

THE RABBIT AND THE TORTOISE. CLIMATE CHANGE POLICY DEVELOPMENT ON THE LOCAL LEVEL IN NORWAY AND POLAND*

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Abstract

Policy innovation in unitary states relies heavily on the proclivity of local governments to identify and respond to emerging policy challenges. The article contributes by applying a framework for policy innovation normally used in federal systems to a comparative analysis of two unitary states – Poland and Norway. The analysis serves to highlight how the effectiveness of horizontal, non-coercive diffusion mechanisms relies on established norms and traditions for local political self-rule. A key finding is that the prospects of success for ‘soft’ central government steering seem to rely not least on the resourcefulness of the local units. The study furthermore highlights the importance of historical trajectories for internal as well as external determinants for policy innovation.

Keywords: climate change, multilevel governance, local government, comparative policy analysis, policy innovation, Poland, Norway.

1. Introduction

In modern societies, public policy is to a great extent executed in systems of multi-level governance (Bache and Flinders, 2004; Piattoni, 2010). The scope for centrist political control is commonly seen to be delimited by a growing dispersion of authority upwards to supranational institutions as well as downwards to regional and local governments (Marks and Hooghe, 2004, p. 15). A common observation is that the governing role played by central government institutions and actors has been diminished (Bartolini, 2011, p. 3). As a consequence, there is a growing interest in non-centralized mechanisms for policy development, subsumed under headings such as policy innovation (Berry and Berry, 2014), policy transfer (Dolowitz and Marsh, 1996), institutional design (Lowndes and Wilson, 2001) and lesson-drawing (Rose, 1993). The underlying assumption of these and other related concepts is that policy change and dispersion of new policies among lower-level tiers of government are not necessarily or even primarily results of hierarchical central government steering. Rather, the focus is on how new policies are invented and spread across jurisdictions horizontally, through voluntary mechanisms (Stone, 2012).

Such mechanisms of horizontal policy innovation have primarily been studied in the context of international relations or in federal systems (Graham, Shipan and Volden, 2013), including notably among US states (Walker, 1969; Allen, Pettus and Haider-Markel, 2004), among EU member countries (Bulmer, 2007) or on the regional level in European federal states (Benz, 2007). Less attention has been paid to decentralized, non-coercive mechanisms for policy change in unitary states. One of the reasons for this bias is probably that lower-level tiers of government are on the whole more autonomous in federal systems than in unitary states (Pollitt and Bouckaert, 2011, p. 51). The legislative and budgetary powers retained by central governments in unitary states, leave more leeway for centrist control and less for local policy development than what is the case in federations (Bouckaert and Kuhlmann, 2016, p. 8). But unitary states should not be seen as a homogenous group. The scope of decentralization and autonomy varies widely between countries (Sellers and Lidström, 2007). Lower-level tiers in unitary states in many cases enjoy considerable 'jurisdictional integrity' (Skelcher, 2005). Furthermore, public spending on the local level tends to be higher in unitary states than in federations (Bertrana and Henielt, 2011, p. 309). Local governments in unitary states should, as a consequence, be seen as more than just implementers of central government policies. Central government controls are not always authoritative, and rely sometimes more on 'prayers' than on 'muscle' (Gormley, 1989). This calls for increased focus in comparative studies about how lower-level tiers of government in unitary states contribute to policy development through horizontal, non-coercive diffusion mechanisms.

This article seeks to provide a more nuanced understanding about non-centralized policy invention and diffusion in the multi-level governance systems in unitary states. Specifically, it contributes by showing that approaches to policy innovation that originate from the study of federal and multinational governance can be applied

to the comparative study of unitary states, and under which circumstances. In order to highlight non-coercive diffusion mechanisms, the analysis deals with an emerging policy issue that has not, as of yet, been transformed into binding central government regulations. This design choice is in line with Schneider and Ingram's (1990, p. 524) perspective on changes in the use of policy tools as a given policy area matures. On a general level, these authors expect newer policies to rely on learning tools, inducements and capacity building.

Climate change adaptation policy in local governments in Poland and Norway is a pertinent empirical case of policy innovation in unitary states. Climate change adaptation can be defined as adjustment of social and economic practices to match (inevitable and irresistible) shifts in underlying climate conditions (Howlett, 2014). The need for policy measures to enhance the capacity of societies to cope with the effects of climate change is increasingly being recognized (Keskitalo, 2010), and subnational governments across the globe have taken up the challenge (Jones, 2014). Local and regional governments are often seen as key actors due not least to their responsibilities related to planning, infrastructure, water and sewage and other relevant services (IPCC, 2014). Although such policies are promoted by the EU and to varying extent by national governments, adaptation policy has not (as yet) been transposed into legally binding requirements for local and regional governments in the two countries. As a consequence, the pattern of policy adoption has been found to vary a lot, domestically and between countries (O'Brien and Selboe, 2015). The absence of coercive measures for adoption of specific policies, as well as the recognized need for developing policies that take local and regional contingencies into account, means that this policy area is highly illustrative for a comparative study of non-centralized policy invention and diffusion.

