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No more fashion victim? Spillovers across multiple streams: The case of fur farming bans during the COVID-19 pandemic

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Abstract

Though spillovers have been initially described in the Multiple Streams Framework (MSF), we know little about how to conceptualize and measure them. To investigate spillovers, we draw on the case of fur farming bans during the COVID-19 pandemic. Whereas fur farming has long been criticized for its animal welfare problems, with the onset of the pandemic, it turned into a public health issue. We argue that COVID-19 outbreaks on fur farms can be characterized as spillovers from the health to the agricultural sector, opening a window of opportunity for policy change. By means of a quantitative analysis, we explore under which conditions policy change in fur farming took place. By this, our study also presents an innovative attempt to quantitatively apply the MSF. We use Cox proportional hazard models based on data from 2017 to 2022 to study the effect of MSF variables on policy change for all countries that documented outbreaks on fur farms. The empirical results demonstrate the relevance of integrating spillovers into the MSF. The study makes theoretical contributions by conceptualizing spillovers and methodical contributions by offering a novel and quantitative approach to the MSF.

KEYWORDS

COVID-19, fur farming, mixed method, multiple streams framework, spillover

INTRODUCTION

The culling of 15 million minks in Denmark for the sake of public health was one of the biggest headlines during the COVID-19 pandemic. Minks and other carnivores bred for fur production are a potential risk, given that they are sensitive to respiratory illnesses and that in close contact to humans, interspecies transmissions are possible, which might entail dangerous mutations (Fenollar et al., 2021; Nova, 2021). Over 200 COVID-19 cases in humans have been linked to fur farms (Halliday & McCulloch, 2022). Against this background, several countries that reported COVID-19 outbreaks on farms closed the industry immediately and banned or suspended fur farming (e.g., France, Latvia, Sweden). Other countries, in contrast, did not regulate this sector and continued mink farming despite COVID-19 outbreaks on fur farms (e.g., Poland, Greece, Lithuania). Thus, the question arises: Which conditions increase the likelihood for policy change in fur farming during the COVID-19 pandemic?

The depicted developments in the fur farming sectors are one example of exceptional policy-making during the pandemic, which as a unique event exerted a great impact on different policy areas. Recent years have highlighted the necessity for preparedness in facing similar comprehensive crises more frequently in the future. In addition to the potential emergence of new pandemics, climate change continues to subject societies worldwide to a range of challenges, including natural disasters and food shortages. Consequently, gaining insights into the dynamics of policy-making under exceptional circumstances is increasingly crucial.

The Multiple Streams Framework (MSF) deals with the complexity of agenda-setting and the consequences for policy change by addressing problems, political power constellations, and policy solutions. Distancing themselves from approaches that assume a rational process behind policy-making, MSF scholars describe the policy process as characterized by ambiguity, time constraints, as well as the spontaneous and creative seizing of opportunities (Herweg et al., 2023). We argue that the COVID-19 outbreaks on fur farms opened a window of opportunity, and that these public health problems "simply bowl[ed] over everything standing in the way of prominence on the agenda" (Kingdon, 2014). Nonetheless and despite previous MSF studies on effects of COVID-19 (Harris & McCue, 2023; Möck et al., 2022; Vince, 2023), it is conceptually challenging to capture this process in terms of the MSF. Infections could be ascribed to the problem stream, but effects go beyond the original policy area of health and exceed national policy-making as single level of policy-making. We expect the longstanding but rarely utilized MSF concept of spillover to offer respective insights. Spillovers are situations in which policy change departs from familiar paths, thereby providing novel conditions for future policy-making and related political struggles.

Developing spillovers within the MSF offers the advantage that they help to explain why the ripeness of streams and policy windows opening in the problem or political stream are not the only sources of coupling and policy change. Following Ewert and Loer (2023), we distinguish different types of spillovers based on the realized transfer and the streams involved. While spillovers seem well developed for the policy and the political stream, we regard the problem stream as posing a conceptual gap and suggest the notion of problem spillover in multi-level or cross-sectional constellations. We utilize problem spillovers as additional conditions influencing the likelihood for policy change in the case of fur farming during the COVID-19 pandemic.

The article is structured as follows: Fur Farming Between Economic Interests and Animal Welfare Concerns section two introduces the case of interest – regulation on fur farming. Multiple Streams, Spillovers, and Hypotheses Development section proposes conceptual thoughts on how to theorize and measure spillovers in the MSF. Relying on (Herweg et al., 2015), we utilize an extended version of the MSF integrating a decision-making window because we study not only agenda-setting, but primarily policy change. After having formulated hypotheses, Method and Data section describes the methodical approach and the operationalization. The quantitative analysis is based on a monthly data collection on eleven countries ($n = 737$) that all reported COVID-19 outbreaks on fur farms. The results of the analysis are described and discussed in Results section. Conclusion section concludes with a summary, limitations, and avenues for further research.

FUR FARMING BETWEEN ECONOMIC INTERESTS AND ANIMAL WELFARE CONCERNS

The practice of raising animals for fur production on farms is more than 150 years old. Nowadays, around 100 million animals are killed in fur farms worldwide annually (Linzey & Linzey, 2022). Minks account by far for the largest share of global fur production, followed by foxes and chinchillas (Fur Free Alliance, 2023). In general, the farming of animals for fur production is a controversial and polarized issue. Criticized by animal rights movements as morally unacceptable in light of the animals' suffering, citizens in Europe and the U.S. have expressed increasing discomfort with the industry since the late 1980s (Olson & Goodnight, 1994). This has led fashion labels to ban fur products and has contributed to the ban of fur production in many countries. A more specific argument against fur production from an animal welfare point of view highlights that carnivores such as minks are not domesticated, contrary to most other animals kept for food production. It is argued that their species-specific needs are hard to fulfill in current production systems, with small cages and unnaturally large herd sizes (Fur Free Alliance, 2023). The welfare of farmed fur animals is considered to be low (Xia et al., 2020): For instance, many animals express abnormal behavior such as fur-chewing or tail-biting and are kept in cages that do not resemble their habitat (Pickett & Harris, 2015). Before the COVID-19 pandemic, animal welfare organizations occasionally revealed abuse of animals in fur farms, but the practice of fur farming remained a lowly salient issue in many countries.

