Environmental management in industry and government

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Measuring environmental management and explaining the fact out of two competing theoretical frameworks

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1.   Introduction

In the period 1990-1996 we conducted fundamental research on the topic of environmental management in organizations. This research was funded by the Dutch Association for Fundamental Research (NWO) and was conducted with assistance of the Dutch Ministery of Environment and Public Housing and several branch-organizations of industry. The central theme of research was clearing the relations between dependent and independent variables. The dependent variables express the attitudes towards environmental management and the progress and quality of environmental management in both public and private organizations. The independent variables are clustered in two competing theoretical frameworks which translate two well-known approaches in the field of environmental management. The data-collection in branches of industry and municipalities has taken considerable effort. Data-interpretation has been done with both simple and more advanced statistical techniques. In this paper we present some interesting results of our study. The complete results are published by the authors as *Bevordering van milieumanagement in organisaties. Een kwantitatief onderzoek naar beleidsvoering met doelbewust gebruik van beleidsnetwerken [Stimulation of environmental management organizations. A quantitative study on policy-implementation with intentional use of policy networks]*, Enschede, 1996.

2   Background of the study

Social background of this study
During the seventies much has become known about the impact and effects of regulation. Partly on the basis of this knowledge, alternative policy instruments began to attract more attention. There was an increased interest in financial stimuli, among other things. In addition, a number of complex social problems proved difficult to influence.
A loss of faith in the steering capacity of the (central) authorities was accompanied by calls for these same authorities to step down. The concept that interiorization of standards and values on the part of the target group could result in an inner drive towards the desired behaviour led to a -renewed- focusing of interest on instruments of communication. Society would have to organize itself of its own accord to a greater extent.
Certainly in environmental policy, the sector to which the field of our study can be attributed, the interiorization of environmental values became a policy objective in itself. At the end of the eighties the National Environmental Policy Plan marked this shift towards a greater role for consultation and agreement in both policy-making and policy implementation in the Netherlands.

In such an approach to environmental problems, the social centre could play an important role. In consultation between the government and intermediary organizations, policy frameworks could be

implemented in such a way as to correspond closely to the characteristics of the target group. Besides, organizations from the social centre could perform executive tasks. A first argument in favour of such a steering arrangement was that organizations that are more closely involved with the eventual target group are well able to implement policy framework in an effective, *practically* applicable way, in consultation with the central government. In addition, intermediary organizations would be able to get the message across to the policy's target group *more convincingly*. Finally, the target group would sooner feel a tendency to *justify* its own behaviour towards some intermediary organizations.

Theoretical background of the study
During the eighties a great deal was published about the impact and effects of policy instruments. The knowledge obtained in this way on developments in social and political reality was incorporated into the development of concepts and theory in policy science. The 'policy network' concept is being used more and more often as a basis for modelling the above-described system of policy-making. Here the classic contrast between policy-making and policy implementation is weakened. Thinking about steering arrangements with the use of policy networks can be combined with choices in favour of various policy instruments. Furthermore we can distinguish between intended and spontaneously developing policy networks. In the former case the realization of the policy network is an intended effect of policy implementation. The realization of the policy network is an intermediary objective to urge the eventual target group of the policy to exhibit the desired behaviour. In this sense we have a policy programme with an intentional use of policy networks. In the case of spontaneously developing networks we see a side effect, whether intentional or not. We can also imagine a situation where the network exists before the policy is implemented. In our study we define the 'policy network' concept as a social system within which actors develop patterns of interaction and communication, which show a certain durability and are focused on policy issues or policy programmes.

Our study is in line with a long tradition of research about the impact and the effects of various policy instruments. To this our study adds theory development and an evaluation of the effect of intentional policy networks. One restriction regarding the scope of theory development and evaluation lies in the fact that for the steering of the final target groups from the policy network, use was made to a large degree of a communicative instrumentarium. This means that no conclusions can be drawn on the basis of this study about the impact and effects of intended networks from which the target group is steered dominantly by means of regulation or financial stimuli.

3   Problem definition and research questions

The problem definition of our study is 'What are the possibilities and limitations of steering with the intentional use of policy networks?' This problem definition is worked out in five research questions.

The first research question is of a descriptive nature; its aim is to obtain information about the features of the policy problem, policy content and policy organization of the studied policy field:

1.   What is the history, the content and the organization of environmental management stimulation policies?

Our field of study concerns environmental management in organizations. Since the Government Memorandum on Environmental Management was published in 1989, the introduction of systems

of environmental management in organizations has been an item on the political agenda. This Government Memorandum marked the official start of the Industrial Environmental Management Stimulation Programme. This policy involved, among other things, that the organizations were expected to introduce and implement environmental management within their own ranks. The policy was aimed at the interiorization of environmental values in the organization. The target group of this policy consisted of organizations from the private and public sector. The interiorization should manifest itself in research on the causes of environmental pollution, control and reduction of environmental pollution, and the integration of environmental management into ordinary management. Here we found that to a large extent, an indirect steering model existed which was characterized by steering with an intentional use of policy networks. In policy-making the central government, to a significant if not predominant extent, made use of the intermediary organizations both as partners in consultations and for executive duties.

Environmental management stimulation policies are intended to increase environmentally oriented actions within organizations. This requires a process of change in organizations. Our answer to research question 2 on the basis of study of the literature is intended to obtain an empirically applicable model of change with which we can determine the facts to be explained.

2.   How do change processes within organizations develop?

Much of the behaviour of the individual members of an organization takes place according to relatively stable patterns of behaviour. Changes in these behavioural patterns mean that the rules which steer these patterns are adjusted. These rules are established by negotiations between actor coalitions. In the case of planned changes within the organization, these rules reflect the extent to which the dominant coalition is willing to cooperate or wishes to oppose the intended changes. The behavioural intentions regarding changes in the rules of behaviour and stable patterns of behaviour can be placed on a continuum ranging from acceptance to rejection of change. Research expectations are formulated about the relations between the behavioural intention of the dominant coalition and stable patterns in the behaviour of members of the organization.
We have defined behavioural intention as 'the degree of commitment expressed to statements describing choices of personal action (of a designated type) towards some class of objects, persons or events'. A behavioural intention has three underlying actor characteristics. The three characteristics, motivation, resources and position of power, not only determine the readiness to act within the organization, but also the organization's readiness to interact about the policy theme with its environment. We have distinguished five behavioural intentions which may occur among the members of the target group:

Collaboration: Investing in resources which stimulate the realization of the desired behavioural alternative, without avoiding interaction surrounding the policy theme.