In unitary states, and in the absence of coercive centrist control, policy innovation and diffusion relies heavily on the proclivity of local governments to identify and respond to emerging policy challenges. The comparison of Poland and Norway serves to illuminate how such capacities are shaped by historical trajectories. While the present-day system of democratic local governments in Poland was established in 1990 following the fall of the Iron curtain, Norway's current system is to a great extent a continuation of the system that was established as early as in 1837. Local self-rule has been an integral part of Norway's system of government for almost two centuries; however, corresponding value sets have not had the same amount of time to take root in Poland. A key point in the analysis will be to what extent the effectiveness of horizontal, non-coercive diffusion mechanisms relies on established norms and traditions for local political self-rule.

The article is structured as follows. In the section 'Policy innovation in systems of multi-level governance' key theoretical considerations to do with non-centralized policy invention and diffusion in unitary states are elaborated upon, and the analytical model is presented. The section on data and methods presents a survey questionnaire distributed to local governments in the two countries, as well as other data

sources. The results section presents the operationalization of the model, and the empirical results of the regression analysis. The discussion section draws implications of the results for the understanding of policy innovation mechanisms in multi-level governance systems in unitary states. The conclusions section maps out key findings on the preconditions for use of 'soft' steering mechanisms in multi-level governance processes in unitary states.

2. Policy innovation in systems of multi-level governance

A reasonable starting point for a discussion about policy innovation is the term's underlying assumptions about 'newness' – perhaps the most intuitively obvious element of the term innovation, and a recurring issue in the debate. From early stages on, it has more or less been agreed upon that innovation does not by necessity equate invention. In his seminal study of diffusion of policy among US states, Jack L. Walker (1969) defined innovation as 'a program or policy which is new to the states adopting it, no matter how old the program may be or how many other states may have adopted it' (p. 881). A similar approach was taken in early studies of organizational innovation (Mohr, 1969, p. 112). Later contributions have upheld this position. In a recent study, policy innovation is defined so as to include not just invention of new policies, but also diffusion to new units, and the identification of new effects of existing policies (Jordan and Huitema, 2014, pp. 389-390). This broadly inclusive definition seems helpful not least from an empirical perspective, because the initial 'first mover' may be hard to identify. Invention of policies that are 'novel to the world' (Sørensen and Torfing, 2011, p. 850) are probably rare in a networked and integrated society. Indeed, it has been argued that the flow of policy images and ideas in society is such that one would be hard pressed to trace the origins of emerging policies at all: 'The impetus for the spread of ideas does not lie with the persuasiveness of the originator of the idea (...) all ideas are in the air all the time and are implemented depending on the purpose at hand' (Weick and Quinn, 1999, p. 376).

But to regard diffusion as a form of invention is not to say that adoption of a policy that pre-existed in other jurisdictions removes the element of 'newness' from the term innovation. As noted by Diane Stone in a recent review article (2012), a burgeoning literature 'query and contest assumptions of undiluted dichotomous diffusion or unmediated 'import' of transferred ideas' (p. 488). By speaking of 'lesson drawing', Rose (1993) emphasized the creative processes involved in voluntary and smart uptake of ideas from a jurisdiction's environment, and the resulting scope for adaptation of broadly diffused policies to local contingencies. The term 'policy transfer' is used as a headline for various approaches to the analysis of policy innovation in such a perspective.

In a multi-level context, the scope for local adjustments and 'translation' of diffused policies (Prince, 2010) may however be highly variant. As noted in an earlier review article, transfer of policy between jurisdictions is not necessarily voluntary (Dolowitz and Marsh, 1996). Direct and indirect coercion are alternative transfer mechanisms.

The former scenario occurs when one government forces another to adopt a policy; the latter emphasizes how various forms of interdependency may cause pressure to adopt a policy that is already in place in another jurisdiction (pp. 347-349). This distinction between voluntary and coercive forms of policy innovation has later been conceptualized in the context of EU policy diffusion as a trichotomy of transfer types, based on the type of governance that gave rise to the new policy (Bulmer and Padgett, 2005). While hierarchical governance gives rise to coercive policy transfer, agreements reached by consent or majority are often associated with transfer by negotiation. A third category of transfer is facilitated unilateralism, which signifies voluntary adaptation in policy areas where member states retain national sovereignty.

