



# THE COVID-19 PANDEMIC AS A CATALYST FOR CROSS-BORDER COOPERATION? LESSONS LEARNT FOR BORDER-REGIONAL RESILIENCE

Stefan Hippe , Dominik Bertram , Tobias Chilla 

Institute of Geography, University of Erlangen-Nuremberg  
Wetterkreuz 15, 91058 Erlangen: Germany

[stefan.hippe@fau.de](mailto:stefan.hippe@fau.de) • [dominik.db.bertram@fau.de](mailto:dominik.db.bertram@fau.de) • [tobias.chilla@fau.de](mailto:tobias.chilla@fau.de)

**Abstract.** The COVID-19 pandemic led to a suspension of the Schengen Agreement within the European Union: national borders were partially controlled or closed. Especially in European border regions, where the idea of European integration is most evident, this led to limitations of cross-border linkages, putting the question of border-regional resilience into the focus of border studies. Based on the case study of German border regions, we operationalize the various impacts of the COVID-19 pandemic alongside the German border. Particularly interesting with regard to the concept of border-regional resilience are the results of a two-stage Delphi survey with border-regional experts. Even if the border closures as such were a political crisis, some of the long-term effects might be considered positive.

**Keywords:** border regions, border-regional resilience, COVID-19 pandemic, crises, cross-border cooperation, resilience.

## Introduction

The COVID-19 pandemic has influenced cross-border cooperation in European border regions on many levels. In Germany, the Federal parliament declared an ‘epidemic situation of national scope’ in March 2020, which was maintained until November 2021. During this time, numerous regulations were issued and laws adopted at the national level to mitigate the effects of the pandemic. As a result, public life was restricted and civil society limited in various aspects. Furthermore, national borders were closed as a short-term reaction to the crisis. From a border-regional perspective, such an approach is rather paradoxical, as global phenomena such as economic shocks, natural hazards or pandemics rarely respect national borders (Prokkola, 2022). Even today, with borders open again, border controls continue in some areas. In the scientific debate, these border policies are known as ‘covidfencing’ (Medeiros et al., 2021; Novotný, 2021).

The suspensions of the Schengen Agreement have disrupted and hampered many cross-border linkages. As open borders bring opportunities for cross-border regional development (ESPON, 2022), regions close to national borders have been particularly affected by closures. Examples of areas that have been negatively impacted include flows of goods, commuter links, and cross-border cooperation (cf. Novotný & Böhm, 2022; Weber, 2022). This confirms the findings of Prokkola (2019) that their location on the border and their cross-border dependencies make

border regions particularly vulnerable to geopolitical changes. Moreover, Hippe et al. (2023) state a high short-term vulnerability of European border regions with regard to the financial crisis. However, border regions tend to be more resilient than non-border regions in the long run.

At the beginning of the pandemic, border closures and controls were a national decision, diverging from the specific interests of people living in border regions (cf. Lara-Valencia & García-Pérez, 2021). Crises thus reveal diverging interests between national and border-regional decision-makers (Kajta & Opiłowska, 2021) and have caused border regions to be discussed as the ‘forgotten’ regions at the local level (cf. Böhm, 2021; Goolsbee & Syverson, 2020). As such, crises highlight the need for cross-border integration, as limited cross-border linkages can weaken local economies and cooperation in the long term (cf. Böhm, 2021).

The influence and effects of crises on border regions are discussed in terms of border-regional resilience, with the border referred to as a common good (Lois et al., 2022). The resilience of border regions can be influenced by geopolitical regimes, (cross-border) institutions, culture, and trust (Prokkola, 2022). While an increasing number of studies have recently examined the impact of crises on border regions, the discussion of border-regional resilience is still young in contrast to the concept of regional resilience; thus, further studies on the impact of crises in border regions are being encouraged (e.g. Phelan et al., 2013; Gong & Hassink, 2017; Slusarciuc, 2017; Prokkola, 2019). In border studies, multiple recent studies have described and analyzed the impacts of the COVID-19 pandemic on cross-border linkages (cf. Kurowska-Pysz et al., 2022; Opiłowska, 2022; Dittel, 2023; Tarvet & Klatt, 2023).