Cooperation: Investing in resources which stimulate the realization of the desired behavioural alternative, while procuring resources surrounding the policy theme.

Expectant attitude: Investing little, for the time being, in resources which stimulate the realization of the desired behavioural alternative, without avoiding interaction surrounding the policy theme.

Opposition: Investing as little as possible in resources which stimulate the realization of the desired behavioural alternative, and undergoing interaction surrounding

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the policy theme.

Disregard: Not investing in resources which stimulate the realization of the desired
                       behavioural alternative, and avoiding interaction surrounding the policy
                       theme.

In the order given above, we expect a diminishing chance of adaptation of stable behaviour
patterns within the organization.

Our study focuses on explaining the behavioural intentions found with municipalities and
businesses. Research questions 3 and 4 deal with theory development. We intended to arrive at two
explanatory models of behavioural intentions on the basis of study of the literature.

3.   How can processes of change in organizations be explained on the basis of the assumption
        that they are determined by inter-organizational characteristics?

The first theory consists of an inter-organizational explanatory model. This model describes the
impact of the implementation of a policy programme which steers behaviour through the intentio-
nal use of policy networks. This model is based on the axiom that 'network steering is effective in
complex, uncertain policy fields'.
To make it possible not only to test theory to empiricism, but also to confront competing
explanatory models, we formulated research question 4:

4.   How can processes of change in organizations be explained from the assumption that they
        are determined by intra-organizational characteristics?

We called the second model 'the intra-organizational model'. This model denies that processes of
change in public and private organizations are caused by steering from a policy network, even
when attempts are made to do so, as in our case. Here intra-organizational characteristics existing
before and independently of network steering, serve to explain the processes of change as far as
environmentally oriented action is concerned.
We will discuss the two competing explanatory models in more detail in the next paragraph.

The fifth research question concerns the confrontation of both competing explanatory models with
empiricism, i.e. the stimulation of environmental management within organizations. This fifth
question reads:

5.   How well do the inter- and intra-organizational explanatory models stand the test of
        empiricism?

The confrontation between theory and empiricism take place step by step. For this reason we
divided the fifth research question into a number of sub-questions. These are discussed in
paragraph 5 of this paper.

4   The competing theories

The inter-organizational explanatory model
The inter-organizational explanatory model has as its central concepts: steering with the intentional
use of policy networks, the policy theme, the target group, and (intended) network relations. The
policy network which is intended for steering refers to the group of organizations that is thought to

contribute to policy-making, and their mutual relationships. In this study we use, as an operational criterion to define the network, the fact that involvement in policy implementation is a necessary and sufficient condition for being seen as part of the policy network. Organizations from the policy network are often also involved in policy-making. The *policy theme* refers to the intended change in behaviour on the part of the policy target group. The *target group* is the group of individuals and/or organizations within which the eventually intended behavioural change should take place. A *network relation* consists of a combination of a network organization and the function this organization should perform within the network.

Network organizations can perform three functions. We may speak of a *will-influencing function* when a network organization tries to influence the objectives of the target group with regard to the planned policy theme. Exercising a will-influencing function implies, therefore, that interaction exists between a network organization and the target group with the intention to arrange the distribution of targets over those involved. We speak of a *supporting function* when a network organization tries to help the members of the target group to achieve the desired behavioural alternative. This involves supplying model approaches, guidelines and manuals for environmental management and steering. Thus, performing a supportive function implies interaction between a network organization and the target group in order to arrange the distribution of resources over the parties involved. We speak of a *repressive function* if the network organization is intended to steer the unwilling members of the target group in the desired direction through gentle or hard pressure. Performing a repressive function, therefore, involves interaction between a network organization and the target group in order to emphasize the distribution of power.

The main expectation for the inter-organizational explanatory model is that as the intended network relations are exercized to a greater extent, the members of the target group will show a more positive behavioural intention.

The intra-organizational explanatory model
The second, competing theory does not deny that the members of the target group have a behavioural intention with respect to the policy theme. This intra-organizational explanatory model of the behavioural intention of organizations within the target group does deny that steering from the network is essential. As an explanation of the extent to which the intended processes of change occur, the echo of actions surrounding the organization in the past is presented. Intra-organizational characteristics, existing previous to and independently of steering from a network, in this case serve to explain the processes of change for environmentally oriented behaviour.
Working with a competing explanatory model does not only enable us to test each of the explanatory models to empiricism individually. The explanatory models can also be confronted with each other. The final objective is to evaluate the inter-organizational explanatory model. This was reason for us to set up the intra-organizational explanatory model on a broad basis. Several schools of thought from organizational theory were discussed; they constitute the frameworks within which the intra-organizational model is given shape. To this end we distinguished eight organizational characteristics, arranged in the areas of attention 'structure' and 'culture'.

As far as the structural characteristics are concerned, five characteristics are distinguished. We see the structure of an organization as more than just the sum of task allotment and coordination, the 'classic' organizational structure. In this study we see organizations as open systems, i.e. systems that maintain relations with their environment. This is reflected by the choice of characteristics. Many studies mention the *size of the organization* as an important explanatory factor. The *executive structure for environmental tasks* within the organization as a characteristic represents task allotment and coordination, i.e. the 'classic' organizational structure. We also see the durability of the executive structure for environmental tasks as belonging to this characteristic. The

third structural characteristic, the *performance level of the organization*, refers to the functioning of the organization. Actually this characteristic refers to performances other than those in the field of environmental management[1]. The fourth characteristic concerns the *seriousness of the environmental problem* in the domain where the organization operates; this characteristic links the organizational system to a feature of the environment within which it operates. This is reflected even more clearly by the last structural characteristic, which concerns the features of the *market of the organization*. For firms the market in which they operate is their 'raison d'etre'. Each behavioural intention is subject to influences from characteristics of this market[2].

With regard to the cultural frames of reference existing within the organization we distinguish three characteristics. First, we have the *focus on environmental values*. This characteristic concerns the extent to which attention is given within the organization to the realization of environmental objectives. The second characteristic concerns faith in its feasibility: The *focus on manageability* refers to the extent to which the dominant coalition is convinced that the functioning of the own organization and the environment can be managed. The third cultural characteristic concerns the *focus towards innovation*. This refers to the extent to which standards and values dominate that aim to be in line with innovative views on the functioning of the organization.