In 2009, the European Fur Breeders' Association launched the "WelFur" project that enabled welfare protocols for minks and foxes on fur farms (Mononen et al., 2012; Pickett & Harris, 2015). In March 2023, an official EU-wide petition to end fur farming received more than 1.7 million signatures (EU Citizen Initiative, 2023), indicating that the practice of fur farming has been a well-known policy problem in the EU. So far, there is no species-specific EU legislation on fur animal welfare, leading to different husbandry conditions in the member states. The first country to ban fur farming as a consequence of public animal welfare concerns was the United Kingdom in 2000. Other countries, such as Austria, Belgium, Bosnia-Herzegovina, Croatia, Czech Republic, Estonia, Ireland, Luxembourg, also passed bans prior to the COVID-19 pandemic. Yet another set of countries such as Germany passed animal welfare regulations for the sector that are extremely cost-intensive to fulfill, which has made fur farming unfeasible in these countries and thereby led to a phase out (Fur Free Europe, 2022). Contrary to these cases, a number of countries, and among them especially Denmark, kept up an economically successful fur branch that could count on comparatively high political and public support. Prior to the pandemic, Danish mink farmers supplied around 40 percent of the world's production. Despite this success, the outbreak of COVID-19 cases on mink farms led to the unexpected and sudden ban and closure of the whole industry in Denmark, but also in other countries (Courthouse News Service, 2021).

The fur farming bans in the wake of the pandemic cannot be explained within the area of agricultural policy, as policy proposals were not worked out over a long period of time. In terms of the MSF, the streams were not ripe, which means that the sudden agenda and policy change, mainly in the form of executive directives, cannot be explained by the original MSF. Adaptations need to be made to understand the influential case of fur farming (Seawright & Gerring, 2008). In the following section, we shortly introduce the MSF and propose an approach on how to integrate policy change and spillovers during times of crises into the MSF.

MULTIPLE STREAMS, SPILLOVERS, AND HYPOTHESES DEVELOPMENT

The multiple streams framework

The Multiple Streams Framework (MSF) is a well-established theory of the policy process (Herweg et al., 2018). Originally conceived by John Kingdon in the 1980s (Kingdon, 2014), in recent years the

framework has been developed conceptually (Ackrill & Kay, 2011; Herweg et al., 2015; Knaggård, 2015) and applied empirically to a wide diversity of research topics (Kuenzler, 2018; Sager & Thomann, 2017; Staff, 2018).

According to the MSF, policy-making is not "an exercise in rational problem solving" (Herweg et al., 2018), but occurs under conditions of ambiguity and severe time constraints. Building on this assumption, the process of agenda-setting is conceptualized as the coupling of three independently flowing streams. In the problem stream, we find a variety of phenomena that might be interpreted as problematic by citizens and policymakers (Herweg et al., 2018). The policy stream contains policy solutions that are generated and recombined by experts, interest groups, and policy networks, with some of these ideas surviving and others disappearing over time (Herweg et al., 2018). The political stream represents power constellations, which are composed of political parties in the executive and legislative branches, the campaigning of interest groups, and "the national mood" (Herweg et al., 2018). For a policy proposal to appear on the agenda, a policy entrepreneur – an individual or organization with a specific policy goal – must couple the three streams by connecting a problem definition with a policy solution that fits the given power constellations (Herweg et al., 2018; Sager & Thomann, 2017). The coupling of streams may only be achieved during a limited time frame, the so-called "window of opportunity" or policy window. Consequently, the MSF is basically about getting the right timing and portraying conditions of the world in a way that makes a policy look like an idea whose time has come.

Policy windows indicate periods of such a good timing, providing suitable circumstances for agenda-setting activities. Therefore, they constitute a core notion of the MSF. Policy windows open in the flowing of the streams and can be traced back to either the problem or political stream (Kingdon, 2014) and even to specific developments within streams like focusing events or electoral turnovers (Zahariadis, 2003). Yet, developments within one stream do not suffice for agenda change (Herweg et al., 2015). If, for example, circumstances allow for being easily interpreted as a problem for the entrepreneur's favored policy at stake, a devastatingly flowing political stream may still prevent decision-making, for example, by exhibiting a governing parties' ideology at odds with the policy. This is reflected in the concept of ripeness of streams (Herweg et al., 2015). It is important to note here that a problem window cannot cause a political window on its own and vice versa, as this would violate the independence assumption (Mucciaroni, 1992). Against this background, a ripeness of all streams is a very rare occasion.

While the MSF was initially designed as a framework to explain agenda-setting, theoretical advancements have integrated policy change into the MSF (Herweg et al., 2015). Policy change is not only different from agenda change due to its later position in the policy cycle, it is also expected that the three streams are of different importance for agenda versus policy change: To explain policy change, the key question in parliamentary systems is whether policy proposals gain the parliamentary majority required for being passed. Therefore, the political stream is of great importance. By contrast, the policy and problem streams are less important at this stage of the policy process because the phenomenon is already defined as problematic and a policy solution is already on the table (Herweg et al., 2015). To utilize this theoretical advancement to explain the empirical case of policy change represented by fur bans, we rely on "decision-making windows" developed by (Herweg et al., 2015) (see also Figure 1). Located downstream to the agenda window, it builds on an elaborate policy and on political entrepreneurs pushing for the policy's adoption. Figure 1 demonstrates inter alia how decision-making windows can be integrated into the MSF.

Spillovers in the multiple streams framework

Building on the MSF, we turn to and conceptually develop the concept of spillover as a consequence and a driver of policy change. Terminologically, spillovers go back to neofunctionalist theory (Haas, 1958), referring to a mechanism of self-reinforcing integration in the European Union. Decisions increasing European integration "tend to generate unexpected pressures for further integration" (Moravcsik 2005, p. 352). Haas (1958) distinguishes functional spillovers, that is, stimulated integration in one economic

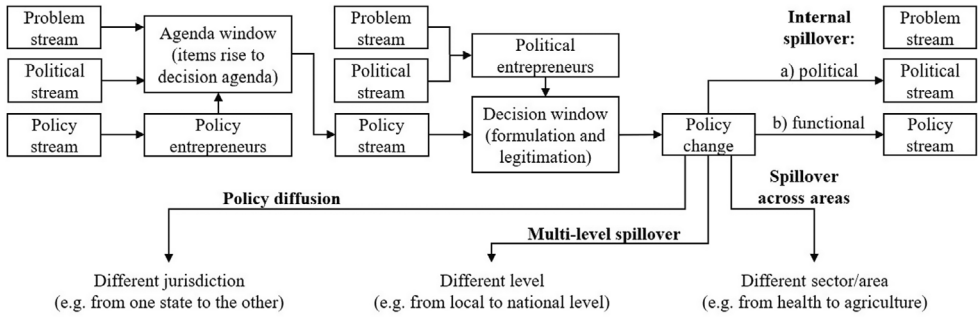

FIGURE 1 Multiple Streams Framework for policy change with decision-making windows and spillovers. *Source*: Adapted and extended figure from Herweg et al. (2015).

