aspects (Lennerlöf, 2008). The change of name from Workers Protection Fund to Work Environment Fund is also indicative of the change in perspective from protection against dangerous exposures at work to the inclusion of psychosocial issues. In the area of psychosocial medicine, political parties as well as the social partners supported the idea of a professorship and the establishment of an institute for psychosocial medicine (Levi 2002, p. 76-77). However, it took until 1980 for this idea to become reality (see Table 1), when the Institute for psychosocial environmental medicine (*Statens institut för psykosocial miljömedicin IPM*) was established in connection to the Karolinska Institute in Stockholm.

As already mentioned, the PA Council was instrumental in strengthening the area of behavioural work sciences in the 1950s and 1960s. In the 1970s, research in this area developed further and included work satisfaction, work design, mental health, technical development and alienation, workplace democracy, organisational development and conflicts (SOU 1973:35, p.28). In 1977, the Working Life Centre (see Table 1) was set up by government in response to the perceived needs of research in the behavioural sciences. The new institute was supposed to: *carry out and promote research and development about relationships of importance to individuals and groups in working life, the relations between the social partners, questions about influence in working life and the organisation and functioning of work* (from the instruction to the centre SFS 1976:943, author's translation). The Working Life Centre was constructed around three professorships: one in work organisation with focus on production forms and co-determination; one in administration; and one in public administration. The centre became the main research institution in the field of work related behavioural and social research and by 1983 it had 70 employees (Gustafsson & Kjellberg, 1983)

However, although researchers working for the department of occupational health at the Board of Workers' Protection, and later the Work Environment

Institute as well as those employed by the Working Life Centre worked in the spirit of Bertil Gardell and his colleagues at the PA Council, there was little contact between the two groups. According an employee at the Working Life Centre for 20 years, the Work Environment Institute and the Working Life Centre “walked in parallel but with the back turned against each other”, i.e. they operated in parallel with very little contact: *Many [at the Work Environment Institute] had an arrogant attitude towards the woolly social scientists (...). I have a feeling that my colleagues at the Working Life Centre were interested in industrial relations, in which work environment was not considered an issue.* One reason for the lack of contact between the institutes may have been political. According to a Department Head both at the research department of the National Board of Workers’ Protection and the Work Environment Institute in the 1970s and 1980s: *The Working Life Centre was considered very radical and on a leash by LO [the blue collar trade union confederation]. Those in leading positions at the Occupational Safety and Health Agency had been recruited from the PA Council and supposedly took a more neutral position.* Another reason was the resistance against the new breed of research that developed in the end of the 1970s, mixing psychology and sociology. Some of the leading work psychologists claimed that only psychologists were capable of understanding the effects of psychosocial risk factors, a point that was rejected by the sociologists (Björkman & Lundqvist, 1981, p. 24-26).

### **4.3. Science as strategic opportunity**

During the 1980s and 1990s, global science policy shifted again (e.g. Ruivo, 1994). A third science policy paradigm was added to the two previous ones: “Science as strategic opportunity”. The backdrop to this change was globalisation and the increasing pressure on nations to improve their competitive edge. The leading ideology was neo-liberalism which also led to the introduction of more market oriented approaches in the public sector, New Public Management, including in the area of publicly funded research. The declining popularity of sectorial research coincided with a legitimacy crisis for the corporatist system in Sweden (Öberg, 1997). In 1991 this development culminated with the withdrawal of the employers’ organisations from most boards in the public sector organisations.

#### *4.3.1 Science policy*

The decline of sectorial research in Swedish science policy during this period had negative consequences for work environment research. As mentioned in section 4.2., criticism against sectorial research had begun already in the 1970s despite initial positive reactions from the universities. According to Premfors (1986 p. 65) and Lundberg et al (SOU 1995:121, p. 38), this positive attitude was explained by government promises that universities would remain main educator and principal recipient of sectorial funding. Government also guaranteed permanent resources for research to the universities.

Nevertheless, the initial harmony was not to last. During preparations for the first research bill in 1982, a debate erupted about the balance and coordination between basic and sectorial research. According to critics from universities and research councils, sectorial research did not meet sufficiently high levels of quality and, they argued, should be placed under university control. The political centre-right opposition parties also voiced criticism and suggested direct transfer of sectorial research funding to the universities and the abolition of some sectorial bodies (SOU 1995:121). According to one of the critics (Elzinga, 1985), the problem of Swedish research policy was political dirigisme causing “epistemic drift”, erosion of peer review, arbitrary decision-making and, as expressed by Elzinga (1985, p.204): *a conflict between internalist and externalist modes of assessing scientific progress – a conflict between equity and excellence...*

The mounting criticism caused the government to suggest assessments of the organisations funding and implementing sectorial research (SOU 1989/90:90). The results of these assessments subsequently led to changes in the government instructions to public organisations funding and performing sectorial research so that they would become more similar to how traditional research councils and universities were organised. In this process of “councilisation” (*rådifiering*) of the public science system, which began in the late 1980s and continued throughout the 1990s, peer-review was increasingly held up as the best model for ensuring quality by politicians in the government as well as the opposition. Public institutes were told to increase their use of internalist academic criteria and to collaborate more with universities. However, although sectorial funding organisations were told to change in the direction of research councils, they remained under the responsibility of the ministry of “their sector” rather than the Ministry of Education, which was responsible for the “traditional” research councils.

In the 1990s, the Swedish government used the concept “knowledge society” to describe the goal of policies aiming to strengthen individual initiative, risk-taking behaviour and entrepreneurship through the creation of stronger links between scientists and the market (Benner 2001). One consequence of this shift in policy came in 1994, when the government introduced five quasi-private strategic research foundations (*forskningsstiftelser*)<sup>11</sup>. This was welcomed by Swedish industry but criticised by scientists who perceived the new market-orientation of public research policy as the replacement of one enemy (sectorial research) with a new one (the industry) that could lead to commercialisation and degradation of science (Schilling 2005).

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<sup>11</sup> These foundations were financed by money from the dismantled “salary funds” (*löntagarfonder*), which had been established by the previous Social Democratic government with a purpose to nationalise production.

#### 4.3.2 Funding

In 1989, calls for assessment of sectorial research led the government to request an investigation into the organisation of working life research. The directive to this investigation (Dir. 1989: 59) stated that it should provide an overview of the organisation of research but would not lead to a decrease in levels of funding. References in the directive to several investigations made by the Working Life Centre in the 1980s furthermore indicated that the Wor4king Life Centre was perceived as that main problem. The resulting report, *Work science – direction, organisation, funding* (SOU 1990:54), revealed several weaknesses with regard to the Work Environment Fund. One was the low share (20% in 1989/90) of grants available for open competition to university researchers. Another perceived problem was the large share of ear-marked funding to the Working Life Centre and the Work Environment Institute as well as weak allocation process to the institutes. Yet another perceived problem was the absence of systematic evaluation.

One reason behind the perceived problems of the Work Environment Fund was disagreements between the social partners on the managing board of the Work Environment Fund in the 1970s about what to finance and how to operate. One area of contention was a disagreement between the employers and the trade unions on which areas to give priority with regards to the Working Life Centre, leading to their refusal to even discuss allocation procedures. To overcome the stalemate, most funding to the Centre was therefore allocated without any assessments or discussions (Oscarsson, 1997).

The suggestions of the report were:

- To change the division of responsibilities between the managing board and the secretariat. To improve long term, strategic planning, it was suggested that the board should be less involved in single project decisions and more engaged in strategic policy questions.
- To strengthen the assessment system for allocation of grants and funding to the institutes.
- To introduce a system of continuous evaluation of research funded by the Fund, using scientific, relevance and utility criteria.

The suggestions of the report were to a large extent included in modified instructions to the organisations involved. After the changes had been implemented in the early 1990s, scientists became more influential thanks to the introduction of a scientific council and their increased involvement in the planning of new programmes. Furthermore, long term allocations to university research grew in size (Oscarsson, 1997).

The Work Environment Fund was also affected by the withdrawal of the employers' confederation (SAF) from the managing board of the Fund in 1991. Subsequently, government selected members to the board and members (many from the social partners) acted in their capacity as individuals rather than a representative of an organisation (Oscarsson, 1997)

By 1990/1991, the Work Environment Fund received 1500 applications every year, of which two thirds were granted. The Fund received about 900 million SEK

from the payroll tax, but only half could be used by the Fund. The rest was allocated by the government to training of the social partners related to the co-determination act (about 225 million SEK), to finance the organisation of regional health and safety representatives (about 75 million SEK) and to finance the Work Environment Institute (about 70 million SEK) as well as the Working Life Centre (about 40 million SEK). The secretariat of the Work Environment Fund employed 60 persons and an additional number of experts working on a project basis for various programmes (Oscarsson, 1997: 87).

In 1995, the Work Environment Fund was abolished despite the changes made and replaced by a new organisation: the Council for Working Life Research (RALF). The main difference between the old Fund and the new Council was that the Council was to concentrate more on research funding than on training and to put even more emphasis on scientific quality and support to university research. Another change was the definition of the research area: Working life research. This concept was defined as the combination of occupational health, work organisation and labour market research<sup>12</sup>. Funding of the new Council was no longer channelled via the payroll tax but over the regular state budget.