The characteristics were operationalized individually for the three policy themes.

5   Empirical research results

Empirical research was done on three policy themes from the Industrial Environmental Management Stimulation Programme. These policy themes are:

Policy Theme A: The introduction and adoption of environmental management in the municipal organization.
Policy Theme B: The realization of municipal stimulation policies aimed at firms.
Policy Theme C: The introduction and adoption of environmental management in business organization.

We studied municipalities of more than 30,000 inhabitants and firms from four branches of industry. All 110 municipalities in the Netherlands with more than 30,000 inhabitants were contacted. Of these municipalities 74 (67.3%) responded. We looked at the following branches of industry in the Netherlands: the chemical industry, the printing industry, synthetics processing industry and concrete products industry. Random samples were taken from these four industrial branches. Out of the 343 firms we contacted, 141 (41%) responded.

The elaboration of the problem definition and the research questions is characterized by the search for an explanation. Data were collected using a mainly quantitative approach, while two competing theories were formulated beforehand. We investigated to what extent the patterns predicted by the theories were present. This was done in two steps. As a first step, aspects from both explanatory models were evaluated in a bivariate way. To be able to judge the explanatory capacity of the models as a whole and in their mutual competition, we also used the regression analysis technique.

Research question '5. *To what extent do the inter- and intra-organizational explanatory models*

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[1]   For the indicators used see paragraph 5 of this paper.

[2]   Naturally, this feature is only relevant if an organization has a clearly defined market. This feature was not used for policy themes A and B.

stand the test of empiricism' was divided into several sub-questions, enabling a step-by-step evaluation of the explanatory models.

The level of target achievement on the three policy themes
The first sub-question was intended to determine the level of target achievement:

5.1   To what extent was behaviour within the organizational context adjusted according to the intentions of the policy?

The level of target achievement for policy theme A and policy theme C was determined by means of a number of indicators. The indicators used operationalize two dimensions of target achievement. Firstly, establishing 'how far' an organization has come with its own environmental management. Secondly, measuring 'how well' an organization is handling its activities. On the basis of the indicators of how far an organization has come, we constructed the *'progress'* variable:

Category	Policy Theme A municipalities number (%)	Policy Theme C firms number (%)
passive	6 (8.6)	9 (7.5)
exploratory	16 (22.9)	46 (38.3)
beginning	46 (65.7)	60 (50.0)
advanced	2 (2.9)	5 (4.2)
Total	70 (100)	120 (100)

Figure 1:   Progress made by municipalities and firms in the field of internal environmental - management

The level of target achievement for Policy Theme B was determined as well, using several indicators. These indicators measure whether the municipality is not taking any action for the time being, is taking only preliminary internal action, is taking only external action towards firms, or is also structurally adjusting its internal organization to the new tasks, as well as performing its external tasks towards firms and businesses. On this basis we constructed a second variable, *'progress'*, which differs from the variable that was used to determine target achievement on Policy Theme B and Policy Theme C:

Category	Policy Theme B municipalities number (%)
inactive	31 (44.3)
internal	7 (10.0)
external	26 (37.1)
structural	6 (8.6)
Total	70 (100)

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The behavioural intentions of municipalities and firms

The two explanatory models to be evaluated have the assumption in common that, at the level of the individual members of the research population, achievement of the objectives is linked to the basic attitude towards the policy theme. In both explanatory models, this basic attitude or behavioural intention determines how members of the target group will deal with the policy theme. To judge whether this common element can be rejected in both explanatory models, we first determined the behavioural intention of the dominant coalition per unit of research. Here an answer is given to research question 5.2:

5.2   What are the behavioural intentions of organizations from the target group of the policy theme?

To determine behavioural intention three scales were constructed. Behavioural intention is seen as originating from three dimensions. Each scale depicts one of these three dimensions.
First we have the *objectives* as regards the required behaviour. Secondly, there are the existing *resources* which do or do not make realization of the desired behaviour possible. Thirdly, we look at the *position of power* that the organization thinks it holds. This third aspect basically concerns the question whether it is felt that others can punish any failure to exhibit the desired behaviour. Figure 3 shows the distribution of behavioural intentions over the studied policy themes.

Behavioural intention	Municipalities policy theme A number (%)	Municipalities policy theme B number (%)	Firms policy theme C number (%)
Disregard	3 (4.4)	6 (9.4)	15 (16.9)
Opposition	6 (8.8)	24 (37.5)	5 (5.6)
Expectant attitude	21 (30.9)	18 (28.1)	19 (21.3)
Cooperation	10 (14.7)	8 (12.5)	13 (14.6)
Collaboration	28 (41.2)	8 (12.5)	37 (41.6)
Total	68 (100)	64 (100)	89 (100)

Figure 3:   *The behavioural intentions of municipalities and firms with respect to policy themes A, B and C.*

The connection between behavioural intentions and progress made by municipalities and firms

Research question 5.3. concerns the relation between the behavioural intentions of organizations and (the increase in) environmentally oriented actions within organizations. Its purpose is to evaluate a central assumption in the used model of processes of change in organizations, as shown by the answer to research question 2:

5.3   What is the relation between the behavioural intention of organizations from the target group of a policy theme and the extent to which behaviour in the organizational context is adjusted accordingly?

Hypotheses 1, 2 and 3 about the expected connection between behavioural intention and progress were formulated as null-hypotheses. Formulating null-hypotheses menas that these hypotheses do not formulate our research expectations, but instead deny them. When null-hypotheses are rejected, the empirical facts are in accordance with the theoretical model and therefore also in accordance with research expectations.

The figure below summarizes the evaluation of null-hypotheses 1, 2 and 3.

	Policy Theme A	Policy Theme B	Policy Theme C
Null-hypothesis 1 No positive connection exists between the behavioural intention to be found and the adjustment of behaviour in the organizational context.	rejected	rejected	rejected
Null-hypothesis 2 Adjustment of behaviour in the organizational context does not increase proportionally to a disregarding, opposing, expectant, cooperative and collaborative behavioural intention.	rejected	rejected	rejected
Null-hypothesis 3 It is not possible to predict the adjustment of behaviour in the organizational context on the basis of the found behavioural intention.	rejected	rejected	rejected

Figure 4:   The evaluation of hypotheses 1, 2 and 3 about the connection between behavioural intention and the level of progress.