A number of voluntary mechanisms for diffusion of new policies have been suggested. In some cases, policies aimed at giving one government economic advantage are adopted by other governments in order to even the score (Berry and Berry, 2014, p. 312). Governments tend to imitate practices in governments that seem similar to themselves, for instance in terms of resources and ideologies (Dolowitz and Marsh, 1996, p. 353). A variation of this mechanism is emulation of best practice, where governments adopt solutions that are generally seen as successful, regardless of similarity or geographical proximity with the exporting government. Mimetic strategies can be interpreted as an economical approach to policy development in light of uncertain knowledge about the relative merits of different policies, in other words a boundedly rational strategy (Simon, 1957). But emulation of best practice may also be interpreted as manipulation of symbols; a strategy for gaining legitimation by giving an appearance of modernity, regardless of the actual merits of the policy in question (DiMaggio and Powell, 1991). A more tangible mechanism for diffusion with roots in the early literature (Hägerstrand, 1967; Hudson, 1969) is geographical proximity (Karch, 2007, pp. 57-59) – learning from neighbors. Spatial diffusion processes are seen as ‘contagious’ or ‘hierarchical’. Whereas contagious diffusion denotes diffusion among neighbors, hierarchical diffusion refers to the spread of new policies first adopted by the largest cities and locations highest in the urban hierarchy. However, these types of diffusion often coexist in the same space and time. A powerful mechanism for policy diffusion is the extensive participation of local governments in intergovernmental networks (Rhodes, 1991, p. 205). Because such networks may include members from a wide geographical area, they can potentially mitigate the importance of geographical proximity for policy diffusion. Extensive participation in intergovernmental networks may heighten the importance of the individuals who represent their local government in the network arenas as agents of diffusion. But the literature provides scant evidence for making assumptions about the relative importance of such ‘personalized’ diffusion mechanisms as compared to other mechanisms.

An alternative strategy for studying policy innovation is to investigate internal determinants for adoption of new policies; in other words, to look for characteristics that may explain why some governments appear to be more innovative than others (Berry and Berry, 1990; 2014). The internal determinants and the diffusion effects

should be seen as complementary. A focus on internal determinants does not presume that governments innovate in isolation. Rather, the question is one of why some governments are quicker than others in terms of picking up ideas that float about, and transform these into working policies. Berry and Berry (2014) suggest that three classes of internal determinants deserve particular attention. The first of these is related to problem perception and motivation for innovation. The assumption is that a government will be highly motivated to innovate if a policy problem is perceived as severe. This class of internal determinants also includes the character of public opinion and electoral competition, as well as other ad hoc motivation factors that can push a new policy higher on the agenda (Berry and Berry, 2014, p. 326).

The second class of internal determinants relates to ‘obstacles to innovation and the resources available to overcome them’ (Berry and Berry, 2014, p. 324). Organizational capacity, financial resources, economic development in the jurisdiction and the availability of slack resources are some of the main determinants mentioned. With reference to mainstream policy analysis theory, they note that the existence of policy entrepreneurs and policy windows (Kingdon, 1984) or strong advocacy coalitions (Jenkins-Smith *et al.*, 2014) may be key factors for inducing change.

The third class of internal determinants relates to other policies. This determinant is based on the assumption of ‘innovation interrelationships’ developed by Mahajan and Peterson (1985, pp. 39-40 *apud* Berry and Berry, 2014, p. 329). The gist of this is that the probability of adoption of policy B will increase provided that the two policies are complementary (A creates precedence for B) or contingent (B depends on the prior implementation of A). If the two policies are substitutable however, adoption of A will inversely affect the probability for adopting policy B.

Berry and Berry’s Unified Model of Government Innovation (Berry and Berry, 2014) combines these internal determinants for policy innovation with external determinants, in other words diffusion effects such as the ones briefly discussed above. The basic model is presented in Figure 1.

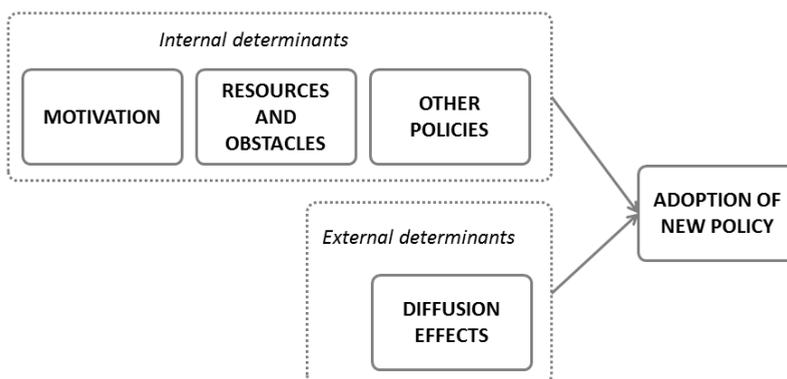


Figure 1: The Unified Model of Government Innovation

Source: Berry and Berry, 2014.

The generic nature of this model necessitates contextual operationalization for empirical analysis. This is presented in the results section. The following section presents the empirical basis for the analysis, the method used and specifics about the national context in the two countries.

3. Data and methods

3.1. Survey questionnaire to local governments

The empirical research in Poland and Norway was carried out separately by the two project member institutions in 2014, based on a shared approach. The research included a survey questionnaire to local governments, as well as case-studies in selected cities. In Norway, the survey was conducted by means of the web survey program Beetrieve. An invitation to participate in the survey was issued to the public email address of all of Norway's 428 local governments. The email message asked for the invitation to be passed on to the person responsible for climate change adaptation. If this responsibility was not allotted to a specific person or position, the email was to be sent to the head of the planning department. The invitation was repeated three times. A total of 218 municipalities completed the entire, or parts of, questionnaire, resulting in a response rate of 50.93%. In light of previous studies to the same group of respondents, this is a satisfactory result.