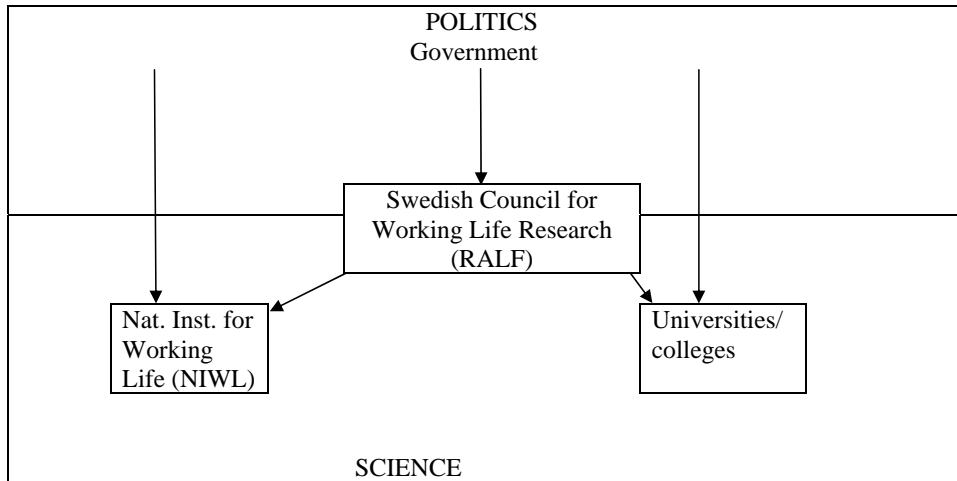
Figure 5 below illustrates the principal agent relationship between organisations of major importance to work environment health research during 1995 – 2001. A difference with Figure 4, in which the principal consists of government and the social partners, is that the social partners no longer have a formal status. This is in line with the “decorporatisation” process during this time period that reduced the influence of the social partners in the public administration.

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<sup>12</sup> The emergence of this new definition in the political discourse is the topic of a forthcoming article by the author of this article.



Figure 5. Relations between politics and science in a principal-agent perspective: 1995-2001 (arrows = flow of research funding from principal to agent)



Similar to other sectorial funding organisations, RALF was placed under the ministry responsible for the sector: the Ministry of Labour. Other characteristics that set RALF apart as sectorial funding agency and not a “traditional” research council were: 1) assessment criteria of RALF included both internalist and externalist criteria; 2) members of the governing board and the Director General of RALF were appointed by government (in traditional research councils this was done through nominations by the universities); 3) the Director General of RALF made final decisions on funding rather than a board set up by scientists, as was the case in research councils. Another difference was that the administrators working at RALF had more room for manoeuvre, for instance in setting up research programmes, than at the research councils (K Abrahamsson, personal communication 7 April 2013).

Despite these changes criticism against sectorial research agencies, including RALF, persisted. A director of RALF recalled: I felt that if we want to gain confidence in the academic world we need to do things like this [let the scientists decide], so we constructed a system of review committees that were totally run by scientists...I did not differ from the committee proposals except perhaps one per mille – extremely little. When I did change it was rather to the advantage of the scientists. ..but still, this is what they meant when they said that we were not run by scientists – that this was what was wrong with RALF. Maybe it was because I did not carry a doctoral hat [part of the academic dress of Ph.D. recipients in Finland and Sweden] as did all the others around me.

As indicated in Table 2 (Section 4.2.2.), the managing board of RALF was very small. In addition to the Director General, the board consisted of four members

selected by the government. Two were scientists and two were representatives of the civil society.

A Professor and member of the governing board of RALF described his time on the board as chaotic but interesting. His personal agenda was to contribute to making the organisation “respectable”: My agenda was to make sure that it [the board] maintained conventional scientific standards. That you could not get money just by suggesting a popular theme but there must be a theory and a methodology. I was like a caricature of a Professor from Uppsala, always asking for basic research. (---) and then RALF was supposed to become presentable (---) this did not happen by itself. The whole process was considered, justly, with great scepticism by the university establishment and RALF never really reached the level of status as the others. But I was loyal, I saw my role as making RALF scientifically sound and worked steadily towards this goal.

#### 4.3.3 Research

In 1987, the research department at the Occupational Safety and Health Agency regained its status as independent institute after 15 years. The new institute, named the Work Environment Institute (*Arbetsmiljöinstitutet*), continued the expansion that had started in the 1970s, reaching a staff of about 400 and a yearly budget of about 300 million Swedish Crowns (Skerfving et al, 2007: 13). It was located in Stockholm but had a rather large affiliation in the Northern city of Umeå (established in 1972). The growth of the institute was paralleled with an increasing number of clinics of occupational medicine and occupational dermatology, leading to a system in which each Swedish region was covered by a clinic responsible for prevention, investigations and examining patients. The contacts between the clinics and workplaces provided possibilities for creative research that was fairly unusual in an international perspective (Skerfving et al, 2007: 13). Furthermore, during the 1980s and 1990s, all Swedish universities formed departments of occupational medicine, which were coupled with the clinics of occupational medicine at the university hospitals. Important areas of research during this period include markers of damage to genetic material and susceptibility, occupational musculoskeletal disease and vibrations from handheld tools.

Research into the psychosocial work environment became an important area of occupational medicine in the 1990s but the relationship between researchers in traditional and psychosocial work environment areas was initially strained due to resistance on the part of many researchers in the traditional work environment areas (Theorell, 2007). The first department to integrate psychosocial factors with occupational medicine was the department at Karolinska Hospital in Stockholm the 1980s. Soon thereafter, other departments of occupational medicine also employed experts in psychosocial factors. The National Board of Workers’ Protection studied both psychosocial and environmental factors and it housed a successful collaboration with biological stress researchers at the University of

Stockholm. In 1980 another important step was taken in the development of psychosocial work environment research with the establishment of the National Institute for Psychosocial Factors and Health (*Institutet för psykosocial medicin*, IPM), under the leadership of Professor Lennart Levi (Theorell, 2007: 21). At IPM, primarily two areas were in focus in the 1980s and 1990s: work organisation and shift work or night work (Theorell, 2007: 21).

Criticism in the government investigation, *Work science – direction, organisation, funding* (SOU 1990:54) led to changes in the 1991 government instruction to the Working Life Centre. The Centre received a budget cut and was told to focus more on research and build stronger links to the universities.<sup>13</sup> However, the Centre hardly had time to implement the changes until a new reform came their way. In 1994/1995, the newly elected Social Democratic government announced a reform with the purpose to make structures and resources in the area of working life research more efficient and multidisciplinary. The suggested changes were also an element in a larger effort to reduce public expenses. The Work Environment Institute and the Working Life Centre were merged and a new institute took their place: the National Institute for Working Life (NIWL). According to the 1995 government instruction to NIWL, the institute was supposed to: *...carry out and promote research and training as well as development projects related to working life, work environment and relations on the labour market. The institute should collaborate with other public authorities, academic institutions, universities and other institutions of higher education inside and outside of the country* (SFS 1995:864, author's translation)

For the researchers employed at the Work Environment Institute, the merger and transition to NIWL was everything but smooth. Whereas focus of the previous institute had been on the relationship between workers, environmental exposures and health, NIWL was instructed to focus more on work organisation, labour market issues and the psychosocial work environment. Furthermore, the volume of research was reduced, causing about half the personnel and research funding for classical occupational health research to move from the institute to various universities with a “backpack” of funding that would support them for a number of years (Skerfving et al, 2007).

#### **4.4. The 21st century**

The two decades leading up to the 21st century was thus characterized by a weakening of sectorial research and corporativism and an increasingly strong position of the third paradigm, “science as strategic opportunity and technical innovation”. This section presents the effects of this development on work environment research since the beginning of the new millennium.

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<sup>13</sup> It was also given a new name, the Institute for Working Life Research (*Institutet för arbetslivsforskning*). For the sake of simplicity only one name is used in this article.

#### 4.4.1 Science policy

In 2001, the Swedish public science system went through a complete transformation. It was the result of the government report “Research 2000” (SOU 1998:128), which presented a plan for renewal of Swedish research. The report, which caused debate between critics and defenders of sectorial research, suggested that academic freedom and power to the universities should be given more prominence and that focus should move back to basic research. Although sectorial research should continue to exist, the report suggested a reduction in size and scope to only serve the needs of the public sector (Shilling 2005; Benner 2001).

The Swedish public science system had until then been characterised by a dual system consisting of traditional, academic, mainly basic research on the one hand, and applied, sectorial research on the other. In 2001, this dual system was replaced by another dual system. From now on, sectorial research was excluded from the science policy discourse. The new dual system consisted of traditional, mainly basic, research on the one hand and innovation on the other (Schilling, 2005). In the reorganisation of the Swedish research system, all traditional research councils as well as the sectorial funding organisations were abolished. In their place, four new organisations were created: the Swedish Research Council (*Vetenskapsrådet*), the Swedish Research Council Formas, the Swedish Council for Working Life and Social Research (*Forskningsrådet för arbetsliv och socialvetenskap*, FAS), and the innovation agency Vinnova. The effect of this transformation was, according to some, the eradication of sectorial research (Benner, 2001). The design of the new system is such that the largest organisation, the Swedish Research Council, funds basic research in all discip-lines. Formas and FAS fund basic and “needs-driven” (*behovsstyrd*) research and Vinnova finances “needs-driven” research and development of innovation systems.

The origin of the current public science system can thus be seen as a reaction against political intervention and a support of the freedom and autonomy of the scientific community with the purpose of promoting excellent science. However, more recent science policy is showing signs of change. The research and innovation bill (Prop. 2008/09:50) previous to the last one identified a number of strategic areas of research that government had selected for additional funding. In the last bill (Prop 2012/13:30), a description of Swedish science policy is divided into five parts. The first part is about “Freedom, long-termism and increased possibilities for taking risks”. The fifth part is about “Increased utilisation of research-based knowledge”. There are thus contradictions in the current policy regarding the “freedom” of science. On the one hand, freedom and risk taking are encouraged but at the same time government selects “strategic areas” and a number of other selected areas to which ear-marked funding is channelled via the research councils. In addition, government puts increasing emphasis on the implementation and utilisation of research.