Rejection of null-hypotheses 1, 2 and 3 in all cases means that the patterns which may be theoretically expected for all three policy themes were found in empirical reality.

After establishing that the expected connection between behavioural intention and the level of progress is confirmed by our data, next it was attempted to explain the behavioural intention on the basis of the two competing explanatory models.

The evaluation of the inter-organizational explanatory model
The next two research questions concern the evaluation of the inter-organizational explanatory model. Explanation on the basis of inter-organizational characteristics is only possible after we have determined if the intended network relations were in fact realized. Research question 5.4 deals with this question:

5.4   To what extent do the intended network organizations within the policy network perform the intended functions?

This question was answered by asking core functionaries in the target group to what extent the intended network organizations were performing their intended function, in their opinion. To verify to what extent an organization exercised a will-influencing function, respondents were asked to what extent they felt that the organization was influencing the point of view within the organization about the policy theme. As a second indicator we asked per organization to what extent the

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respondents felt that the organization in question was acting in the interest of the policy theme. As a first indicator of the extent to which an organization facilitated the policy theme, we asked per organization to what extent the respondent felt that the input from a network organization was applicable in practice. As a second indicator we asked per organization whether aspects of environmental management with which the organization were struggling, were contacted from the municipality. As an indicator of the extent to which an organization was acting repressively, per organization we asked to what extent the municipality saw reason to report its own efforts on behalf of the environment.

On the basis of the results we obtained in this way, we evaluated null-hypothesis 4 *'the intended network relations between intermediary organizations and the target group were not realized'*. For the three studied policy themes, null-hypothesis 4 was specified up to the level of individual network relations.

We studied a network concerning environmental management surrounding municipalities with regard to policy theme A which consisted of: the central government, the provinces, the Association of Dutch Municipalities (in short: VNG, the 'branch organization of the municipalities'), the Environmental Hygiene Inspectorate (which supervises the implementation of environmental policy by municipalities) and consulting firms. The sub-hypotheses with regard to policy theme A are summarized in Figure 5:

Function **Actor**	**Will-influencing**	**Support**	**Repressief**
Central government	intended (A.4.1)	intended (A.4.5)	
Provinces	intended (A.4.2)	intended (A.4.6) (A.4.7)	
VNG	intended (A.4.3) (A.4.4)	intended (A.4.8) (A.4.9)	intended(A.4.12)
Environmental Hygiene Inspectorate			intended(A.4.13)
Consulting firms		intended (A.4.10) (A.4.11)	

Figure 5:   Network relations with regard to policy theme A (with null-hypotheses A.4.1 through A.4.13, to be evaluated)

Only sub-hypothesis A.4.7 was not rejected. The other twelve sub-hypotheses were rejected. Rejection of the null-hypotheses means that the empirical facts are in accordance with the inter-organizational explanatory model. That is, the network functions are realized.

The studied network of environmental management surrounding the municipalities with regard to policy theme B consisted of: the central government, the provinces, the VNG, the Environmental Hygiene Inspectorate, the industrial environmental services[3], the branch organizations and the consulting firms. The sub-hypotheses with regard to policy theme B are summarized in figure 6:

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[3]   These organizations are established as part of the stimulation policy. Their prime duty is to stimulate environmental management in organizations in a regional setting.

Function / Actor	Will-influencing	Support	Repressive
Central government	intended (B.4.1)	intended (B.4.5)	
Provinces	intended (B.4.2)	intended (B.4.6) (B.4.7)	
VNG	intended (B.4.3) (B.4.4)	intended (B.4.8) (B.4.9)	intended(B.4.16)
Environmental Hygiene Inspectorate			intended(B.4.17)
Industrial Environmental Service		intended (B.4.10) (B.4.11)	
Branch organizations		intended (B.4.12) (B.4.13)	
Consulting firms		intended (B.4.14) (B.4.15)	

Figure 6:   Network relations with regard to policy theme B (between brackets null-hypotheses B.4.1 through B.4.17, to be evaluated)

Hypotheses B.4.2, B.4.6, B.4.7 and B.4.15 were not rejected. The other hypotheses were rejected. Rejection of the null-hypotheses means that the empirical facts are in accordance with the inter-organizational explanatory model. That is, the network functions are realized.
All in all, five null-hypotheses were not rejected with regard to policy themes A and B. In four cases this concerned the performance of functions by the provinces. The level of provincial activity was relatively low also at the time of the study.

The studied network of environmental management surrounding firms with regard to policy theme C consists of the branch organization, the industrial environmental services, the central government, the municipalities, the employee organization and the consulting firms. The sub-hypotheses with regard to policy theme C are summarized in Figure 7:

Function / Actor	Will-influencing	Support	Repressive
Branch organization	intended (C.4.1) (C.4.2)	intended (C.4.8) (C.4.9)	intended (C.4.16)
Industrial Environmental Service	intended (C.4.3) (C.4.4)	intended (C.4.10) (C.4.11)	
Central government	intended (C.4.5)		
Municipality	intended (C.4.6)	intended (C.4.12) (C.4.13)	intended (C.4.17)
Employee organization	intended (C.4.7)		
Consulting firms		intended (C.4.14) (C.4.15)	

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Only null-hypothesis C.4.7 was not rejected. We have to reject the other sixteen null-hypotheses. Rejection of the null-hypotheses means that the empirical facts are in accordance with the inter-organizational explanatory model. That is, the network functions are realized.

The evaluation of the sub-hypotheses enabled us to evaluate hypothesis 4. For all three policy themes null-hypothesis 4 was rejected. This means that the intended network relations between intermediary organizations and the target group with regard to policy themes A, B and C were mainly realized.

This evaluation enables us to further confront the inter-organizational explanatory model and empiricism. This led to the formulation of research question 5.5:

5.5   To what extent is the behavioural intention of the target group related to the performance of functions by the intended network organizations?

On the basis of the inter-organizational explanatory model *null-hypothesis 5* was formulated, which states that *there is no positive connection between being steered by the policy network and the behavioural intentions of organizations from the policy theme target group*. To judge this hypothesis, we determined to what extent frequent contacts were maintained with the organizations in the policy network. We expected to find a positive connection between this indicator (frequency of contacts) and behavioural intention.