The municipalities that responded to the survey were compared with the universe of municipalities in order to assess potential bias in the data. The participating municipalities were on average larger (17,417 inhabitants) than those that did not participate (7,220 inhabitants). The geographical spread is satisfactory, although local governments in northern Norway are somewhat underrepresented. The participating municipalities were fairly similar to the universe in terms of income level and level of education in the population.¹ Because the analysis will contain a variable to assess the effect of municipal size, the bias in the composition of the data material is controlled for in the analysis.

In Poland, the survey was conducted by means of internet questionnaire, but the form could also be returned by land mail. All of Poland's 2,479 municipalities received an invitation to participate via their public email addresses. The invitation was to be passed on to the person responsible for climate change adaptation. If the responsibility was not allotted to a specific person or position, the invitation was to be sent to the mayor or someone who is on the top level of the municipality's management. The invitation was repeated two times.

A total of 1,311 questionnaires were completed entirely or partly, resulting in a response rate of 52.9%. In light of previous studies to the same group of respondents, this is a satisfactory result. The municipalities that responded to the survey were compared with the universe of municipalities in order to assess potential bias in the

¹ The authors will supply data on the distribution of the sample upon request.

data and the set of answers can be considered as representative in relation to types of municipalities and in relation to spatial distribution.

3.2. Method

Empirical studies of policy innovation are commonly carried out by means of event history analysis (Berry and Berry, 1990; Box-Steffensmeier and Jones, 1997; Allison, 2014) or other methods that accommodate the use of pooled time series data. Event history analysis provides estimates of the ‘hazard rate’ for implementation of a new policy by jurisdiction i in year t , by constructing a data set in which each unit denotes one jurisdiction/year. Each unit is allocated the value 0 on the dependent variable until the policy in question is implemented, in which case the value changes to 1. Logistic regression is commonly used for estimating the effects of internal and external innovation drivers for the probability of value = 1 on the dependent variable (Allen, Pettus and Haider-Markel, 2004). Event history analysis enables the researcher to analyze varying rates of policy innovation through a set period.

The purpose of the analysis in this article is to test the effects of internal and external drivers for policy innovation based on cross-sectional data for one single year. This approach has definite disadvantages in terms of analytical leverage as compared to event history analysis. Our analysis cannot capture differences between early adopters and latecomers, nor can it identify changing patterns in the rate of policy innovation over time. The key advantage of our approach is economical, in the sense that it allows analysis of policy innovation in cases where pooled time series data are unavailable – not an uncommon occurrence in political science.

The analytical model takes the following general form:

$$\text{ADOPT}_{i,t} = f(\text{MOTIVATION}_{i,t}, \text{RESOURCES}_{i,t}, \text{OTHERPOLICIES}_{i,t}, \text{EXTERNAL}_{i,t}, e).$$

In this model, policy innovation (defined as adoption of a new policy in jurisdiction i in one given year t) is a function of four variables that affect jurisdiction i 's motivation to adopt, available resources to innovate, the presence or absence of other policies that may affect jurisdiction i 's probability to adopt, and diffusion effects due to the pattern of adoption in other jurisdictions. The specification of the variables is described in the results section.

3.3. The national context

Norway and Poland are both highly decentralized unitary states. According to Swianiewicz' (2013) categorization, Poland along with Hungary and Slovakia is a ‘type 1’ country, termed ‘champions of decentralization’ (p. 303). This category has a lot in common with the established ‘Northern European’ model of local governments in the comparative literature (Hesse and Sharpe, 1991; Page and Goldsmith, 1987), which includes Norway. In this sense, Norway-Poland is probably as far as one can get in terms of conducting a most similar case design (Gerring, 2007) for comparative

study of an established western democracy and a country with far shorter traditions for local self-rule.

Norway has a three-tier system of government. There are 428 local governments and 19 county governments including the capital. Local governments are spatial planning authorities as well as local environmental authorities. They are in charge of technical services including water and sewage, local infrastructure including roads and parks, environmental issues in addition to a wide range of welfare services (Fiva, Sørensen and Hagen, 2014). The Ministry of Climate and Environment and the Norwegian Environment Agency are in charge of climate change adaptation policy at the central level. Currently, information and capacity building measures (Schneider and Ingram, 1990) directed towards local governments comprise the main thrust of national adaptation policy (MoCE, 2013).

Poland has a four-tier system of government. Each of the 2,479 municipalities has directly elected mayors and councils. The 380 counties and 16 regions all have directly elected councils. Municipalities were introduced by law in 1990 and the counties, and the regions in 1999. The basics of local government are also defined in the Polish Constitution of 1997. All municipalities have the same functions and are responsible for the provision of public services in areas such as education, culture, healthcare, transportation, water and sewage systems, waste collection and environmental protection. The largest 66 Polish cities have county rights, and are in charge of functions normally carried out by municipalities and counties. In Poland, climate change policy is not listed as a mandatory task of local governments. Nevertheless, local governments are responsible for implementing measures to protect the environment and the health of residents.