#### 4.4.2 Funding

The reorganisation of the research system had several consequences for work environment research. One was a reduction in the level of government sponsored research funding to the area. RALF's budget was divided between FAS and Vinnova. This meant that only the half allotted to FAS continued to fund research in the areas of work organisation, labour market studies and work environment research. Vinnova, which had a different purpose and organisation than RALF and FAS, included the money into their own budget, allowing only a smaller share to work related research (FAS, 2009). Another consequence was that funding of work environment research moved from the responsibility of the Ministry of Labour to the Ministry of Social Affairs<sup>14</sup>.

The closure of NIWL in 2007 (see section 4.4.3 below), caused an additional loss of government resources to the area. The research budget of NIWL, which in 2006 had been 237 million SEK, disappeared except for 60 million SEK which were set aside for the scientists to finish on-going projects.

In the 2008/09 research bill, FAS received additional funding earmarked for work-related research of 20 million SEK per year. This money was used to finance three six-year programme grants and three ten-year centre grants, so-called FAS-centres, in different areas of work related research. There was also a subtle suggestion in the text that FAS could take over the coordinating role that NIWL had had for the area: *FAS should support research considered of highest scientific quality and should thereby contribute to sustaining high quality research in the area on a longer term. FAS may thereby, through this initiative, assume a coordinating role for Swedish working life research* (Prop. 2008/09:50, p. 173, author's translation). However, the addition to FAS' budget did not compensate for the added reduction in available government funding due to reductions incurred by the creation of RALF and NIWL in 1995, by the creation of FAS in 2001 and the disappearance of NIWL in 2007. Interviews carried out with work environment researchers for a government report (SOU 2011:60), reflected frustration in this regard: *The researchers also point at an unfortunate effect of the limited amount of resources and that they are distributed according to a system in which citations of scientific publications lead to funding rather than new research ideas...The consequence of this situation is that some researchers would like more political interference in the distribution of research funding. They consider it reasonable that work related health problems, which are one of the most expensive public health problems in Sweden, should be given priority...* (Rolfer et al 2012, p. 8. Author's translation).

To a certain extent, the social partners have compensated for this loss in research funding. AFA Insurance, which is an insurance company owned and run by the social partners, has supported different types of research projects in the area of injury prevention for decades. However, in the beginning of the 21<sup>st</sup> century, when

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<sup>14</sup> Currently FAS is placed under the responsibility of the Ministry of Social Affairs, Vinnova is placed under the responsibility of the Ministry of Enterprise, Energy and Communications and the Swedish Science Council is placed under the Ministry of Education.

Sweden experienced very high levels of sick leave, AFA Insurance initiated two targeted programmes and in 2006, the social partners introduced a more organised assessment procedure, inspired by the organisation of the research councils. The renewed focus and more ambitious research funding drive in the 21<sup>st</sup> century was thus not a conscious way of replacing the decrease in government funding to the area, but it was certainly the outcome (Interview Hans Augustsson, 11 May 2011). AFA Insurance has become an important source of funding outside of the university together with FAS.

The research funding activities of AFA Insurance in the 21<sup>st</sup> century are to a certain extent similar to the PA Council in the 1950s-1970s since both fund research and are organised by the social partners. But there are two differences. Whereas the PA Council had its main focus on behavioural science, AFA Insurance focuses on the work environment. Furthermore, whereas the PA Council was financed by the employers, funding of AFA Insurance research comes from both the employers and trade unions, thus creating a more equal situation (see Figure 6)

The Swedish European Social Fund is another arena for funding over which the social partners enjoy considerable influence over the decision making process due to their representation on the managing board. Although the ESF is supposed to finance development projects and not research, in some cases research teams have been engaged to evaluate ESF programmes. In several respects the organisation of Swedish ESF used the Working Life Fund (*Arbetslivsfonden*) as model when it was established (Forsberg, 2000). The Working Life Fund was a corporative government agency during the years 1990-1995 that administered the largest programme ever in the work environment area, mainly in the areas of rehabilitation and education.

#### 4.4.3 Research

In 2006, FAS asked an international expert panel to evaluate Swedish work environment research (excluding psychosocial issues). Regarding the structure and funding of Swedish work environment research; the expert panel noted that it had become quite decentralized and scattered due to a large number of active universities, including groups that were outsourced from NIWL (the evaluation was made before the closure of the institute). The panel suggested a more coordinated structure of research and a more priority driven research funding (FAS, 2006, pp 6-7). Regarding the standard and societal relevance of work environment research, it was established that Sweden plays an important role internationally. Based on a bibliometric study, Swedish researchers contributed to 8% of international production of scientific articles in occupational health and ergonomics. Adjusted for country population, that would make Sweden number one in the world. In their recommendations, the panel suggested that the following three research areas should be given priority (FAS, 2006: p.10):

- Exposure modelling and related risk modelling
- Systematic intervention studies
- Research into methods and strategies for the implementation of scientific knowledge

Notwithstanding the perceived high quality of Swedish work environment research, the criticism that had plagued the Working Life Centre in the 1980s continued to haunt the National Institute for Working Life (NIWL). Media as well as politicians from the Centre Right opposition accused the institute of being too close to the trade unions and the Social Democratic Party as well as having a poor academic track record. When the Social Democrats lost the election in 2006, the new Centre-Right government closed down the institute. The reason given was that work related research should move out of the government bureaucracy: *The decision should be seen as part of making the administrative service more efficient and to reduce the government bureaucracy. The government is of the opinion that research in the working life area is continuously important, but to ensure quality, research of this type should henceforth be assessed in the usual manner by research funding organisation in open competition* (Dir 2007:42, author's translation)

The following excerpt from the editorial page of a leading Swedish Newspaper (DN 3 Nov 2006) is a response to protests against the decision to close down the institute. It illustrates the type of criticism NIWL was exposed to before being abolished: *Sweden needs research about conditions at work, and maybe this should take place at an institute. But it cannot be so biased, so tainted ideologically and so scientifically weak as NIWL. If the National Institute for Working Life had done its academic homework it would probably not have been forced to close down.*

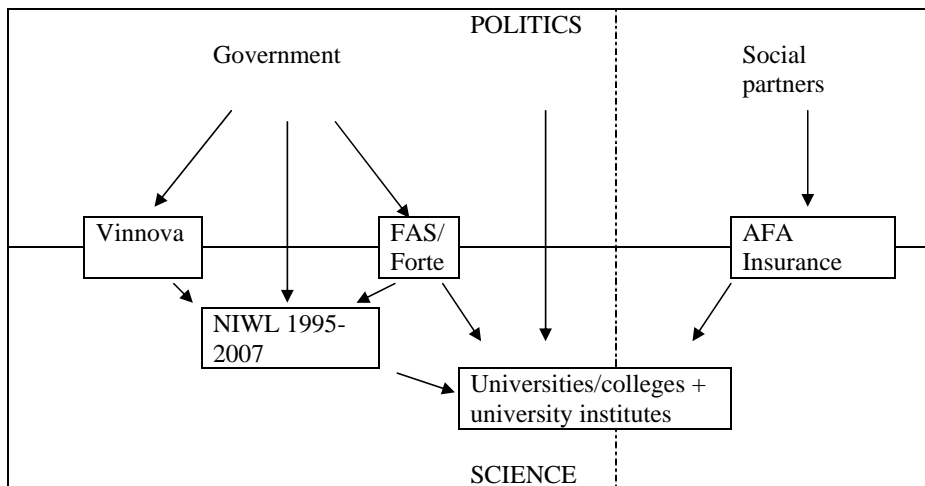
The decision to close down NIWL, which was the result on several mergers of institutes throughout the 20<sup>th</sup> century, produced surprisingly little opposition from the social partners (Interview with Lennart Levi 12 Feb 2010). This may be explained by the fact that trade unions were facing other problems at the same time. At the same time as the closure, government reduced the funding to the labour inspectorate and introduced new regulations related to the organisation and financing of trade unions. However, frustration has been expressed since, for example in a letter to the Minister for Education (copied to Minister of labour) signed by the white collar trade union confederation (SACO) and the blue collar trade union confederation (LO):

*Work science fell into the shadows when FAS and Vinnova received shared responsibility of funding, and it became even darker after closing the National Institute for Working Life. The idea that work science proposals should be assessed only from scientific criteria and not relevance has not been fruitful. The dominance of scientists within the research councils has benefitted insider science at the expense of a demonstration of strength to solve problems. The gap between research and practice widened when the National Institute of Working Life was closed down and the transfer of previously gained knowledge became*

*even more difficult.* (Extract from letter to Lars Leijonborg dated 18 June 2008, author's translation)

Since the closure of NIWL, many researchers have left the area. According to a survey issued by FAS, only half of the 200 scientists employed at NIWL in 2006 were still active two years later (Sturesson 2007, 2008).

Figure 6. Relations between work science and science policy in a principal-agent perspective: 2001-present (arrows = flow of research funding from principal to agent)



Since 2007, the organisation of work environment research has been a frequent topic for discussion (e.g. Albin et al 2009; SOU 2011:60). Complaints include the lack of a national reference point, causing difficulties for government agencies, social partners and other users of the knowledge to know about on-going research and to contact researchers (SOU 2011:60). A related complaint relates to international cooperation since the absence of an institute has made it more difficult for Sweden to participate in international networks and to join large international consortia applying for EU funding. The lack of national reference point was pointed out as one of three concerns in a report on the situation of Swedish working life research (FAS, 2009)<sup>15</sup> as well as in the *National action plan for the renewal of the work environment policy 2010-2015* (Skr. 2009/10:248), issued by government. According to this action plan, the government would look into the needs and preconditions for a coordinating actor for the dissemination of knowledge in the area of work environment research. In 2011 such an investigation was done by the Scientific Advisory Committee for the Work Environment Policy

<sup>15</sup> The report was written by group of Swedish scientists from different disciplines. The other two concerns raised were 1) the reduction in research funding; and 2) that universities had not been able to shoulder the increased responsibility after the demise of NIWL.



