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Policy diffusion, environmental federalism and economic efficiency – how culture and institutions influence the implementation of EU legislation in two Nordic countries

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Abstract
This article explores the changes in central government administration due to European Union (EU) membership and their consequences for policy outcomes and economic efficiency in Finland and Sweden. Both countries became members of the EU in 1995. Upon joining the union, member states are expected to adopt common legislation and encouraged to develop similar rule-making procedures. The actual implementation of EU directives varies considerably between member states, however. This is also the case for Finland and Sweden. Despite the two Nordic countries for historical reasons having had similar government systems, upon becoming members of the EU they started to diverge. Using a model of delegation and comparing the more centralized Finnish system with the decentralized institutional setup in Sweden, we show that the Swedish approach leads to stricter than optimal environmental policy, which in turn makes EU policy non-optimal from a global point of view, ceteris paribus. We also provide empirical support for our findings in the form of some example-cases. We focus on environmental policy since this is an area that has been high on the EU agenda.

1. INTRODUCTION

This paper analyses the influence of European Union (EU) membership on the government system in two Nordic welfare states, Finland and Sweden. Recent findings suggest that the countries' responses to the membership have differed substantially: Finland appears to have been more adaptive to the management practices within the EU than Sweden. This in turn can have implications for the efficiency of EU policy. This paper contributes to the ample social science literature on how institutional factors, such as policy-making culture and traditions, influence policy convergence (Busch & Jörgens, 2005; Linos, 2007; Bednar, Jones-Rooy, & Page, 2015). It also contributes to the literature on public policy and management in multi-level government systems and the need to have mechanisms such as regulatory impact assessment (RIA) to control both the behaviour of the central government but also that of the public administration (Sunstein & Pildes, 1995; Weingast, 1995; Persson, Roland, & Tabellini, 1997; 2000; Blom-Hansen, 2005). We focus on Finland and Sweden both because they share a common history and because they became EU members in the same year in 1995.

Compared with other welfare states, the Nordic countries have highly decentralized public sectors in general and government systems in particular. They are unitary states with, traditionally, a national government level where the ministries are relatively small, and much policy work is done in the government agencies. The local government is organized at both county and municipality level, providing services such as schooling and health care and therefore collecting a large share of the tax revenue (OECD, 2020). Decision-making is characterized by cooperation and consensus. The latter also appears to have influenced the work in relation to the EU. Sverdrup (2004), for example, studied how EU and EFTA member states (MSs) complied with common rules and legislation. He found that there was a distinct "Nordic exceptionalism" in the implementation of legislation in that unlike the larger MSs, the Nordic countries have a tradition of a more consensus-seeking approach to settling disputes with limited use of courts.

One area where the EU has had a large influence on the MSs is in environmental policy. To this end, the EU has mainly used EU directives. This is a legislative act that sets out goals to be reached, but the MSs are free to choose the methods and means to achieve the stated goals and how to implement them in their own legislation. In Sweden, this appears to have resulted in over-implementation (Olsen Lundh, 2014; Darpö, 2019), i.e. Swedish law is more ambitious than required by the directives. The EU has also tried to influence policy-making through its work on Better Regulation, which started in 2000.[1] The focus of this work is on the use of RIA in the development and revision of legislation.

[1] This was introduced by the European Commission in 2000 as part of the Better Regulation Action Plan (European Commission, 2002).

Recent research has illustrated how administrative and/or political culture and institutions influence how RIA has been implemented (De Francesco, 2012; De Francesco, Radaelli, & Troeger, 2012; Radaelli, 2020; 2021). According to OECD (2019), there is still "a substantive gap between the outward commitment and [its] effective use in practice". Regarding the countries in focus in that study, Finland was a late adopter of RIA practices, but this work is now located at the Prime Minister's office, i.e. at the highest political level. RIA is regularly done ahead of the negotiations preceding new EU legislation. This is not the case in Sweden, where the focus of impact assessments is on reducing administrative burdens for businesses (OECD, 2019). Moreover, in Sweden, the responsibility for impact assessments lies with government agencies.[2]

In a comparative analysis, it is difficult to isolate the effects of various explanatory variables, such as institutions versus political culture or policy-making traditions, since many factors vary across countries. This is one of the reasons for our choice to focus on two Nordic countries, Finland and Sweden. The two countries share a common history, and both became members of the EU in 1995.[3] Furthermore, they are both located in northern Europe and have similar characteristics regarding population, industry and geography, which are factors that influence how EU legislation should be implemented. However, as discussed by Laegreid et al. (2004), their attitudes to the EU differ, with Sweden aspiring to change the EU to "fit its own image" and Finland wanting to adapt to existing EU structures. Finland therefore early on made major changes to its government system. This also appears to have influenced the "outcome" in that the country avoided "over-implementing" EU legislation. This is our second reason for focusing on these two countries; according to a recent study done among Swedish government agencies, Finland is often seen as a role model regarding its work in relation to the EU (Jacobsson & Sundström, 2020). Finland is also ranked higher than Sweden in an international study on the efficiency of public administration, being ranked first for the indicator *policy-making* (International Civil Service Effectiveness [InCiSE] Index, 2019)[4].

Today, a major difference between the government systems of Finland and Sweden is that in Sweden, the small ministries and autonomous government

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[2] At the time of writing (April 2023), it appears that changes are underway in Sweden. A proposal for a revised government ordinance has been through a referral process and questions have been raised on the need to establish an Implementation council, as has been done in Denmark.

[3] See e.g. Lindqvist (2013). For about 700 years from the 12th century to 1809, Finland and Sweden were one and the same country. They were ruled by the same king and the same parliament, from the capital Stockholm. The (Swedish) constitution from 1772 applied in Finland (under Russian rule) until a new constitution was adopted in 1869. In Sweden, the 1772 constitution was upended already in the early 1800s, after the splitting of the country.

[4] The efficiency of public administration can be examined in many ways. One is suggested by the InCiSE project (International Civil Service Effectiveness (InCiSE) Index, 2019). The report studies 12 indicators each comprising 2–6 "themes", and appraises the public administrations in 38 developed economies, including Finland and Sweden. The indicator of most interest for this study is *policy-making*, consisting of four themes: the quality of policy advice, the degree of strategic planning, the coordination of policy proposals across government and the degree of policy monitoring during implementation. Finland has an especially high score for strategic planning. Sweden is ranked number 6 for this indicator.

agencies remain. Furthermore, the responsibility for regional development, environmental policy and the EU cohesion policy has been decentralized. Finland on the other hand has transferred work from the government agencies to the ministries and reorganized the administration at the county (regional) level. To analyse how this may influence policy outcomes and economic efficiency, we develop a stylized delegation model and compare the more centralized Finnish system with the decentralized institutional setup in Sweden. Our hypothesis is that there is a difference in policy-making and the work in relation to the EU due to the changes that have been introduced in the Finnish government system. With larger government ministries, less power given to government agencies, changes made at the regional level and more input from research, we think that transparency, accountability and flow of information have been improved, making policy-making and its outcome more efficient.

The paper is structured as follows. In Section 2, we compare the government systems in Sweden and Finland. We also include the regional level. Based on this, we build a theoretical model that is used to analyse how the distribution of information may influence policy diffusion, learning and outcome. In Section 3, we set up a simple model of two small open economies within the EU, and in Section 4 we study how different ways of delegating the implementation of EU directives influence the choice of domestic policies. Section 5 provides some empirical support for our model, and Section 6 summarizes and discusses our findings.

2. FINLAND AND SWEDEN – DIFFERENT APPROACHES TO THE EU MEMBERSHIP

In this section, we start by describing the background of institutional changes in Sweden and Finland after their accession into the EU in 1995. Thereafter, we give an overview of the outcome regarding the institutions working with environmental policy and its implementation.