This article addresses border-regional resilience in the context of the COVID-19 pandemic and focuses on German border regions. The key questions are as follows: To what extent does the COVID-19 pandemic affect German border regions and what differences can be seen among them? What impact does the pandemic have on future resilience of cross-border cooperation? Moreover, what options do border regions have to better prepare for future crises? The empirical data is based on the results of a two-stage Delphi survey and the EU Commission’s official document on the suspension of the Schengen Agreement. Resilience is here operationalized according to Martin and Sunley (2020), who describe regional resilience as a multi-layered process. Our main objective is to shed light on vulnerability, resistance, adaptability, and recoverability in the border-regional context. Our paper builds on ‘crisis timelines’ of all German border regions and the insights of 104 crisis-specific assessments by border-regional experts. We reflect on the role of border regions in times of crisis and discuss possible future development paths. In doing so, we contribute to the debate on border-regional resilience.

## Research Background

### Border regions: linking functional and institutional dimensions

In European border regions, which evince high economic, political, cultural, and social diversity, borders are an essential part of daily life (Durand & Decoville, 2019; Jakubowski, 2020). The border as a ‘resource’ can initiate functional cross-border flows and border-regional innovation (Sohn, 2014; Cappellano et al., 2022). To do so, it needs sufficient permeability (O’Dowd, 2002). With the introduction of the European single market and the Schengen Agreement, the free movement of people, goods, capital, and services has reduced transaction costs and encouraged cross-border

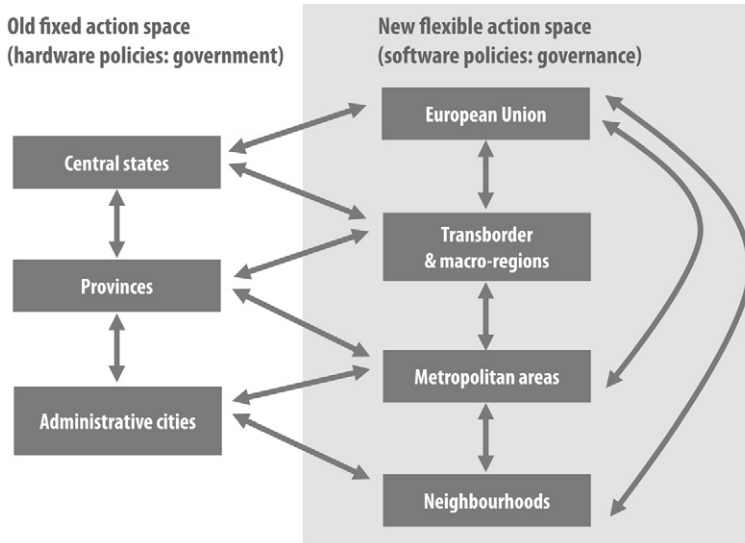
linkages (Havlíček et al., 2018). However, due to heterogeneous political systems either side of a given border, borders can be highly porous for capital flows while being relatively impermeable to labor migration (Medeiros, 2019).

In this context, borders can generate or highlight many obstacles. In addition to difficulties caused by differing legal systems, a 'multi-level mismatch' leads to challenges in finding solutions and responsibilities due to the different political levels of state systems (Chilla et al., 2012). In several European Member States, for example, there are still restrictions on ambulances transporting patients to neighboring countries due to non-harmonization (EC, 2017). Moreover, language-related barriers and 'mental' borders still hamper cross-border daily life and cooperation in European border regions (EC, 2016). At the same time, infrastructures in border areas are often insufficient in many respects (Christodoulou & Christidis, 2019), from roads and railways in the catchment areas of large border cities to cross-border education infrastructures. Additionally, morphological features such as mountains, rivers, and coasts can be geomorphological barriers to cross-border cooperation (e.g., Klatt & Herrmann, 2011; Chilla & Heugel, 2022). The long-standing challenges of cross-border coordination have been intensified by the partial reintroduction of border controls in recent times, increasing Euroscepticism and signs of 'rebordering' (Durand et al., 2017; Schimmelfennig, 2021). Furthermore, European funding has been important in past decades, but it is visible that the current budgetary framework at the European level is smaller, which will also be reflected in border areas (Chilla & Lambracht, 2022). In this context, Kolossov and Scott (2013) highlight the relevance of multi-level, cross-sectoral, and long-term approaches to cross-border cooperation. Cross-border regions are often referred to as 'laboratories of European integration', since border-regional tailor-made solutions need to be 'explored' (Decoville & Durand, 2019).