(Arbetsmiljöpoltiska kunskapsrådet).<sup>16</sup> The resulting report (SOU 2011:60) concluded that: ... *the current level of dissemination of knowledge is dissatisfactory, a view supported by a majority of interviewed stakeholders who represent worker representatives and employers, practitioners and researchers.... The Advisory Committee is therefore of the opinion that there is both a need and a responsibility at the national level to develop, manage, update and support a strong centralized knowledge base...*(SOU 2011:60, p.70)

As a reaction to the lack of coordination, the scientific community has become more active in various collaborations and networks. One is the Forum for Working Life Research (*Forum för arbetslivsforskning*, FALF, [www.falf.se](http://www.falf.se)), which was set up in 2008. It has members from the whole country and organises a yearly conference. Although the group that initiated FALF were primarily from the more technical, psychosocial and organisational sides of work environment, efforts have been made in recent years to also attract researchers in the more traditional work environment areas. Another initiative is the establishment of a competence centre for work environment in Southern and Western Sweden (*Kompetenscentrum för Arbetsmiljö – Sydväst*). In a letter to the Minister of Labour, eight senior scientists active in Lund and Gothenburg offered their support to the establishment of a national centre for the development, dissemination, overview and care of work environment knowledge. This is how they described the centre in the letter: *It is a joint undertaking between university institutions and hospital clinics with a regional coverage equivalent of slightly more than 1/3 of employed as well as companies in the country. The total current work force consists of about one hundred persons* (Letter dated September 2012 to Minister of Labour Hillevi Engström, author's translation).

In 2012 the budget bill (Prop. 2012/13:1) announced that the Swedish Work Environment Authority (*Arbetsmiljöverket*) was given a small budget to set up a national function for the "knowledge area work environment and working life". In February 2013, the Work Environment Authority sent a suggested budget and plan of setting up such a function to the government. Only a few weeks later, seven representatives of the social partners in leading positions, including the three trade union confederations (LO, TCO and SACO), the Confederation of Swedish Enterprise and the Swedish Association of Local Authorities and Regions signed a letter to the government stressing the need of the centre as well as criticism of the suggested set-up. Although they agreed with the idea that the centre should only disseminate and not produce knowledge, it was critical to the location. They would have preferred the centre at a higher education institution. Furthermore, they would like to have influence in the priority setting of the centre: *In order to promote good relations and contact with working life, we think that the central parties of the labour market and concerned government organisations should be given possibilities to transparency,*

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<sup>16</sup> Arbetsmiljöpoltiska kunskapsrådet was set up by the Swedish government and existed between 2008 and 2011. It was an advisory group consisting of eight scientists and four representatives of related organisations, including FAS

*consultation and influence among other things concerning the priorities of the knowledge centre* (Letter dated 1 March 2013 to the Ministers of Labour, Education, Social affairs and Finance, copied to the Prime Minister, author's translation).

Despite many complaints and nostalgia for the past, far from everyone consider the closure of NIWL problematic. A researcher from the University of Gothenburg indicated that work environment research had obtained a higher status in the scientific community in the past 10-20 years. He also described how his institution had become bigger and busier since 2007: *I find it good that NIWL was closed with regards to research. I think that it is a good thing that it has been placed at the universities. I mean... Gävle, KI, Lund, Göteborg. I think that it is better that researchers are connected out here. But then, NIWL had a lot of other activities: training, information and international contacts and that [the loss of these functions] is of course not good...* Another researcher commented that the field had become more multidisciplinary: *I think that the approach has become much broader today. Before, we had a few main issues that we knew very well and had been working on for a very long time - within traditional work environment research. But now there are many more and above all, we are all the time broadening the field in multidisciplinary contexts.*

#### **4.5. Summary**

The Swedish public science system was established in the 1940s and grew in size and importance over the years until the end of the 1960s. Public research funding was channelled directly to the universities/institutes or via research councils. In the 1970s, a reform of the public science system led to increased central planning and transparency. Other reforms aimed for democratisation of the universities; university education was expanded to give room for more people and the societal relevance of research became the topic of much debate. So-called sectorial research, that aimed to fill the needs of various sectors of society, expanded strongly in the 1970s and 1980s. In the 1990s, criticism against what was perceived as harmful interference in science by government and other stakeholders led to a process of “desectorialisation”. By 2001 sectorial research had disappeared from Swedish research funding, replaced by innovation research.

The science policy reforms had considerable effects on funding to work environment research. In the 1940s-1960s, work environment research did not receive much public funding from the research councils. Instead, traditional work environment research received public funding via clinics and institutes, first in a department of the National Institute for Public Health, later in separate institutes for occupational medicine. From the 1950s, much research on organisational and psychosocial issues was funded by the employers via the first boundary organisation of importance: the PA Council. In the 1970s and 1980s public funding to work environment research increased significantly. A research funding agency as well as two new institutes, one for work environment issues

and one for work organisation issues, were established. In the 1990s the two institutes were merged and public funding was “desectoralised” so as to become more similar to traditional research councils, i.e. with a more influential role of the researchers in decisions related to funding (through peer review) and administration matters. In the 2000s public funding to work environment research was divided in two parts: to the research council FAS and to the innovation agency Vinnova. Also, the National Institute for Working Life was closed down. All in all, the effect of these two events was a reduction in public funding to work environment research. However, a new non-public source of funding has become important to the area: AFA Insurance, which is run by the social partners. In addition, the Swedish European Social Fund provides funding to research and (mainly) development.

Research in work environment research began on a small scale and in close connection to work through the collaboration between researchers and medical practitioners or the social partners. In the 1970s and 1980s political interest in work environment issues in combination with a beneficial science policy led to a considerable strengthening of the field. Increasingly, work environment research included psychosocial work environment issues and the development of legislation brought political dimensions to the field. The 1990s reforms changed the conditions for research, especially for the institutes. These reforms led to a reduction of funding and a merger of the two institutes. After the closure of the remaining institute and the reform of the public science system in the 2000s, most work environment researchers are currently employed by universities or university hospitals.

## 5. Swedish work environment research, science paradigms and institutions

In this section, the historical development of Swedish work environment research is placed in the context of changing international science policy paradigms and the path dependencies of the two institutions already mentioned: 1) the Swedish model, in particular the influence of the social partners in the formulation and implementation of policy, and 2) Academic culture, in the sense of scientists defending their interests, often autonomy.

Secondly, the relationship between policy makers, research funding organisations and researchers are looked into in the search for processes forming the field, using the four types of problems that typically occur in principal-agent relationships (Braun, 2003):

1. getting scientists to do what politics wants (problem of responsiveness)
2. being sure that they choose the best scientists (problem of adverse selection)
3. being sure scientists do their best to solve problems and tasks delegated to them (moral hazard)
4. knowing what to do (problem of decision-making and priority-setting)

Focus is on problems and contradictions in each historical period contributed to policy change.

The set-up is as follows: Section 5.1 presents the emergence of Swedish science policy. In sections 5.2 and 5.3, contributing reasons for policy shifts in the respective periods are discussed. Section 5.4 looks at the current situation and policy tendencies. Section 5.5 presents a summary.

### **5.1. Emergence of “science as motor of progress”**

In the 1940s, the Swedish government established a public science system consisting of research councils complementing the direct transfers of research funding to the universities. There was great optimism in the power of science, which is why the paradigm of the period is called “science as motor of progress” (Edqvist, 2003).

#### *5.1.1. The institutional perspective: The Swedish model and Academic culture*

Around the turn of the century, demand for work related science emerged from the industry. The employers’ organisations lobbied effectively to increase access to training and information as well as the establishment of work science at the university (Giertz, 2008; Glimell, 1997). In the 1950s, this demand also led to the establishment of a funding organisation promoting behavioural work science: the PA Council. When the focus of the PA Council moved from machines to humans, work organisation research and psychosocial work environment research benefited (Lennerlöf, 2008). Under influence from the Swedish model, trade unions were represented in the PA Council already from the start and towards the end of the 1960s, by which time the PA Council had become an important platform for work related research, the trade unions became full members of the PA Council’s governing board. In practice this meant that both trade union and employer representatives had a say in what kind of research should be supported.

This was also a period when the institution of “Academic culture” grew strong in most OECD governments (e.g. Ziman, 2000). The Swedish government established a public science system consisting of science councils and increasing levels of public research funding. However, work environment research did not benefit much from the funding made available through the research councils (Skerfving et al, 2007).

#### *5.1.2. The principal-agent perspective*

The first, second and third typical problems in the principal-agent relationship (problem of responsiveness, problems of adverse selection and moral hazard), was not considered dilemmas by the government. Until then, the government had seen universities as educators and providers of professionals. Now science became a vital ingredient in the government policy towards economic progress (Edqvist, 2003). The government believed in the linear model, according to which investment in science would automatically provide financial returns and autonomy should be given the academic community. Also, there had been no previous me-

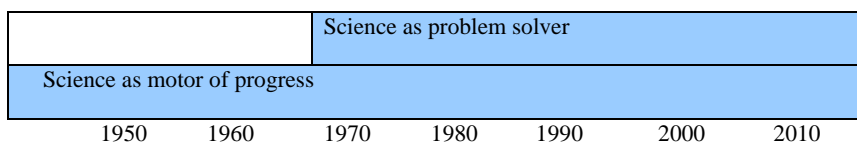
chanism of selecting which scientists should be funded. The emerging selection processes of research funding came to be dominated by peer review.