2.1. Institutional change

When it comes to policy-making, Nordic exceptionalism has attracted much interest from scholars and policy-makers (Hilson, 2011). Characteristics of the Nordic model include the welfare state, a corporatist tradition of negotiations between the parties of the labour market, the faith in the ability to create the good society, and a strong emphasis on decision-making (and revenue collection) at the sub-national level. Finland and Sweden have a common history that has shaped their government systems. At the time when many of the institutions that are now part of their government systems were established, they were one and the same country. Hence, both countries have autonomous municipalities at the local level, (have had) county administrative boards at the regional level and autonomous government agencies at the national level connected to the various government ministries. Both countries, when becoming members of the EU, were also influenced by the international literature on new public management (NPM)

(Molander, Nilsson, & Schick, 2002; Temmes, 1995; 2003; Molander, 2017).[5] This entailed deregulation, privatization, changes to the government system and new management practices in the public sector.

Regarding Finland, Temmes (1995; 2003) describes the changes in the government system before and shortly after the country became a member of the EU. He notes that Finland at an early stage analysed how it, being a small country in the periphery of the EU, could adapt its government system to create functional channels to the EU institutions. According to him, this caused centralization in the administration in order to increase control and coordination. He also notes that this process was influenced by top-level civil servants that (Temmes, 1995, p. 258): "… have important roles as pioneers and as administrative thinkers in reforming the structures and systems in the administrative machinery." He also discusses the difference between the administrative model of the Nordic countries and that of the EU, and the need for newcomers in the EU to learn new procedures as quickly and effectively as possible. Finland therefore made investments in competence building about EU in the administration.

In practice, the Finnish discussions resulted in a change in the constitution where the Prime Minister and not the President was given the responsibility to inform the Parliament of Finnish EU policies. A grand committee of the Parliament for the communication and coordination on EU matters was established. Raunio and Wiberg (2001) note that this is where Finland and Sweden diverge: the Finnish Parliament has been much more informed and involved in the positions taken by the Government in its work in relation to the EU. There has also been a change in the work performed in the ministries, where "the traditional Swedish type of committee institution" has almost disappeared (Temmes, 2003). Moreover, Temmes (1995) concludes that the "former Swedish-type two-level central administration" has shrunk and more work is done by the ministries themselves, instead of in government agencies, implying increased centralization. Regarding the vertical division of labour in EU matters, a question he raises is what can be expected from the responsibility given to the regional level regarding the structural funds.

From the above, it can be concluded that the actual influence of EU membership on the government system and its development turned out to differ substantially between the two countries. There also appears to have been more discussion in Finland regarding the need to adapt the government system to the federal system entailed by the EU membership. In Sweden, the following quote by Nilsson (1999, p. 80) illustrates that a few years after the EU accession, there seemed to be frustration regarding the lack of analysis in the administration of EU matters: "Our ability to influence our future relies on active domestic commitment, initiative and formulation of an agenda on the international stage, combined with

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[5] Molander et al. (2002) note that the central government offices should receive more resources in order to reach the size, level of competence and authority required for doing their job. Molander (2017) also identifies the need for an independent agency that would evaluate the work done in the administration. This is expected to contribute to transparency, accountability and development, and he concludes that this is missing for e.g. environmental policy.

dissemination of information about the positions taken. It seems to me that transportation is not the only sector in which there is a need to take the new conditions for political decision-making more seriously" (our translation).

2.2. Institutional set-up for environmental policy

Between 1987 and 2022, the Ministry of the Environment had the main responsibility for environmental policy in Sweden. The main environmental agencies are the Swedish Environmental Protection Agency (SEPA) and the Agency for Marine and Water Management. The agencies are, relatively speaking, independent of the government. However, there are close informal and formal contacts between the ministries and the agencies, and many civil servants can, over the course of their careers, move back and forth between them (Molander, Nilsson, & Schick, 2002; Hansson, 2019). In addition to the agencies, there are expert authorities. For example, the Swedish Meteorological and Hydrological Institute (SMHI) serves an important role in providing environmental data on air and water quality.

An environmental objective system (EOS), established in 1999, guides policy. The decision to adopt the EOS was made by the Parliament, but it is not a law that can be challenged in a court (Swedish Environmental Protection Agency, 2023). Around the same time, an environmental code was also adopted to harmonize with EU legislation (Government Environmental Code Commission, 1996; Duit, 2007). According to Swedish Government Bill 1997/98:145, the EOS was a way to reach the Government's vision of a sustainable Sweden. It was also, together with the environmental code, a way to decentralize the work on improving the environment, for example by allowing the business sector to contribute with their own initiatives. The ambition level is high: a government report to the parliament (Regeringens skrivelse 1994/95:167) states that the highest ambition level among EU countries will be the benchmark in Sweden's work within the EU and a lowering of standards should not be applied in Sweden. It is also clearly stated that Sweden wants to be a driving force in the development of environmental policy in the EU based on the view that a proactive environmental policy can benefit economic growth.

Currently, the responsibility for achieving the 16 EOS is delegated to 26 government agencies, although at the national level, the SEPA has a coordinating role. Among the agencies that are in some way responsible for the EOS are the Energy Agency, the Board of Agriculture, the Forest Agency, the Agency for Marine and Water Management, the National Heritage Board, the Agency for Economic and Regional Growth, the Transport Agency and the Transport Administration (Sveriges miljömål, 2022). Eight of the agencies are responsible for coordinating the monitoring of specific environmental quality objectives. This delegation has been criticized by the OECD (2007), which states that there are conflicts between environmental goals and other societal goals that are not managed at the central level, and that these conflicts are instead left to sub-national levels in the government system to solve. The sub-national government entities often do not have either the requisite knowledge or the tools to do this work.

There are 21 counties at the regional level. They are governed both by county administrative boards (a central government agency) and by directly elected so-called Regions with their own administrations.[6] The administrations at this level are assigned responsibilities in the EOS.[7] To some extent, this work is guided by the government agencies at the national level. The Energy Agency for example provides funding and support to the County Administrative Boards for strategic work with climate and energy, and to the Energy Offices, which often are part of the regions. SEPA on the other hand supports the County Administrative Boards in their work with the environmental objectives. Environmental data are also collected by RUS (the regional development and collaboration in the work with Sweden's environmental goals).[8]

Finally, the Swedish Agency for Economic and Regional Growth has the responsibility for developing practices for and supporting government agencies in their work with RIA. The Better Regulation Council, established in 2008 (Dir 2008:57), is located in conjunction with this Agency. The Council's task is to examine the impact of new and changed regulations on the regulatory pressure on firms and enterprises. Hence, the Council does not examine whether an RIA has been performed or its quality, but only whether the consequences for businesses have been sufficiently studied ahead of new or changed regulations. The parts of the Swedish administrative system relevant for this paper are depicted in a simplified form in Figure 1.[9]

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[6] The regions are mainly responsible for health care, but also public transport and regional development.

[7] How this is done in practice is under development. The Swedish Agency for Economic and Regional Growth (2020) highlighted e.g. the need to differentiate the programmes offered between regions.

[8] Environmental information is found on several websites: rus.se, scb.se, naturvardsverket.se, energimyndigheten.se, smhi.se/data, sverigesmiljomal.se/fakta-och-statistik etc.