or societal sector changing the context for another towards integration, and political spillovers, that is, stimulated integration in one area that shift power relations, thus enabling supranational actors to engage in other areas (see also Moravcsik, 2005). Kingdon (2014) has adapted the concept of spillover to address the consequences of policy change. Once there has been a policy change in a certain issue area, it might establish a principle that rearranges context conditions for future policy-making. Whether it succeeds in this task does not depend on the extent of policy change, but on being a precedent. For instance, the US waterway user charge of 1978 was a very small policy change, but it established the more general idea of letting users pay fees (Kingdon, 2014, p. 191). Kingdon (2014) also implicitly accounts for the difference between functional and political spillover. A policy change that successfully establishes a precedent in one area of regulation may functionally facilitate similar legislation in adjacent areas. A successful deregulation, for example, could become a general trend across sectors. At the same time, a policy establishing a new principle may politically entail adaptations in coalitions, the power distribution among them and their favored strategies. Similar to Haas, the political spillover in multiple streams has also implications for distinct policy areas: "The coalition resisting change is defeated, and the coalition that was built and nurtured to establish the new policy can be transferred to other fights" (Kingdon, 2014, p. 192).

Spillovers are a highly interesting, but also challenging and rarely utilized concept within the MSF (Ackrill & Kay, 2011; Hawkins & McCambridge, 2020). As shown in The Multiple Streams Framework section, Kingdon's original contribution aimed at understanding processes of agenda-setting, while explanations of decision-making and policy change represent more recent contributions in the MSF literature (Herweg et al., 2015). Yet, spillovers do not only refer to policy change; they even focus on its consequences. Therefore, they become relevant at a point in the policy process where most multiple streams studies end. An initial policy window has already been successfully utilized by policy entrepreneurs to push a proposal to the agenda, which has been picked up and supported by a political entrepreneur and accepted during a decision window. This success can provide a blueprint for other policy-making processes elsewhere, altering the respective policy and/or political stream in a favorable way. Following Kingdon (2014, p. 192), these spillover effects are sometimes referred to as policy windows of their own (Zahariadis, 2016, p. 8). In analyzing a case study in the MSF, it would then be important to not only study streams regarding general ripeness and policy windows opening in the problem or the political stream, but to also probe for spillovers as suitable points in time that require action. Below, we further advance the conceptual integration of spillovers into the MSF by connecting it to the three streams and by clarifying where spillovers originate and where they take effect.

Drawing on the MSF as well as on the Political Process Inherent Dynamics Approach (Töller, 2021; Vogelpohl et al., 2022), Ewert and Loer (2023, p. 745) introduce three spillover dimensions to differentiate three types of spillovers. First, spillovers can relate to different levels (e.g., a shift from local to national level). Second, they can relate to a power and influence shift between groups of actors. Third, spillovers can erupt between distinct areas of policy-making. Building on this insightful differentiation

and focusing on the MSF, we suggest to further distinguish between the type of transfer realized by a spillover and the stream(s) involved. This does not only provide a more nuanced representation of possible spillover constellations in the MSF, but also allows to identify potential conceptual gaps. We proceed by introducing the different types of transfer, discussing the role of stream-specific spillovers for each of them. Figure 1 provides an overview that builds on Herweg et al. (2015).

Internal spillovers establish a principle that influences policy-making within the same context, in which a principle-setting policy change occurred. Although this is a simple and straightforward type of spillover, it is at the same time counterintuitive in light of the term because there is no actual transfer involved in it. Instead, a policy change rearranges the respective policy area, adapting the overall approach toward an issue like the waterway user charge mentioned by Kingdon (2014). These effects functionally influence the policy stream, in which the novel principle allows for the establishment of similar and more nuanced policies, for example those addressing the original policy calibration like the fee amount. Yet, implications can also materialize in the same context in the political stream as described by the second spillover dimension (Ewert & Loer, 2023): Winning coalitions may acquire additional supporters and resources, while losing coalitions experience pressure to adapt strategies. Even major political shifts like re-elections are conceivable. Ewert and Loer (2023), for example, show how the COVID-19 pandemic changed power relations in the food-manufacturing and agricultural industry. Regarding the problem stream, the implications of previous policies are already conceptualized in the MSF as feedback (Herweg et al., 2023; Kingdon, 2014) and therefore do not need to be considered in the context of internal spillovers.

Spillovers across areas capture consequences of policy change that unfold in a different policy area, for example, a principle established by transport policy-making being utilized by policy and political entrepreneurs in environmental policy. A spillover across areas is a transfer from one topic to another, with the context of the political system staying the same. This case of spillover reflects the original concept by Haas (1958) as well as the third spillover dimension (Ewert & Loer, 2023). As far as the policy change itself provides a convenient policy stream in a distinct area, the spillover across areas can be functional, but also political spillovers are possible if successful coalitions transfer their cooperation and strategy to another field. It is important to note that the difference between internal spillover and spillover across areas may not always be clear-cut and rather represents a continuum. For example, a spillover across areas may occur between two sectors within a broader policy area, for example, from aviation to rail within transport policy. Furthermore, some policy areas are of a cross-sectional nature and hard to isolate. Ackrill and Kay (2011) have suggested considering the degree to which different areas are institutionally related. Endogenous spillovers remain within an institutional context of multiple and vague responsibilities, while exogenous spillovers move to a different institutional context.

Multi-level spillovers refer to situations in which a precedent policy at a lower or higher level of regulation may create an instance that facilitates the agenda-setting or decision-making on a distinct but relatable proposal, introducing top-down versus bottom-up processes to the MSF literature (Hawkins & McCambridge, 2020). As in spillovers across areas, there is a transfer of a successful precedent from one context to another, yet not thematically, but across different levels of regulation like local, regional, national, or supranational policy-making. Clearly, multi-level spillovers take up the first spillover dimension of Ewert and Loer (2023) and may be specified functionally or politically. A successful implementation of pilot policies in local contexts, for example, might facilitate a nationwide realization, while a coalition involved in this process might seek to utilize the additional influence at the national level as well. It is important to caution that levels of regulation are often nested, that is, higher-level legislation prescribes a certain scope for lower-level legislation. This often also entails an asymmetric distribution of policy-making competencies and implementation responsibilities, with the former being located higher and the latter being located lower within many multi-level systems.