4. Results

4.1. Operationalization

The relevant parameters for operationalization of the analytical model were identified from a review of previous research on factors that enable or constrain adaptation to climate change. This review was conducted by the United Nations' Intergovernmental Panel on Climate Change (IPCC), published in the 5th assessment report of the IPCC (Klein *et al.*, 2014). It includes a number of variables that align well with explanatory variables used in the general literature on policy innovation. In addition to the data gathered by means of the survey questionnaires in Norway and Poland, data on some indicators were gathered from other sources. See Appendix A for specifics on the measurement of variables.

Dependent variable: In the analysis, policy innovation (adaptation of new policy) is operationalized by means of an index variable – Climate Change Adaptation Propensity (CCAP). The variable is based on survey data, and is composed by a selection of variables that indicate how far each individual local government has progressed in terms of developing adaptation strategies and measures. Adaptation is an emerging

issue not least in Poland, and local governments in Poland and Norway vary a lot in terms of such propensity. In order to capture adaptation policy innovation in an earlier stage, a number of indicators were included even though they fall short of actual policy implementation. The purpose is to capture the relative degree of attention to adaptation in the policy development phase – hence the term ‘propensity’. In the Poland analysis, the CCAP index was computed as the non-weighted sum of four binary variables taken from the survey. The respondents were asked to identify activities conducted by the municipality related to climate change mitigation and adaptation. They were also asked if the municipality had produced a strategy, plan or other document entirely or partially devoted to responding to climate change. Accordingly, the CCAP is coded with values ranging from 0 to 4, representing an increasing propensity for climate change adaptation policy development. In the Norway analysis, the CCAP index is constructed as a non-weighted additive index based on ten binary variables taken from the survey. Respondents were asked whether or not climate change adaptation has been addressed in five specific planning documents. They were also asked to indicate whether or not five specific measures related to climate change adaptation had been implemented; flood protection, landslide protection, building restrictions, erosion prevention and surface water management. The Norway CCAP is coded with values from 0 to 10, denoting increasing propensity to address climate change adaptation issues.

Motivation: The theoretical assumption is that risk perception will encourage policy innovation. According to the IPCC, risk perception is positively associated with the probability of implementing climate change adaptation measures (Klein *et al.*, 2014, p. 911). In the Poland analysis, this assumption is tested by the inclusion of data from the Polish Ministry of Finance. The indicator used is budgetary expenditure of municipalities on dealing with the effects of natural disasters 2008-2013 (PLN per capita).² In the Norway analysis, the motivation assumption is tested by the inclusion of data on compensations from the Norwegian National Fund for Natural Damage Assistance. This scheme provides compensation for damages to private property caused by natural disasters including floods, landslides and storm surges, to the extent that these cannot be covered by private insurance schemes.³ This data set comprises of the number and monetary value of annual compensations in each municipality.⁴ 154

2 During this six-year period, 83% of the municipalities that answered to the questionnaire received direct grants from the central government for repairing damages to local infrastructure caused by natural disasters. A total of PLN 246 million (EUR 56 mill.) were allocated. For most of the municipalities (95%) the sum per head was less than PLN 1,000 (EUR 230).

3 The scheme is managed by The Norwegian Agriculture Agency (NAA), pursuant to the Natural damages act of 1994. Data on compensations in the period 2008-2013 have been made available by courtesy of the NAA.

4 During this six-year period, 9,250 reparations were made in all, for a total of NOK 876 million (EUR 94 mill.).

of the 178 municipalities who responded to the survey questionnaire received payments during this period. For Poland as well as for Norway, the assumption is that a relative high rate of damages will be associated with a corresponding awareness of climate-related risk, and so enhance the motivation for adaptation policy innovation.

Resources and obstacles to innovation: Berry and Berry (2014, p. 326) suggests that the jurisdiction's level of economic development, the professionalism of its legislature and 'factors indicating the presence (and skills) of interested policy entrepreneurs or the strength of advocacy coalitions in the jurisdiction' are relevant variables for this determinant. According to the IPCC, economic and financial constraints affect adaptation inversely (Klein *et al.*, 2014, pp. 914-915). Smaller local governments have been found to be slow adopters of new policies, due to capacity limitations (Shipan and Volden, 2008; Krause, 2011). Conversely, local governments with larger political-administrative capacities are expected to be more innovative because they are more resourceful and therefore able to absorb emerging policy signals and adopt new policies than smaller local governments. Accordingly, a variable denoting the number of inhabitants in each local government (transformed) was included in the analysis for both countries. Furthermore, it was assumed that the degree of interest in climate change adaptation issues by local NGOs, the local press and the citizens is a resource for policy innovation. Accordingly, the analysis included the variable *interest*, denoting the respondent's assessment of the degree of interest in climate change adaptation issues by local NGOs (both countries), the local press and the citizens (Poland).