[9] It is worth noting that the structure of the Swedish government ministries is not fixed. Therefore, after the change of governments in 2022, the ministries of enterprise and environment were merged into a Ministry of Climate and Enterprise. This led to changes in the organization of government agencies, too. For example, the Swedish Energy Agency, which during the previous government sorted itself under the Ministry of Infrastructure, was moved under the new ministry. Historically, the Energy Agency has moved between the Ministry of Infrastructure and the Ministry of Environment, changing "ministries" several times.
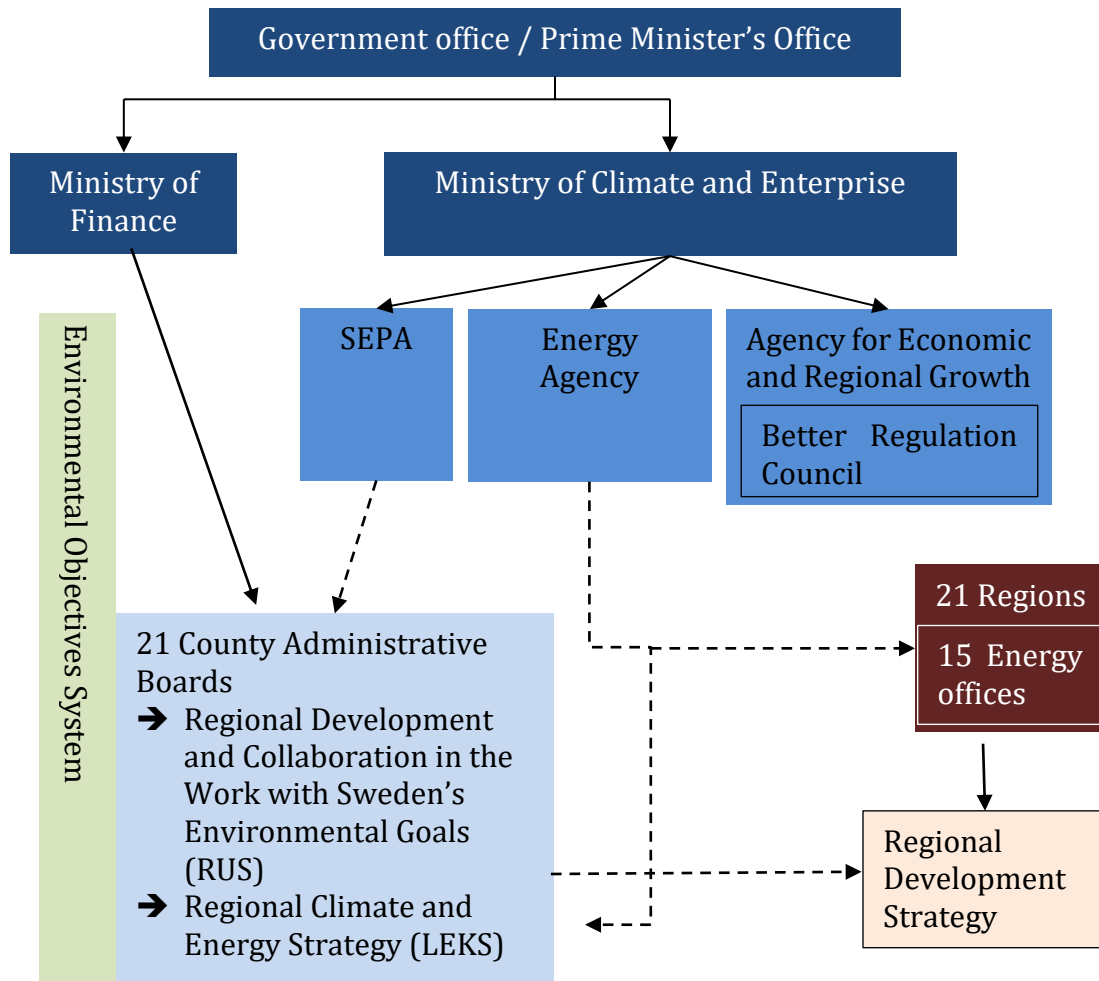
Figure 1. An illustration of the main administrations working with environmentally sustainable development in Sweden in 2023. In dark blue are the ministries at the national level, medium blue the government agencies at the national level and light blue at the regional level. Regions are separate, directly elected administrative bodies and therefore marked in dark red. The environmental objective system, in green, is the responsibility of the Ministry of the Climate and Enterprise. Domestic strategies, depicted in beige, are developed by the Regions with support from the County Administrative Boards, the arrow indicating that this work is also related to the EOS. Otherwise, the solid arrows indicate delegation and the dashed lines indirect activities such as support or funding.

In Finland, the Ministry of the Environment is in charge of developing and implementing environmental legislation. The ministry consists of several departments dealing with different kinds of environmental issues: natural environment, built environment and environmental protection (Ministry of the Environment, 2022a). If delegation is necessary, the Ministry can delegate to the 15 Centres for Economic Development, Transport and the Environment (the ELY Centres) (Ministry of the Environment, 2022b). These centres were established in 2010 together with six regional state administrative agencies, each of which covers several regions.[10] These replaced the 18 county administrative boards that were dismantled in 2010. The ELY centres together with the ministry and a

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[10] A seventh regional state administrative agency in the autonomous area of Åland is named the State Department of Åland.

research institute, the Finnish Environment Institute (SYKE), provide information on the state of the environment through one source: Environment.fi.

The ELY Centres belong to the administrative branch of the Ministry of Economic Affairs and Employment but are also steered by other ministries since they deal with cross-sectoral issues. In addition to environmental issues, they also play a role in the promotion of regional business policy and transport-related issues (Centre for Economic Development, Transport and the Environment, 2022). They perform environmental impact assessments (Darpö, 2019). In matters related to environmental permits, the Ministry of the Environment directs the Regional State Administrative Agencies, four of which issue environmental permits (Ministry of the Environment, 2022b). Even SYKE has some administrative tasks, above all concerning issues falling under the Ministry of Agriculture and Forestry, pertaining to the use and quality of water (Ministry of the Environment, 2009). The Forest Agency is responsible for nature conservation (Ministry of the Environment, 2022b). The setup of the Finnish administrative system relevant for this paper is depicted in a simplified form in Figure 2.
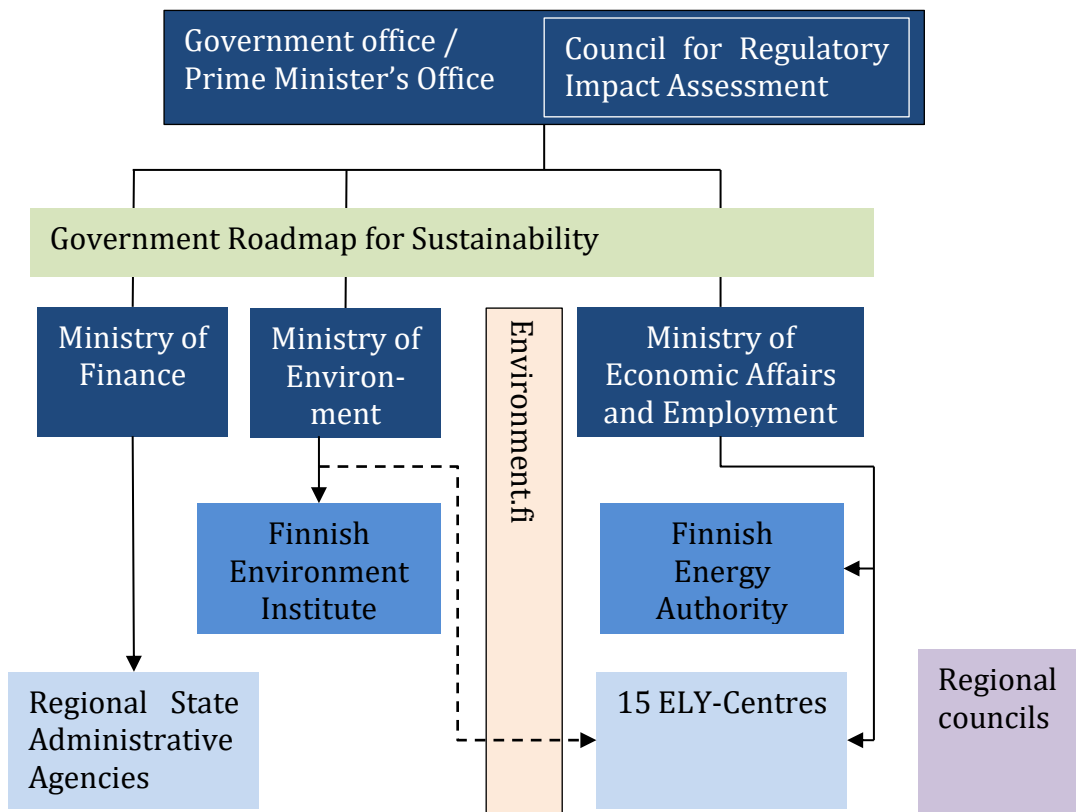

Figure 2. An illustration of the main administrations involved in environmental policy in Finland. In dark blue are the ministries, in medium blue the Finnish Environment Institute and an agency at the national level and in light blue the regional level. The Regional councils are separate elected bodies and therefore marked purple. Data and information about the environment are coordinated at the national level. The strategy for sustainable development is determined by the Government. The solid arrows indicate delegation and the dashed lines indirect activities.