There is a third type of transfer that does not relate to different policy areas or system levels, but to adjacent jurisdictions, thereby representing the horizontal equivalent to vertical multi-level spillovers. However, we explicitly exclude this type of transfer from studying spillovers, as it is already covered by work on policy diffusion. It is important to distinguish the concept of spillover from policy diffusion.

While both concepts focus on interdependencies, policy diffusion is an approach that focuses on external factors that influence decision-making as opposed to internal factors such as issue salience or political power balance (de Porto Oliveira et al., 2023). That is, policy diffusion scholars ask whether and how policymakers "react to decisions from *elsewhere*" (Gilardi & Wasserfallen, 2019, p. 1249), emphasis added by the authors). By contrast, the concept of spillover homes in on interdependencies *within* a political system, be it between levels of government or between policy fields (Ewert & Loer, 2023). Thus, spillover as a concept is distinct from policy diffusion, which has been investigated in the MSF on its own (Goyal, 2022).

As shown, in each of the three types of spillover distinguished by transfer relations, two streams are already taken up and well developed. Functional and political spillovers remain relevant and closely connected in internal, multi-level, and cross-sectoral spillovers. The problem stream is not conceptualized in the internal spillover, as consequences of policy change are represented by feedback in the problem stream. Yet, this does not mean that problems originating in policy processes in one subject area or at one level of regulation do not exert influence on policy-making beyond them. We therefore argue that spillovers in the problem stream constitute a conceptual gap that can be addressed by the notion of a problem spillover. Problem spillovers could be represented by well-known components of problem streams, that is, indicators and focusing events, but they become spillovers only by moving from one policy area to another or by moving up- or downwards within a multi-level system.

Previous MSF studies have shown that the pandemic is a useful context for investigating the interaction of different sectors by creating attention for employment policies (Möck et al., 2022), facilitating the implementation of transport policies (Harris & McCue, 2023), or impeding environmental policies (Vince, 2023), each against the background of the health issue of COVID-19. This indicates that the case of fur farming bans does not need to be limited to problem or political windows within animal welfare and agricultural policy, but that problem spillovers from the health sector may provide an additional condition that increases the likelihood of (radical) policy change. Furthermore, within the area of animal welfare, problems occurring and defined at a different, for example, international, level might influence policy-making at the, for example, national, level of analysis. In the following, we comparatively investigate the role of problem spillovers in fur farming policy-making.

Figure 1 displays the MSF's extended version to policy change as proposed by Herweg et al. (2015), with additional modifications regarding the integration of spillover. Even though the quantitative analysis can only be used to estimate the likelihoods for policy change without analyzing the causal mechanisms, the use of the large sample size provides the possibility to test rigorously the theoretical expectation that the spillover effect from area A (health) leads to policy change in area B (fur farming in our case).

Hypotheses

In order to understand how the COVID-19 pandemic as a public health issue could have had such a game changing impact on the fur farming sector, we expect COVID-19 outbreaks on fur farms to function as problem spillover across areas. The outbreaks offered an opportunity to argue that fur animals can spread the virus and that farming them therefore represents a public health problem. Herweg et al. (2018, p. 30) argue that a problem window is more likely to open if "a condition puts a policymaker's re-election at risk." As the pandemic required extensive governmental action and since policymakers were mainly evaluated on how they responded to this specific threat, we expect COVID-19 outbreaks on fur farms to act as problem spillovers. If these spillovers open novel problem windows in a different policy area, policy change in the latter is more likely. Thus, with regard to the problem stream we propose two divergent problem perceptions that may contribute to policy change, one conventional relating to animal welfare concerns and one relating to the COVID-19 pandemic as a problem spillover from another sector.

In order to make the MSF testable, we deduce several hypotheses based on the problem and political streams. While the variables are explained in more detail in Sample and Study Period section, the remainder of this section develops hypotheses from our previous considerations. With regard to the pandemic, we expect that COVID-19 outbreaks on fur farms represent focusing events leading to problem spillovers. Consequently, we expect them to increase the likelihood for policy change.

H1. COVID-19 outbreaks on fur farms increase the likelihood of fur farming bans.

Additionally, we expect that animal welfare scandals on the national or the international level led to increasing problem pressure. Such scandals provide instances that could be framed against the background of animal welfare concerns on fur farming. We differentiate between national and international scandals because the former take place within the respective jurisdiction, while the latter represent an effect from a different level of governance. This multi-level distinction therefore covers potential multi-level problem spillovers within the animal welfare policy area.

H2a. National animal welfare scandals increase the likelihood of fur farming bans.

H2b. International animal welfare scandals increase the likelihood of fur farming bans.

In addition to the problem stream, we formulate three hypotheses on the political stream, covering different aspects of the political stream as established in the MSF.

Firstly, we expect fur farming to be politicized by animal welfare organizations via organizing public activities against the sector, assuming that this increases public as well as political attention. This is generally expected in the MSF under the notion of interest group campaigning.

H3a. Demonstrations and protests against fur farming increase the likelihood of fur farming bans.

Secondly, we take party ideology of key decision-makers as a political variable into account, expecting that it makes a difference whether the responsible ministry is held by a party that is generally supportive of the agricultural sector. Systematic comparative studies on partisan politics in the area of agricultural policy are rare and as of today, only limited empirical evidence exists on the questions whether and how political parties make a difference in agricultural policy-making. Previous studies find that conservative political parties often protect the traditional interests of the farming community (Tosun, 2017; Vogeler, 2019). Historically, farmers constitute well-organized interest groups in many countries and they are usually closely aligned to conservative political parties or specific agrarian parties (Grohmann & Feindt, 2024; Malang & Holzinger, 2020; Sheingate, 2004). In contrast, green parties advocate for higher environmental standards and animal protection, which often contradicts traditional agricultural goals related to high productivity and income security (see e.g., Roederer-Rynning, 2003; Vogeler 2021). This should increase the likelihood of fur farming bans. However, since green parties are still very underrepresented in national governments and since we do not have any agrarian minister with a green party affiliation in our sample, we only formulate a hypothesis on the decreasing likelihood of fur farming bans due to pro-agrarian partisan effects.

H3b. If the agrarian minister is a member of a pro-agrarian party, the likelihood of fur bans decreases.

Thirdly, we look at the power of agrarian interest groups by referring to industrial figures from fur farming. It is expected that a sector with higher revenues and resources is better protected than a small sector. Even though we cannot measure the power and influence of agrarian interest groups directly, we assume that the share of fur animals in the EU fur market is a good proxy.