Unsurprisingly, cross-border cooperation is a key part of the European integration process and often deals with highly complex topics and settings (Caesar & Pallagst, 2022; Turner et al. 2022). Successful cooperation is strongly dependent on common interests, day-to-day political opportunities, local actor settings, and effective multi-level governance (Zumbusch & Scherer, 2015; Wong Villanueva et al., 2020). Here, governance can be seen as a transboundary network of politics, administration, economy, and civil society (Kramsch & Mamadouh, 2003; Bufon, 2011). Cross-border cooperation initiatives do not aim to remove administrative or cultural borders; rather, they perform a linking function to create cross-border benefits in various economic, social, environmental, and political fields (Scott, 2015). The challenging framework conditions such as language barriers and different legal, political, administrative, and planning systems often result in border-specific regionalism (ESPON, 2017; Peyrony, 2020; Pupier, 2020). This leads to institutional ambiguity everywhere from informal working communities and association structures at the local and regional level to Euroregions and Eurodistricts and large-scale macro-regions (Kaucic & Sohn, 2021).

Figure 1 illustrates that the EU interacts with 'hard spaces' and 'soft spaces'. In Europe, the idea of soft spaces with 'fuzzy boundaries' has evolved into a policy concept promoted by the Interreg Europe program (Allmendinger et al., 2014; Purkarthofer, 2018). Instead of developing binding plans or regulations, the focus is on cross-border strategy development, coordination, and agenda setting as well as mutual learning (Metzger & Schmitt, 2012). The basic precondition for cross-border governance is the possibility of interacting across open borders (Blatter, 2004). Particularly in crises, there is a risk that interests differing between national and local actors will lead to hampered or even suspended cross-border cooperation (Kajta & Opiłowska, 2021). The current example of the COVID-19 pandemic illustrates that a crisis can lead to decreased cooperation and the re-emergence of mutual animosities or even closed borders (see, e.g., Böhm, 2021; Lara-

Valencia & García-Pérez, 2021; Medeiros et al., 2021). Evidently, the resilience of cross-border cooperation is of high significance for border-regional development (Prokkola, 2019).



**Figure 1.** Government and governance: linkages between hard and soft spaces in border regions  
Source: author's illustration based on Purkarthofer (2018, p. 1013).

## Border-regional resilience

The refugee movements of 2015/16, the COVID-19 pandemic, and the war against Ukraine illustrate the increasing scale and intensity of crises that crystallize, to a certain extent, along borders (Brakman et al., 2020; Gong et al., 2020). These crises especially affect border regions in the EU (cf. Gräbner et al., 2020; Fedajev et al., 2021; Martinho, 2021; Böhm, 2022; Chilla et al., 2022). The concept of resilience in this context is widely discussed in the literature, with resilience frequently defined as 'bouncing back' or 'rebounding'. Resilience refers to the ability of a system to recover, reposition, and evolve after shock or disruption (Martin, 2012; Giacometti et al., 2018). To simplify the matter somewhat, there are two ways a system can respond to shocks. It can 'bounce back' to its pre-crisis baseline, or it can 'bounce forward' on a new path (Simmie & Martin, 2010; Hu & Hassink, 2015; Bonß, 2016; Muštra et al., 2016). Here, the 'system' under consideration is a border region whose ability to adapt to emerging structural changes is analyzed (Di Caro, 2015). Former initial conditions can be transformed into new ones, into a different post-crisis normality (Bonß, 2016; Muštra et al., 2016). Moreover, new connections can be established, and future pathways for more intensive cross-border cooperation become possible (Boschma, 2015; Prokkola, 2019).