Table 1 compares the Finnish and Swedish public administrations with regard to the delegation of responsibility for a number of environment-, transport- and

regional development-related tasks. As is clear from the table, the Swedish public administration is much more fragmented than the Finnish one. We will return to the consequences of these differences in Section 3.

Table 1. A comparison of agency competences in Sweden and Finland

Task	Responsible in Sweden	Responsible in Finland
Regulatory impact assessment	Agency for Economic and Regional Growth, Swedish National Financial Management Authority, SEPA for the use in the EOS system	The Finnish Council of Regulatory Impact Assessment at the Prime Minister's Office
Environmental protection and conservation	SEPA, County Administrative Boards	ELY Centres
Monitoring of the state of the environment		
Management of the cultural environment	National Heritage Board	
Guidance of land use and construction activities	Swedish National Board of Housing, Building and Planning	
Road maintenance	Transport Administration	
Road projects		
Traffic safety		
Transport system management	Transport Agency	
Public transport		
Regional business policy	Agency for Economic and Regional Growth	
Environmental permits	SEPA, County Administrative Boards	Regional State Administrative Agencies (AVI)
Use and quality of water	Agency for Marine and Water Management	SYKE
Expert services on the environmental area for relevant ministries	SEPA	
Nature conservation	SEPA, Swedish Forest Agency, Swedish Agency for Marine and Water Management	Metsähallitus

Sources: Centre for Economic Development, Transport and the Environment (2022), Ministry of Environment (2009; 2022b), https://www.regeringen.se/, https://www.sverigesmiljomal.se/.

3. A MODEL OF THE INSTITUTIONAL STRUCTURE AND THE ECONOMY

Given the differences in the setup of national administrations, we will develop a model to analyse the impact of implementation of EU legislation on economic efficiency. The EU's preparation process for directives usually includes an RIA. Moreover, a directive is designed to allow for the differences that exist between member states. The air quality directive, for example, defines that measurements should be made in agglomerations exceeding 250 000 inhabitants, but for smaller communities, the member states can set their own population density limits defining when the legislation should apply. The latter because population exposure and the external health cost is higher in densely populated areas. Since directives also aim for certain goals to be achieved, they also include requirements regarding measurement. The Court of Justice of the European Union (CJEU) has for example in Case C-723/17 Craeynest regarding the air quality directive stated that the very purpose of the directive would be

compromised if sampling points were located in such a way that exceedances of air quality limit values would not be detected. There can however also be exemptions. According to the water quality directive, member states can declare some waters heavily modified, which means that not all the environmental standards need to be achieved.

Once EU policy is determined, the directive has to be transposed into domestic law in the MSs and implemented. The focus here is differences between Finland and Sweden in this process of implementation, especially differences in whether an RIA is performed and whether the countries use the possibilities for exempting certain areas or pollutants from the legislation. We start by describing the institutional setup. Thereafter, we construct a simple model of a small open economy. In Section 4, the policies chosen under various institutional arrangements are calculated.

3.1. The institutional setup of the model

Figure 3 shows a stylized model of the government structure in the two countries, one with a decentralized governance structure (Sweden) and one with a centralized governance structure (Finland). The figure is an adaptation of the model of decision-making in firms that has been used by many authors, e.g. Milgrom and Roberts (1992) and Martin (1994). The administrative system of Finland is then seen as a "vertically integrated" one, while the Swedish system is a "delegating" one. Reasons given for vertical integration include increased efficiency, i.e. that negotiations with many actors entail large transaction costs, bounded rationality, i.e. a better control over the enterprise and increased flexibility, and hindering opportunism, i.e. inducing the employees to act in the respective organization's interests (Martin, 1994).

Once an EU directive is ready for implementation in an MS, the government ministry responsible for the implementation will have to decide whether it wants to obtain more information about the impact of regulation on the regional and/or local level of the country. If the decision is "no", the government obtains no more information and implements a uniform policy in the entire country. However, even at this stage there is a difference between the two countries: In Finland, the government ministry nevertheless has the capability to assess the impact of the regulation on the economy as a whole. In Sweden, the government ministry does not have this capability but will have to make policy without any further information.
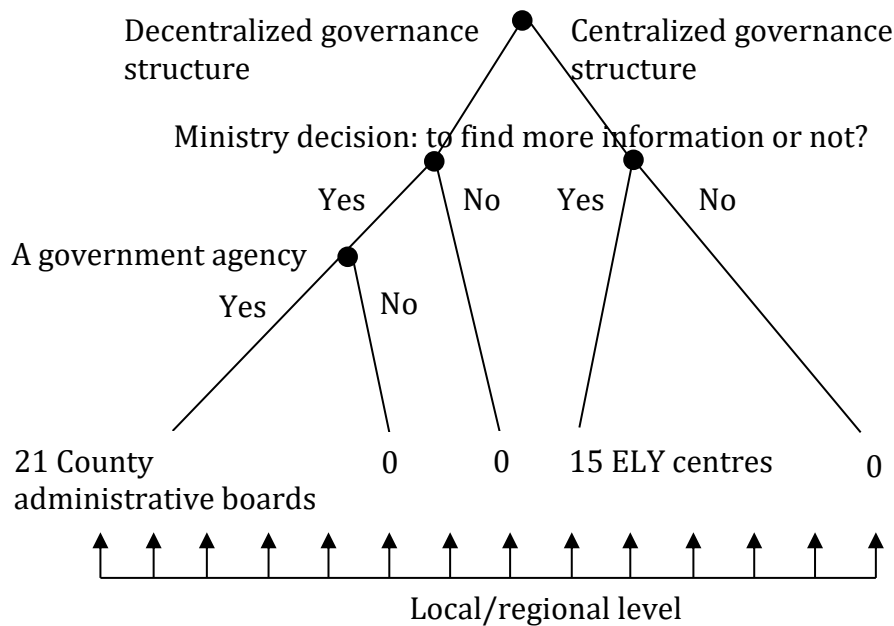
Figure 3. Two governance structures: a decentralized (fractured) and a centralized one, and the paths to information about the local level these lead to. Adapted from REF.

If the decision is "yes", the two countries diverge further from one another. Looking at the right-hand side of Figure 3 first, in a centralized country a government ministry itself has the capacity to order the analysis, and the RIA-maker can obtain more information from the local offices of the 15 ELY centres. These centres can provide information on the consequences of the policy for at least the economy, environment and transport system in their local area.

In a country with a decentralized government structure (the left-hand side) the government ministry is small and does not have the capacity to perform the necessary analysis alone. Instead, it delegates the task of obtaining information to a government agency selected depending on the issue at hand. The agency, depending on its competence, makes another decision of whether to obtain more information. If it decides that no more information is needed, no more information is obtained, and the government will consequently have to implement a uniform policy in the entire country.

However, the agency may also decide to obtain more information. If so, it turns to the 21 county administrative boards, which, after several reforms where tasks have been removed from them, mainly deal with environmental policy and rural issues. The county administrative boards are then able to provide information about these aspects to the agency, which in turn reports its findings to the ministry. Given the information obtained, i.e. how the proposed legislation might affect the environment in each region, the ministry then decides whether to differentiate policy across regions or not.

There are two sources of possible inefficiencies in our model, which we will study: the inefficiency that arises from a uniform policy when the pollutant is a local one, and that arising from the information obtained by the government agencies. In the centralized governance structure, the government will get

information about several aspects of the policy (defined more closely below), while in the decentralized governance structure the government only gets information about the environmental consequences of the policy.

We do not have enough information to assign any probabilities for the "yes" and "no" decisions by the government ministry or the agency. However, as an illustration we could assume that the probability of wanting more information is 50 per cent at each node. Thus, in the centralized country, the ministry will with a 50 per cent probability obtain more information about the local consequences of a policy and how the policy could be differentiated across the country to mitigate eventual negative consequences. In the decentralized country, the probability of obtaining this information is 50 per cent times 50 per cent, i.e. 25 per cent, since both the ministry and the agency will make the decision with a 50 per cent probability. Thus, ceteris paribus, the decentralized country is much less likely than the centralized country to find out information about the consequences.