Indicator Policy theme	Frequency of contact
Policy theme A	0.17 Kendall's tau-c, t= 1.75 0.21 Spearman's rho, alfa= 0.04
Policy theme B	0.27 Kendall's tau-c, t= 2.87 0.33 Spearman's rho, alfa= 0.01
Policy theme C	0,18 Kendall's tau-c, t= 1.99 0.23 Spearman's rho, alfa= 0.02

Figure 8:   *The connection between frequency of contact and behavioural intention*

The above figure shows that in the three studied policy networks there was a positive and significant connection between the frequency of contacts with the network organizations and the behavioural intention of the municipalities or firms. This means that null-hypothesis 5 was rejected. Rejection of the null-hypothesis means that the empirical facts are in accordance with the inter-organizational explanatory model. That is, the network functions are realized. Next we looked at the connection per intended function performance and behavioural intention. This may enhance or nuance our general evaluation of hypothesis 5. Figures 9, 10 and 11 give the results per policy theme:

Function	Indicator	Connection with behavioural intention
Target function	Determining position	0.06 Kendall's tau-c, t= 0.60 0.08 Spearman's rho, alfa= 0.28
	Defending interests	0.09 Kendall's tau-c, t= 0.98 0.13 Spearman's rho, alfa= 0.17
Resources function	Usefulness	0.14 Kendall's tau-c, t= 1.47 0.18 Spearman's rho, alfa= 0.08
	Seeking support	0.23 Kendall's tau-c, t= 2.39 0.29 Spearman's rho, alfa= 0.01
Power function	Reporting	0.25 Kendall's tau-c, t= 2.91 0.32 Spearman's rho, alfa= 0.01

Figure 9:   *The connection between performed functions and behavioural intention with respect to policy theme A*

Function	Indicator	Connection with behavioural intention
Target function	Determining position	0.13 Kendall's tau-c, t= 1.18 0.16 Spearman's rho, alfa= 0.13
	Defending interests	0.16 Kendall's tau-c, t= 1.45 0.19 Spearman's rho, alfa= 0.10
Resources function	Usefulness	0.10 Kendall's tau-c, t= 1.01 0.15 Spearman's rho, alfa= 0.15
	Seeking support	0.17 Kendall's tau-c, t= 1.39 0.19 Spearman's rho, alfa= 0.08
Power function	Reporting	0.24 Kendall's tau-c, t= 2.32 0.28 Spearman's rho, alfa= 0.03

Figure 10:   The connection between performed functions and behavioural intention with respect to policy theme B

Function	Indicator	Connection with behavioural - intention
Target function	Determining position	0.27 Kendall's tau-c, t = 3.08 0.34 Spearman's rho, alfa = 0.00
	Promoting interests	0.05 Kendall's tau-c, t = 0.58 0.07 Spearman's rho, alfa = 0.30
Resources function	Usefulness	0.24 Kendall's tau-c, t = 2.29 0.30 Spearman's rho, alfa = 0.01
	Seeking support	0.01 Kendall's tau-c, t = 0.09 0.01 Spearman's rho, alfa = 0.46
Power function	Reporting	0.16 Kendall's tau-c, t = 1.71 0.21 Spearman's rho, alfa = 0.04

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Figure 11:   The connection between performed functions and behavioural intention with respect to policy theme C

For each of these functions, according to the inter-organizational explanatory model a positive connection is expected with the behavioural intention. In view of the way in which behavioural intentions are linked to actor characteristics and the expectation that there will be interaction between the impact of functions on actor characteristics, not each connection needs to be significant to still reject null-hypothesis 5. A pattern analysis is applied to the indicators. All indicators show the expected positive connection with the behavioural intention. If no connection exists, as we formulated in hypothesis 5, the likelihood that the found pattern will be coincidental is very small. All indicators yield the expected positive correlations, although in a number of cases their statistic significance is limited. The pattern is correct. On the basis of this additional analysis, the evaluation of null-hypothesis 5 remains the same. Also in this evaluation the empirical facts prove to be in accordance with the inter-organizational explanatory model.

The evaluation of the intra-organizational explanatory model
Of course the question also remains to what extent the intra-organizational explanatory model can stand the test of empiricism. This is the purpose of answering research question 5.6:

5.6   To what extent are various characteristics of the target group in its environment related to its behavioural intention with regard to the policy theme?

Regarding structural characteristics, five features were distinguished:
1.   size of the organization;
2.   executive structure for environmental tasks;
3.   performance level of the organization;
4.   seriousness of the environmental problem;
5.   market characteristics.
Regarding the cultural frames of reference present within the organization, we distinguish three characteristics:
6.   focus on environmental values;
7.   focus on manageability;
8.   focus on innovation.
These eight characteristics were operationalized individually for the three policy themes. The following figure shows the indicators used, as well as the connection between the indicator and the behavioural intention. We always begin by giving Kendall's tau-b or tau-c with t-value, followed by Spearman's rho with alfa.