The regional resilience approach extends the concept of resilience to a regional perspective (Martin & Sunley, 2015; Sensier et al., 2016). It describes regional economic, institutional, and social reactions to a shock (Di Caro, 2015). Martin and Sunley's (2020) approach to regional resilience

as a multi-layered process was originally developed with a regional-economic focus. However, their five resilience components can be applied to border-regional systems as well:

1. **Risk:** the vulnerability of a border region to different types of shocks
2. **Shock:** the origin source and duration of a shock
3. **Resistance:** the impact of the shock on the border region
4. **Adaptability:** how border-regional linkages deal with a shock
5. **Recoverability:** the degree and direction of recovery after a shock

These components are essential for understanding border-regional resilience, which describes the response of border regions to crises (cf. Prokkola, 2019). Resistance, adaptability, and recoverability depend on the shock event and its impact. Meanwhile, the political dimension is a key factor for resilience, as pre-crisis decisions can have an impact on the reaction to shock events (Martin et al., 2016; Sensier et al., 2016). In cross-border contexts, this dimension is particularly relevant, because decisions on one side of the border can have serious impacts on the other side. Furthermore, the quality of cross-border linkages influences the reaction to a crisis (Christopherson et al., 2010). Thus, border regions can actively influence their activities in the direction of increased resilience. It is essential to know about the regional adaptive capacity to external shock events because missing capacities can then be anticipated and compensated for (Giacometti et al., 2018).

In this framework, open borders with effective cross-border cooperation generally serve as a resource and enhance resilience (O'Dowd, 2002; Bristow & Healy, 2014; OECD, 2014; Sohn, 2014). Moreover, Prokkola (2019) identifies four elementary building blocks for border-regional resilience: political relations, socio-cultural links, non-formal networks, and long-standing economic relations. Thus, the intensity of cross-border cooperation, cross-border institutionalization, cultures, and trust is significantly relevant for resilience in border regions (cf. Blatter, 2004; Jakola & Prokkola, 2018; Hippe & Chilla, 2021; Prokkola, 2022). From a more positive perspective, Prokkola (2019) argues that enhanced cross-border governance in the post-crisis era can provide sustainable benefits to border regions in the long run. However, since the refugee crisis in 2015/2016, many EU countries concentrate on tightened border security measures rather than further developing border regions and cross-border cooperation (Prokkola, 2022).

The border closures and controls in the wake of the mentioned crises have led to severe restrictions on cross-border interaction. In this context, borders become obstacles for commuter links, trade relations, institutional cooperation, and social contacts (cf. Evrard & Chilla, 2021; Peyrony et al., 2021; Weber et al., 2021). For example, national minorities in the Danish-German border region were especially impacted by border control measures as their interaction with their high numbers of relatives and contacts on the other side of the border was limited. In times of crisis, 'borderless' Europe is anything but borderless. This is a significant handicap for border regions, as they tend to rely on cross-border connections (Kajta & Opiłowska, 2021; Novotný, 2021).

Opioła and Böhm (2022) studied the impact of Euroregions along Polish national borders during the COVID-19 pandemic and found diverse border-regional patterns. They concluded that Euroregions only had a marginal impact on national decision making, even though effective cross-border cooperation in crises and cross-border resilience require national decisions and national interest in border issues (cf. Chilla, 2022). Böhm (2021) confirms the high relevance of the national level for cross-border development in the Polish-Czech border region, as do Haist and Novotný (2022) in the case of the German-Czech border region. Trust, permanent contact points, border-regional risk analyses, harmonization processes, and joint crisis scenarios and exercises as well as strengthened regional competencies can have 'border resilience-promoting' effects. Opiłowska (2022) con-

firms that for the German-Polish border, established cross-border networks, trust and institutional structures were resilience enhancers. In contrast, Renner et al. (2022) find an increased incidence of nationalist and populist opinions in the German-Polish border region.

Overall, border regions seem to be more vulnerable to crises in the short term. During the COVID-19 pandemic, it became particularly clear that border-specific decisions on one side of the border can have an impact on the neighboring side (e.g., different entry regulations or quarantine rules). In the Belgian-Dutch-German border region, for example, non-harmonized control measures led to a complex set of rules that made cross-border solutions almost impossible (Unfried, 2020).

## Data and methods

Our study builds on border-specific data from the COVID-19 pandemic period. The empirical work originates from the research project 'BMBF CoBo (Cohesion in border regions)', which examines crises effects on border regions with German participation. The spatial focus of our study is, therefore, on all nine border regions of Germany with its neighboring countries of Austria, Belgium, the Czech Republic, Denmark, France, Luxembourg, the Netherlands, Poland, and Switzerland.

Germany's border settings are highly geographically diverse, exhibiting morphological specificities (maritime, land, river, and mountain borders) and socio-economic differences. The country's border regions are also politically heterogeneous: Germany has borders to 'old' EU countries (e.g., France, the Netherlands), 'new' EU countries (the Czech Republic and Poland), and an external EU border with Switzerland. Different cultures, languages, and forms of cross-border institutionalization are thus added to border-regional specificities.

