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Institutional Competition in the German Federalism during the COVID Crisis

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Abstract

The COVID pandemic caused the political competition between the prime ministers of the German states to reach its peak. Whoever is the best at announcing, launching, or implementing policies to combat the pandemic can hope to capitalize most politically. In this paper, we attempt to document which state leaders are forerunners or latecomers in this political competition, when going more into depth of a region's contextual factors. Based on several databases, we perform a survival analysis to compare state leaders' relative determination to implement COVID policies. As our results show, the forerunners in the political discourse are not necessarily forerunners in the implementation, nor in the enforcement of COVID policies.

Keywords: Corona, COVID, political competition, institutions, survival analysis

JEL classification: D7, H7, H11, H12, R5

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1 Introduction

Dynamic political competition within a federal system of states includes forerunners that innovate in political interventions and latecomers that imitate successful strategies. Similar to goods markets, the interplay of both types drives competition and both strategies may be fruitful. Forerunners seek first-mover advantages, which are however risky, since it often is not known *ex ante* whether consumer/citizens will like the new “good”. Latecomers, thus, seek to avoid first-mover disadvantages and benefit from competitors’ experiences. A situation where this interplay specifically becomes relevant is when states within a federal system must react to a series of external shocks like a pandemic. Being a *forerunner*, i.e. the first to introduce a measure that people think is necessary, can boost one’s political stature (if, in retrospect, it proves to be correct). Conversely, it may also be worthwhile performing as a *latecomer* and wait before introducing measures that could restrict the freedom of citizens and thus damage their own political reputation. A common strategy to avoid the risk of either being a forerunner proven wrong in retrospect after introducing unpopular COVID policies or being accused of being a latecomer without leadership quality is to be the first to announce policy and then to be less strict in its implementation.

While the underlying dynamics of federal competition represent a general phenomenon, the Covid-19 pandemic offers us a unique setting to empirically identify forerunners and latecomers in the German federal system, differentiated regarding announcements and actions. In contrast to a centralized political system, the German federal system sets the stage for political competition (Hegele and Schnabel, 2021). While a centralized and closely coordinated system appears advantageous in times of crisis, as rapid political action is required, regional differences and uncertainties tend to call for a federal system in order to be able to take region-specific measures accordingly. In rural regions, for instance, the (social) cost of contact restrictions tend to be lower than in densely populated cities. These differences should be taken into account and they therefore advocate a decentralized approach.

As to the German political system, While the federal state (“Bund”) has the legislative competence for infection control (Art. 74 Nr. 19 Grundgesetz – German Basic Law), the relationship to how much discretion and political leeway should be given to the individual states (“Länder”) concerning their implementation and enforcement of such rules has changed starkly over time. This has created tension not only between the federal government and the states but also between (and in) the state governments themselves.

The topic of federalism in the context of the Covid-19 pandemic is addressed by a growing literature, which, however, mostly focuses on which responses were best to fight the pandemic. In a theory paper, Congleton (2023) derives a superiority of federal systems over unitary systems when combating a pandemic. Greer et al. (2022a, 2023) compare different countries (Brazil, India, U.S. in the first and Germany, Spain, U.S. in the second paper). This literature looks at country-level data and focuses on the quality of the combat against the pandemic. We address the (strategic) inconsistency between announcements and action within a federal system.

There are several rather early papers who predominantly describe how federal states (e.g. Belgium, India, Spain) handled the first weeks of the pandemic without providing empirical evidence or an in-depth analysis (inter alia, Bursens (2020); Kölling (2020); or Saxena (2020)). Going beyond this in their conceptual and descriptive papers, Benton (2020), Kettl (2020), Rocco et al. (2020), and Birkland et al. (2021) analyse frictions between different government levels in the U.S. during the pandemic with a focus on an effective health policy. Jacobs (2021) as well as Biddle et al. (2023) extend this analysis survey-based by looking at pandemic-related changing views on federalism in the U.S. and the Australian population, respectively, with Martín and Roman (2021) providing a similar study for the European Union. Clemens et al. (2021) as well as López-Santana and Rocco (2021) discuss fiscal effects on different government levels from the pandemic. In similar veins, the historical-institutional paper by Abrucio et al. (2020) tackles the Brazilian federalism.

Choutagunta et al. (2021), Kumar et al. (2022) as well as Sahoo and Ghosh (2021) analyse conceptually, descriptively, and empirically how the Indian federalism handled the Covid-19 pandemic. They conclude that the states have initially been the first movers but the federal level took over control very early and virtually suppressed any federal competition further on. Migone (2020) analyses mostly conceptually how the Canadian federalism handled the COVID-19 pandemic in regard of emergency management. They identify a pattern of punctuated gradualism in pandemic management: incremental negotiation, where federal-provincial actors are dominant, followed by short bursts of hyper-activity during emergencies, whereas, however, when the perception of the danger is shared among the key policymakers, the process becomes more cooperative ("emergency centralism"). By analysing Health Systems Response Monitor's data on government responses in Austria, Czech Republic, and France, the important paper by Greer et al. (2022b) finds that a first wave of centralization of policies is followed by later decentralisation. They interpret that during the first wave (spring 2020), heads of government raised their profile to gain credit for decisive action (centralization tendency), however, they later focused on

avoiding blame for unpopular restrictions on everyday life (decentralization tendencies). While we find a comparable grand pattern to Migone (2020) for Germany, we go beyond this analysis by providing an empirical analysis of the announcements and actual actions of the federal elements in Germany. This allows us to look deeper into actual policies performed by state-level heads of government. As such, our analysis complements the “credit and blame”-game (Greer et al., 2022b) by using more granular data and digging deeper into the underlying politico-competitive mechanisms. We show that also on the level of states and their leaders, strategies looking at the popularity of response instruments play an important role. We also add the deviation between announcement and action which proves to be decisive.

Closest to our research is the study by Broschek (2022) who analyses how well different response strategies by the Canadian provinces worked to fight the pandemic and draws conclusion about political leadership. The paper compares three response strategies: laissez-faire (although no Canadian province employed this strategy), mitigation (six provinces), and containment (four provinces). Using a process-tracing approach, the paper tests different hypotheses on whether leadership contributed to success or failure of the pandemic response during the second and third wave, concluding that the containment strategy is superior to combat the pandemic and political leadership plays an important role both for successes and failures. Broschek (2022) urges further research into the role and behaviour of political leaders during such crises. Our paper differs in that we are not analysing what was the best response in terms of combating the pandemic. Instead, we follow the call for more analyses into the role of leading politicians and focus on the mechanisms of federal political competition where leading politicians have an eye on public opinion and re-election probabilities and, thus, announcements and actions may strategically deviate from each other. To our best knowledge, no paper has tackled this issue so far.

In this paper, we intend to identify political forerunners and latecomers within their scope of discretion, differentiated according to announcement and different stages of action as well as analyse the competitive dimension of their policy choices. We discuss a simple model that substantiates a policy leader’s propensity to introduce a new COVID policy. Furthermore, we use NUTS-3 level data from the German statistical office (Destatis) to identify forerunners and latecomers on the state level. Its implementation we perform via a survival model. Our results show remarkable differences between announcement-related and action-related forerunners, i.e. state policy does empirically exploit the mentioned strategies on different levels. We identify “procrastinators”, that is, states that are quick in announcement but rather slow in codifying regulations, “armchair activists” that are quick

codifiers but law enforcers as well as “silent policymakers” who are quick in announcement but low-ranked in enforcement.

The remainder of the paper is constructed as in the following: In Section (2) we give a brief overview on the German federal system and the legal choices that were made within that framework during the course of the pandemic. We further give a short theoretical background on how politicians tend to act and communicate in times of crisis. In Section (4) we model the propensity of political leaders to implement a new COVID policy. The data we describe in Section (3). Regression results are laid out and discussed in Section (5). Section (6) concludes.

2 Political Competition in a Federal System

Germany is a federation of sixteen states with a large scope in individual sovereignty. While the COVID-crisis was a national health crisis and, thus, to be coordinated at the federal level, the implementation lied at state and regional levels with considerable scope for their own actions. In particular during the beginning of the pandemic this created a widely diverse array of political statements and rules to be followed by individual citizens.

2.1 The Scope for Political Competition

In order to analyze the competition leading to forerunners and latecomers, it helps to provide an overview of the legal framework that determines the vertical competition first between the federal state (Bund) and the individual states (Länder), which therein determines the scope of horizontal competition between and within the individual states, thus providing the institutional framework to act as forerunners and latecomers in the first place. We also show the shifts and changes the amount of executive discretion afforded to the individual states during the pandemic, thus providing a timeline for the scope of political competition.