Other policies: This determinant is based on the assumption of 'innovation inter-relationships' developed by Mahajan and Peterson (1985, pp. 39-40 *apud* Berry and Berry, 2014, p. 329). IPCC findings suggest that a more general prioritization of environmental management is often seen in conjunction with stronger emphasis on adaptation policy (Klein *et al.*, 2014, p. 916). The Poland analysis included an indicator of the respondent's assessment of the frequency with which the different issues were debated in recent years in the municipality at the council sessions or meetings with inhabitants of municipality's authority. The ensuing variable, *polact*, is a sum of three values describing activity undertaken in waste management, water pollution and extreme weather occurrences policies, which can be identified as *complementary* policies. The Norway analysis includes the variable *RWA* which indicates whether or not the municipality has considered climate change hazards in their risk- and vulnerability assessment. Such assessments include a broader scale of risks than climate change-related ones. Data has been made available courtesy of the Norwegian Directorate for Civil Protection.

Diffusion effects: The assumption about diffusion of policies between neighboring jurisdictions is a staple element in the policy innovation literature (Karch, 2006). In studies of policy diffusion between US states for instance, a common operationalization is to include data on states with common borders (Berry and Berry, 1990, p. 404). Similar approaches are less practical in local government systems with numerous individual units. Instead, we apply a procedure inspired by Knutsen (2014) whereby

each local government's score on the dependent variable is subtracted from the mean value on the dependent variable for all local government in the same county (excluding the local government in question). This procedure creates a unique value for each unit on the geographical diffusion variable. The variable denotes the degree of climate policy innovation in neighboring local governments, and is expected to co-vary positively with the dependent variable. In addition to the geographical diffusion variable, a *personal* diffusion variable was included. This variable denotes policy diffusion through participation in seminars and networks by local officials, based on a question from the survey. Descriptive statistics for all variables are presented in Appendix B.

The results of the analysis are presented in Table 1.

Table 1: The results of the analysis

Model	Indicators	Poland		Norway	
		<i>b</i>	(Std. error)	<i>b</i>	(Std. error)
Motivation	<i>Natural damages</i>	0.46	(0.00)	0.19 [#]	(0.12)
Resources and obstacles	<i>Size</i>	0.16**	(0.00)	0.54**	(0.17)
	<i>Local interest</i>	0.16**	(0.03)	0.14*	(0.06)
Other policies	<i>Polact/RVA</i>	0.14**	(0.12)	1.04	(0.72)
Diffusion effects	<i>Spatial diffusion</i>	0.07*	(0.11)	-0.03	(0.21)
	<i>Personal diffusion</i>	0.10*	(0.05)	1.21**	(0.47)
Constant		-0.14	(0.20)	-4.09	(2.21)
Adj. R2		0.121		0.245	

Significance: ** = 0.01, * = 0.05, # = 0,1.

The model explains a modest amount of the variation observed on the dependent variable (adj. R2 = 0.121 and 0.245 for Poland and Norway, respectively). The results indicate that Berry and Berry's (1990; 2014) integrated approach is appropriate, in the sense that internal as well as external determinants are found to co-vary significantly with the dependent variable.

Motivation, the first internal determinant, gave rise to the expectation that previous experience with climate-related damages would increase risk perception and, as a consequence, motivate local governments to take up climate change adaptation measures. Due to the low N in the Norway study, a significant result at the 10% level is reported. This estimate indicates that previous experience with climate-related damages can stimulate local innovation in the field of climate change adaptation. In the Poland analysis, compensation for damages incurred by natural disasters also correlates positively with the dependent variable. However, the results are not sufficiently robust to reject the null hypothesis within established requirements for statistical significance.

Both indicators for the second internal determinant, *resources and obstacles*, were found to co-vary in the expected direction for both countries. These results are statistically significant. In Poland as well as in Norway, larger local governments are found to have higher innovation propensity than smaller ones. Local interest in the policy

issue at hand, however, is also found to be a significant internal determinant. This indicates that internal determinants should be observed both within the local political-administrative system and in its surroundings.

As noted, the third internal determinant, *other policies*, is included to analyze how policy innovation in one specific field is affected by previous implementation of complementary or contingent policies. The results from the Poland analysis indicates that the degree of political attention to issues related to waste management, water pollution and extreme weather occurrences positively affect the propensity for addressing the issue of climate change adaptation. The Norway analysis, however, did not identify any significant correlation between including climate change in a preceding risk assessment analysis, and the dependent variable.

The results of the analysis of the external determinant in the analytical model, *diffusion*, reveal interesting patterns. The effect of geographical proximity is only significant in the Poland analysis, but the findings on 'personal' diffusion mechanisms are consistent in both country studies.