H3c. The lower the share of fur animals in the EU fur market, the higher the likelihood for fur farming bans.

Next to these main hypotheses, we also explore the connection of coupling and spillovers as well as the special characteristic of the crisis mode of policy-making and its impact on the MSF. As this undertaking is explorative, we do not formulate hypotheses. With regard to coupling, we expect a higher likelihood for policy change if the problem spillover couples with the political stream. Thus, for instance, if the agrarian minister is a member of a pro-agrarian party, the intersectoral problem integration through the problem spillover is less likely to lead to policy change than if the agrarian minister is not member of a pro-agrarian party. Thus, if a key policymaker is supportive for policy change, they can stitch together a majority and the political stream is ready to couple (Zohlnhöfer, 2016). Within our quantitative analysis, we can, however, only provide some first hints for the coupling process. As coupling is an activity of the policy entrepreneur and as the measurement of coupling through interaction terms, as suggested by Engler and Herweg (2019), does not involve this strategic undertaking of a policy entrepreneur, we are cautious with our conclusions here. Nevertheless, as coupling is one of the main parts of the MSF, we consider its analysis important here. We elaborate on this in more detail when describing the empirical results on coupling in the discussion.

METHOD AND DATA

Method

We rely on a Cox proportional hazard model, a specific form of event-history analysis (see more elaborations below). As quantitative applications of the MSF are rare so far (Engler & Herweg, 2019; Jones et al., 2016), our research also addresses a methodological gap. Reasons for why the MSF is rarely applied quantitatively are the difficulties of operationalization and issues of modeling the high number of interactions in the course of coupling. However, using large-n designs can be valuable for MSF research. By assessing, for example, the effect of open windows on agenda or policy change, regression analysis is able to test the core components of MSF (Engler & Herweg, 2019). Another advantage of large-n designs is the possibility to generalize findings and test MSF assumptions by formulating falsifiable hypotheses, which could refute key criticisms of the MSF (Herweg et al., 2023; Kuhlmann, 2016). So far, the studies that use regression methods to test the MSF are limited (DeLeo & Duarte, 2022; Fowler, 2019, 2022; Goyal, 2022; Liu et al., 2011; Staff, 2018; Travis & Zahariadis, 2002). In contrast to other regression methods, event-history models focus on the time until policy change happens and on the factors decelerating or accelerating policy change (Jäckle, 2020). Event-history models combine a probability density function, which describes the conditional and immediate probability that an event will occur in a given time interval, and a survival function, which describes the probability that an event does not occur until a defined endpoint of time. The division of both functions results in the so-called hazard ratios, which represent the specification of effect sizes in event-history models. Thus, the hazard ratio reports the risk of an event taking place in an infinitesimal time interval Δt if it has not taken place during t (ibid.). Since fur farming legislation as a dependent variable is a discrete measurement, meaning that the ban can occur at any time, continuous-time models are mathematically suitable. We cannot formulate a priori the function form of the baseline hazard (e.g., exponential or u-shaped function), so we use the Cox proportional hazard model as a semi-parametric procedure to estimate the effect of the problem and political streams on fur farming bans.

Sample and study period

Since we are interested in spillovers from the health to the agricultural sector, we selected only countries in which COVID-19 outbreaks on fur farms have been confirmed. By January 2021, more than 400 farms across Europe and North America had detected the coronavirus in their farmed mink population (National Geographic, 2021). Countries with reported COVID-19 outbreaks on fur farms are: Canada, Denmark, France, Greece, Italy, Latvia, Lithuania, Poland, Spain, Sweden, the Netherlands, and the USA. Since fur legislation in the USA is fragmented due to the many decision-making levels, we decided to exclude this country. While some countries had only one confirmed outbreak (e.g., France), others reported several (e.g., Canada ten, or the Netherlands eight outbreaks). The Cox proportional model estimates whether an outbreak in a specific month is related to a fur farming ban in a specific subsequent month. We cover the time period from January 2017 to November 2022 to include a pre- and post-COVID-19 time period. In 2022, the pandemic had reached an endemic state; consequently, the expected effect of the health crisis on agricultural decision-making decreased.

A distinctive feature of our analysis is that we collected the data on a monthly basis, with country-months constituting our unit of analysis. This allows for a more fine-grained tracking of changes than annual observations. Thus, from our understanding, we expect events on a monthly basis, for example, protests or elections, to influence policy change on fur farming. This leads to a sample size of 781 cases (11 countries * (5 years with 12 months) * (1 year with 11 months)). The majority of cases report no COVID-19 outbreak: in 44 country-months, we observed COVID-19 outbreaks on fur farms, while we have no outbreaks in 737 country-months.

Operationalization

As illustrated by Engler and Herweg (2019), the MSF is a challenging framework for quantitative applications due to its large number of theoretical components. Hence, they argue that quantitative MSF studies might be well-advised to test only partial components of the framework and reduce the number of in detail operationalized streams. Following this advice, we focus on the problem and political streams and whether the spillover based on COVID-19 outbreaks led to fur farming bans. The policy stream and the implications of disregarding it in the quantitative analysis are briefly discussed below. Most variables were derived from primary sources, for example, newspaper articles, which the researchers extracted and coded on the basis of a codebook developed for that purpose (cf. Appendix S1). This allows us to collect the variables of interest in a valid and reliable way. Two researchers collected data for each country to make sure that the coding is reliable. We used English and native key words to search for related events and similar. Nevertheless, there is a possibility that some events (e.g., protests) have been overlooked. However, we assume that all important demonstrations, protests, etc. will be reported in the media, for example, newspaper articles but also social media. Most variables are captured binarily (existent vs. non-existent). The researcher-based coding process has been complemented by extracting industry, election, and political party data from secondary sources.

The *dependent variable* – ban on fur farming – includes all fur production-related restrictions during the covered time period. It might be a full ban, meaning that it is forbidden to breed any species for their fur, or a partial ban, meaning that fur farming is temporarily suspended or only the breeding of some species is forbidden. In many cases, partial bans were de facto full bans as they complicated the reconstruction of the fur industry. Since legislation events are rare, we include all types of fur farming bans. The estimation is much more efficient if partial and full bans are included. The sample consists of countries where fur farming was not banned until 2017. During the time period covered, Greece, Lithuania, Poland, and Spain continued with allowing breeding fur animals, while France, Italy, Latvia, and the Netherlands prohibited the breeding of fur animals fully, and Canada, Denmark, and Sweden banned the production partially. In terms of country-months indicating policy change, we have 7 cases of fur bans and 774 cases without regulation events.