Being a federal country, both the federal state (Bund) and states (Länder) enjoy legislative and administrative competences. In relation to the states, the federal level either has exclusive, concurrent, or ancillary legislative powers. According to the constitution, federal legislation takes precedence of state legislation (Art. 31 German Basic Law).

For dangerous and infectious diseases there exists a so-called concurrent legislative power (in German: konkurrierende Gesetzgebung): Art 74 para. 1 Nr. 19 of the German Basic

Law names the competence for “measures to combat human and animal diseases which pose a danger to the public or communicable”⁶ as such a concurrent power between federal and state level legislation. This means that the states can pass legislation only until and in so far as the federal state has not done so. With the German Act on the Prevention and Control of Infectious Diseases (Infektionsschutzgesetz, InfSchG) of 2000, the federal state made use of these powers.⁷

During the Covid-pandemic, this federal act (InfSchG) has seen many rounds of amendments and is the primary source of law governing all measures and decisions passed in relation to the pandemic. In addition, the federal state has passed other acts and regulations (pertaining to travel restrictions, labour conditions, protective vaccinations) as well.⁸

The federal InfSchG proscribed legally enforceable substantive measures, such as social distancing, the wearing of masks, the closing of schools, to mitigate the effects of the pandemic and control the spread of the virus. Within the framework of the federal law, the states passed regulations (executive laws) who maintained considerable scope to further specify the measures found in this act and their implementation, also regarding the time schedule. In the course of the pandemic, the scope for the state regulations gradually decreased.

The execution and practical implementation of these regulations (executive orders) was not done by the states (Länder) themselves but by smaller administrative units, by counties and districts (in city states such as Berlin, Hamburg and Bremen). Only Bavaria passed its own disease control act — the constitutionality of this is however disputed. Several states also passed ancillary regulations on sanctions (fines) and interpretations of the primary regulation.⁹

⁶For an official version and translation of the Federal Basic Law (Grundgesetz), see [gesetze-im-internet.de/gg/](https://www.gesetze-im-internet.de/gg/).

⁷Infection Protection Act of July 20, 2000 (BGBl. I p. 1045), which was last amended by Article 4 of the law of March 18 2022 (BGBl. I p. 473). The law was introduced as Article 1 G of. July 20, 2000 I 1045 (SeuchRNeuG) from the Bundestag decided with the consent of the Federal Council. According to Article 5, Paragraph 1, Sentence 1, this law comes into force on January 1, 2001, Sections 37 and 38 came into force with effect from July 26, 2000.

⁸COVID-19-Schutzmaßnahmen-Ausnahmenverordnung (SchAusnahmV); Coronavirus-Einreiseverordnung (CoronaEinreiseV); SARS-CoV-2-Arbeitsschutzverordnung (Corona-ArbSchV); Verordnung zum Anspruch auf Schutzimpfung gegen das Coronavirus SARS-CoV-2 (CoronaImpfV); Verordnung zum Anspruch auf Testung in Bezug auf einen direkten Erregernachweis des Coronavirus SARS-CoV-2 (TestV).

⁹Find a list here: <https://www.twobirds.com/de/insights/2021/germany/covid-19-verordnungen-und-verfuegungen-bl> .

The leeway and discretion given to the individual states (Länder) changed significantly during the course of the crisis as ever more uniform rules were set on the federal level which also included implementation guidelines and guidance on which interests to consider when exercising discretion. An assessment/opinion of the legal service of the federal parliament from 29.3.2021 found that the federal state has all-encompassing and far-reaching legislative competences in relation to all measures pertaining to the Covid-pandemic and could also specify the implementation of these measure in full detail. This means that the powers and discretion of the states could have been reduced to zero, including measures related to schools and health facilities. By 22nd April, 2021, Federal Infection Protection Act (InfSchG) was so detailed and expansive that no significant competition among the individual states could still take place. From this point onwards the competition for announcing and implementing preventative measures was largely replaced by the roll-out of the vaccination. Most of the restrictive measures on federal and state level have now been lifted.

2.2 Leadership in times of crisis

The dynamics of political competition in a federal system are multidimensional including horizontal and vertical effects. Focusing on the situation of state-level leaders in the German federalism (as described in the preceding section) and their horizontal competition¹⁰ among each other reveals a number of interesting competition mechanisms that are relevant for our paper.¹¹

First, leading state-level politicians, compete for voters with all the typical caveats and imperfections of the political process in a representative democracy, i.e. imperfect knowledge, asymmetric information, rational ignorance, etc. Here, providing high quality policy solutions for relevant problems of the population naturally represents a channel of competition.

Second, state-level leaders stand in competition with their fellow state-level leaders as voters may observe and assess (both imperfectly) what happens in other German states. Thus, also the relative quality of their policies plays a role.

¹⁰As discussed in the literature review (section 1), the literature focused predominantly on the vertical competition between the federal and regional levels so far.

¹¹In order to keep our paper compact, we do not discuss the huge body of general economics of federalism and political economy in a federal and democratic state. For a recent theory-driven approach with reference also to generally relevant literature see, inter alia, Congleton (2023).

Third, media attention is a relative parameter of political competition. By winning the attention of their own and the other states' population, state leaders may improve their re-election chances and, at the same time, qualify for a career on the federal level by gaining popularity across the states. In this paper, we put a special emphasis on this dimension.

We assume that state-level political leaders instrumentalize all three dimensions to position themselves favorably in this horizontal political competition. Strategy choice is not trivial in a multi-dimensional strategy space under imperfect information, wherefore we expect that different political leaders will view different strategies as individually optimal for them due to different weighing of the pros and cons and the dimensions sketched above.

In times of unexpected crisis, the knowledge problem is particularly relevant as there is usually no blueprint for successfully dealing with the crisis problems. At the same time, the population expects their leaders to prove themselves as successful crisis managers. In such a scenario, for which the COVID-19 pandemic is a representative case, the strategy of acting as a forerunner comes with advantages and disadvantages. A common expectation of political leaders in times of crisis is the effect that the respective politicians in charge take initiative and provide a clear direction in the crisis that the population can follow. Thus, forerunners can be expected to be praised by the press and the public for their decisive action. They may be seen as strong leaders who, in spite of obstacles, move forward with determination, set the course for their state, communicate clearly and often with the citizens, and also enjoy increased popularity in this phase because they "don't talk, they act". However, while consequent and clear measures may be popular *ex ante*, this may change when the population actually suffers from them and when, in the course of time, doubts emerge that these interventions were necessary or the "right" ones. If that happens, the initial popularity for forerunners turns out to be short-lived and the midterm effects may be negative.

Latecomers, on the other hand, may be perceived as being too cautious, lacking leadership and being insecure politicians during the initial phase of the crisis. Their cautious approach to restricting civil liberties may get sharply criticized and there is pressure to follow the forerunners. However, if the more cautious approach turns out to have saved the population from (perceived or real) unnecessary hard interventions into their daily life and welfare, then the latecomer may gain reputation as a "thoughtful person" providing measured policy responses. Thus, the choice whether to act immediately or rather wait is not trivial *ex ante*.

The picture gets even more complicated when mixed strategies are considered. In reality, political leaders do not have to decide to act as a forerunner with all subsequent effects. Instead, they could choose to be a forerunner in announcing consequent interventions and measures but then be careful to codify them into law and/or actually enforce them. By splitting strategies — a forerunner in announcements combined with a latecomer in codification and enforcement — the advantage of media attention (which always focuses on the first calls for actions of a new measure) may be combined with minimizing the danger of getting slated by their own population suffering harder interventions than the citizens in other states. Vice versa, other political leaders may find it attractive to be comparatively silent at first but then prove to be persons of action by being forerunners in codification and enforcement of measures, thus avoiding possible characterizations as being “just loudspeakers” or “populists”. If codification — i.e. the implementation of a law/regulation introducing a certain instrument or measure — can be seen as a signal, then splitting strategies between codification and enforcement may also make sense since only the enforcement will actually hurt people by restricting their life and reducing their welfare.

It is important to emphasize that the quality of the policies — here: avoiding deaths and controlling infection waves — plays the most important role. However, especially under the assumption of imperfect knowledge about the “right” anti-crisis policy — the scope for strategic horizontal competition may be used by political leaders. The following empirical investigation is meant to shed light on the existence of forerunners and latecomers as well as mixed strategies during the pandemic in Germany. Of course, we control for the main goal — the combat of death tolls and infection rates. Before doing so, we provide a brief overview of the data used in our study.