The fourth problem (of decision-making and priority-setting) was the main reason why government established a public science system in the 1940s. During the Second World War, science had proved important e.g. through the development of the atomic bomb, and now many OECD governments wished to have a more structured policy on science. Work environment research was not affected to any great extent by the emerging public science system since most funding to the area came through other channels, mainly the employers and government funding to hospitals and institutes (Skerfving et al, 2007).

## 5.2. Shift from “motor of progress” to “science as problem solver”

From the end of the 1960s, the initial science policy paradigm was complemented by a second one, see Figure 7 below.

Figure 7. The dominating views of science in the period before 1990 (adapted from Edqvist, 2003)



### 5.2.1. The institutional perspective: The Swedish model and Academic culture

During the 1970s and 1980s, the Swedish model came to influence Swedish public sector administration through corporativism. The corporatist system allowed the social partners influence in the making and implementation of public policy, including science policy. Corporativism coincided with the increase of sectorial research in Swedish science policy, which was yet another factor boosting the influence of the social partners in organisations funding and performing work environment research. As illustrated in table 2, representatives nominated by the social partners made up between 57 % and 80 % of total board members in these organisations. In the funding organisations, the dominant position of the social partners gave them considerable influence in the development of research programmes and in the evaluation process of incoming research proposals (e.g. Oscarsson, 1997).

Universities were initially positive to the increase in sectorial research since it led to an increase in their total influx of public research funding. However, not too long thereafter they started to defend their position, which they perceived to be threatened by government interference (Premfors, 1986; SOU 1995:121). The actors defending “academic culture” had been privileged before the ascendancy of sectorial research. They came from universities and research councils and

they preferred the peer review system of the research councils and the no-strings attached block funding. Furthermore, they criticised institutes performing work environment research for performing science of poor quality. The sectorial funding organisations, including the one funding work environment research, were victims of similar critique. Persistent criticism of sectorial research in this period from the scientific elites represented in the research councils and universities was thus an important factor in the process of change (SOU 1995:121).

#### *5.2.2. The principal-agent perspective*

One factor influencing the science policy shift from the previous to this period was the political radicalisation, causing demands for more democratic organisation of the public science system. Another factor was the perceived need for better planning and transparency of public research funding (SOU 1995:121). Table 3 below provides a summary of the four typical principal-agent problems and their solutions.

The first type of problem (of responsiveness) manifested itself in criticism against the perceived “ivory tower” of science making (Edqvist, 2003). According to the critics, the linear model and policy of academic autonomy allowed too little influence from the government and other stakeholders. The solution chosen by the government was to increase funding of mission-oriented (sectorial) research and to include stakeholders in governing boards of funding organisations and institutes. This caused a shift in the power balance of the public science system as the scientific elite, i.e. influential scientists at universities and research councils, no longer dominated the science system. Instead, civil society and the government gained more influence in the decision making related to research funding.

The second type of problem (of adverse selection) was not perceived problematic.

The third type of problem (moral hazard) was perceived problematic due to the limited insight of the government in decision making in universities and research councils. To improve transparency, the government introduced central planning of the science policy, e.g. in the form of research bills.

The fourth type of problem (of decision-making and priority-setting) was related to demands for increased democracy in the decision making processes of research councils as well as demands for transparency and accountability of public funding spent on research. In addition to increased central planning (see above), the government responded to the demands by strengthening the role of stakeholders in the decision making process of science funding (especially sectorial research) and institutes.

Table 3. Problems in the principal-agent relationship in Sweden representing factors in the transition from the early to the radical phase

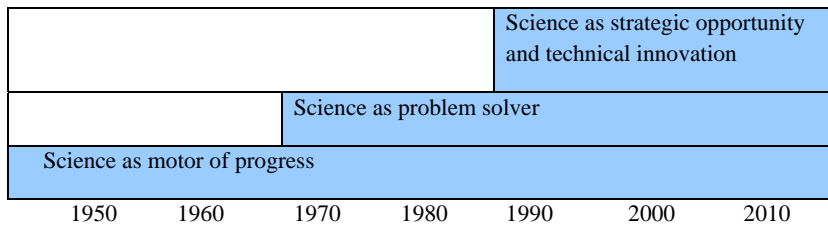
Problem type	Problem	Solution
1) getting scientists to do what politics wants (problem of responsiveness)	“Ivory Tower” and research councils dominated by scientific elite	Establishment of sectorial principle
2) being sure that they choose the best scientists (problem of adverse selection)	Not perceived as a problem.	Not perceived as a problem
3) being sure scientists do their best to solve problems and tasks delegated to them (moral hazard)	Research councils too far removed from political control.	Central planning, research bills.
4) knowing what to do (problem of decision-making and priority-setting).	Undemocratic decision making process. Not transparent public science system	Sectorial research with stakeholders, corporativism in decision making process. Central planning.

Work environment scientists benefitted from the new paradigm “Science as problem solver” because it led to increased political attention, to the influence of the social partners in decision making, which had a positive effect on available research funding to the area.

### 5.3. Shift from “problem solver” to “science as strategic opportunity”

In the 1980s and 1990s, yet another paradigm was added to the two dominating the previous years: “science as strategic opportunity” (see Figure 8 below). One explanatory factor to the new science policy paradigm was increasing globalisation. In order to remain competitive, governments came to focus on science assumed to increase industrial competitiveness.

Figure 8. The dominating views of science in the period from 1990 (adapted from Edqvist, 2003)



#### 5.3.1. The institutional perspective: The Swedish model and Academic culture

The collaborative spirit that had been the hallmark of the Swedish model weakened in the 1980s. In 1991, after increasingly conflicting relations between the social partners and with the government, the employer organisations withdrew from the boards of public sector organisations. One year later, the government decided to end all corporatist participation in the

public administration. At the same time there was a decline of sectorial research, which has been considered a revenge for “academic culture” (e.g. Benner, 2001). The effect of the “decorporatisation” and “councilisation” was a shift of power back to the academic elites. Again, peer review became the norm of public research funding and the government stressed that sectorial research institutes must support and collaborate with university research (E.g. Schilling, 2005; Benner, 2001).

For the development of work environment research, “decorporatisation” and “councilisation” meant that the academic elites and peer review gained more influence in the sectorial organisations that funded and performed research during this period (e.g. Oscarsson, 1997; Lennerlöf, 2008). In addition, a decline in the levels of research funding in general and sectorial funding in particular had the effect of reducing the level of public funding to work environment research (FAS, 2006).

### *5.3.2. The principal-agent perspective*

The problems causing a policy shift in the 1990s were partly similar to what had caused the emergence of Swedish science policy some fifty years earlier. The first type of problem (of responsiveness, see Table 5 below) was not considered a problem – rather to the contrary.

The second type of problem (of adverse selection) was central to the policy shift. Concern with too much involvement from politicians and stakeholders in sectorial research was perceived to affect the objectivity and quality of science (e.g. Elzinga, 1985). To solve this dilemma, policy makers reverted to the ideals of the period after the Second World War, i.e. allowing research councils to administer funding to universities through peer review process. There was a gradual process of “councilisation” of the sectorial research system which caused a shift of power from the government and other stakeholders back to the scientific elites.

The third type of problem (moral hazard) was related to accusations against sectorial research institutes for producing science of poor quality (SOU 1995:121). The government called for an investigation of the organisation of work related research (Dir. 1989:59), resulting in suggestions for change of working life research funding and institutes to adopt procedures more in line with those practiced by universities and research councils (SOU 1990:54).

The fourth type of problem (of decision-making and priority-setting) was manifested in the assumption that political dirigisme and stakeholder influence were detrimental for scientific quality. As already mentioned, the solution to the problem was the “councilisation” of the public science system.



Table 4. Problems in the principal-agent relationship in Sweden as factors in the transition from the radical to the strategic phase

Problem type	Problem	Solution
1) getting scientists to do what politics wants (problem of responsiveness)	Not perceived as a problem.	N.a.
2) being sure that they choose the best scientists (problem of adverse selection)	Non-academic selection of scientists leads to biased and low quality science	“Councilisation” of sectorial research
3) being sure scientists do their best to solve problems and tasks delegated to them (moral hazard)	Perceived poor quality in sectorial research institutes	Critical evaluations, audits
4) knowing what to do (problem of decision-making and priority-setting).	Political dirigisme and stakeholder influence considered detrimental to science	“Councilisation” of the research system,.

In sum, the weakening of the Swedish model and sectorial research coincided with the reinforcement of the scientific community and values related to peer review and scientific autonomy. Work environment research, which had benefitted from the sectorial research policy dominating the previous period was the object of criticism, evaluations and reforms including reductions in the level of available public research funding.

#### 5.4. The current situation

##### 5.4.1. The institutional perspective: The Swedish model and Academic culture

In the 21<sup>st</sup> century, the Swedish model is continuing to weaken due to sinking levels of unionisation and frequent disagreements between employers and workers’ organisations. However, in comparison with other countries, the influence of the social partners is still relatively high (Forsberg, 2000). This relative strength is manifested in the regular participation of the social partners in advisory groups to the government, especially in relation to labour issues. With regards to work environment research, the social partners have become an important contributor to research funding via their insurance company AFA Insurance. Another channel through which the social partners exert indirect influence are various EU bodies in which they and the government represent Sweden in matters like work environment legislation and how EU Institutes<sup>17</sup> of importance to the work environment should be run. Yet another channel is the Swedish Social Fund, through which considerable levels of funding to development projects is channelled to different parts of Sweden. Most of this

<sup>17</sup> Institutes of importance to the work environment, in which the social partners have influence, include: European Foundation for the Improvement of Living and Working Conditions (EUROFOUND), European Agency for Safety and Health at Work (OSHA), European Centre for the Development of Vocational Training (Cedefop).

funding cannot be considered research in the strict sense but sometimes researchers are involved for example in the monitoring and evaluation of projects.