The *problem spillover across areas* is represented by COVID-19 outbreaks on fur farms. We do not count the number of detected animals or the number of affected farms, but just code binarily whether a country has reported a COVID-19 outbreak on fur farms in a certain month. Thus, there might be several outbreaks in different farms per month, which are, however, only coded as "1". Using count data is difficult due to a varying degree of data availability depending on the country of interest. The number of events ranges from one (France) to ten outbreaks during the study period (Canada).

The *problem stream* also covers further focusing events to investigate whether animal welfare concerns increase the likelihood of fur farming bans. Thus, we coded national and international animal welfare scandals on fur production. At least two independent sources needed to report on the scandal to be coded as such. While national animal welfare scandals take place in the country of interest, international scandals represent the scandalization of animal welfare events in other countries. We expect that such scandals in other countries can lead to policy diffusion or can, respectively, initiate processes of policy change (see Knaggård & Hildingsson, 2023). We do not include problem indicators here. Examples of classical problem indicators as specified by Kingdon (2014) are crime rates, unemployment rates, or similar statistics. The quantification of problem indicators in this case is not possible due to insufficient data availability on the number of infected animals/humans due to interspecies transmission or on how many fur animals suffer from animal welfare issues (for a discussion of this issue, see DeLeo, 2018; Dool, 2022).

The *political stream* is measured by four indicators: demonstrations/protests, partisan effects, and the size of the industry. First, we extract information on demonstrations or protests. If citizens take to the street to oppose fur farming or if animal welfare groups organize visible, public campaigns, we code this variable as "1" in the month of the event. We do not include opinion polls to measure public mood because no comparable surveys on this issue exist. With regard to partisan effects, we extracted data on the party affiliation of the health and agricultural ministers. Here, we expect ministers from agricultural supportive parties to prevent a fur farming ban. We coded ministers from conservative, Christian democratic, right, and agrarian parties in the agricultural resort as "1" and ministers from social-democratic, communist, and liberal parties as "0" (Tosun, 2017; Vogeler, 2019). Ministers that have no party affiliation were coded as missing due to lack of knowledge on personal agrarian preferences/interests. To capture the relative power of the fur farming industry, we included a country's relative share in fur animals at the EU market. Here, we had to exclude Canada. While some countries have an EU market share of less than one percent (e.g., France, Italy), others take up half of the market (Denmark).

In the quantitative analysis, we focus on the problem and political stream and neither measure the influence of the policy stream nor distinguish between the policy alternatives of full and partial bans in the dependent variable. As Engler and Herweg (2019) explain, gathering and quantifying information on the technical and financial feasibility or normative acceptability of policy proposals is very challenging. Similarly, mapping all policy alternatives emerging and recombining in all studied countries would undermine the goal to limit the quantitative application to some components. However, the policy of fur farming bans can be briefly characterized in the context of the policy stream. As a regulative policy, implementation does not require additional administrative structures, which indicates a comparatively high technical feasibility in light of established monitoring systems in agriculture. This does not imply, however, that a transformation of fur sectors would be highly feasible as well. Regarding affordability, the situation is similar. Implementing the policy would not generate high costs by itself, but the complete loss of fur farms may entail a loss of jobs or taxes. Finally, normative acceptability will vary among policy communities in different countries and probably also along an urban–rural gradient. Although it could be argued against the background of animal welfare considerations that normative acceptability is comparatively high, we exclude the policy stream to focus on specific streams and variables and to make the quantitative analysis manageable.

In Table 1, the distribution of the variables is summarized. Note that the unit of analysis is country-months. Dichotomous variables are characterized by the percentage of the values zero and one, while metric variables are described by their mean and standard deviation. In general, most variables are

TABLE 1 Descriptive statistics.

	Variables	*N* (= country- months)	Percentage (in %)
Dependent variable	Fur farming ban 0	774	99.10
	1	7	0.90
Problem spillover	COVID-19 outbreak 0	737	94.37
	1	44	5.63
Multi-level problem spillover	National animal welfare scandal 0	772	98.72
	1	10	1.28
	International animal Welfare scandal 0	777	99.49
	1	4	0.51
Political stream	Pro-agrarian affiliation of Agricultural minister 0	386	51.33
	1	366	48.67
	Demonstration/protest 0	766	98.08
	1	15	1.92
	Fur animals EU market share (in %)	588	Mean: 8.839 (St. Dv. 12.67)

Note: own calculation based on the original fur farming dataset.

zero-inflationary, meaning that the occurrence of events (both for the dependent variable and the independent variables as petitions or elections) is rare.

RESULTS

Cox proportional hazard models on fur farming bans

In a next step, we estimated Cox proportional hazard models to answer our research questions: Which conditions increase the likelihood for policy change in fur farming during the COVID-19 pandemic, and more precisely, what role did spillovers play to explain cross-national differences in whether fur farming was banned?

We estimated separate models for the two streams because MSF assumes them to be independent. As we have a time series cross-sectoral dataset, we include robust standard errors to control for serial autocorrelation. Table 2 shows the results of the Cox proportional hazard models displayed as hazard ratios. The higher the hazard ratio, the higher the likelihood of countries being excluded from the risk set due to the occurrence of a fur farming ban.

In model 1, the variable COVID-19 outbreak on fur farms has a hazard ratio of 10.98, meaning that country-months with a COVID-19 outbreak have a strong increase in their hazard ratio for a fur farming ban compared to country-months where no COVID-19 outbreak on fur farms takes place, ceteris paribus. This large effect size is also illustrated by the survival function in Figure 2. The country-months with COVID-19 outbreaks have a much higher rate of dropping out of the risk set compared to country-months for which no COVID-19 outbreak on fur farms was reported. However, the graph also shows an unbalanced sample: The fur farming ban is a rare event. As seen in Table 1, only 0.9 percent of all observation units report a full or partial fur farming ban. National and international animal welfare scandals, in contrast, decrease the hazard ratio of fur farming bans. Thus, country-months with animal welfare scandals had less fur farming bans than country-months without animal welfare scandals, thus rendering the relationship negative. A reason for this could be time lags between policy decisions and animal welfare scandals. All three variables are statistically significant at the 1 percent level. Looking at model 2 reporting the political stream, we find significant effects for demonstrations. The effect is significant at the 1 percent level; however, the hazard ratio is zero, meaning that it decreases the likelihood of a fur-farming ban, ceteris paribus. We find

TABLE 2 Cox proportional hazard models on fur farming ban.