3 Data and Descriptive Statistics

Forerunners and *latecomers* can be identified from different perspectives: (1) who is first (last) in the media addressing a crisis-related aspect, (2) who is first (last) to cast a policy measure into law, and (3) who serves as a role model in law enforcement. Using different data sources, we will try to identify the *forerunners* and the *latecomers* in the three categories: first (last) in media, first (last) in legislation, and first (last) in enforcement. In the following, we provide a rough sketch of the pandemic’s progress in the 16 federal states.

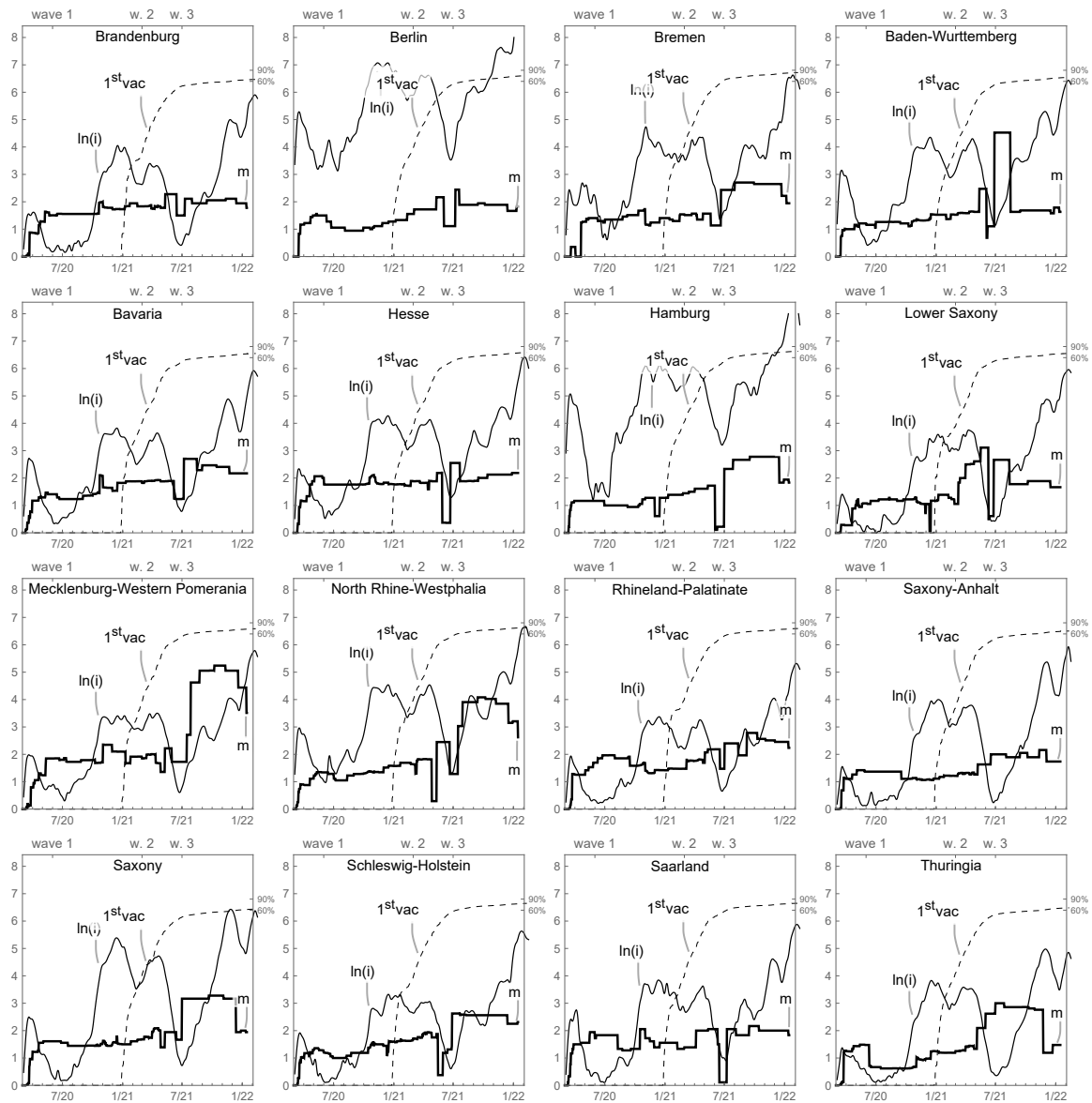
3.1 The COVID pandemic in the 16 Länder

The data we use in the econometric part of the paper comes from the statistical office (Destatis) that provides regional data on the NUTS-3-level. It includes daily information on COVID figures such as actual COVID-infection rates, hospitalization rates, number of deaths with COVID, the vaccination rate, and most importantly, the type, start and end of COVID policies as enforced at the regional NUTS-3-level.

Table (1) reports the corresponding summary statistics about COVID policies of all 16 federal states in Germany. Note that in this table we aggregated all figures to the state level (BL) starting from the NUTS-3 level. The largest federal states in number of sub regions (German: Kreise und kreisfreie Städte) are Bavaria (BY) and North Rhine-Westphalia (NW) with 96 regions and 53, respectively, the smallest ones are the city states (German: Stadtstaaten) with only one or two regions, i.e. Hamburg (HH), Berlin (BE), and Bremen (BR). The latter represent the two most densely populated regions (HH with 2453 and Berlin with 4112 residents per square kilometer). Unsurprisingly, they also report the highest average infection rate (i_μ), the highest average duration of COVID-policy measures, and the highest average rate of employees with reduced working-hours (German: Kurzarbeit, henceforth: KU) where the state compensates partially for the loss in wages. The industry structure, with respect to the share in sales of hotels and restaurants, education, health and social services, and arts, entertainment and recreation in total sales of a region ranges between 18-24%. This regional aspect should also have a positive impact on regional leaders' propensity to introduce restrictive COVID policies.

Figure (1) provides a first glance on the progress of the COVID pandemic in the sixteen federal states (Bundesländer). The data is provided by the German Statistical Office. The state-specific infection rate i is depicted in logarithm labeled $\ln(i)$. The pattern of the infection rate across states looks similar, although the manifestation of the different waves was not perfectly synchronous. Comparing the general level of the infection rate, Berlin (BE) and Hamburg (HH) record the highest rates reaching a logged infection rate of 7 (i.e. $\exp(7) = 1,096$). Berlin and Hamburg are always above the average infection rate. The remaining states are close to or substantially below the mean. In total, we observe four waves during the period under consideration: the first wave, beginning of March 2020 till June/July 2020, followed by the second wave which ended in January 2021 when vaccination had become available, and the third ending with beginning summer 2021. The fourth wave started as early as autumn 2022 and kept on growing unceasingly until the end of January 2022. The shape of the (first) vaccination curves also look alike. They rise steeply until early spring when the incidence rate had fallen substantially, which in

Figure 1: Development of the pandemic in the 16 Länder (federal states).



Note: $\ln(i)$: incidence rate as weekly log-average of NUTS-3 regions by state; m : state-level average of valid policies across sub-regions. $1^{st}vac$: first vaccination rate in percent (right vertical axis); frame ticks on the upper horizontal axis indicate the (approximate) end of the respective COVID wave.

Table 1: Summary statistics by federal state.

BL	# regions	Pop tot.	Pop dens.	i_μ	i_σ	D_μ	D_σ	KU_μ	KU_σ	S_μ	S_σ
SH	15	2911	184	2.8	6.8	10.8	13.8	2377.6	4648.7	0.2	0.04
HH	1	1852	2453	60.5	96.1	13.	12.2	29621.9	58180.2	0.19	0.00
NS	45	8003	168	3.0	6.1	10.2	15.	2747.9	7462.	0.21	0.04
BR	2	680	1621	8.5	30.5	14.2	16.1	6029.7	11252.9	0.22	0.02
NW	53	17926	525	7.2	12.2	10.8	12.4	3715.2	9267.4	0.19	0.02
HE	26	6293	298	4.2	5.7	12.8	14.8	3316.5	8021.7	0.19	0.02
RP	36	4098	206	1.8	3.	11.6	13.2	1340.8	2848.9	0.21	0.03
BW	44	11103	311	4.0	7.2	12.8	14.7	3700.4	8793.6	0.19	0.03
BY	96	13140	186	3.2	8.6	13.9	16.7	3285.3	8741.6	0.18	0.03
SR	6	984	383	2.3	4.5	13.	13.5	2766.4	5754.4	0.22	0.00
BE	1	3664	4112	81.6	157.0	15.6	18.8	43312.3	71533.6	0.23	0.00
BB	18	2531	85	3.0	5.8	15.3	17.2	1687.9	2934.5	0.19	0.03
MV	8	1611	69	2.2	3.4	8.9	9.7	1613.3	2434.6	0.24	0.04
SS	13	4057	220	10.7	16.4	10.4	12.4	4361.7	8131.1	0.18	0.02
SA	14	2181	107	4.0	9.1	19.2	21.5	2171.3	3368.9	0.22	0.03
TH	22	2078	129	3.8	7.9	12.	15.2	1722.3	2661.3	0.19	0.03