### The crisis timelines approach

In our first methodological step, we evaluate the border controls at the German borders during the COVID-19 pandemic. The EU Commission's official document on the suspension of the Schengen Agreement (EC, 2022), which captures the border control periods at intra-European land, sea and air borders, serves as the data's basis.

In form of so-called 'crisis timelines', we present the number of days with border controls at the land borders for Germany and all corresponding neighboring countries for the years 2020 and 2021. This period covers the first four German COVID-19 infection waves (first infection wave: from March 2020; second infection wave: from October 2020; third infection wave: from March 2021; fourth infection wave: from October 2021). We aggregate the number of days with border controls per month and plot them for each nation state in line graphs. This comprehensive visualization illustrates border-regional differences between the respective country pairs in a simple manner.

### Delphi survey in German border regions

To complement our empirical basis on border-regional resilience, we applied a two-stage Delphi survey to analyze specific impacts of the COVID-19 pandemic on the German border regions. The Delphi approach is a systematic multi-stage survey aiming to identify future developments and pathways (Evrard et al., 2014), which uses interviews in an established method based on suc-

cessive rounds of expert opinions for future-oriented problem-solving (Wolf, 2017). The process also involves a written, structured consultation building on the findings of the previous survey (Häder, 2014). Our Delphi included qualitative and quantitative methods using multiple-choice and open-ended questions, while elementary parts of the questionnaire included in-depth reflections on the resilience of border regions. We also aimed to identify and discuss future developments and policy options for border regions with German participation.

We designed the first survey based on findings from the research project 'BMBF CoBo (Cohesion in border regions)' and several interviews with border-regional experts. The first round was conducted from December 2021 to January 2022, the second from June to August 2022. For the first survey, a total of 267 experts were contacted, of which a total of 104 participated (response rate: 39%). For our cross-border Delphi approach, we defined an expert as a person key to cross-border cooperation (i.e., Euroregion president/director, ministerial representatives, sectoral stakeholders, Interreg stakeholders, and 'visionaries').

The proportion of male participants is 62%, and that of female participants is 38%. For reasons of confidentiality, the affiliations of the experts are not presented in detail. Of course, an institutional role brings with it a specific institutional bias that can determine response behavior. Therefore, we chose a broad set of actors from different institutions and levels therein for our research design. To be as transparent as possible at this stage, we display the percentage distribution of the experts' institutions in Table 1.

**Table 1.** Institutional distribution of the participating experts

Category of experts' institution	Percentage share (n=104)
Cross-border institutional cooperation (e.g., Euroregions, Eurodistricts)	31.7
Regional level (NUTS1, NUTS2)	25.0
Sectoral institution in border region	21.2
Interreg administration	10.6
National level (NUTS0)	7.7
Local level (NUTS3, LAU)	3.8

For the second round, only participants of the first survey were contacted. The second survey built on the findings of the first survey, allowing for validation and forward-looking in-depth analysis of the results from the first round. A total of 70 experts participated in the second survey (response rate: 67%). Figure 2 provides an overview of the response from the German border regions and the spatial perimeter of the study. We evaluate the results for each border region individually to examine border region-specific obstacles and future paths.

For the operationalization of regional resilience, Martin and Sunley (2015) give four different approaches: (i) case studies (qualitative surveys); (ii) resilience indices (quantitative assessments); (iii) statistical time series models; and (iv) causal structural models. Our Delphi study follows the first approach to operationalize (border)-regional resilience as a multi-layered process (Martin & Sunley, 2020) and enquires into the vulnerability, resistance, adaptability, and recoverability of cross-border linkages in German border regions with regard to the COVID-19 pandemic.