As for academic culture, the 2001 reform of the public science system has been considered the end of sectorial research in Swedish science policy (Benner, 2001). According to Schilling (2005), the two strands of research, sectorial and applied on the one hand and basic research on the other, was replaced in 2001 by a new dual system consisting of three research councils mainly funding basic research and a new type of funding organisation focusing on innovation and the collaboration between science and industry. Academic culture plays an important role in the decision making processes and peer review systems of the research councils but less so in the innovation agency. For work environment research, the reform of the public science system has led to a more competitive situation. Although peer review was used to assess grant applications prior to 2001 too, societal relevance played a larger role and funding was set aside only for working life research. Since 2001, work environment researchers compete with scientists from other research areas and research councils place scientific relevance higher in the assessment of applications than societal relevance. The innovation agency Vinnova applies different assessment criteria and usually requests researchers to collaborate with industry.

#### *5.4.2. The principal-agent perspective*

The first type of problem (of responsiveness, see Table 6 below) seems to have reappeared. The abolishment of sectorial research in combination with the policy of relying on university research rather than institutes has created a situation in which there are few links between policy makers and researchers in work environment research (SOU 2011:60). A discussion about the utilisation of research-based knowledge in the current research bill (Prop. 2012/13:50) indicates a return of focus to societal relevance. Another indication of such a return is an increase in ear-marked public funding delegated to the research councils to administer. For work environment research, the most tangible evidence of the missing link between policy makers and research is the government decision to set up an information unit at the Swedish Work Environment Authority, which is supposed to disseminate scientific knowledge to various stakeholders.

The second type of problem (of adverse selection) is not considered problematic.

The third type of problem (moral hazard) is related to increasing pressure on the government to solve problems and the government's desire that science should contribute to solving these problems. The government strategy is to exert pressure on the universities to improve their performance through a redesign of the allocation system. The latest research bill (Prop. 2012/13:50) also involves the research councils in this process. Until now, research councils have focussed their efforts on the assessment process of proposals in the calls for funding, so-called *ex ante* evaluation. An increasing number of government requests for data on research already funded by the research councils could be an indication of a shift

towards more focus on the assessment of finished research, e.g. bibliometric evaluations, so-called ex post evaluation.

The fourth type of problem (of decision-making and priority-setting) is related to the dual system mentioned earlier of innovation research funded by Vinnova and traditional research funded by the three research councils (Schilling, 2005). The problem of the dual system is that they are based on conflicting rationales: the two paradigms “science as motor of progress” (dominated by academic culture) and science as strategic opportunity (power sharing between industry, government and scientific elites). If the innovation aspect had been integrated in all the funding organisations or if sectorial research had not been banned, it would probably have been easier to introduce “usefulness” into the current system. To rectify the situation, a number of strategies have been tried by the government including strategic foundations, strategic research areas, strategic innovation areas and innovation offices (e.g. Prop. 2008/09:50; Prop. 2012/13:30). The effect of these developments on work environment science is so far small.

Table 5. Problems in post-2001 science policy making in Sweden in a principal-agent perspective

Problem type	Problem	Solution
1) getting scientists to do what politics wants (problem of responsiveness)	Fewer links between policy makers and scientists.	“Utilisation of research-based knowledge”, evidence based methods/policy, ear-marked funding
2) being sure that they choose the best scientists (problem of adverse selection)	Not perceived as a problem (yet).	N.a.
3) being sure scientists do their best to solve problems and tasks delegated to them (moral hazard)	Conflicting objectives: “utilisation of science” and “freedom of science”.	University allocations based on performance, research councils more involved in ex post evaluation.
4) knowing what to do (problem of decision-making and priority-setting).	Conflicting objectives: “utilisation of science” and “freedom of science”.	Trial and error e.g. innovation offices.

In sum, the reform of the public science system in 2001 was the culmination of a process towards the return of the values of academic culture which began in the 1980s and gathered force in the 1990s. In 2001, a reform erased sectorial research from public science policy. Instead, the funding agencies that replaced previous sectorial funding agencies were instructed to finance “needs-driven research”. For work environment research, this policy shift caused a decline in public funding to the area. However, the social partners continued to support the work environment area via national and EU advisory groups and as funders of research and development thorough AFA Insurance and the European Social Fund. Emerging signs in the public science policy towards more emphasis on the usefulness of science could, potentially, lead to increased levels of funding to applied, problem-oriented research in the future. This could benefit work environment research.

## 5.5. Summary

Section 5 showed the importance of the Swedish model in the development of work environment research due to the influence of the social partners in funding and deciding over the research area. In the 1950s this influence was manifested in the first boundary organisation, the PA Council, in which the employer organisations provided funding and both social partners exerted influence in the governing structure. In the 1970s and 1980s, funding was primarily taken over by the government but the social partners remained influential in their positions on the governing boards of the research funding organisations and research institutes. The effect of this change in science policy was beneficial to work environment research because of the establishment of a specialised funding organisations and research institutes, as well as increased levels of public funding. In the 1990s this influence was weakened and after 2001 the social partners have no influence in the formulation and implementation of Swedish research policy. However, the social partners continue to exert influence on the development of work environment research via national and EU advisory or decision making groups and as funders of research and development through AFA Insurance and the European Social Fund.

Academic culture was influential in the first decades after the Second World War in the newly established research councils and because of the combined effects of increased public research funding and government respect of scientific autonomy. This did not affect work environment research at the time. However, in the 1980s and 1990s, when the critique against sectorial research was increasingly taken into account, it did. Funding levels to sectorial institutes and research funding agencies dropped and the governing structures changed. In 2001, a reform of the public science system led to a new structure consisting of three research councils funding basic and needs-driven research and one innovation agency, funding primarily researchers collaborating with the industry.

The principal-agent analysis shows that Swedish science policy has undergone several reforms since the 1940s. These reforms have affected power relations in the public science system and the levels of available research funding levels. Since 2001 Swedish science policy is characterised by a combination of the three research policy paradigms. The paradigm “research as motor of progress” is evident in the focus of the science councils on scientific excellence. The second and third paradigm, “research as problem solver” and “research as strategic opportunity”, are present in the objectives of Vinnova but also, to some degree, in the objectives of Forte and Formas to finance “needs-driven research”. The paradigm “research as problem solver” is less present after the weakening of sectorial research, with exception for the growth oriented science funded by Vinnova. However, there are signs of change as government places increasing emphasis, at least rhetorically, on the practical usefulness of science. In the early 1990s, the social partners ceded as principals in the public science system. However, via their insurance company AFA they have become principals in

principal-agent relationship parallel to and complementing the public science system.

## 6. Concluding discussion

The purpose of this study has been to look into how Swedish work environment research was formed. This is interesting because of the strength of the area in international comparison and recent concerns about the future of the field. The results suggest that the field experienced a “golden age” from the early 1970s until the mid-1990s, during which work environment enjoyed attention from society as well as the science community. As a consequence, significant levels of public resources were put aside to fund research and build up infrastructure including research funding organisations and research institutes. The effect on work environment research was that the number of researchers and levels of research funding increased.

The factors behind the advent of this golden age can be found in both of the arenas explored for this study, the labour policy and science policy arenas. In the labour policy arena, the so-called “Swedish model” benefitted work environment research because of the interest of the social partners to finance research and lobby for the institutionalisation of the field. In the 1970s, the social partners gained considerable influence in the public administration because of the corporatist system applied in Sweden. Corporatism meant that the social partners no longer needed to lobby “from the outside” but were allowed into the decision making room of public research funding organisations and research institutes. In fact, Swedish workers’ and employers’ organisations came to dominate the managing boards of public organisations related to work environment research until 1995.

In the science policy arena, Sweden followed the international trend in the 1970s to support problem-oriented research. The leading principle of “sectorial research”, i.e. problem-oriented research intended to serve the needs of various sectors of society, meant that applied research received more funding and that stake holders were allowed more influence. Since the work environment field was dominated by such research, the policy shift meant an increase in funding. The social partners, being important stakeholders in work environment research, became involved in the research funding organisations and institutes as well as in the development of theories and methods.

The “golden age” of Swedish work environment research thus coincided with policy shifts both in the labour and science policy arena, leading to corporatism and sectorial science policy. Seen in a broader perspective, the advent and subsequent disappearance of beneficial conditions for the field were affected by the social partners, who lobbied for problem oriented research in general and work environment research in particular. The conditions were also affected by actors

resisting problem oriented research due to the perceived government and stakeholder interference in decisions on what research to fund.

This study indicates that current concerns about the future of Swedish work environment research are related to the science policy paradigm that was introduced in Swedish science policy in the 1990s, with focus on scientific excellence and innovation. Scientists in the work environment field find it more difficult to meet criteria used in the current public research funding system, compared to the 1970s-1990s (Albin et al, 2009; Wegman, 2007, Rolfer et al, 2012). However, there are tendencies of a comeback of problem-oriented research. Current Swedish science policy (Prop. 2013/13:30) stresses the importance of “usefulness” of science. The social partners already finance problem oriented work environment research via the insurance company AFA Insurance. How the implementation of a shift towards more problems oriented focus in Swedish science policy is an interesting question. The current set-up of public research funding in Sweden, with three research councils and one innovation agency, is designed to finance excellent science and research that combines science with growth. The situation raises several questions. Will there be another reform or a new definition of “useful” science? Is the same shift occurring in other countries and if so, how is it affecting work environment research?