Note: BL: indicates the individual state of Germany, # regions: number of NUTS-3 regions, Pop tot.: total population in thousands Pop dens.: population density per square kilometer, i_μ : average infection rate, i_σ : standard deviation of infection rate, D_μ : average duration of policy measure, D_σ : standard deviation of duration, KU_μ : average of reported Kurzarbeit, KU_σ : standard deviation of reported Kurzarbeit, S_μ : industry structure indicating the share in sales of ‘Hotels and restaurants’, ‘Education’, ‘Health and Social Services’ and ‘Arts, Entertainment and Recreation’ in total sales of a region.

turn made many people hesitant to get vaccinated. The incoming third wave pushed this reluctance away. Also, there does not appear to be much of a difference between countries in terms of willingness to be vaccinated. Across all states, about 25% refrained from vaccination.

Concerning COVID policies, the pattern of effective measures too look alike across states. One moment worth mentioning is summer 2021 when almost all countries relaxed their measures, except for Saxony-Anhalt (SA), and Thuringia (TH). Conversely, Baden-Württemberg (BW), Lower-Saxony (NS), North-Rhine-Westfalia (NW), and – to some lesser extent – Saxony (SC) stand out as states tackling the upcoming fourth wave most decisively, as the sudden increase in policies shows. They, on average, increased the number of COVID-policies significantly more than the remaining states.

3.2 Forerunners and Latecomers in the (Print) Media

For identifying *forerunners* and *latecomers* in the (print) media, we consulted the database LexisNexis and performed a keyword search on the individual measures. Individual measures, we report in Table (7) in the appendix.

The 23 measures as identified by the German Statistical Office had all been addressed in the media together with the federal state’s leader at some point in time. In Figure (2), we report the average date when a measure had been initially addressed in the media while naming the measure as well as the state leader of the respective federal state. It also shows the deviation from this average date, which discloses which of the leaders were forerunners or rather latecomers. There seemed to be agreement on the usefulness of some of the measures. The discussion to restrict wholesale and retail business, for instance, was lead within less than a week by all state leaders. This still was at an early stage at 16. March 2020. In contrast, there was less agreement on the introduction of masks, which, on average, was led on the 7. April 2020. Overall, the discussion of possible COVID restrictions took place at an early stage of the pandemic.

The winners in being a *forerunner* in the media had been the prime ministers Markus Söder (BY) and Winfried Kretschmann (BW), when taking the average rank as reported in Table (2). Accordingly, the latecomers were state leaders Peter Tschentscher (HH) and Andreas Bovenschulte (Bremen) at this early stage of the pandemic.

Table 2: Ranking of state leaders as forerunner in announcing measures.

State	Leader	μ	median	σ	rank
BY	Söder	3.13	1.5	3.6	1
BW	Kretschmann	2.74	2.38	3.77	2
BE	Müller	2.48	2.38	4.04	3
NW	Laschet	2.35	1.44	4.46	4
RP	Dreyer	2.17	0.44	3.94	5
SL	Hans	2.13	2.38	4.63	6
ST	Haseloff	1.48	0.25	5.17	7
HE	Bouffier	0.78	0.25	4.07	8
BB	Woidke	0.65	-0.5	4.72	9
SH	Günther	0.35	0.38	5.05	10
TH	Ramelow	0.00	-0.62	4.05	11
MV	Schwesig	-0.83	-1.62	4.67	12
SN	Kretschmer	-1.61	-0.75	6.49	13
NI	Weil	-1.78	-0.62	5.7	14
HH	Tschentscher	-4.30	-0.19	9.01	15
HB	Bovenschulte	-9.74	-0.62	39.07	16

Note: μ : average number of days (measured against the average date) when the policy measure had been associated with a state leader in the (print) media, for the first time; σ : standard deviation.

Table 3: Ranking of state leaders as forerunner in legislation.

	μ	median	σ	rank
HE	-30	-10	58	1
NW	-25	-5	46	2
HH	-16	7	50	3
BW	-15	-9	62	4
SA	-9	-2	43	5
BE	-2	-9	48	6
SH	-2	-8	35	7
BR	-1	8	33	8
RP	5	-4	73	9
MV	8	-8	73	10
TH	8	0	42	11
SR	12	6	51	12
NS	13	2	61	13
BY	16	1	78	14
SS	16	6	65	15
BB	17	19	52	16

Note: μ : average number of days (measured against the average date) when the policy measure had been identified in a legal text of the federal state according to the search terms documented in Table (8) in the appendix; σ : standard deviation.

3.3 Forerunners and Latecomers in Legislation

Announcing the meaningfulness (senselessness) of a measure is one thing, anchoring it in a legal text is another. We ran a keyword search to identify the object of COVID regulations. The respective keywords used are documented in Table (8) in the appendix. After identifying the legal text, we checked manually, whether the text can be assigned to the respective object of regulation. It is to be stressed at this point that there is no exact mapping between federal state norms (German: Verordnungen) so that we had to decide whether it is applicable in the specific domain or not. Figure (3) shows the results of the search for the respective regulatory fields as indicate in captions of the panels. Also in the case of codifying policy measures in legal texts, all sixteen federal states address the topics within a narrow time span. Table (3) reports the average performance of state leaders measured in days against the average date of all 16 federal states.

Certainly, the occurrence of a term in a regulation is not tantamount to actual law enforcement. Nor does the actual day of codification delivers a fair judgment about a state's commitment to do so. The pandemic hit the federal states at different times and with varying severity. This not only is due to the timely process of COVID contagion as such but above all to the heterogeneity of these regions. A more detailed look at states' actual enforcement of COVID policies we give in the next section.

3.4 Forerunners and Latecomers in Law Enforcement

Of the 24 aggregated measures by the statistical office reported in Table (7) of the appendix, we only use 21 categories of protective policies. Some of the measure had not been used by anyone and therefore does not provide any further information about federal states' pandemic history. We have chosen the period from March 1, 2020 to January 15, 2022. Before this period, no COVID-policy had been implemented as the virus did not provoke any political action. End of 2021, the omicron variant started to spread, as is was perceived as a less vulnerable variant, the virus more and more lost its fright, especially as large majority of the population had received its second vaccination. Moreover, the invasion of Russia in Ukraine marginalized the COVID crisis even further. Hence, we ended up with the information about 21 policy categories from 400 NUTS-3 regions from 16 states for 686 days, i.e. in total 5,762,400 data points.

As we are interested in *forerunners* and *latecomers*, we only look at the events when a policy was introduced. Within the period under consideration, we identified 47,301 moments when a COVID policy was introduced. Table (4) shows the variables that we calculated from the available information. Because many policies were introduced, abolished, and reintroduced several times, we count more than just a single introduction of a given policy in a certain county. Every policy was introduced at least 4 times, some even 25 times. The statistical office provides further information on the NUTS-3 level which we will also exploit.

The remaining variables in the table are industry structure, which ranges between 10 and 30% and measures the share in total sales of near-personal services (Hotels and restaurants, Education, Health and Social Services, and Arts, Entertainment and Recreation); total population, and population density; the number of installed policies in all other states as a measure of imitation (technically, a measure of spatial correlation); the number of employees in partial employment (i.e. Kurzarbeit or in short: KU); and calendar time measured in weeks. Before our empirical exercise, we present a simple model that motivates the propensity of regional leaders to implement a COVID policy.

4 The Role of Policy Makers

During the COVID pandemic, policy makers had to decide whether to introduce protective measures and policies and, if so, which kind. As a gauge, the infection rate, which we label i in the following, was agreed on. In Germany's federal system, each state had some

Table 4: Summary statistics on NUTS-3-level.