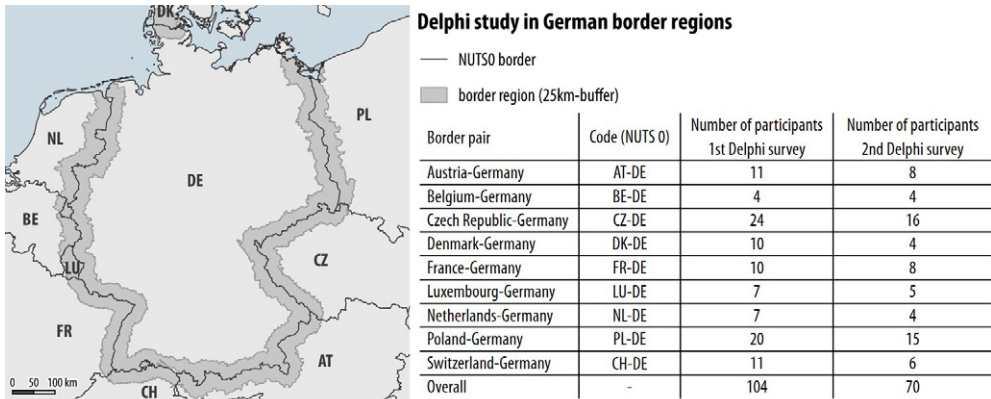


Figure 2. Spatial perimeter and number of participants in the Delphi study

### A) The vulnerability and resistance perspective: short-term impacts on cross-border linkages

In the first Delphi round, we asked, ‘*In which areas was your border region particularly affected?*’ to measure and operationalize the short-term impact of the COVID-19 pandemic on cross-border links. The question was open-ended, making individual responses possible. The experts’ answers were analyzed qualitatively and assigned to keywords. Subsequently, we categorized those keywords and established generic terms. Each border pair was evaluated individually, and the number of mentions per generic term was calculated in relation to the total number of responses. Table 2 lists the generic terms and their assigned keywords.

**Table 2.** Generic terms and keywords for the analysis of the answers to the question, ‘*In which fields was your border region particularly affected?*’

Generic term	Keywords
Economy	Economy, labor market, trade
Social	Personal and business contacts, generalization of and hostility towards neighbors
Mobility	Cross-border mobility, border closures and controls
Legal	Different (quarantine) rules, juridical mismatch, different legal responsibilities in the cross-border multi-level system
Tourism	Missing overnight guests
Health	Shortage of health care workers
Education	Cross-border studying and education

### B) The adaptability perspective: intensity of cross-border cooperation in the pandemic context

In the first round of the Delphi survey, the experts reported on the development of cross-border cooperation during the pandemic and COVID-19’s possible ‘catalyst function’. Investigating the adaptability perspective, we asked, ‘*In your opinion, have the experiences from the pandemic led to increased cross-border cooperation in your border region (e.g., ad-hoc cooperation on health issues, joint lobbying against border closures, new networks or institutions)?*’. The experts had



multiple answers to choose from: not at all, moderately, strongly, very strongly, and don't know. Moreover, they were asked to comment on their answer in a blank text box. The multiple-choice section was evaluated in a quantitative way, with the number of mentions per choice option calculated in relation to all responses. The responses to the open questions complemented the quantitative response patterns.

### C) The recoverability perspective: consolidating cross-border cooperation and lessons learnt for future crises

The findings of the first Delphi round indicate that border regions and their numerous border specificities were strongly affected by the COVID-19 pandemic. It is apparent that the crisis affected large parts of 'daily cross-border life'. Many experts emphasized the relevance of preventive efforts in planning for future crises. For this reason, we decided to ask the following question in the second round of the Delphi survey: *'In the first round of this Delphi study, it was often mentioned that it is important to prepare for crises and not only to react to them. What does this mean in concrete terms for your border area, and what preventive actions should be taken in the future?'* This question, which operationalizes the long-term perspective of recoverability and learning from the crisis, was formulated openly. As in the first round, we analyzed the experts' responses in a qualitative way and assigned them to keywords. Subsequently, we categorized those keywords and established generic terms. Again, each cross-border region was evaluated individually and the number of mentions per generic term was calculated in relation to the total number of responses. Table 3 lists the generic terms and the assigned keywords.