Another aspect that seems to have affected the formation of the field is cultural differences between scientific disciplines regarding what is considered “good science” in terms of theories and methods. This became evident in the 1980s, when a group of psychologists resisted the concept of psychosocial health and the entrance of non-psychologists into the area. In 1995, when the National Institute for Working Life (NIWL) was established through a merger of the Work Environment Institute and the Working Life Centre, a similar situation occurred. The medical doctors, physiologists and psychologists from the work environment tradition had a quantitative approach to research and were sceptical of the qualitative methods used by scientists from the Working Life Centre. According to interviews with scientists previously active at NIWL, the cultural divide between the two groups persisted until the end. Criticism against perceived low scientific quality was also used as argument in the political and media debate that preceded the closure of NIWL. The resistance to interdisciplinary collaboration raises several questions. Did the efforts at NIWL to establish a multidisciplinary research environment lead to more collaboration? How multidisciplinary is work environment researcher taking place at Swedish universities? What is the situation in other countries?

Another aspect of the development of work environment research is the position of policy relevant science. Unlike disciplines like physics or astronomy, work environment research has been central in discussions on the regulation of the labour market between the government and the social partners. This centrality seems to have been a blessing and a curse to the field. During the “golden age” it led to a substantial increase in funding and infrastructure as well as the entrance of many

young researchers to the field. After 1990, the proximity to policy makers became a burden when critics accused NIWL of being politicised due to the perceived proximity to the Social Democratic government and the trade unions. An interesting question for further research would be why the political interest has receded vis á vis this field of research. In the 1970s, the natural environment as well as the work environment received attention from politicians, media and researchers. Today, the natural environment is still high on the political agenda but the work environment is less so. Is this related to the rise of neoliberalism and individualism in the 1980s-1990s, leading to a change in the perceived responsibility for health at work from the employer to the employee? Or is it related to the transformation of work, both in terms of new forms of employment and the growth of service jobs replacing industrial and other branches? Or has it to do with the new blurring of working time and leisure time of the emerging 24 hour economy, changing family norms and technologies making it possible to work from anywhere?

The analytical framework used in this study, resting on historical institutionalism and principal-agent theory, proved useful in identifying factors and processes shaping the development of work environment research. The same framework could be used in international comparisons, leading to deeper understanding of variations in work environment research. Such studies could have a broad approach, similar to this one, or focus more narrowly on one aspect such as the role of science policy paradigms in the evolution of the field, or the consequences of policy relevance and proximity to policy making for the development of science.

## Sammanfattning

Syftet med den här studien är att ta reda på hur svensk arbetsmiljöforskning har formats. Denna fråga är intressant eftersom den är stark i internationell jämförelse och att det råder oro om områdets framtid. Fokus ligger på två arenor: arbetsmarknadspolitiken och forskningspolitiken. Med avstamp i historisk institutionell teori och principal-agent teori har ett analytiskt verktyg tagits fram i syfte att analysera de processer som påverkar arbetsmiljöforskningens utveckling. Det studerade materialet inkluderar intervjuer med forskare och avnämare samt regeringsdokument, monografier, artiklar och biografier.

En av studiens slutsatser är att det verkar ha funnits en ”gyllene era” i arbetslivsforskningens historia från 1970-talet till 1990-talet, då nivåerna av forskningsfinansiering steg liksom antalet aktiva forskare inom området. Orsaker bakom ökningen finns på den arbetsmarknadspolitiska såväl som den forskningspolitiska arenan. På den arbetsmarknadspolitiska arenan gynnade den svenska modellens samarbetsklimat mellan arbetstagar- och arbetsgivarföreningarna svensk arbetsmiljöforskning på flera sätt. Dels har parterna finansierat arbetsrelaterad forskning, dels har de agerat som lobbyister för dess institutionalisering. På 1970- och 1980-talet ledde korporatismen dessutom till att parterna fick en direkt maktposition i relation till finansiering och utförande av offentligt finansierad arbetsmiljöforskning. På den forskningspolitiska arenan ledde inriktningen mot problemorienterad, tillämpad forskning på 1970- och 1980-talet till ökade resurser till arbetsmiljöforskningen och till att parterna fick inflytande i såväl beslutsfattande om forskning som utövning av forskning. Sammanfattningsvis gynnades arbetsmiljöforskningen av såväl arbetsmarknads- som forskningspolitiken under 1970 och 1980-talet.

En annan slutsats är att förflyttningar av tyngdpunkten i den svenska forskningspolitiken mellan vetenskaplig relevans och samhällsrelevans har påverkat arbetsmiljöforskningens utveckling. Innan 1970-talet låg tyngdvikten på vetenskaplig relevans innan den ändrade riktning till nytta och samhällsrelevans under 1970- till 1990-talen. Sen 2001 har den vetenskapliga relevansen gjort en comeback i kombination med innovationsparadigmets fokus på tillväxt. Parterna har lobbats för problemorienterad forskning, medan aktörer inom forskarsamhället och politiken lobbats mot regeringens eller andra aktörers i deras tycke olämpliga inblandning i forskningsrelaterade beslut. En orsak till oron för forskningsområdets framtid är svensk forskningspolitikens inriktning mot vetenskaplig excellens och innovation vilket innebär att den problemorienterade, tillämpade arbetsmiljöforskningen har svårare att hävda sig i konkurrensen. Det finns emellertid tecken på förändring. Sedan början av 2000-talet finansierar parterna problemorienterad arbetsmiljöforskning genom AFA Försäkring och svensk forskningspolitik verkar vara på väg tillbaka mot mer fokus på forskningens samhällsrelevans.



## Summary

The purpose of this study is to look into how Swedish work environment research was formed. This is an interesting question because of the strength of the area in an international comparison and worries about the future of the field. The study focuses on two policy arenas: labour policy and science policy. Inspired by historical institutionalism and principal-agent theory, an analytical tool was developed and used to unravel the processes underlying the formation of the field. The material used for the analysis includes interviews with scientists and other stakeholders as well as government documents, monographs, articles and biographies.

One conclusion is that there seems to have been a “golden age” in the history of work environment research from the 1970s until the 1990s, during which levels of research funding increased as well as the number of researchers active in the field. Reasons behind this increase can be found in the labour policy as well as the science policy arena. In the labour policy arena, the “Swedish model” facilitated collaboration between the social partners related to Swedish work environment research in various ways. The social partners have acted as research funders and lobbyists for the institutionalisation of work related research. During the 1970s and 1980s, corporatist influence in the public sector administration furthermore led the social partners to a position of direct power in matters related to funding and execution of publicly funded work environment research. In the science policy arena, an orientation towards problem-driven, applied research in the 1970s and 1980s led to more funding to the work environment research and to influence in funding decisions and the persecution of research by the social partners. In sum, both the labour and science policy arenas of the 1970s and 1980s benefitted the growth of work environment research.

Another conclusion is that shifts in emphasis in Swedish science policy between scientific relevance and societal relevance have affected the development of work environment research. Before the 1970s, the emphasis was on scientific relevance until it changed for emphasis on usefulness and societal relevance in the 1970s-1990s. After 2001, scientific relevance made a “comeback” in combination with the focus of growth of the innovation paradigm. The social partners have lobbied for problem-oriented research, while actors in the scientific community and politics have lobbied against what they perceived as undue interference from government or other stakeholders in decisions related to science. One reason for current concerns about the future of the field is the focus of Swedish science policy on scientific excellence and innovation which means that problem-oriented, applied work environment research has difficulties to compete. However, there are signs of change. Since the early 2000s the social partners finance work environment research via AFA Insurance and Swedish science policy seems to be moving back towards more focus on the societal relevance of research.

## List of references

- Albin M, Johansson G, Järholm B & Wadensjö E (2009) Att säkra arbetslivsforskning av hög relevans och kvalitet (To secure working life research of high relevance and quality). *Arbetsmarknad & Arbetsliv*, årg 15, nr 2. Karlstad: Karlstads universitet.
- Benner M (2001). *Kontrovers och konsensus. Vetenskap och politik i svenskt 1990-tal* (Controversy and consensus. Science and politics in the Swedish 1990s). Stockholm: SISTER.
- Benner M (2009) *Kunskapsnation i kris?* (Knowledge nation in crisis?) Stockholm: Sister.
- Bergh A (2008) *Den kapitalistiska välfärdsstaten*. Stockholm: Norstedts.
- Björkman T & Lundquist K (1981) *Från MAX till PIA: reformstrategier inom arbetsmiljöområdet*. Lund: Arkiv för studier i arbetarrörelsens historia.
- Braun D (2003): Lasting tensions in research policy-making – a delegation problem. *Science and Public Policy*, 30(5), October 2003, 309-321.
- Braun, D & Guston DH (2003) Principal-agent theory and research policy: an introduction. *Science and Public Policy*, 30(5), October, 302-308.
- Cawson A (1986) *Corporatism and Political Theory*. Oxford: Basil Blackwell Ltd.
- Christiansson L et al (1969) *Konsten att dressera människor* (The art of domesticating people). Stockholm: Prisma.
- Coleman J (1990) *Foundations of social theory*. Cambridge, Massachusetts: Harvard University Press.
- DiMaggio PJ & Powell WW (1983) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48:147-160.
- Dir 1989:59 *Översyn av arbetslivsforskningens organisation* (Review of the organisation of working life research). Stockholm, Government.
- Edqvist O (2002) "Den svenska forskningspolitikens tre världar" (The three worlds of Swedish research policy) in U Sandström (ed) *Det nya forskningslandskapet* (The new research landscape). Göteborg: Nya Doxa.
- Edqvist O (2003) "Layered Science and Science Policies" in *Minerva* 41:207-221.
- Elzinga A (1985) "Research bureaucracy and the drift of epistemic criteria" in B. Wittrock & A Elzinga (Eds) pp 191-220. *The University Research System*. Stockholm: Almqvist & Wiksell International.
- Elzinga A & Jamison A (1995) "Changing Policy Agendas in Science and Technology" in *Handbook of science and technology studies*, edited by S Jasanoff, GE Merkle, JC Petersen, T Pinch xxx-xxx, Thousand Oaks, CA: Sage.
- Esping-Andersen G (1990) *The Three Worlds of Welfare Capitalism*, Cambridge: Polity Press.
- Etzkowitz H (2005) *Trippelhelix – den nya innovationsmodellen. Högskola, näringsliv och myndigheter i samverkan*. Stockholm : SNS förlag,
- Etzkowitz, H (2008) *The triple helix: university-industry-government innovation in action*. Oxon, UK: Routledge.
- FAS (2006) *International evaluation of Swedish work environment research*. Stockholm: FAS.
- FAS (2009): *Svensk arbetslivsforskning – en resurs för välfärd, hälsa och tillväxt. Att säkra forskning av hög relevans och kvalitet*. Stockholm: FAS.
- Gardell B (1969) "Konsten att dressera människor": Vrånghild av svensk arbetsvetenskap. *Läkartidningen*, Vol 66, nr 49, pp 5105-5112.
- Gibbons M, Limoges C & Nowotny H (1994) *New production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London, UK: Sage.