	(1) Problem spillover	(2) Political stream
COVID-19 outbreak on fur farm (0;1)	10.98***	
	(9.958)	
National animal welfare scandal (0;1)	0***	
	(0)	
International animal welfare scandal (0;1)	0***	
	(0)	
Demonstration (0;1)		0***
		(0)
Pro-agrarian party in agrarian ministry (0;1)		0,611
		(0.536)
Share of farmed fur animals/EU market		1.050**
		(0.017)
N	475	356
Prob < chi2	0.000	0.000

Note: Hazard ratios, robust standard errors in parentheses, ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

a negative hazard ratio for the pro-agrarian affiliation of the agrarian minister, which supports our theoretical reasoning. However, the effect is not significant. When looking at the relative market share in fur animals, we find a positive and significant hazard ratio. If the share of fur animals in the EU fur market increases in a country-month, the hazard ratio for a fur farming ban also increases. This is surprising, as we expected a powerful industry to be less likely to be closed. An explanation for this finding is that fur farming in countries with a high market share is more salient. Put differently, health risks are larger in countries that host a larger share of the industry. As a result of these health risks, calls for agenda change are more likely.

By using Cox proportional hazard models, we tested the hypotheses on the likelihood of policy change. While we find support for the relevance of problem spillover through COVID-19 outbreaks on fur farms, the results on animal welfare scandals, demonstrations, pro-agrarian minister, and number of animals are less empirically supported. In a next step, we provide some robustness checks before we elaborate on a first quantitative attempt to uncover the coupling mechanism via interaction terms.

To test whether the values of the categorial variables (e.g., COVID-19 outbreak, demonstrations) are statistically different from each other, we use a Wilcoxon Breslow test, which finds a significantly lower probability of survival for observation points with COVID-19 outbreaks and the number of animals. The other independent variables (animal welfare scandal, demonstrations and pro-agrarian minister) are insignificant, which is supported by the Cox proportional hazard models in Table 2. We also tested whether the hazard is proportional as a key assumption of the Cox proportional hazard model for our two models. The values for column (1) – the problem stream – as well as for column (2) – the political stream – are insignificant, meaning that the proportional odds assumption is not violated. The results of the proportional assumption test are found in Appendices S2 and S3.

Exploring potential coupling avenues with interaction terms

In a next step, we want to provide a first attempt to uncover the coupling of the problem and political stream quantitatively. As proposed by Engler and Herweg (2019), we estimate interaction terms to find out whether the configurative assumption of the MSF holds, that is, whether streams need to couple for policy change. As coupling is an activity of the policy entrepreneur, we refrain from drawing finite

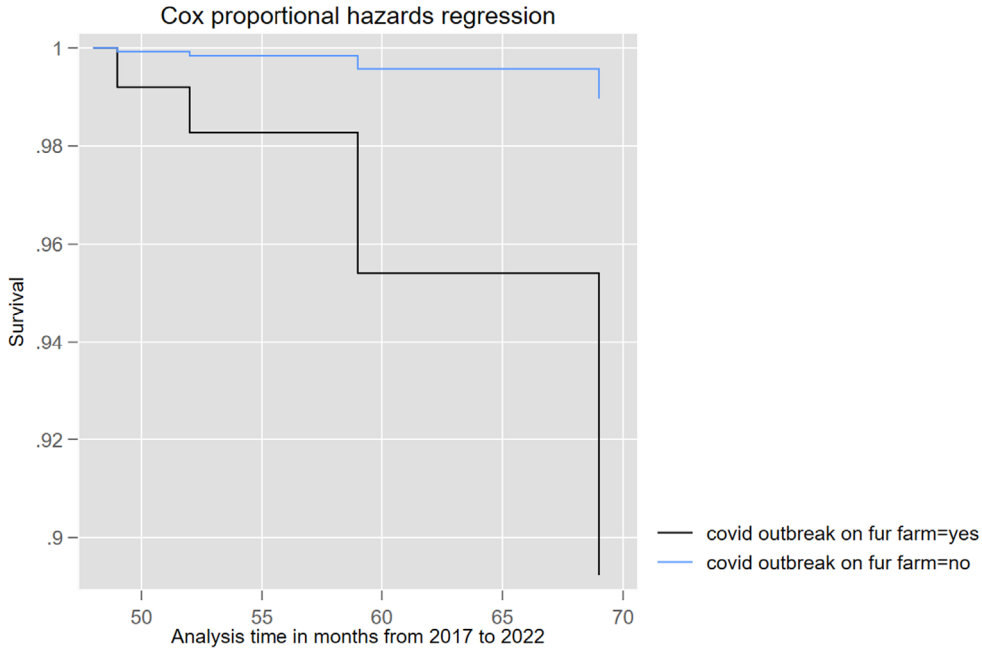

FIGURE 2 Survival function upon COVID outbreak on fur farm. *Source*: Own illustration.

conclusions based on the interaction terms. Instead, we want to provide some first hints for coupling. We estimate interaction terms between COVID-19 outbreaks and our three indicators of the political stream: a pro-agrarian party member as agrarian minister, demonstrations/protests, and the fur animals market share (see Table 3). The results are mixed and demonstrate the complexity of the issue.

In Table 3 model 1, the individual variables are insignificant, but we find a negative, statistically significant interaction for agrarian ministers of a pro-agrarian party (model 2). Thus, if a country records a COVID-19 outbreak in a certain month, the hazard ratio of fur farming bans decreases under a pro-agrarian minister. Therefore, party affiliations of decision-makers play a role under these conditions and the direction of the effect is as expected: Ministers from pro-agrarian parties try to protect the sector while ministers from other political parties are more likely to ban fur farming. Here, it is important to keep in mind that we only look at eleven countries with a restricted number of governmental regimes.

Looking at model 2, we find no evidence for coupling between demonstrations/protests and COVID-19 outbreaks. Thus, if COVID-19 breaks out on fur farms, policy change is neither less nor more likely due to demonstrations/protests. On the one hand, a reason for this might be the COVID-19 policy-making as such: As many countries forbid public demonstrations, citizens were also less likely to take to the street to protest fur farming. Therefore, demonstrations and protests might play only a minor role during this time period. On the other hand, this might indicate the special policy-making situation during the pandemic as a crisis, during which governments passed laws under time pressure via decrees without consulting the parliament and the public (Boin et al., 2017).