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Characteristic	Indicators for policy themes A en B	Connection with behavioural intention for policy theme A	Connection with behavioural intention for policy theme B	Indicators for policy theme C	Connection with behavioural intention for policy theme C
Size of the organization	- Number of inhabitants of the municipality	0.27 t= 2.79 / 0.33 alfa= 0.01	0.17 t= 1.91 / 0.22 alfa= 0.05	- Number of staff members	0.24 t= 2.61 / 0.28 alfa= 0.00
	- Urbanization	0.23 t= 2.39 / 0.29 alfa= 0.01	0.05 t= 0.45 / 0.06 alfa= 0.33	- Turnover of the firm	0.23 t= 2.60 / 0.28 alfa= 0.00
	- Number of institutions	0.11 t= 1.12 / 0.14 alfa =0.14	0.13 t= 1.28 / 0.21 alfa= 0.11	- Part of a concern	0.21 t= 1.86 / 0.20 alfa= 0.03
				- Number of low-level employees	0.17 t= 1.16 / 0.16 alfa= 0.13
				- Number of high-level employees	0.07 t= 0.49 / 0.07 alfa= 0.32
Executive structure for environmental tasks	- Autonomy of Environmental Department	-0.16 t= -1.67 / -0.20 alfa =0.05	0.15 t= 1.41 / 0.18 alfa= 0.08	- Independent environmental department	0.21 t= 1.97 / 0.20 alfa= 0.04
	-Date of foundation of Environmental Department	0.15 t= 1.08 / 0.14 alfa=0.14	0.03 t= 0.20 / 0.03 alfa= 0.42	- Place of the environmental department	0.20 t = 1.44 / 0.22 alfa = 0.06
	- Size of Environmental Department	0.03 t= 0.26 / 0.03 alfa= 0.40	0.01 t= 0.13 / 0.02 alfa= 0.45	- Size of environmental department	0.30 t= 1.16 / 0.28 alfa= 0.12
	- Fragmentation of environmental tasks	-0.01 t= -0.10 / -0.01 alfa=0.46	0.21 t= 1.56 / 0.19 alfa= 0.06	- Average level of education of environmental employees	0.26 t= 1.42 / 0.27 alfa= 0.10
Performance level of the organization	- Evaluation of environmental tasks	-0.04 t= -0.42 / -0.05 alfa=0.34	0.15 t= 1.42 / 0.18 alfa= 0.08	- Profitability	0.30 t= 3.39 / 0.35 alfa= 0.00
	- BUGM/FUN progress	-0.04 t= -0.23 / -0.06 alfa=0.41	0.26 t= 1.16 / 0.32 alfa= 0.14	- Economic prospects	0.13 t= 1.30 / 0.15 alfa= 0.09
Seriousness of the environmental problem	- Cat.IV institutions	0.13 t= 1.01 / 0.12 alfa= 0.16	0.16 t= 1.07 / 0.14 alfa= 0.13	- Branch	0.21 t= 2.55 / 0.26 alfa= 0.01
	- Average hours of institutions	0.09 t= 0.86 / 0.10 alfa= 0.21	0.08 t= 0.85 / 0.09 alfa= 0.23	- Extent of environm. pollution	0.21 t= 2.52 / 0.26 alfa= 0.01

Category	Indicator	Theme A	Theme B	Indicator	Theme C
	- Number of soil pollutions	0.21 t=1.61 / 0.20 alfa=0.06	0.03 t=0.19 / 0.02 alfa=0.43	- Nature of immediate environment	0.15 t=1.80 / 0.18 alfa=0.05
	- Average extent of pollution	-0.08 t=-0.59 / -0.07 alfa=0.28	0.15 t=1.06 / 0.14 alfa=0.15	- Competent authorities	0.23 t=1.93 / 0.22 alfa=0.03
Market characteristics				- Production method	-0.09 t=-0.94 / -0.10 alfa=0.20
				- Main customer	0.11 t=1.09 / 0.11 alfa=0.14
				- Level of competition	-0.23 t=-2.08 / -0.23 alfa=0.02
Focus on environmental values	- Alderman	0.04 t=0.38 / 0.05 alfa=0.35	0.10 t=0.83 / 0.12 alfa=0.18	- Environmental consideration in decision-making	0.21 t=2.63 / 0.28 alfa=0.01
	- Municipal council	0.27 t=2.92 / 0.34 alfa=0.01	0.15 t=1.37 / 0.17 alfa=0.09	- Environmental considerations in labour negotiations	0.26 t=3.28 / 0.34 alfa=0.00
Focus on manageability	- Importance of strategic policy planning	-0.09 t=-0.92 / -0.12 alfa=0.18	0.01 t=0.14 / 0.02 alfa=0.45	- Term of strategic planning	0.21 t=1.75 / 0.24 alfa=0.05
	- Executive programming	0.01 t=0.14 / 0.02 alfa=0.45	0.09 t=0.88 / 0.11 alfa=0.23	- Level of formalization	0.09 t=0.71 / 0.08 alfa=0.24
	- Planning Chapter of the Environmental Control Act	-0.02 t=-0.16 / -0.03 alfa=0.41	0.12 t=1.21 / 0.15 alfa=0.12	- Frequency of labour negotiations	0.03 t=0.40 / 0.04 alfa=0.35
	- Framework plan of NMP approach	0.01 t=0.20 / 0.02 alfa=0.43	-0.03 t=-0.41 / -0.05 alfa=0.34	- Written working instructions	0.15 t=1.75 / 0.19 alfa=0.04
Focus on innovation	- Guidance orientation-licensing	0.03 t=0.30 / 0.03 alfa=0.38	0.11 t=1.06 / 0.13 alfa=0.15	- Quality Management system	-0.02 t=-0.17 / -0.02 alfa=0.41
	- Guidance orientation-control	0.05 t=0.48 / 0.06 alfa=0.32	0.09 t=0.43 / 0.11 alfa=0.20	- Economic objectives	0.18 t=2.31 / 0.24 alfa=0.01
	- Focus on role of EMS-system	0.19 t=1.88 / 0.23 alfa=0.03	0.12 t=1.16 / 0.15 alfa=0.13		

Figure 12: The indicators used in the intra-organizational explanatory model per policy theme. and connections with the behavioural intention of municipalities (policy themes A and B) and firms (policy theme C).

Hypothesis *8* reads that *there is no positive connection between characteristics of an organization and the behavioural intention of organizations from the target group of a policy theme*. Also this hypothesis was formulated as a null-hypothesis. This means that this hypothesis denies our research expectations. Rejection of the hypothesis means that the empirical facts are in accordance with the intra-organizational explanatory model.

Null-hypothesis 8 was specified on the basis of the found structural and cultural characteristics. Using the above-mentioned connections, we can evaluate these hypotheses. This evaluation is summarized for the three studied policy themes in Figure 13.

Area of attention	Characteristic	Policy theme A	Policy theme B	Policy theme C
Structure	Size of organization	Rejected	Rejected	Rejected
	Executive structure for environm. tasks	Not rejected	Rejected	Rejected
	Performance level of organization	Not rejected	Tendency to reject	Rejected
	Seriousness of environmental problem	Not rejected	Tendency to reject	Rejected
	Market charac-teristics	-	-	Not rejected
Culture	Focus on environ-mental values	Tendency to reject	Tendency to reject	Rejected
	Focus on manageability	Not rejected	Not rejected	Rejected
	Focus on innovation	Rejected	Tendency to reject	Not rejected

Figure 13: The evaluation of the hypotheses on connections between characteristics of the target group and behavioural intention with regard to the three policy themes

With regard to policy theme A we were able to reject two of the eight null-hypotheses. For one null-hypothesis we tend towards rejection. With regard to policy theme B we were able to reject two of the seven null-hypotheses, while we tend towards rejection for four hypotheses. Remarkably, we rejected six out of the eight null-hypotheses for policy theme C.