5. Discussion

The context for the study is an emerging policy area of increasing political salience that has not, at present, been transformed into statutory central government requirements. The study indicates that in such a context, the mechanisms that drive local level policy innovation in the multi-level governance systems of unitary states are quite similar to the mechanisms that have been found to be at work in federations and multinational systems in previous studies (Bulmer, 2007; Benz, 2007). If so, the absence of coercive, hierarchical diffusion mechanisms tends to nullify the differences between these classes of systems, in terms of their potential for local level policy innovation. This is an important finding, because it demonstrates that it makes sense to apply analytical models developed in the context of federations and multinational systems to the study of unitary states, *within certain constraints*. These constraints are posed mainly by variations in the availability of catalytic, hortatory and coercive central government controls respectively (Gormley, 1989). The availability of these classes of tools may vary greatly between different classes of multi-level systems, notably between federations and unitary states. Central governments in unitary states generally speaking tend to hold more extensive powers over sub-national tiers of government than do their counterpart in federations. A prerequisite for applying similar models for analysis of policy innovation and diffusion in both classes of multi-level systems is clearly to determine the scope for centrist control and local level discretion prior to the analysis of the diffusion mechanisms at play.

Because both cases included in this study are unitary states, however, our main analytical interest is about identifying systematic differences between different types of unitary MLGs. The analysis indicates that internal as well as external drivers are relevant for explaining policy innovation in multi-level governance systems of unitary states. However, the comparative analysis highlights interesting differences be-

tween the two countries included in the study. These differences may provide the basis for developing more differentiated theories about policy innovation.

As noted, motivation based on previous experiences of natural disasters as a determinant for policy innovation did not yield significant results in the Poland analysis, but a positive and significant effect was reported in the Norway analysis. This indicates that compared to their Polish counterparts, local governments in Norway have more highly developed capabilities in terms of acting upon risk perception – identifying emerging challenges and transforming these into items on the policy agenda. This finding may be attributed to the key difference between the two countries in the most similar cases design used in this study, namely, the highly variant institutional histories of the two local government systems. Norway's long-standing traditions for local self-rule have apparently provided its local governments with greater propensities for acting autonomously upon own risk perceptions.

In both countries, larger local governments were found to be more innovative than smaller ones. Population size is an important determinant for the local tax base as well as for central government grants. Relative resourcefulness translates into increased potential for administrative specialization and tackling of emerging issues. Due to capacity differences, larger local governments are in a better position than smaller ones for developing specialized administrative competencies, as well as for processing a wider range of issues politically. It is noteworthy that this effect is not affected by the different institutional histories of the two local government systems. One feasible implication is that highly fragmented local government systems, with many small units, may not be optimal for non-centralized policy invention and diffusion.

The results indicate that *local interest* plays an important role in terms of pushing emerging policy issues higher on the political agenda, regardless of differences in the institutional history of local government systems. This finding is interesting not least in light of the different results on the motivational variable noted above. Apparently, administrative capacity and civic awareness provide a boost for policy innovation that is more significant and consistent than risk perception due to previous experience. One possible explanation for this is that climate change policy is based on rather complex knowledge that does not lend itself easily to policy development. As shown by previous research (Pearce, 2014), the process of transforming quantitative, science-based climate change data to implementable policies is quite demanding. The level of local government engagement in climate change policy has been found to be affected by the degree of citizens' participation and engagement due to the high financial and developmental costs of this policy (Kwon, Jang and Feiock, 2014). Thus, the resourcefulness of local administrations as well as the engagement of local specialized NGOs creates innovators' advantages that may be more important than actual experience of climate risk.

Interestingly, the 'neighboring effect' – a staple element in policy diffusion studies – was not identified in the Norway analysis, but in the Poland analysis it yielded the

expected, positive results. A 'personalized' diffusion mechanism however was identified in both countries. In other words, diffusion has become de-spatialized in the Norwegian context to an extent not observed in Poland. This can be taken as an indication of a more highly developed system of supra-local networks in the Norwegian local government system. While differences in available resources probably allow local officials in Norway to travel more extensively than their Polish counterparts, it is also relevant to assume that the long-standing institutional history of Norway's local government system to a great extent has been a history of network-building. This line of argument suits well with findings from previous research on transnational municipal networks namely, that activity in climate change policy networks is characteristic of pioneers – the most active and strongest political actors (Kern and Bulkeley, 2009).

6. Conclusions

The overall conclusion of the study is that the viability of non-coercive mechanisms for promoting new policies among lower level governments in multi-level governance systems varies between unitary states. The prospects of success for 'soft' central government steering seem to rely not least on the resourcefulness of the local units – in terms of building specialized administrative competencies, managing to transform complex knowledge into policy, participating in non-local networks and engaging with civil society groups. As a consequence, soft steering in multi-level governance systems need to include capacity building measures (Schneider and Ingram, 1990), not least in order to bridge the gap between the larger and more innovative units, and the smaller ones with less capacity.