VARIABLES	N	Mean	Stand.dev.	Min	Max
Number of policies	47,301	8.364	5.528	1	21
Number of previous policies	47,301	4.0	3.6	0.0	25.0
Industry Structure	47,301	0.20	0.00	0.10	0.30
Total population	47,301	210,769.0	231,552.0	34,001.0	3,664,000.0
Population density (per square kilometer)	47,301	553.6	712.8	36.0	4790.0
Deaths	47,301	2.8	2.1	0.0	33.3
Number of policies in remaining states	47,301	1.7	0.7	0.0	3.2
Number of employees in KU	47,301	3,076.0	8,847.0	0.0	255,368.0
week	47,301	46.3	29.5	1.0	98.0

Note: Overall, 400 NUTS-3-regions have been identified. As we only take the information about the day a region introduces a policy, the number of observations decreases to 47,301.

scope in the decision about the ‘right’ timing of a further measure. Therefore, we consider the propensity to introduce a policy m of leader l as a random variable $\lambda(i)$ that depends on the actual infection rate i . In contrast to traditional survival studies, we do not use calendar time as duration parameter.¹²

4.1 Propensity to Implement COVID Policies

The cumulative density of a policy measure that has not yet been implemented at infection rate i is $P(I > i) = 1 - F(i) = S(i)$. Hence, the probability of state leader l to introduce a COVID-policy m is:¹³

$$\lambda_l^m(i) = \lim_{di \rightarrow \infty} \frac{P(i \leq I < i + di | I \geq i)}{di} = \frac{f_l^m(i)}{1 - F_l^m(i)} \quad (1)$$

with $f_l^m(i)$ as the probability density function of leader l with respect to measure m . Equation (1) is therefore equivalent to the hazard function. It is the instantaneous rate of introducing a policy at survival-time i .

We hypothesize that, aside from the infection rate, the probability of political action depends on the state leaders l baseline determination $\mathbf{D}_l(0)$, regional *calendar-time-invariant* factors \mathbf{R}_l (e.g. industry structure, population density) as well as *calendar-time-variant* determinants, i.e the current state of the COVID pandemic $\mathbf{I}_l(\mathbf{t})$ such as the hitherto experienced intensity of restrictions, the number of deaths, or the vaccination rate; furthermore, the contemporaneous economic situation $\mathbf{E}_l(\mathbf{t})$ (the severer the economic damage

¹²A further advantage of this procedure is that all time-variant variables, which we discuss below, are time-invariant with respect to survival-time i , though they are time-variant with respect to calendar time t .

¹³Our model is aligned to the work by Agarwal and Gort (2002).

of previous COVID-policies, the higher policy makers' reluctance to increase restrictions) plays an important role and last not least, under strong uncertainty, the extent to which policy makers imitate other leaders $L^{-l}(t)$ due to no better knowledge.

4.2 Leaders' Baseline Determination

For readability we leave out super- and subscripts m and l , in the following. We assume leaders to have an individual and constant baseline determination to impose restrictions for protective reasons. This is what makes a leader either a forerunner or a latecomer. It is assumed as a fixed personality trait that determines the leader's baseline determination $D_l(0)$ to introduce a restrictive COVID policy measure by evaluating the trade off between citizens' freedom and the protection of their health. The determination changes as the pandemic progresses. The change can be expressed as:

$$\Delta D_l(i) = D_l(i) - D_l(i - 1) \quad (2)$$

where the determination $D_l(i)$ depends on:

$$D_l(i) = f(D_l(0), D_l(i - 1), I_l(t), R_l, E_l(t), L^{-l}(t), \varepsilon(i)) \quad (3)$$

which is, the leader l 's baseline determination $D_l(0)$, the determination $D_l(i - 1)$ given the previous infection state $i - 1$, the current pandemic situation $I_l(t)$, regional time-invariant specificities (R_l), the region's economic situation ($E_l(t)$, i.e. number of workers in subsidized part-time employment, henceforth: Kurzarbeit, KU), and the current policy actions of remaining states $L^{-l}(t)$. To allow for external shocks, we include a disturbance $\varepsilon \sim N(0, \sigma)$.

Whereas the leaders' baseline determination $D_l(0)$ does not change, the course of the pandemic will change his/her actual determination. When the situation gets severer and the human cost of the pandemic increases (deaths), the propensity to introduce further measures will increase ($\Rightarrow \partial f / \partial I_l(t) > 0$), though making the population suffer more and more.

Regional specificities will also force leaders to act accordingly. For instance, a region's industry structure with a high share in services that involves high-frequent human interaction will increase the leader's propensity to pass further COVID policies ($\Rightarrow \partial f / \partial R_l > 0$), although the sign of the derivative is unclear. A high population density requiring more

immediate policy actions may make a leader more reluctant to impose restrictions, as he/she faces substantial political (decline in reputation) as well as socio-economic cost (reduction of citizens' well-being). When the pandemic starts to affect a region's economy, negatively, the leader's willingness to increase the burdening pressure of further policies will decline ($\Rightarrow \partial f / \partial E_l(t) > 0$). An aspect that also will relieve a leader's decision making process is the chance to imitate one's neighbors, that is, looking at one's peers and act alike ($\Rightarrow \partial f / \partial L_t^{-l} > 0$) (=imitation).

4.3 Leaders' Policy Action Function

Assembling all elements from above, we can now formulate the corresponding policy action function (=hazard function):

$$h(i|x) = f(\delta_l + \beta_R \mathbf{R} + \beta_I \mathbf{I} + \beta_E \mathbf{E} + \beta_L \mathbf{L}^{-l}) \quad (4)$$

where $h(i)$ is the hazard rate (or determination) of leader l to introduce a further COVID policy at infection rate i , δ_l captures the leader's baseline determination and f denotes the employed hazard function. In our regressions below, we use the Weibull distribution as hazard function:

$$h_0(i|x) = p \cdot i^{p-1} \exp(\delta_l + \beta_R \mathbf{R} + \beta_I \mathbf{I} + \beta_E \mathbf{E} + \beta_L \mathbf{L}^{-l}) \quad (5)$$

The Weibull distribution allows to consider different shapes of the development of the baseline hazard rate. It may decrease, increase, or remain the same during the pandemic. Parameter p captures the corresponding trend.

5 Results

We perform a survival analysis starting with a non-parametric cumulative hazard function to show states' determination to introduce a restrictive COVID policy without considering any covariates. Afterwards, we run a parametric survival model while including states' context.

5.1 Non-Parametric Cumulative Hazard Function

The cumulative hazard function by states is graphed in Figure (4). The red line indicates the baseline hazard to introduce a COVID policy across federal states. The bands shaded in light gray mark the interquartile range. According to the figure the four most cautious states (forerunners) appear to be BY, NW, BW, and RP. The four least prudent states; HH, BE, BR, and SC, although SC returns to the interquartile range at higher infection rates.

Since we do not consider any contextual variables in the figure, the ranking of forerunners and latecomers is unfair. States are not homogeneous. They, for instance, differ in industry structure and population density, both determinants that draw different conclusions with respect to COVID policies. The actual COVID situation itself will call for specific policies. Furthermore, a densely populated region with a high share of vaccinated people allows for less restrictive policies than in other regions that lag behind in immunization coverage; in regions with an economically difficult situation, politicians will hesitate to introduce a restrictive and thus additionally restrictive policy measure; the uncertainty that is involved in a hitherto unknown pandemic will exacerbate a stringent purposeful policy; therefore, policy makers will also look at neighbors how they cope with the pandemic (imitation). We will address all these determinants in the following survival model.

5.2 Survival Regression Analysis

In Table (5) we start with a semi-parametric proportionate hazard model (Cox, 1972). The Cox model (Model 1) is presented in the first column of this table. As covariates we included several groups of variables.

First, we look at the regional characteristics. An industry structure with a high share in near-person services forces policy makers to pass COVID policies and so does a high population density because it facilitates the spreading of the virus. A higher population density, however, conversely increases the reluctance to introduce further restricting policies.

Second, the current COVID situation in the region, such as the vaccination rate, the number of deaths from which a region suffers will influence the decision making process of politicians. The more human casualties, the higher leaders' determination to introduce further measures. The more advanced the vaccination rate, the stricter the new measures to be introduced.

Third, the involved uncertainty in policy making shows up in the degree of imitation. Leaders of a given region will increase COVID measures, if the remaining ones have done so. Note that the timely association is not on calendar time but on survival time i . In other words, if other regions introduced certain measures at a given infection rate i , so will the respective region under consideration. As the positive coefficient suggests, there is imitation (spatial correlation) among regions to a significant extent.

Fourth, a difficult economic situation makes politicians more reluctant to impose restrictive policies. This is what the negative coefficient for the variable labeled ‘Number employees in KU’ suggests. An increasing ‘Kurzarbeit’, i.e. partial employment subsidized by the state, will reduce policy makers’ willingness to further weaken the economy with COVID policy measures.