3.2. The economy

Assume an economy consisting of EU and its two MSs, $i \in \{F, S\}$, both of which consist of two regions, $r \in \{1,2\}$. We normalize the geographical area of each region to one and denote the population of each region by n_{ir}, where we assume that $n_{i1} \gg n_{i2}$. Each MS is assumed to be a small open economy, thus taking the price of the traded good, y, as given: p_y. Moreover, we assume perfect competition in all sectors.

There are two consumption goods in the economy: a numeraire, x, and the traded good y. While good x is produced using labour only, good y is produced using a decreasing-returns-to-scale technology with two production factors, labour, l, and emissions, ϵ.[11] The production set Y is convex. In each region, there are m_{ir} identical firms that produce good y. We assume that the number of firms in region 1 greatly exceeds that in region 2: $m_{i1} \gg m_{i2}$.

Labour and emissions are imperfect substitutes to one another.[12] We assume wages, w, to be constant. The shadow price on emissions is denoted λ_{ir}, and the restriction creating it is $E_{ir} \geq m_{ir}\epsilon_{ir}$ if the emissions are regulated at the local level, and $E_i \geq m_{i1}\epsilon_{i1} + m_{i2}\epsilon_{i2}$ if a uniform regulation is imposed on the entire country. $E_{i1} + E_{i2} = E_i$ are the emissions allowed for country i by the EU directive, and it is up to the country to allocate the emissions between its two regions. This gives us the profit-maximizing condition for firms producing y in each of the two countries i and regions r:

(1) $\qquad \max p_y m_{ir} y(l_{ir}, \epsilon_{ir}) - w m_{ir} l_{ir} + \lambda_{ir}[E_{ir} - m_{ir}\epsilon_{ir}],$

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[11] Including emissions arising from consumption would not change the model's basic predictions.
[12] We interpret the labour input broadly: it represents all factors of production except emissions. Thus, both capital and the institutional quality of the country where production takes place can be seen to be incorporated in the labour input. Therefore, it captures all inefficiencies associated with regulation. Of course, *optimal* internalization of external effects, i.e. the emissions, does not lead to a deadweight loss, even though in our model, some labour will be vacated.

$$\text{where } E_i \geq E_{i1} + E_{i2}$$

(2) $$\max p_y m_{ir} y(l_{ir}, \epsilon_{ir}) - w m_{ir} l_{ir} + \lambda_i [E_i - m_{i1}\epsilon_{i1} - m_{i2}\epsilon_{i2}]$$

Equation (1) is applicable if the emissions are differentiated at the local level and equation (2) if there is a uniform regulation for the entire country. With no environmental policy in place, $\lambda_{ir} = 0$. We assume that the result of the policy is not certain, however. Differentiating equations (1) and (2) with respect to emissions, we can solve for the expected impact of local or national policy, respectively:

(3) $$\mathrm{E}(\lambda_{ir}) = p_y \frac{\partial y_{ir}}{\partial \epsilon_{ir}} + d_{ir},$$

(4) $$\mathrm{E}(\lambda_i) = p_y \frac{\partial y_{i1}}{\partial \epsilon_{i1}} + d_{i1} = p_y \frac{\partial y_{i2}}{\partial \epsilon_{i2}} + d_{i2}.$$

E in equations (3) and (4) is the expectations operator and d_{ir} is a uniformly distributed error term in range $[-D, D]$ with a mean of zero.[13] Knowing the cost of environmental policy, we can solve for labour demand and emissions in sector y as functions of the prices $l_{ir}\left(p_y, w, \mathrm{E}(\lambda_{ir})\right)$ and $\epsilon_{ir}\left(p_y, w, \mathrm{E}(\lambda_{ir})\right)$, respectively. We assume that both labour demand and emissions increase in the output price of good y, and that both fall in the prices of the two inputs. Since both p_y and w are constants, both labour demand and emissions can be expressed as functions of the environmental policy (the shadow price) only.

Since production is assumed to take place in each of the four regions, emissions, too, arise from all regions. We denote damages from pollution by $\delta(e)$. Damages are assumed to be exponentially increasing in emissions: $\delta'(e) > 0, \delta''(e) \geq 0$. They are either local (only affect the region where emissions take place) or global (i.e. affect the entire EU, $i \in \{F, S\}$). This means that there may be spillovers of emissions from one region to another. We denote spillovers $\kappa \in [0, 1/4]$, with $\kappa = 0$ denoting no spillovers (a local pollutant) and $\kappa = 1/4$ a uniformly mixing (global) pollutant (Besley & Coate, 2003).[14] We assume κ to be constant for all four regions for each respective pollutant.

Normalizing the price of the numeraire good, x, to one, the representative citizen in each region has continuous, quasi-linear preferences:

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[13] This form of policy outcome is similar to that of e.g. Bendor and Meirowitz (2004), who study models of delegation in Euclidean spaces.

[14] Intermediate values of κ in the range $[0, 1/4]$ are of course also possible and indicate an increasing degree of spillovers. However, we found it difficult to imagine a type of emissions that exactly follows the national borders, thus creating a truly national external effect. For this reason, we analyse only the extremes. For a more realistic depiction of spillovers, we could use a gravity model of spillovers, the impact of a pollutant decreasing in distance (except for the global pollutants). This goes beyond the scope of the present paper, however.

$$U_{ir} = x_{ir} + p_y y_{ir}^c$$

$$- \delta \left[(1 - 3\kappa) m_{ir}\epsilon_{ir} + \kappa m_{i,-r}\epsilon_{i,-r} \right.$$

$$\left. + \kappa \sum_{-i,r=1}^{2} m_{-i,r}\epsilon_{-i,r} \right].$$

y_{ir}^c denotes consumption of good y in region r of country i. Utility then equals utility from consumption minus the disutility from own emissions, adjusted for the emissions "exported" to the other regions, and minus disutility from "imported" emissions. In order to keep the notation simple, we denote the downfall of emissions in each region by $e_{ir} = (1 - 3\kappa) m_{ir}\epsilon_{ir} + \kappa m_{i,-r}\epsilon_{i,-r} + \kappa \sum_{-i,r=1}^{2} m_{-i,r}\epsilon_{-i,r}$.

Citizens get labour income from working in one of the two sectors. Labour demand in sector y in each region is given by $l_{ir}[E(\lambda_{ir})]$, and labour demand in sector x in region r of country i is assumed to be constant throughout: l_{ir}^x. A stricter environmental policy lowers $l_{ir}[E(\lambda_{ir})]$. Income in region r is then given by $w[l_{ir}^x + l_{ir}[E(\lambda_{ir})]]$, and we can write the representative citizen's budget constraint as $w[l_{ir}^x + l_{ir}[E(\lambda_{ir})]] \geq x_{ir} + p_y y_{ir}^c$. Disregarding the constant $w l_{ir}^x$, we can write the indirect regional utility function as

(5) $V_{ir} = w l_{ir}[E(\lambda_{ir})] - \delta[e_{ir}[E(\lambda_{ir})]]$ s.t. $m_{ir}\epsilon_{ir} \leq E_{ir}, \ E_{i1} + E_{i2} \leq E_i$.