Our opinion on null-hypothesis 8 was nuanced for all policy themes. Regarding all three of the policy themes our opinion is that we tend towards rejection of the null-hypothesis, which denies that there is a positive connection between characteristics of an organization and the behavioural intention of this organization. After all, connections were found to a greater or lesser extent between some characteristics and the behavioural intention of the target group. The intra-organizational explanatory model was set up on a broad basis as a competing model. It is not surprising, therefore, that not all characteristics show a clear link with the behavioural intention.

Weighing the competing theories
The above summary of the first part of the empirical analysis always concerned bivariate connections. The results of this analysis do not give us any reason to reject one or both explanato-

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ry models as a whole. After empirical testing of both explanatory models individually, they may be confronted with each other. To this end we formulated research question 5.7:

5.7   Can differences in behavioural intention regarding the policy theme be better explained by assuming inter-organizational characteristics, or by assuming intra-organizational characteristics?

For this reason the explanatory force of both explanatory models should be investigated further before we can answer research question 5.7.

In research question 5.7 three null-hypotheses were formulated. These hypotheses therefore also deny our research-expectations. *Null-hypothesis 6* states that the *variation found for intra-organizational characteristics explains more of the differences in behavioural intentions of a target group than the variation found for inter-organizational characteristics. Null-hypothesis 7* states that *network functions that are performed by organizations with which organizations from the target group of a policy have a long-standing relation, do not explain the behavioural intention of the target group any better than the performance of network functions by the other network organizations. Null-hypothesis 9* states that *the variation found in inter-organizational characteristics explains more of the differences in behavioural intention than the variation found for intra-organizational characteristics.*

To evaluate the above null-hypotheses, we carried out a number of regression analyses. To evaluate null-hypothesis 7, regression analyses were performed on aggregations of network indicators. To this end the average score for the intended network functions was calculated per network organization. This gives a measure of total activities within the network per organization. The organization that contributes most to the explanation of behavioural intention with regard to policy theme A is the VNG. The organization that contributes most to the explanation of behavioural intention with regard to policy theme B is again the VNG. The organization that contributes most to the explanation of behavioural intention with regard to policy theme C is the branch organization. With regard to all three policy themes this results in the rejection of null-hypothesis 7. Our data indicate that the performance of functions by organizations that already have a long-standing relation with the target group, gives a better explanation of behavioural intention than the performance of functions by other organizations. Also in this evaluation the empirical facts prove to be in accordance with the inter-organizational explanatory model.

Secondly, we looked at the explanatory force of both explanatory models individually. Results are given in figure 14 below.

	Explanatory indicators policy theme A	Explanatory indicators policy theme B	Explanatory indicators policy theme C
Inter-organizational explanatory model	- Informing VNG - Practical input from VNG - Number of contacts VNG - Approaching VNG - Approaching consulting firms	- Informing VNG - Practical input from VNG - Provinces influence - Practical input BMGh - Government influences	- Branch organization influences - Government influences
Total explanation	*34.1%*	*56.4%*	*21.8%*
Intra-organizational explanatory model	- Number of inhabitants of municipality - Municipal council - Importance of strategic policy planning - Focus on role of BMZ-system - Autonomy of Environmental Department - Urbanization	- Evaluation of environmental tasks - Focus on role of BMZ-system - Alderman - Number of inhabitants of municipality - Average level of pollution - Guidance orientation - control - Autonomy of Environmental Department	- Environmental considerations in labour negotiations - Independence of Environmental Department - Profitability - Level of competition - Nature of immediate environment
Total explanation	*40.2%*	*28.8%*	*43.1%*

Figure 14:   *Explained variance of behavioural intention by means of indicators from competing theories*

These results enable us to evaluate null-hypotheses 6 and 8. It is clear that these null-hypotheses exclude each other. Our data result in a varied picture. With regard to policy theme A null-hypothesis 9 is rejected, but not null-hypothesis 6. This means that with regard to this policy theme the intra-organizational explanatory model explains more than the inter-organizational model.
With regard to policy theme B null-hypothesis 6 is rejected but not null-hypothesis 9. This means that with regard to this policy theme the inter-organizational explanatory model explains more than the intra-organizational model.
With regard to policy theme C null-hypothesis 9 is rejected but not null-hypothesis 6. This means that with regard to this policy theme the intra-organizational explanatory model explains more than the inter-organizational model.

Regarding our evaluation of null-hypotheses 6 and 9 we should note that both models have a certain explanatory force with regard to all three policy themes. To investigate to what extent both models can be considered complementary, we performed a regression analysis on indicators of both theories taken together. The results of this analysis are given in the figure below.

Total explanation of behavioural intention	Policy theme A	Policy theme B	Policy theme C
Indicators from both explanatory models[4]	60.0%	65.0%	57.9%

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[4]   The explanatory indicators are a combination of the indicators resulting from the individual regression analyses.

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Figure 15:   *Explained variance of behavioural intention using indicators from the theories seen as complementary*

These data show that the explanatory force increases if indicators from both explanatory models are used.

Final conclusion
The aim of our study is to map out the possibilities and limitations of steering with the intentional use of policy networks. We tried to show that such a steering method does not work. We did not find any indications, however, that justify this statement. There are indications, though, that the reactions from organizations within the target group of a policy depend partly on a number of intra-organizational characteristics. These characteristics differ per target group and per policy theme.

6   Concluding remarks

In the previous paragraphs we answered the research questions and evaluated the null-hypotheses. In this final paragraph we will discuss the outcome of our study, also from the point of view of its usefulness.

We studied the impact and the effects of environmental management stimulation policies. Such policies are characterized by the indirect steering of the target group from a policy network. Both in policy practice and in the scientific sphere, network steering has been the focus of much interest. During the past few years many case studies were performed on network steering. We have always followed the results of case studies of network steering with some suspicion. Often, researchers leave the actual effectiveness of network steering implicit. Our study does not show that this suspicion is justified. After all, also we have concluded that network steering can work. We tried to prove that network steering does not work. By using a broad competing theory, we made the evaluation of network steering as critically as possible. No indications were found which would justify the statement that such a steering arrangement does not work.