- Gibbons M., Limoges, C, Nowotny H., Schwartzman S., Scott P & Trow M. (1994) *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: SAGE.
- Gibbons MC, Limoges C & Scott P (2011) "Revisiting Mode 2 at Noors Slot" in *Prometheus: Critical Studies in Innovation*, 29:4, 361-372
- Giertz E (2008) "Arbetsstudier – en grundbult i den svenska modellen" i Giertz, E: *Då förändrades Sverige. 25 experter beskriver drivkrafter bakom utvecklingen*. Pozkal, Poland: Studentlitteratur.
- Giertz E (1981) *Om arbetsstudieutbildningens institutionalisering i Sverige*. Stockholm: Institutionen för industriell ekonomi och organisation. KTH.
- Glimell H (1997) *Den produktiva kroppen. En studie om arbetsvetenskap som idé, praktik och politik*. (The productive body. A studie about work science as idea, practice and policy). Stockholm/Stehag: Symposion.
- Guldbrandsen, J M 2005: Tensions in the research council-research community relationship. *Science and Public Policy*, 32(3), June, 199-209.
- Gustafsson RÅ & Kjellberg A (1983). *Beteendevetenskaplig arbetsmiljöforskning. Historisk bakgrund och utveckling i Sverige Rapport 1983:6* (Behavioral science in work environment research. Historical background and development in Sweden). Stockholm: Arbetskyddsfonden.
- Guston, D H (2000) *Between Politics and Science: Assuring the Integrity and Productivity of Research*, Cambridge, UK: Cambridge University Press.
- Klerkx L & C Leeuwis (2008): Delegation of authority in research funding to networks: experiences with a multiple goal boundary organization, *Science and Public Policy*, 35(3), April 2008, 183-196.
- Hall, PA & Taylor, RCR (1996): "Political Science and the Three New Institutionalisms". *Political Studies* 44(5): 936-957.
- Lennerlöf L (2008): *Mitt arbetsliv* (My working life). Stockholm: Premiss.
- Levi L (2002): *Stressen i mitt liv* (The stress in my life). Stockholm: Natur och kultur.
- Lijphart, A (1999): *Patterns of democracy : government forms and performance in thirty-six countries*. New Haven, Conn.: Yale University Press.
- Magnusson L & Ottosson J Eds (2012) *Den hållbara svenska modellen – innovationskraft, förnyelse och effektivitet* (The sustainable Swedish model – power if innovation, renewal and efficiency). Stockholm: SNS Förlag.
- March, J.G. & Olsen, P (1989), *Rediscovering institutions: the organizational basis of politics*. New York, USA: The Free Press.
- Micheletti M (1994) *Det civila samhället och staten – medborgarsammanslutningarnas roll i svensk politik*. Stockholm: CE Fritzes AB.
- Oscarsson B (1997) *25 år av arbetslivets förnyelse – forskning och utveckling på arbetslivsområdet 1972 – 1997* (25 years for the renewal of working life – research and development in the area of working life 1972 – 1997). Stockholm: Rådet för arbetslivsforskning.
- Persson B (2001) *Motsträviga myndigheter. Sektorsforskning under politisk styrning under 1980-talet* (Reluctant Agencies. Sectorial Agencies and Swedish Research Policy in the 1980s). Stockholm: Sister.
- Premfors R (1986) *Svensk forskningspolitik* (Swedish research politics). Lund: Studentlitteratur.
- Prop. 1978/79:119 Om vissa frågor rörande forskning och forskarutbildning (About certain questions related to research and research training) 1979. Stockholm: Government.
- Prop. 1989/90:90 Om forskning (About research). 1990. Stockholm: Government.
- Prop. 2008/09:50 Ett lyft för forskning och innovation. 2008. (Government Bill: A Lift for Research and Innovation). Stockholm: Government.

- Prop. 2012/13:30 Forskning och innovation. 2012. (Government Bill: Research and Innovation). Stockholm: Government.
- Rolfer B, Mathiasson SE, Vingård E (2012) *Forskning i fara? Forskarna själva om dagens arbetsmiljöforskning* (Research in danger? Researchers about today's Swedish occupational health research). Gävle: Gävle University Press.
- Rothstein B & Bergström J (1999) *Korporatismens fall – och den svenska modellens kris* (The fall of corporatism and the crisis of the Swedish model). Stockholm: SNS Förlag.
- Ruivo B (1994) “Phases” or “Paradigms” of Science Policy?” in *Science and Public Policy*. 21 (3):157-164.
- Schilling, P (2005) *Research as source of strategic opportunity? Re-thinking research policy development in the late 20<sup>th</sup> century*. Umeå: Umeå University Press.
- Rhodes RAW, Binder SA, Rockman BA (2006) *The Oxford handbook of Political Institutions* Oxford: Oxford University Press
- SFS 1995:864. Förordning med instruktion för Arbetslivsinstitutet (Ordinance with instruction for the National Institute for Working Life). Stockholm: Government.
- Skerfving S, Hogstedt C, Welinder H (2007) “Broad overview of the history of Swedish occupational health research” in *Scand J Work Environ Health*, vol 33, suppl 1. Pp 6-19.
- Skr 2009/10:248 En förnyad arbetsmiljöpolitik med en nationell handlingsplan 2010-2015
- Slipersaeter S, B Lepori, M Dinges 2007: Comparing the evolution of national research policies: what patterns of change? *Science and Public Policy*, 34(6), July 2007, 401-415.
- SOU 1973:55 *Beteendevetenskaplig arbetslivsforskning* (Behavioural working life research). Stockholm: Government.
- SOU 1990:54 *Arbetslivsforskning: Inriktning, Organisation, Finansiering*. (Government Official Reports, Working Life Research – Direction, Organisation, Funding). Stockholm: Government
- SOU 1995:121 *Parliament, Government and Research. Some Features of Swedish research policy over two decades*. By H. Lundberg, Olle Edqvist, Uno Svedin. Stockholm: Government.
- SOU 1998:128 *Forskningspolitik* (Research politics). Stockholm: Government.
- SOU 2011:60 *Ett nationellt kunskapscentrum för arbetsmiljö – behov och förutsättningar*. (Government Official Reports, A National Knowledge Centre for the Work Environment – Objectives and Activities). Stockholm: Government.
- Stevrin P (1978) *Den samhällsstyrda forskningen* (Science managed by society). Stockholm: Libris.
- Sturesson L (2007): *Vart tog dom vägen? Uppföljning av forskare och forskning vid nedläggningen av Arbetslivsinstitutet*. Stockholm: FAS.
- Sturesson L (2008) *Arbetslivsforskning i Sverige 2008 – en lägesbild*. Stockholm: FAS.
- Sundin J (2005a): ”Folkhälsa och folkhälsopolitik” in Sundin J et al (eds): *Svenska folkets hälsa i historiskt perspektiv*. Stockholm: Statens folkhälsoinstitut. S. 363-469.
- Sundin J et al eds (2005b): *Svenska folkets hälsa i historiskt perspektiv*. Stockholm: Statens folkhälsoinstitut.
- Theorell T (2007) Psychosocial factors in research on work conditions and health in Sweden. *Scand J Work Environ Health*, vol 33, suppl 1. Pp 20-26.
- Thörnquist A (2005) “Arbetskydd och samhällsförändring i Sverige 1850 – 2005” in Sundin J et al (eds): *Svenska folkets hälsa i historiskt perspektiv*. Pp. 223-414. Stockholm: Statens folkhälsoinstitut.
- Van der Meulen B J R (1998) “Science policies as principal-agent games: Institutionalization and path dependency in the relation between government and science” in *Research Policy*, 27, 397-414.

- Walters D, R Johnstone, K Frick, M Quinlan, G Baril-Gingras, A Thebaud-Mony (2011) *Regulating Workplace Risks. A Comparative Study of Inspection Regimes in Times of Change*. Cheltenham UK, Northampton MA USA: Edward Elgar.
- Ziman J (2000) *Real Science: What it is, and What it Means*. Cambridge, UK: Cambridge University Press.
- Wegman DH, Hogstedt C (2007). Status report on Swedish work environment research—history, context and international evaluation. *Scand J Work Environ Health* 33 suppl 1:1–53.
- Whitley R, Gläser J , Engwall L (2010). *Reconfiguring Knowledge Production: Changing authority relationships in the sciences and their consequences for knowledge production*. Oxford: Oxford University Press.
- Öberg PO (1997) *Medborgarnas inflytande och särintressenas makt – Korporatism och lobbying i statsförvaltningen*, Rapport till forskningspolitiska kommissionen, Politiska institutioner och strategiskt agerande 17. Uppsala. Statsvetenskapliga institutionen, Uppsala universitet

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