In Model (2), we employ an exponential hazard function to test the robustness of our results. The signs do not change and the coefficients remain stable, except for the first vaccination coefficient that becomes negative and significant. As in Model (1), we also implemented state dummies (which we will use later on to derive the ranking of federal states) and dummies for the kind of measure. The drawback of the previous models is that it assumes a constant baseline hazard which is rather unlikely in the case of the spreading of a virus. An exponential spreading, as is the case with COVID will also affect policy makers sensitivity to act and fight the pandemic in order to keep social and economic cost low. Using a Weibull hazard function will allow estimating a disproportionate hazard rate.

Model (3) reports the corresponding results with the Weibull hazard function. Again, the estimated coefficients remain robust compared to models (1) and (2). Parameter p indicates a decreasing hazard for $p = \exp \ln(p) = .83 < 1$. This suggests that the baseline probability to take measures against COVID decreases when the infection rate i increases.

Last not least, we include an indicator variable for the time after when the COVID policy was centralized end of April 2021 by the Federal Infection Protection Act (InfSchG). By and large, it depletes any significant competition among the individual states. As the estimate suggests, with centralization the propensity to introduce restrictive measures increased significantly.

As we are interested in forerunners and latecomers, we extract the state dummies from the regression, which indicate the state-specific baseline hazard to enforce COVID-policies. The respective coefficients thus allow us to rank states according to their baseline hazard, or in other words, according to states’ determination to act.

Table 5: Survival regression models.

time variable: infection rate	Cox (1)	Exponential (2)	Weibull (3)	Weibull (Inst.change) (4)
Regional Characteristics				
Industry Structure	0.046*** (0.002)	0.059*** (0.002)	0.050*** (0.002)	0.049*** (0.002)
Population density	-0.210*** (0.008)	-0.292*** (0.011)	-0.239*** (0.010)	-0.225*** (0.010)
Current COVID Performance				
Number of 1 st vaccination (= 1 st vac)	0.000 (0.002)	-0.012*** (0.003)	-0.007*** (0.003)	-0.047*** (0.003)
Number previous policies	-0.068*** (0.002)	-0.079*** (0.003)	-0.070*** (0.002)	-0.084*** (0.003)
Deaths	26.557*** (2.297)	31.199*** (4.189)	28.518*** (3.554)	36.504*** (3.817)
Policy Imitation				
Number policies remaining states	0.582*** (0.017)	0.545*** (0.017)	0.602*** (0.020)	0.608*** (0.020)
Economic Situation				
Number employees in KU	-0.010*** (0.001)	-0.013*** (0.001)	-0.011*** (0.001)	-0.015*** (0.001)
Institutional Change				
Centrally managed				0.786*** (0.018)
Disproportionate Hazard				
ln(p)			-0.179*** (0.004)	-0.161*** (0.004)
State Dummies	Yes	Yes	Yes	Yes
Policy Dummies	Yes	Yes	Yes	Yes
LL	-391,801	-72,292	-71,033	-70,071
Observations	41,221	41,221	41,221	41,221

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Note: Each column presents regression coefficients: (1) a semi-parametric Cox regression, parametric survival regressions assuming (2) an Exponential, (3) and (4) a Weibull probability distribution, respectively.

Together with the ranking identified in Figure (3), which reports forerunners/latecomers in codifying policies, we can now confront that ranking with the ranking we get when considering state characteristics. Figure (5) presents the performance of the countries in the three competitive fields: Announcers, Codifiers (= Law makers), and Enforcers. The left vertical axis indicates the ranking based on the keyword search in the Juris database, whereas the right axis documents the ranking after considering states' context or baseline hazard, respectively. The first four forerunners in codifying COVID-policies are MV, HE, BW, and BE; the latecomers are HH, SR, SC, and BR. The arrows indicate the change in ranking. MV and HE, for example, lose in ranks when it comes to the enforcement of the installed policies; BW gains one rank, finally ranks second. All four latecomers (HH, SR, SC, and BR) gained in ranking. Only BE and NW appear to keep their rank. BB, MV,

SH, and HE belong to the states with substantially less determination in enforcement than in codifying the COVID rules, whereas SC, RP, HH, and BR appear more determined in enforcing than codifying.

Table (6) summarizes the results of Figure (5) and adds three of many conceivable classifications of leaders' strategic behavior. Pairwise comparison of a state's three rankings yields three groups (= behavioral types) of forerunners and latecomers, respectively: *procrastinators*, *armchair activists*, and *slient policymakers*. We emphasize that the designations of the three groups are intended as provocations rather than as a distinctive identification of a class, since the classes are not independent from each other. Nevertheless, this is what state leaders have to justify for, in public.

There are states such as Saarland (SR), one of the forerunners in announcing new COVID measures, that take a rather long time to codify their claims (i.e. $a > c$) relative to other states; we label this behavioral type *procrastinators*; states such as Berlin (BE) that are relatively quick in codifying but rather easy going in enforcement (i.e. $c > e$), we call *armchair activists*, and those that are quick in announcing but very weak in enforcing (i.e. $a > e$), we label *slient policymakers*.

Table 6: Forerunners vs. Latecomers.

critierion		Forerunners				Latecomers			
announcers (a)		BW	BE	SR	BY	NI	BR	SC	MV
codifiers (c)		HE	BE	BW	MV	SR	HH	BR	BB
enforcers (e)		RP	BY	SH	NI	BR	SC	BE	HH
behavioral types		Forerunners				Latecomers			
procrastinators	($a > c$)	SR	BY	BB	HH	SC	TH	HE	MV
armchair activists	($c > e$)	BE	HE	NW	BW	NI	SR	BB	BY
slient policymakers	($a > e$)	MV	NI	RP	SH	BW	HH	NW	BE

Note: The first half of the table indicates forerunners and latecomers according to the ranking they achieved in the three competitive fields: announcers (a), codifiers (c), and enforcers (e). In the second half of the table, the forerunners and latecomers are listed in order of greatest difference in the pairwise comparison of each state's ranking. Comparing ranks such as $a > c$ means that the rank in a (announcing) is higher than the rank in c (codifying). Also, see Figure (5).

6 Discussion/Conclusion

The dynamics of political competition in a federal system include horizontal and vertical effects. Leading state-level politicians, for instance, experience incentives to compete for their voters' sympathy not only through the absolute quality of their policy solutions

within the respective state, but also by the relative quality of their policies compared to other states. Due to information asymmetries, voters often cannot perfectly assess this quality, so politicians act under the incentive to provide popular solutions. This is particularly true if the political challenges are of a novel character and no past experience with solutions and their effects exists. Nevertheless, at least in the short run, popular political action only benefits a political leader if the citizens learn about it, mostly through media channels. In other words, the announcement of the popular political action is relevant – and if many citizens are not well informed beyond the media-transmitted announcements, the announcement may actually matter more than the actual political action – at least in the short run. Therefore, state-level politicians stand in horizontal competition not only through the (perceived) quality of their (announced) political actions, but also through the media time and attention they can generate.

In times of a sudden crisis, the sketched scenario comes into play and state-level political leaders experience incentives to position themselves as “people of action” – acting quickly and decisively to combat the crisis – or “people of thought” – acting carefully and sustainably to steer through the crisis. Both strategies also have their downsides: forerunners may run into the trap of establishing unpopular measures that turn out to have been ineffective/unnecessary. Latecomers may be perceived as bad leaders. Ex ante, it is unclear which strategy is superior in terms of political success – both in the short- and in the medium-run. The strategic puzzle is further aggravated by the fact that announcements of action must be distinguished from the implementation of action and both can have different effects. Actually, the implementation can be further differentiated in the codification of action and the enforcement of the newly codified rules.

The COVID-19 crisis offers a unique example for studying how state-level political leaders behave and choose their strategies in such a scenario. By tracing the announcements of prime ministers, the codification of respective laws in the states of Germany, and the enforcement of these rules, we show that political leaders choose (a) different strategies and (b) these strategies include the systematic deviation of announcements, codification action, and enforcement action. For Germany during the first period of the pandemic, most interestingly, we cannot identify any consistent forerunner: no state managed to be in the top 5 of being fastest announcer, fastest codifier, and fastest enforcer (see Figure 5). The state with the best average rank across all categories was Baden-Württemberg (BW, with Winfried Kretschmann) that scored rank 1 in announcements, rank 3 in codification, and rank 7 in enforcement. By contrast, there are a couple of overall latecomers like Brandenburg (with prime minister Dietmar Woidke) that scored rank 14 (out of 16) in announcements, rank 15 in codification, and rank 13 in enforcement (see Figure 5).