In model 3, we find significant hazard ratios for all three variables: The COVID-19 outbreaks and the market share of fur animals are positive and significant, thus increasing the risk of fur farming bans. The interaction of both is negative and significant, meaning that if COVID-19 breaks out on fur farms, countries with a smaller industry are more likely to face a fur ban early than relatively large industries. Simultaneously, countries with a rather large share of fur animals relative to the EU market are less likely to have a fur farming ban if COVID-19 breaks out on a fur farm. This supports our expectation on the role of interest groups.

To sum up, we find some first empirical evidence for coupling based on the interaction terms. Coupling between pro-agrarian ministers, a low relative number of animals, and COVID-19 outbreaks

TABLE 3 Interaction models based on the Cox proportional functions.

Model	(1) Pro-agrarian party	(2) Demonstrations	(3) Fur animals market share
COVID outbreak on fur farm (0;1)	4.606	3.417	55.163***
	(5.406)	(3.816)	(58.18)
Pro-agrarian party in agrarian ministry (0;1)	0.466		
	(0.489)		
COVID outbreak (0) # pro-agrarian party (0)	1		
	(0)		
COVID outbreak (0) # pro-agrarian party (1)	1		
	(0)		
COVID outbreak (1) # pro-agrarian party (0)	1		
	(0)		
COVID outbreak (1) # pro-agrarian party (1)	0***		
	(0)		
Demonstration (0;1)		0***	
		(0)	
COVID outbreak (0) # demonstration (0)		1	
		(0)	
COVID outbreak (0) # demonstration (1)		1	
		(0)	
COVID outbreak (1) # demonstration (0)		1	
		(0)	
COVID outbreak (1) # demonstration (0)		0.292	
		(0.452)	
Fur animals market share			1.075***
			(0.017)
COVID outbreak # Fur animals market share			0.651***
			(0.097)
N	519	475	408

Note: Hazard ratios, robust standard errors in parentheses, ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

seems to increase the likelihood of fur farming bans, while coupling with demonstrations is not needed. Therefore, the problem spillover plays a crucial role, but its effect increases when indicators of the political and problem stream are ripe. This finding demonstrates that the integration of spillovers into the MSF does not change core MSF assumptions but suits the theoretical framework well.

CONCLUSION

In this article, we investigated the phenomenon of spillovers in the context of the Multiple Streams Framework (MSF) by means of a quantitative analysis. For this purpose, we investigated the case of fur farming bans during the COVID-19 pandemic. Whereas fur farming for long has been criticized for its animal welfare problems, with the onset of the pandemic, it suddenly turned into a widely discussed and highly politicized public health issue. While fur farming is considered a niche policy, it became a much-discussed topic in the context of the pandemic, filling the newspapers. It is expected that such exceptional policy-making is more likely in times of crises, and the case of fur farming therefore provides

some clues for other policy areas. In addition, we expand the applicability of MSF studies to agricultural policy-making, which so far has received less attention. We conceptualized COVID-19 outbreaks on fur farms as a spillover from the health to the agricultural sector, opening a window of opportunity for policy change. By means of a quantitative analysis, we ask which conditions increase the likelihood of policy change in fur farming during the COVID-19 pandemic. Using Cox proportional hazard models on all countries that documented a COVID-19 outbreak on fur farms ($n = 11$), we derived first insights into which variables increase the risk of policy change.

First, COVID-19 outbreaks on mink farms greatly increase the likelihood of fur farming bans. This is a first indication concerning the relevance of the problem spillovers, where problems in the health sector lead to policy change in the agrarian sector. Besides, this finding is in line with previous work documenting effects of the pandemic on neighboring policy areas (Harris & McCue, 2023; Möck et al., 2022; Vince, 2023) and reinterprets these insights as spillovers.

The second finding concerns animal welfare issues. While fur farms traditionally have been criticized as an animal welfare problem and although numerous animal welfare NGOs have campaigned against fur farms for decades, our analysis suggests that neither animal welfare scandals nor demonstrations increase significantly the likelihood of policy change during the study period from January 2017 to November 2022. This implies that within the subsystem of animal welfare, no factors led to the ripeness of the problem and the political stream. However, please note that a part of these findings might also be explained by the fact that COVID-19 led to widespread bans of public demonstrations. Further research on such political windows in pandemic contexts (Moira & Parthenis, 2022) is needed, though they are generally distinguished from spillover effects as overlapping windows (Copeland & James, 2014). Third, we find no partisan effects, meaning that the political affiliation of the agrarian minister has no significant effect on policy change concerning fur-farming bans. However, it must be mentioned here that there is little variance in political party membership and it is likely that party affiliation is more decisive for other policies. Fourth, we find a positive and significant effect for the share of farmed fur animals on the EU market, which contradicts our expectations. We had argued that a large industry has a more powerful interest group that knows how to avert a fur ban. However, another interpretation seems more plausible: the larger the industry, the higher the potential health risks and the bigger the political pressure on policy change.

As an empirical innovation, we provide a first attempt to model coupling via interaction terms as proposed by Engler and Herweg (2019). Here, we find that the effect of COVID-19 outbreaks on fur farms on policy change is higher if the agrarian minister is from a pro-agrarian party and if the number of animals is low. Both findings are theoretically plausible.

Like any empirical examination, this study faces some specific limitations. It is important to note that in the case of fur farming bans during the COVID-19 pandemic, we arguably investigated a special rather than a classic case of spillover, which results in limitations regarding representativeness. The pandemic constitutes an exceptional event that exerted a great impact on many different policy areas, leading to changes that in "normal times" would have been considered impossible. Nonetheless, the last few years have shown that in the future, we should be prepared to deal more often with such all-encompassing crises. Apart from the threat of new pandemics arising, climate change continues to expose societies around the globe to a wide diversity of threats such as natural disasters or food scarcity. Therefore, understanding the dynamics of policy-making in special circumstances becomes increasingly relevant and should be further investigated. In addition, we provide first attempts to measure coupling quantitatively. Further studies should dive deeper into measuring the MSF key assumptions quantitatively. Another point for future investigation is the conceptualization of the power of interest groups. We used the size of the industry as a proxy, which, however, is not completely valid, as small industries can also have powerful interest groups. Therefore, future research would benefit from a transferable, valid measurement of the power of interest groups that does not require in-depth case knowledge.

Overall, the article contributes both theoretically and methodically to MSF research. By theorizing and conceptualizing spillovers, the study demonstrates the usefulness of developing spillovers within

the MSF. Methodically, the present article is one of the few quantitative applications of the MSF and can provide inspiration for future methodological innovations within MSF research.

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DATA AVAILABILITY STATEMENT

The dataset will be made available on the authors' homepage.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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