The national indirect utility (welfare) function is

(6)

$$W_i = w \sum_{r=1}^{2} l_{ir}[E(\lambda_i)] - \sum_{r=1}^{2} \delta[e_{ir}[E(\lambda_i)]] \text{ s.t. } m_{i1}\epsilon_{i1} + m_{i2}\epsilon_{i2} \leq E_i.$$

EU's welfare function is given by

(7)

$$W = w \sum_{i=F}^{S} \sum_{r=1}^{2} l_{ir}[E(\lambda)] - \sum_{i=F}^{S} \sum_{r=1}^{2} \delta[e_{ir}[E(\lambda)]] \text{ s.t. } E_F + E_S \leq E.$$

The EU determines the aggregate level of environmental policy, which is differentiated across the MS in a manner that promotes cost efficiency. Optimal policy is determined by maximizing equation (5) for local pollutants and (7) for global pollutants with respect to λ_{ir} and λ, respectively, subject to $E \geq \sum_{ir} m_{ir}\epsilon_{ir}$. Moreover, a national government may use equation (6), differentiated with respect to a uniform national policy, λ_i, to set a common national policy. This yields for local, national and EU policy, respectively:

(8) $$\frac{w l_{ir}'[E(\lambda_{ir}^*)]}{m_{ir}\epsilon_{ir}'[E(\lambda_{ir}^*)]} = (1 - 3\kappa)\delta'[e_{ir}[E(\lambda_{ir}^*)]],$$

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(9)
$$\frac{w \sum_{r=1}^{2} l'_{ir}[\mathrm{E}(\lambda_i)]}{e'_i[\mathrm{E}(\lambda_i)]} = (1 - 2\kappa)\delta'\big[e_{ir}[\mathrm{E}(\lambda_i)]\big],$$

(10)
$$\frac{w \sum_{i=F}^{S} \sum_{r=1}^{2} l'_{ir}[\mathrm{E}(\lambda^*)]}{e'[\mathrm{E}(\lambda^*)]} = \frac{\sum_{i=F}^{S} \sum_{r=1}^{2} e'_{ir}[\mathrm{E}(\lambda^*)]}{e'[\mathrm{E}(\lambda^*)]}\delta'\big[e_{ir}[\mathrm{E}(\lambda^*)]\big].$$

$e' = \sum_{i=F}^{S} \sum_{r=1}^{2} m_{ir}\epsilon'_{ir}$ are the marginal emissions at the EU level. $e'_{ir} = (1 - 3\kappa)m_{ir}\epsilon'_{ir} + \kappa\big[m_{i,-r}\epsilon'_{i,-r} + \sum_{r=1}^{2} m_{-ir}\epsilon'_{-ir}\big]$, if $\kappa = 0$, $e'_{ir} = m_{ir}\epsilon'_{ir}$, and if $\kappa = 1/4$, $e'_{ir} = e'$. The asterisk ($*$) denotes optimal levels of policy. The left-hand side reflects the marginal costs of emission reduction in terms of reduced employment, while the right-hand side captures the marginal benefits. Policy then fulfils the textbook definition of optimal policy. For a local pollutant, policy is optimally determined for each region, and the optimal shadow price of policy may vary between regions depending on the respective sizes of the marginal costs and marginal benefits of emission control. For a global external effect, the shadow price on emissions should be equalized for both MSs and all four regions.

4. POLICY CHOICE UNDER DIFFERENT INSTITUTIONS

An EU directive obliges the MSs to ensure that emissions do not exceed a given target level. We assume that the EU sets a target (e.g. a level of environmental quality, a maximum concentration of a pollutant in water, soil, or air, a maximum allowed emissions from a sector, hereafter called *target emissions*) that each MS has to reach.

In an MS, the directive is transferred into national law by the national government and parliament. In this process, depending on the governance system chosen, the government may decide to 1. delegate to an agency or not (in the decentralized governance structure), 2. find out more information about the regional and/or local consequences of the policy or not, and 3. perform either a one- or multi-dimensional RIA. The structure corresponds to Figure 3. We start by examining the decisions in a centralized governance structure, decision 2. Thereafter, we turn to the decentralized governance structure, which encompasses all three steps.

A caveat is worth noting here: the way we present things, optimal policies are possible to achieve. This is of course not true – perfect information is very rarely, if ever, available. Nevertheless, a government can do more or less to obtain as good information as possible.

4.1. Centralized governance structure

In the centralized government structure, the government ministries have capacity to perform, or order, an RIA. In this process, they can turn to the local agencies for information about the local circumstances. In Finland, the 15 ELY centres deal with economic, transportation and environmental issues and are able to provide information about at least these aspects of a legislation. This gives the government the information needed to carry out multi-dimensional RIAs.

Completing an RIA means obtaining information to determine the value of d_{ir} in equations (3) and (4), and setting policy without uncertainty. In addition to performing an RIA, the ministry decides whether to obtain more information about the local/regional consequences of legislation. In case the government does not obtain more information, it sets a uniform policy for the entire country in line with equation (9). This is denoted by the policy having a shadow price, λ_i, that is equal for both regions.

We start by examining a local pollutant and summarize the findings in the following proposition:

Proposition 1. A government, setting a uniform environmental policy to regulate a local pollutant, chooses a policy that is too lax for region 1 and too strict for region 2.

Proof: The optimal policy for a local pollutant is obtained by maximizing equation (5), while the government maximizes equation (6) to set a national policy. We prove Proposition 1 by showing that a national shadow price cannot exceed the shadow price in region 1, and that the shadow price in region 2 can never exceed the national shadow price. For a local pollutant ($\kappa = 0$), we start with region 1 and set $\lambda_{i1} < \lambda_i$. Substituting in from equations (8) and (9):

$$(11) \qquad \delta'(e_{1r}) < \frac{\sum_{r=1}^{2} m_{ir} \epsilon'_{ir} \delta' \left[e_{ir} [\mathrm{E}(\lambda_i)] \right]}{m_{i1} \epsilon'_{i1} + m_{i2} \epsilon'_{i2}}.$$

Simplifying the equation yields $\delta'(e_{i1}) < \delta'(e_{i2})$. But we have assumed that the exposure in region 1 greatly exceeds that in region 2. This is consequently impossible, and it must be that $\lambda_{i1} > \lambda_i$. It can similarly be shown that it must be that $\lambda_{i2} < \lambda_i$. The government's chosen policy is thus lower than optimal for region 1 and higher than optimal for region 2: $\lambda_{i2}^* < \lambda_i < \lambda_{i1}^*$. ∎

The result in Proposition 1 is unsurprising and well established in the literature; see e.g. Baumol and Oates (1988). It states that despite performing an RIA, a government that does not differentiate policy to regulate a local pollutant but relies on a national policy instead, chooses a sub-optimal policy.

Proposition 1 does not hold for a global pollutant, however. For these pollutants, it is cost efficient to set policy so that the marginal cost of emissions reduction is equal everywhere and for all firms. Thus, it falls on the EU to propose emission regulation that equalizes the marginal cost of regulation in both countries, ceteris paribus. The centralized country, in turn, chooses optimal policy by maximizing equation (6) subject to its emissions not exceeding the EU's target emissions: $e_{i1} + e_{i2} \leq E_i$. The solution is shown in equation (9). If an RIA has been made, optimal policy can be chosen. Without an RIA, the policy outcome is random and the policy is set at a suboptimal level.

4.2. Decentralized governance structure

In a decentralized governance system, the government has very little capacity for performing RIAs. Such systems have been examined in an extensive literature on delegating, since the information-search activity may be delegated to government agencies (Bendor, Glazer, & Hammond, 2001; Epstein & O'Halloran, 1999). However, should the government decide not to delegate, it would choose policy with no information about d_{ir}. In this case, the government chooses an inefficient policy with a very high likelihood: the probability of choosing exactly the correct policy given the continuously distributed d_{ir} is zero. Whether the policy outcome under- or overshoots the optimal policy cannot be determined at the present level of generality; the probability of either happening is equally large. This is the same outcome as for the government that does not performing an RIA in the previous section.

Most of the time, then, the government of Sweden delegates to a government agency. These agencies usually have a one-dimensional policy space within which they work, however. Thus, if the issue is delegated to an agency dealing with environmental issues, it is these aspects that the agency will concentrate on. If it is delegated to an agency tasked with e.g. promoting regional growth, the agency will concentrate on this aspect.