The study furthermore highlights the importance of historical trajectories for internal as well as external determinants for policy innovation. Long-standing traditions for local autonomy probably enhances the local units' propensity for transforming emerging problems into policies even in the absence of coercive central government controls – possibly because the capacity for autonomous action depends on attitudes and role conceptions that need time to develop. Furthermore, the study indicates that patterns of policy diffusion may change from a purely local 'neighborhood' effect to a more non-local, network-based pattern as local government systems mature. The implication is that central governments may need to support efforts to develop and utilize non-local networks in settings where these have not had the time to reach maturity.

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Appendix A: The measurement of variables

Variables	Measurement, Norway*	Measurement, Poland*
CCAP (Climate Change Adaptation Propensity) index (dependent variable)	<p>Are climate change concerns integrated into (1) municipal planning strategy (2) municipal societal plan (3) spatial plan (4) partial plan/thematic plan (5) detailed regulations?</p> <p>Has the municipality implemented any of the following measures for climate change adaptation? (1) flood protection (2) landside prevention (3) building restrictions in exposed locations (4) erosion prevention (5) surface water management¹</p> <p>Source: Survey</p>	<p>(1) Has the municipality taken on any activities in recent years, with the aim of mitigating adverse impacts of human activity on the climate? (2) Has the municipality taken on any activities in recent years, with the aim of adapting to climate change?</p> <p>Does the municipality have a document (strategy, plan, program, study) that directly concerns the response to climate change? (3) Yes, the municipality has a document devoted entirely to the response to climate change.</p> <p>(4) Yes, the municipality has a document that contains a section on responses to climate change.¹</p> <p>Source: Survey</p>
Motivation/ Natural damages	<p>Compensations for natural damages. Sum of annual compensations (NOK, nominal values) paid in 2008-2013 (transformed). Source: Norwegian National Fund for Natural Damage Assistance</p>	<p>Budgetary expenditure for compensating for consequences of natural disasters 2008-2013 (PLN per capita). Source: Polish Ministry of Finance: Budgetary reports of local governments</p>
Resources and obstacles/ Size	<p>Number of inhabitants pr. municipality (transformed), 2014. Source: Statistics Norway</p>	<p>Number of inhabitants pr. municipality (transformed), 2014. Source: Statistics Poland</p>
Resources and obstacles/ Local interest	<p>To what extent is the following concerned about climate change adaptation in the municipality? Local press.²</p> <p>Source: Survey</p>	<p>To what extent is the following concerned about climate change adaptation in the municipality? Local NGO's, local press, citizens.²</p> <p>Source: Survey</p>
Other policies	<p>Are the following factors assessed in the municipality's Risk- and vulnerability analysis? Includes assessment of future risks and vulnerabilities due to climate change?³ Source: Survey (2015, N=335/78, 3%) conducted by Norwegian Directorate for Civil Protection</p>	<p>With what frequency these issues are discussed in recent years in the municipality during: council sessions or authorities' meetings with citizens? Extreme weather events, waste management, water pollution⁴. Source: Survey</p>
Diffusion effects/ Spatial	<p>Calculation based on CCAP (dependent variable).⁵</p> <p>Source: Survey</p>	<p>Calculation based on CCAP (dependent variable).⁵</p> <p>Source: Survey</p>
Diffusion effects/ Personal	<p>During the last three years, have you or anyone else in the municipality participated in a conference, seminar, workshop or other meeting about climate change?⁶ Source: Survey</p>	<p>During the last three years, have you or anyone else in the municipality participated in a conference, seminar, workshop or other meeting about climate change?⁶ Source: Survey</p>

Notes: + Survey conducted in Norwegian and Polish, translated by the authors. 1: Values for all variables in non-weighted additive index: no=0, yes=1, don't know=system missing. 2: Item measured on a 1-5 scale (1=wholly uninterested, 5= very interested, 6 don't know=system missing) and variable is a sum of rates values. 3: No=0, yes=1, not sure: System missing. 4: Item measured on a 0-4 scale (0=never, 1=very rarely, 4=very often). 5: CCAP is calculated using the following formula: ((County mean CCAP * number of municipalities in county) - CCAP) / (number of municipalities in county - 1). 6: Me=1, others/no one/don't know=system missing.

Appendix B: Descriptive statistics

Variables	Norway (N=178)				Poland (N=1311)			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
CCAP (Climate Change Adaptation Propensity) index (dependent variable)	5.61	2.57	0.00	10.00	1.06	0.52	0	3
Motivation/ Natural damages	13.52	1.79	9.11	17.91	187.31	554.24	0	9,511.39
Resources and obstacles/ Size*	18,396.53	55,500.24	211	634,463	15,822.86	40,801.52	1,351	758,992
Resources and obstacles/ Local interest	6.72	3.81	0.00	15.00	1.44	1.26	0	5
Other policies	0.90	0.30	0.00	1.00	7.20	1.75	0	12
Diffusion effects/ Spatial	5.61	1.08	1.60	7.67	1.05	0.62	0	4
Diffusion effects/ Personal	0.53	0.50	0.00	1.00	0.36	0.66	0	2

Notes: + Nominal data on population size (before transformation) refer to municipalities that responded to the survey.