This means that we did not succeed in proving that network steering does not work. However, it would be equally incorrect to assume that a policy network always works. This claim is not justified on the basis of our study. One of the main aspects of our study concerns the fact that environmental management stimulation policies were set up at a time when the environment was an important issue. Both in politics and outside of politics, a great deal of attention was given to the environment. The question of how this influenced the impact of the policy networks we studied, cannot be answered on the basis of our study. The fact that there was an influence seems evident, however.

Our finding that clear connections were found between the extent to which municipalities and firms were steered from the policy network and the extent to which they evidenced the behaviour intended by the environmental management stimulation policies, remains intact. This makes a situation where general attention for the environment is presented as a decisive factor, less likely. Municipalities and firms that were steered in a less convincing way also took less action. Here we should also realize that our study covered large numbers of municipalities and firms. This makes it less likely that the outcome was determined mainly by the interpretations of the researchers.

The contribution of network steering to target achievement

We have investigated processes of change inn organizations. In a correlational design we find with regard to two policy themes (A and C) stronger explanations of behavioural intention by means of intra-organizational characteristics than by means of inter-organizational characteristics. On the basis of this we could quickly conclude that the contribution of network steering tot target achievement is not impressive in these cases. However, it is very doubtful whether this conclusion is warranted.

Popularly speaking, changes are the result and the combination of a 'push' and a 'pushed object'. Characteristics of the pushed object alone usually do not seem to be sufficient for changes. The various different inter-organizational indicators (the 'push') for the construction of the policy network are of a dynamic nature. They change the environment of an organization. The vast majority of the intra-organizational indicators we distuinguished (the 'pushed object') are relatively static ones. This means that these characteristics *in themselves* do not elicit any changes within the organization. But they seem to determine the extent to which an individual within the organization through coalitions can work towards changing the stable patterns of behaviour. The fact, for instance, that a large municipality does a faster or better job where environmental management is concerned than smaller municipalities, does not in any way alter the fact that also in large munici-pality someone has to start up this proces. The intensity of policy-implementation seems of relatively less importance in these situations. But without stimulation policies it is to be expected that target achievement in a complex, uncertain policy field will be lower.

The value of our study to policy-makers

As regards steering with the intentional use of policy networks, a number of aspects emerged from our study which may be interesting to the policy-maker. In our study we encountered a situation where virtually all organizations performed their intended functions within the policy networks. However, the target groups of the policy did not respond equally strongly to each form of function performance. Here two aspects emerge in particular:

1. Including organizations in a policy network is the more promising, the longer the relationship between the network organization and the target group has existed. Our study shows that longer-standing relations between intermediairy organizations and a target group can account for a considerable part of the results of network steering. The efforts made by organizations that maintained a long-standing relation with organizations from the target groups, being in our case municipalities and firms, proved relatively more effective, in other words. Efforts on the part of organizations which were less strongly linked to the target group or were set up especially on behalf of the network, appeared to account for less of the final results. Naturally, the time at which we performed our (empirical) study also plays a part. We cannot exclude the possibility that in some years relatively new organizations, such as industrial environmental services, will succeed in providing a significant contribution. However, this is too late to achieve the policy objectives which were formulated for 1995.

2. The response of the organizations within the target group appears to depend partly on some intra-organizational characteristics. In our study these characteristics proved to be different for municipalities and for firms. No definite statement can be made on the basis of this study regarding the possibility that these characteristics always influence the target groups of municipalities and firms. It does seem possible, however, to distinguish as target groups, organizations that require relatively more and relatively less steering from a policy network before they respond in the required way. To be certain of the correct characteristics needed to take such decisions, either more research or more experience-based knowledge will be neces-sary.

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We studied steering with an intentional use of policy networks. The policy field we studied may be characterized as complex and uncertain. After all, changes were required of large numbers of different organizations that are, moreover, mutually dependent to a lesser or greater extent. Also it was not immediately clear how these changes were supposed to look in practice. This makes it difficult to 'regulate' the behavioural choice situations to be influenced by means of rules or financial instruments. In those situations we found insufficient empirical evidence to justify the statement that network steering is not a serious alternative for the policy-maker. We have reason to assume that for complex policy problems policy-making via a policy network constitutes an alternative which should be taken seriously.

This may be different in the case of simple behavioural choice situations. In such situations, steering by means of regulation or financial stimuli may be relatively simple. Others have researched the form this should take and the conditions under which this can be done effectively. Our study does not make any statements on these situations.

Quantitative public policy research

For some time interest in public policy research has been at a relatively low ebb. With our study we hope to have contributed to insights into the benefits of quantitative public policy research. Its advantages lie in the convincing way in which predictive theories can be evaluated. This is done at the expense of the in-depth insight into a case and the anecdotic amusement value of case descriptions. Regarding the interpretation of cases in a theoretical context, questions often remain, however. There is a danger that cases will be 'moulded' around a theoretical framework. Some researchers justly point out that basically the evaluation of theories on the basis of case-comparative studies is possible. This does require a certain amount of care in selecting the cases, and clear structuring beforehand of the information to be collected. The criteria for case selection and the information to be collected are then determined by the demands imposed by the theoretical explanatory model. As soon as these demands are met, little objection can be made, of course, to case studies or case-comparative studies.

Closer study

Even after our study many questions remain as to the impact and effects of network steering. Thus our study appears to indicate that the behaviour of municipalities can be better explained on the basis of network steering, than that of firms. Furthermore, our study appears to indicate that the more the intended behaviour of the target group is still in its infancy, the better the explanation is given by network steering of the target group. For the rest the question remains whether the explanatory characteristics of municipalities and firms from our study would remain the same if this study were reproduced for other policy fields. This leaves us with sufficient questions which call for further study. Here we think of, e.g., various quantitative research strategies.

A final word about working with competing theories. It is often heard and read that this method is an appealing one. It is seldom practised, however. In our experience, working with competing theories can make the evaluation of these theories more critical. This would strongly advocate their use. As a matter of fact, it is our conviction that competing theories are compatible not only with our type of study, but also with case-comparative studies.

(A complete list of used literature is available on request)