If the agency decides not to obtain more information about the local/regional impact of a policy, it will propose a uniform national policy for the government, based on an RIA at this level. Instead of maximizing welfare as given by equation (6), it will maximize one of the following welfare functions, depending on which aspect of the policy it works with:

(12)
$$W_i^e = -\sum_{r=1}^{2} \delta\big[e_{ir}[\mathrm{E}(\lambda_i^e)]\big] \ \text{s.t.} \ m_{i1}\epsilon_{i1} + m_{i2}\epsilon_{i2} \le E_i$$

(13)
$$W_i^l = w\sum_{r=1}^{2} l_{ir}\big[\mathrm{E}(\lambda_i^l)\big] \ \text{s.t.} \ m_{i1}\epsilon_{i1} + m_{i2}\epsilon_{i2} \le E_i$$

Equation (12) is used by an agency concentrating on environmental issues and equation (13) by one dealing with economic growth and/or employment; however, not with regional growth here, since the agency does not differentiate its policy between regions. Equations (12) and (13) can be used to prove the following proposition:

Proposition 2. Solving a unidimensional environmental policy problem, regardless of whether the environmental problem is a global or a local one, results in policy that deviates from the optimal.

Proof: We prove Proposition 2 for a national-level policy. The solution for a local pollutant is analogous. Maximizing equations (12) and (13) with respect to λ_i and rearranging yields for the environmental agency and the economic growth agency, respectively:

(14) $$(1 - 2\kappa)\delta'\big[e_{ir}[\mathrm{E}(\lambda_i^e)]\big] = 0,$$
(15) $$-w\frac{\sum_{r=1}^{2} l'_{ir}[\mathrm{E}(\lambda_i)]}{e'_i[\mathrm{E}(\lambda_i)]} = 0.$$

Comparing equation (14) with the quasi-optimal policy for a global pollutant in equation (9) indicates that the environmental agency, ignoring the labour market consequences of the policy, will set a stricter than optimal policy, and in fact strengthens the environmental policy up to a point where the marginal benefit from a reduction in emissions is zero. Consequently, $\lambda_i^e > \lambda_i$, i.e. the policy that is set taking only the environmental damages into account is stricter than a policy considering all effects. The economic growth agency in turn will struggle to internalize the external effect since it only considers the negative impact on employment, thus setting a policy that is too low, $\lambda_i^l < \lambda_i$. ∎

A corollary of Proposition 2 is that the country with a decentralized governance structure will set a stricter policy governing the global pollutant than is optimal from a global point of view. Thus, the policy determined by the EU is no longer optimal, ceteris paribus.

The result from Proposition 2 carries over to a situation where the government agency obtains more information from the local/regional impact of regulation. In a similar way as in the proposition, an environmental agency obtaining only environmental information from the county administrative boards sets a too strict policy for both regions: $\lambda_{ir}^e > \lambda_{ir}$. The only question that remains is, whether an agency dealing with regional growth, but which obtains more information about a policy's impact on a regional level from the county administrative boards, which mainly deal with environmental issues, might manage to balance the two opposite impacts affecting general welfare. As the Swedish Agency for Economic and Regional Growth is not an agency primarily tasked with environmental policy, we consider this point moot and conclude that the Swedish environmental policy, due to the way in which the governance system is constructed, tends to impose stricter-than-optimal environmental policies.

4.3. Discussion: consequences for the EU

Whether the Finnish policy vis-à-vis a global externality is optimal or not depends on the policy choice in Sweden. Sweden would need to set a policy at a level that meets the EU's target policy exactly for the aggregate policy to be optimal. However, Sweden tends to set a policy that is stricter than optimal, i.e. a policy that reduces emissions more than is optimal from an economic point of view. In fact, if this were known, Finland would be able to set a laxer policy than optimal and the EU would still meet its aggregate target. This would then decrease unemployment and increase welfare in Finland, at the expense of Sweden.

The consequences of this strict environmental policy are borne by Sweden, however. We have assumed regional labour markets, and the Swedish policy may be expected to lead to greater local unemployment, i.e. less use of all other production inputs except pollution than would otherwise be the case. This

observation applies regardless of the type of externality: local or global. Therefore, the choice is Sweden's, and it does not impose a negative external effect on the EU unless we see the negative economic impact the country imposes as a negative externality on the other EU MSs.[15] Moreover, there may be additional benefits from a stricter than optimal environmental policy, such as faster progress in the development of green technologies. Whether this is the case is a question beyond the scope of this paper.

At a more general level, the results illustrate the need for MSs to understand the motives behind, and the structure of, EU legislation. The EU can be seen as a federal system, although federalism is traditionally connected to policy-making in federal states such as the USA (Petersson, 2004). However, as Weingast (1995) notes, the concept can also be used in other contexts, for example by differentiating between a formal, or "de jure", federalism and de facto federalism. Weingast defines criteria that describe systems he refers to as market-preserving federalism – a system that fosters competition among the lower political units, which imposes restrictions on the central government. Hence, a federal system's ability to limit the growth of the public sector rests on the condition that the central government cannot restrain the lower-level governments.

However, achieving efficiency in a federal system requires that the lower-level governments, in the EU the MSs, are active in the policy-making process. Vogel (2021) gives an example of how this kind of interplay between policy-making at the state and the federal levels regarding risk regulation has shaped the division of regulatory authority and pre-emption in the United States. In our example, Finland appears to have taken a more proactive approach than Sweden. That the MSs are active in the formation and implementation of EU legislation is also important from a democratic perspective. We know from previous literature that transparency and accountability to voters is reduced when the responsibility and decision-making is more fragmented (Persson, Roland, & Tabellini, 1997; 2000).

5. RELEVANCE AND EMPIRICAL EVIDENCE FOR THE MODEL

In this section, we will give some examples of how Finland and Sweden have implemented environmental EU directives. We will also discuss their frameworks related to RIA. The latter is interesting since it is a means to analyse the efficiency of (environmental) policy. We start by commenting on the reasonableness of the model of the Swedish government, however.

The Swedish approach, delineated in Proposition 2, may seem very extreme. However, from previous research we know that RIA is not an established practice in Swedish policy-making (Better Regulation Council, 2023; Nerhagen, Forsstedt, & Hultkrantz, 2017; Nerhagen & Forsstedt, 2019; Fors, 2017). According to Radaelli (2010), this can be explained by the specific culture and tradition of policy-making in Sweden, that is, by the use of government inquiries and a referral process. Regarding environmental policy, it was only in 2010 that the

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[15] Given the many schemes the EU has adopted over the years to boost economic growth in the Union, this may indeed be the case.

SEPA was commissioned to develop the use of cost-benefit analysis in its work with the EOS (Government Proposition 2009/10:155). Since then, some evaluations of how the method is applied have been made (Söderholm, 2014; Wallström & Söderqvist, 2017; Swedish Environmental Protection Agency, 2020).[16] A change of practice might however be underway based on a proposal for a new law presented by the Ministry of Finance (2022).

A couple of examples can be used to illustrate that Proposition 2 is relevant for the Swedish policy-making context. The first is the above-mentioned evaluation by Söderholm (2014, p. 10), who gives a number of examples where the direct costs of an action (e.g. to achieve a goal of reducing noise indoors, or of reducing energy consumption in buildings by a certain amount) have been quantified by government agencies. However, the problem he identifies is that these estimates only weakly reflect the true costs of the actions. These analyses focus on market prices and do not include all relevant societal effects such as external costs of the investments, for example noise emissions from windmills. Moreover, they disregard questions such as which policy instruments must be implemented, the cost of implementing these policy instruments and how high *de facto* costs the actors face due to the policy instruments, e.g. transaction costs or losses of consumer or producer surplus. Moreover, the quantification of the benefits of regulation is also of poor quality.

The second example is from a government inquiry that proposed a framework for climate policy in Sweden (SOU 2016:21). A goal of zero net emissions of greenhouse gases in year 2045 was proposed, 85 per cent of which will have to be reached in Sweden and 15 per cent can be bought from abroad in the form of emissions reductions there.[17] The inquiry quantified the costs using the TIMES-Sweden model, but only after it had already decided its conclusions, i.e. the cost estimates in no way influenced its recommendations. Our third example is from a statement made by the Ministry of the Environment in preparation for the planned revision of the EU's air quality directive (Ministry of the Environment, 2022). The pro memorandum states, as a matter of fact, that an RIA of the possible consequences for Sweden has not been carried out. Instead, it claims that the benefits and costs, i.e. the outcome of the RIA performed for the entire EU, also apply to Sweden, and concludes that the benefits will exceed the costs. This conclusion is in contrast to information presented by the European Environment Agency showing that zero per cent of the population in urban areas are exposed to concentrations above EU air pollution standards in Sweden[18].