However, for most of the states it mattered to split their strategy between announcement, codification, and enforcement times. We identify “procrastinator”, that is, states that are (relatively) fast in announcement but slow in codification. The Saarland (with prime minister Tobias Hans) and Bavaria (with prime minister Markus Söder) that ranked 3 and 4 in announcements but only 13 and 10 in codification (see Figure 5 and Table 6) belong to that category. Note, however, once the rules were codified, their enforcement was relatively instant (see Figure 5 and Table 6). As for citizens’ perception of leadership, the idea may have been to signal strong leadership by frontrunning announcement and a fast enforcement after codification, but avoid burden on the population that may turn out to be overly hard by procrastinating codification. Hence, these two states and their respective leaders appear to have focused on getting media time and audience attention in order to gain reputation as drivers of the politics – but they also were very reluctant to bother their own population with restrictive measures and waited with codification. They appear as procrastinators but not as armchair activist.

Niedersachsen (with prime minister Stephan Weil), which is only ranked 13 in announcements, takes rank 11 in codification, and eventually rank 4 in enforcement (see Figure 5 and Table 6). This state apparently were less concerned with being quick in announcing, but more so with enforcement. Therefore, this state and its leadership could be labelled as silent policymakers. “Armchair activists” refers to forerunners in codification and latecomers in enforcement at the same time, examples for which would include Hesse and Mecklenburg-Vorpommern that rank 9 and 16 in announcements, then 1 and 4 in codification, and eventually 10 and 5, respectively, in enforcement. While Mecklenburg-Vorpommern may also qualify as an extreme case of silent policymakers as Niedersachsen without putting much effort on media and attention capturing, Hesse rather qualifies as an “armchair activists” state. It comes relatively late to the announcement party, focuses on codification, and being little forceful in enforcement.

Berlin (with mayor Michael Müller) combines the strategies of “procrastinators” and “armchair activists”. It ranks 2 in announcement, 1 in codification – but only 15 in enforcement. Thus, Berlin and its leaders pretended to be quick in action but actually was one of the latecomers in enforcement. However, it is conspicuous that all city-states – Berlin, Bremen, and Hamburg – performed worse in enforcement than in the other categories.

Our empirical analysis allows for a number of important insights. The first is that the strategic scope is actively used and different strategies are indeed chosen, including systematic deviations between announcements and different types of action. Federalism matters! Our analysis points to the relevant conclusion that analyses of political com-

petition should carefully differentiate between announced and performed policies because empirical strategies may blur these dimensions. This is neglected so far in many studies. Further research here could more systematically look at the short- and medium-run popularity and election effects of these strategies – although no trivial results should be expected given the variety of strategy choices by the high professional political leaders in our sample.

A second implication is that media does not necessarily manage to transmit sufficient transparency about the consistency of the behavior of political leaders. Inconsistencies between announcements and actual action were hardly discussed in prominent ways — offering additional scope for the populist forerunner strategy: the fastest announcers were not automatically the quickest codifiers and not automatically the strictest enforcers.

Thirdly, we find a pattern similar to Migone (2020). At the beginning of the pandemic, the regional competencies were very actively used with the consequence of a very lively federal institutional competition. Over time, however, the federal level has gradually eroded the scope for independent action at the state level, and thus also the scope for competition, in favor of centralized policy. Interestingly, we do not find a subsequent wave of decentralization in Germany like in Greer et al. (2022b)’s “credit and blame”-game (see section 1). Maybe, both in Canada (Migone, 2020) and in Germany, the relative late grip of the federal level on the anti-pandemic instruments and policies pre-empted a later re-decentralization. Note that our analysis does not discuss whether the decentralized experimentation period or the later centralizing grip by the federal state made the anti-pandemic policy more effective and/or more efficient. Our analysis shows, however, that regional differences both in health statistics-terms and in economic terms did actually drive differences in state-level policies (see Table 5), so that we cannot reject Congleton (2023)’s theory of a better-suited reaction of federal systems to a heterogeneous crisis (i.e. regionally differing effects).

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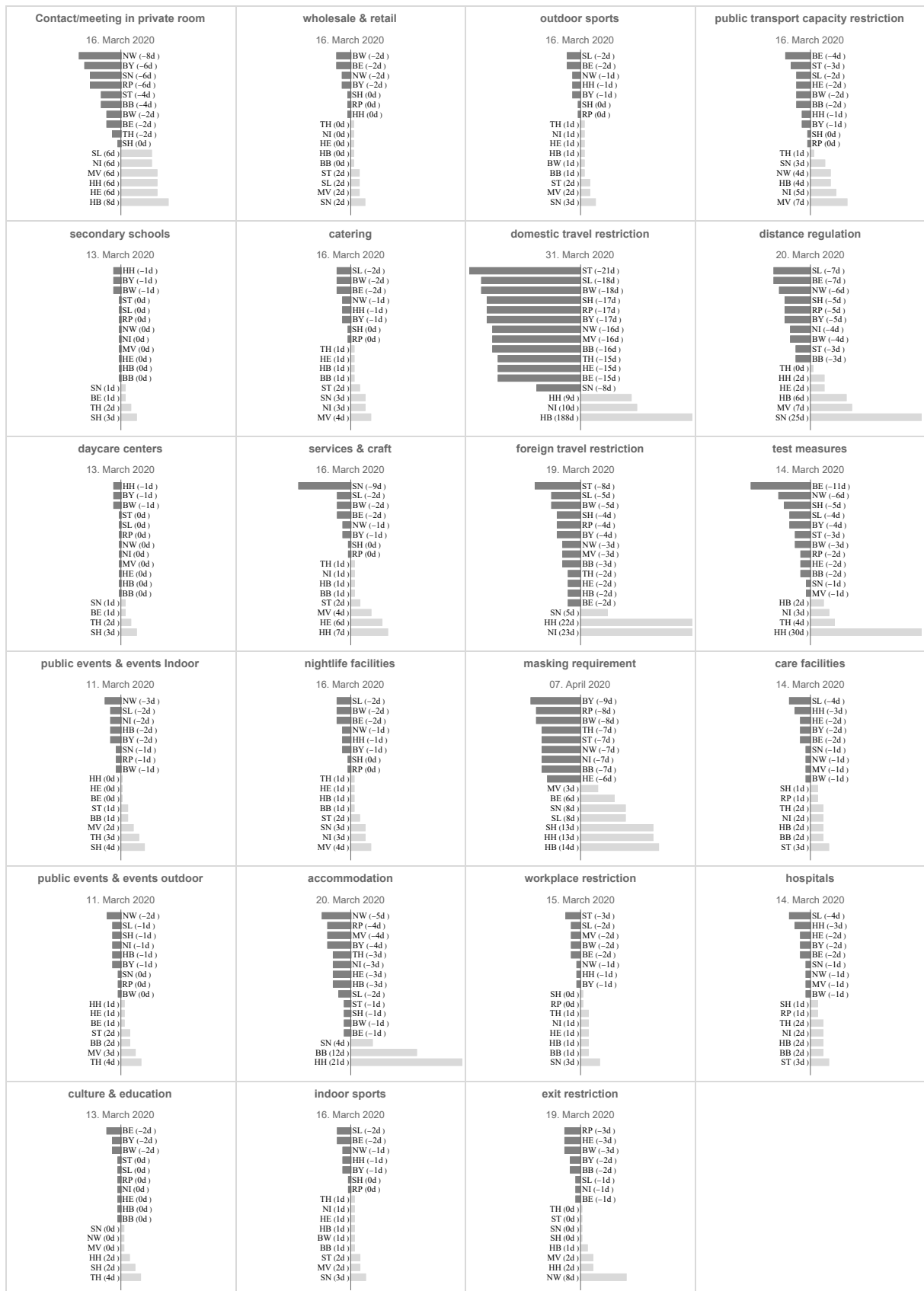
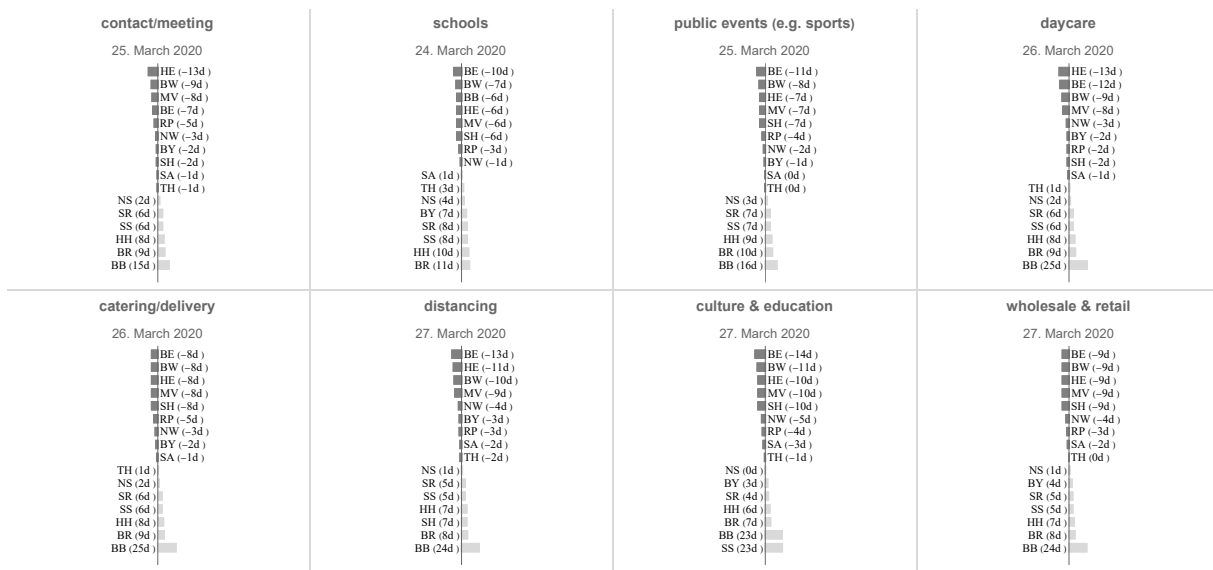


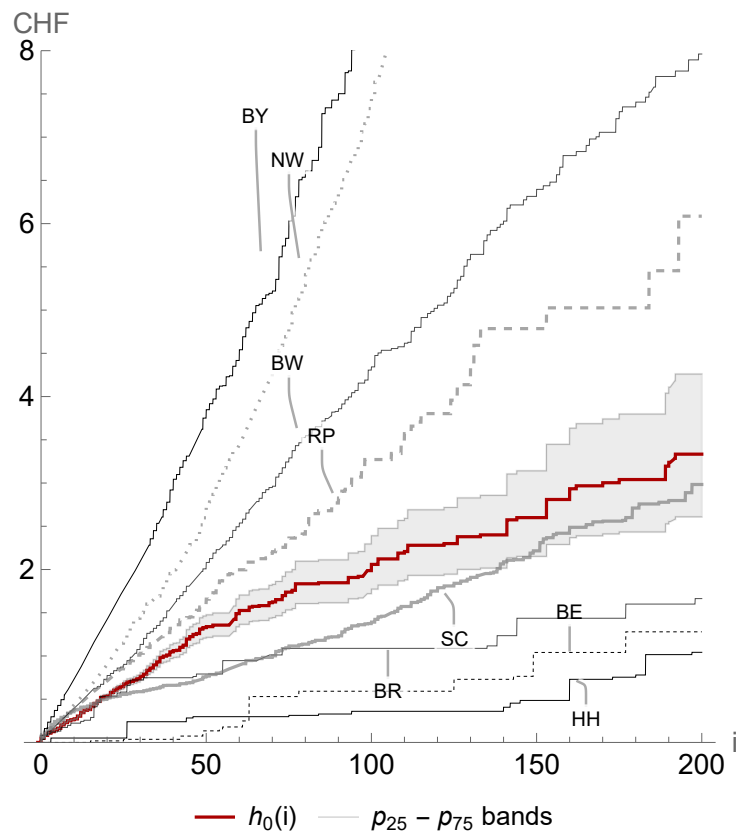
Figure 2: Time at which a measure was requested



Note: The specific search terms can be found in Table (8) in the appendix.

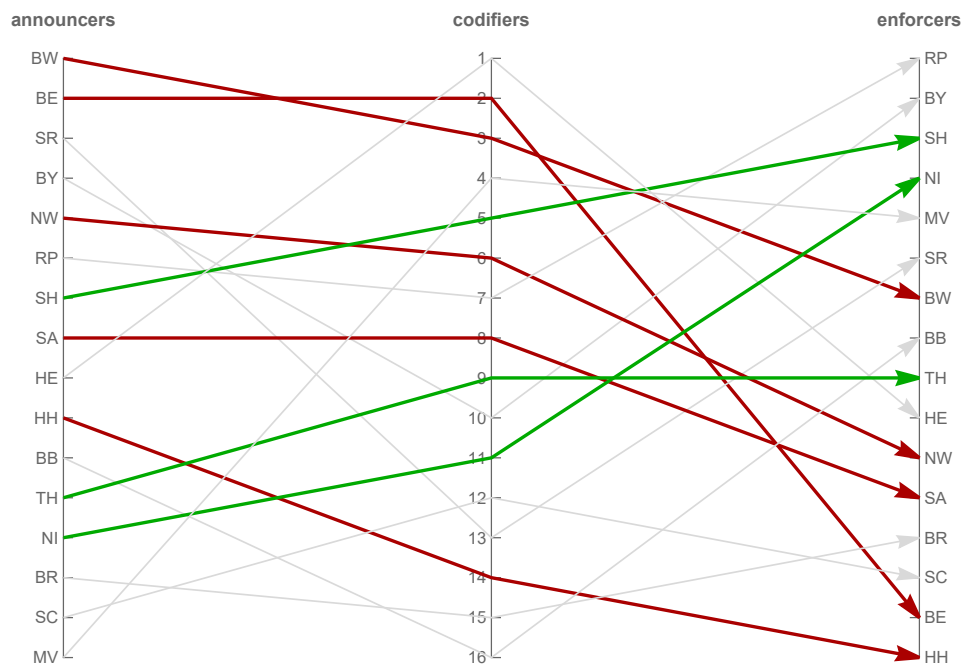
Figure 3: First time keyword in caption can be observed in federal state regulation

Figure 4: Cumulative Hazard by States (CHF)



Note: The red line indicates the baseline hazard ($h_0(i)$) as cumulative hazard function dependent on survival i , i.e. the infection rate, the gray bands the interquartile range.

Figure 5: Rankings: Announcers, Codifiers, and Enforcers



Note: The three axes represent the rankings of the 16 federal states concerning the announcement of COVID-policy measures, the codification of these measures, and their enforcement

Appendices

Table 7: COVID-Measures as identified by the German Statistical Office (Destatis)

Acronym	Subject area of the policy measure
M01	contact/meeting in private room
M02	secondary schools
M03	daycare centers
M04	public events & events Indoor
M05	public events & events outdoor
M06	culture & education
M07	wholesale & retail
M08	catering
M09	services & craft
M10	nightlife facilities
M11	accommodation
M12	indoor sports
M13	outdoor sports
M14	domestic travel restriction
M15	foreign travel restriction
M16	masking requirement
M17	workplace restriction
M18	exit restriction
M19	public transport capacity restriction
M20	distance regulation
M21	test measures
M23	care facilities
M24	hospitals

Note: We aggregated measures to the three digit level. It should be noted that there are identified measures that have never been executed in any sub region. Therefore, we did not report M22, as it has not been applied in the period under consideration.

label	search term
contact/meeting	Kontakt
schools	Schule
public events (e.g. sports)	Sport
daycare	Pflegeeinrichtungen, Kinder, Heime, Tagespflege
catering/delivery	Lieferservice, Lieferdienste, Gastro, Restaur, Essen, Essen auf Rädern
distancing	Abstand
culture & education	Weiterbildung, weiterbilden, Kultur, Theater, Kino
wholesale & retail	Großhandel, Einzelhandel, Handel
travel	reisen
testing	testen, Testung, Testpflicht
curfew	Ausgangssperre, Ausgangsbeschränkung, Bar, Kneipe, Club
capacity restriction	nicht mehr als ... Person, höchstens ... Personen, privaten Bereich
workplace restriction	am Arbeitsplatz, in der Arbeitsstätte, arbeiten
masks	Maske, Mund-Nasen-Schutz, Gesichtsmaske, Mund-Nasen-Bedeckung, Maskenpflicht
masks (FFP2)	FFP2, FFP-2, partikelfiltrierende Halbmaske, Filtermaske, Atemschutzmaske
vaccination	impfen, geimpft, Impfung

Note: search terms with white-space characters means that the search was exerted for whole words in the legal text. Without preceding or trailing blanks represent search terms that may also occur as substrings of words.

Table 8: Search terms for legal texts.