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[16] Wallström and Söderqvist (2017) calculate different types of analyses that have been made, and SEPA (2020) examines whether SEPA's guidelines for performing a problem analysis have been used. Both are of little interest for this study since they do not e.g. calculate the number of analyses performed out of a possible total or evaluate the general quality of the analyses. The latter aspect is, to some extent, assessed by the Better Regulation Council, which gives opinions about the completeness of RIAs with respect to the analysis of consequences for firms and enterprises. The Council disregards the societal costs more generally, however. Nobody in Sweden gives a comprehensive picture of the use of RIAs in the preparation of legislation, or of the quality of the RIAs conducted.

[17] In 2016, the EU's target was zero net emissions in 2050.

[18] www.eea.europa.eu/themes/air/country-fact-sheets/2021-country-fact-sheets/sweden. Accessed 6 April 2023.

In Finland, the policy preparation and negotiation phases ahead of EU legislation were studied in 2014 (Uusikylä, Ahonen, & Takanen, 2015), and the Finnish Council of Regulatory Impact Assessment was created in conjunction with the Prime Minister's office and began work in 2016. According to the OECD (2019), an RIA nowadays is regularly performed ahead of strategically important negotiations. The Government adopts an annual plan for analysis, assessment and research that underpins policy decision-making and steers analysis, assessment and research activities towards specific priority areas selected by the Government. Under the leadership of the Prime Minister's Office, the Government working group for the coordination of research, foresight and assessment activities oversees the formulation of the plan. The working group includes experts from all administrative branches. There are also joint analysis, assessment and research activities coordinated by the Government, which generate information that supports decision-making procedures, work practices and management by knowledge (Prime Minister's Office, 2022).

The Finnish Council of Regulatory Impact Analysis makes a yearly synthesis of its work. In its latest summary (Finnish Council of Regulatory Impact Assessment, 2023), it notes that during 2022, it presented 43 statements altogether, covering about 12 per cent of all government proposals.[19] The Council has made statements both of government proposals that are of broad societal and economic importance, and of proposals of less broad importance that nevertheless have societal and economic impacts. The Council notes that while the quality of the RIAs has increased over time, its recommendations are still not followed to a high enough degree. It recommends that more resources at the ministries should be directed towards preparing legislation in multi-disciplinary teams, and that the government's program, instead of dictating the means to reach a goal, should concentrate on defining the goal. Finally, the Council wants its position to be written into legislation, instead of the present *ad hoc* arrangement.

Finally, two examples show that Finland and Sweden have implemented EU directives differently when they could be expected to be similar. The first example is the air quality directive. Finland implemented the limit values in line with the directive (Kukkonen, Salmi, Saari, Konttinen, & Kartastenpää, 1999), while Sweden chose a more strict implementation (SOU 2015:27). For example, Finland identified and deducted the contribution from sanding and salting of icy roads in the measurement of particulate matter (PM 10) while Sweden did not, despite sanding and salting in the winter being used in both countries.

The second example concerns the action plan that all member states had to submit in 2016 following Directive 2014/94/EU on the deployment of alternative fuels infrastructure. In the evaluation done by the EU (SWD 365), it was concluded that while Finland had fulfilled all obligations, Sweden had not and needed to send in a revised and updated version (Hansson, 2019; Nerhagen, Jussila Hammes, & Pyddoke, 2021).

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[19] Down from almost 20 per cent of all government proposals, 45 statements altogether in 2021; the difference is mainly due to a much larger number of proposals in 2022 than the previous year.

6. SUMMARY AND CONCLUSIONS

This paper describes how EU membership has shaped the government systems in two Nordic countries Finland and Sweden, and the possible implications of this on the efficiency of EU policies. An overview of the actions taken by the two countries to adapt their state administrations to their accession to the EU leads us to conclude that from the beginning the strategies with regard to the EU that the countries chose differed greatly. While Sweden had the ambition of changing the Union, not least regarding its environmental policy, Finland wanted to learn "the rules of the game" as fast as possible. Regarding the administrative system, Sweden has kept the administrative model established centuries ago, which implies much more delegation of preparatory work to government agencies. Sweden also has high ambitions for its environmental policy, which is guided by an environmental objective system. In contrast, Finland has modified its government system compared with the pre-EU era, which has resulted in more government control and enabled strategic work on EU matters. Early on, it also established processes for cooperation between the government and the parliament on EU matters, thus enhancing the democratic legitimacy of its EU policy.

From the literature it is clear that the organization of a government influences policy- and law-making. To study the impact of institutional design on policy outcomes, we analyse a model of a small open economy with emissions resulting from the production of a traded good. The emissions can have either local or global impacts. We conclude that the administrative system in a country can influence the effectiveness of environmental policies. The reason is that with a higher degree of delegation and specialization, it is less likely that a thorough analysis that includes more than one or a few of the consequences of legislation is performed. Inefficiencies in our model can arise from two distinct sources: first, a government imposing a uniform national policy when a pollutant is a local one generates inefficient policies when the regions constituting a country differ from one another and the marginal cost of emissions thus varies spatially, and second, imperfect information, whether it arises from government ministries too small to perform the analysis themselves or from delegating analysis-making to agencies with too narrow (unidimensional) agendas. A third possible source of inefficiency, not included in the model, is that the EU's policy may be wrong to begin with, possibly due to insufficient input from the member states.

The main consequence of ineffective environmental policies is a drag on the economy. Therefore, a logical way of examining its impacts would be to look at the development of some measure of economic welfare in the countries concerned. However, it is unclear from the literature whether environmental policy so far has had a detrimental effect on economic growth, i.e. evidence for the industrial flight hypothesis remains inconclusive. Our results also illustrate that deviations from an optimal policy in one country can have implications for the effectiveness of a policy at the EU level.

Moreover, our model highlights that a fragmented governmental system with much decentralization can have implications for policy-making and how well the

implementation of EU directives is adapted to country-specific circumstances. As noted, the aim of directives is to allow for some flexibility in the implementation of EU legislation. We have also illustrated with some examples that there appears to be a difference in the actual implementation between Sweden and Finland, possibly resulting from Finland having adopted the management practices of the EU and being proactive in the legislative process. For future research, in order to gain a better understanding of the differences in outcome, it could be interesting to systematically study some cases from the infringement database, or to catalogize the RIAs that have been made in both countries vis-à-vis EU directives, and count the exceptions requested by both countries.

Regarding policy, we make no claims of having identified an optimal level of government centralization or decentralization. However, we note that there might be a case for Sweden to strengthen its ministries similar to what Finland has done. As noted, this is an issue that has been raised previously in the literature and more recently also by the Swedish Climate Policy Council in its yearly report from 2022 (Swedish Climate Policy Council, 2022). Moreover, we recommend moving the responsibility for overseeing RIAs to a ministry, preferably the Prime Minister's Office but possibly even the Ministry of Finance would suffice. This institutional change would have to be set in law. This change would ensure the domestic use of the methodology for RIAs used in the EU. In addition, the government and parliament need to take greater responsibility for the implementation of EU directives and the negotiations that precede them.

At present, we do not have any recommendations as to how Finland might enhance its system of RIAs other than that we support all three proposals by the Finnish Council of Regulatory Impact Assessment (2023) for its continued work delineated above. Above all, we support its proposition to write its status in law, instead of the present *ad hoc* arrangement. Future research e.g. on the attitudes and competences of civil servants in both countries, might yield additional insights, however. Other questions for future research include the causes of the differences between Finland and Sweden, and the reasons for the shortcomings in Sweden: Is there a lack of understanding of how environmental policy is designed by the EU, which leads to incomplete implementation? What might cause such a lack of understanding? And how does a decentralized versus a centralized government system impact capacity building and organizational learning?

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