**Table 3.** Generic terms and keywords for the answers to the question, *'What does this mean in concrete terms for your border area, and what preventive actions should be taken in the future?'*

Generic term	Keywords
Being resilient	Analyze risks (crisis prevention), check/create resilient structures, learn from crises and other border regions, run through scenarios, identify responsible actors
Contact / communication (channels)	Strengthen contact/communication (all levels), establish communication channels
National border awareness / regional competencies	National border awareness, importance of national level during crises, involve regional specificities/experts, strengthen regional competencies
Harmonization / neighbor knowledge	Harmonization (e.g., legal, data), legal basis, neighbor and resource knowledge
Joint analyses and (rescue) exercises	Joint analyses, exercises, rescue services, infrastructure
Keep border open	Open border important, cross-border thinking in times of crisis
Cross-border healthcare	Strengthen cross-border healthcare
Crisis unpredictable	Crisis unpredictable, answer difficult
Strengthen cross-border structures	Strengthen cross-border institutions and infrastructure
Other	e.g., flexibility of border regions, SMEs preference of renewed border closures

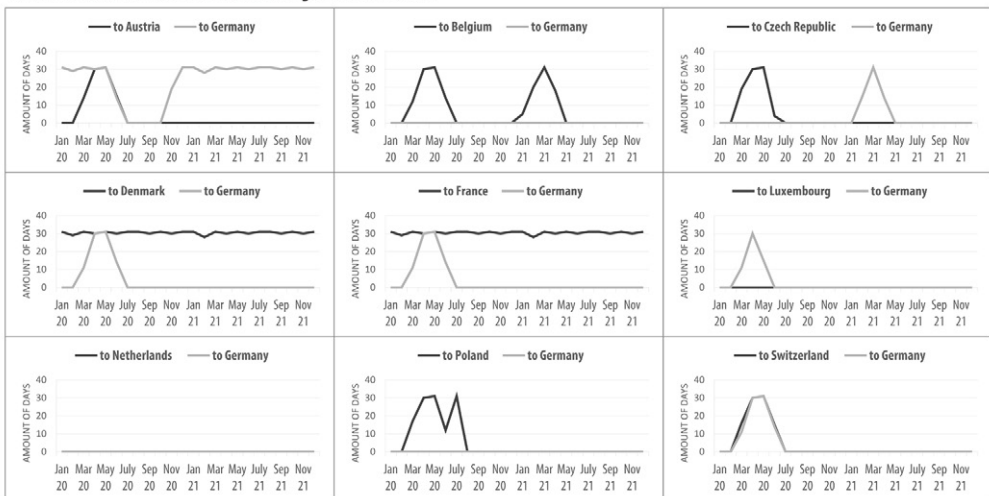
## The COVID-19 pandemic in border regions with German participation

### Crisis timelines: border closures and controls resulting from the virus spread

The EU Commission provides a detailed and open-access table with the suspensions of the Schengen Agreement at all intra-European borders. In most cases, the reasons for suspending the agreement were preventive measures in the wake of the COVID-19 pandemic, but protection against possible terrorist threats or illegal migration was also considered. The reasons overlap in some cases, and the Delphi survey indicates that ‘the reasons listed are not necessarily the actual reasons’ and often seem to be merely a pretext. Denmark and France, for example, have controlled their borders since 2015/2016, extended every six months for various reasons – and this is still ongoing.

Figure 3 shows the monthly aggregated number of days in 2020 and 2021 on which the Schengen Agreement was suspended and border controls were reintroduced along the German borders. In all cases, the crisis timelines represent the number of days on which Germany controlled its own borders with a grey line. Black lines, on the other hand, show the number of days with border controls and a corresponding suspension of the Schengen Agreement by the respective neighboring countries.

Border controls between 2020 and 2021 along the German border



Data: European Commission 2022

**Figure 3.** Crisis timelines for border controls between 2020 and 2021 along German borders  
Source: data EC (2022).

The individual graphs indicate three different patterns:

- 1. Symmetric for the border pairs DE-CH and DE-NL:** In this case, the lines of the two curves overlap (almost) completely. Both countries controlled their borders simultaneously for two years or did not perform any border controls.
- 2. One-sided for the border pairs DE-BE, DE-LU and DE-PL:** In this category, one-way border controls occurred. In the border regions of DE-BE and DE-PL, Germany did not perform border con-

trols. However, border controls were implemented at one point or another towards the neighboring country. In the border region DE-LU, exactly the opposite was the case.

- 3. Asymmetric for the border pairs DE-AT, DE-CZ, DE-DK, and DE-FR:** In this category, both countries controlled their border at least once during the period. However, the controls occurred at different times, resulting in an asymmetric line pattern.

In general, there were two main episodes of border control. The majority occurred in the first halves of 2020 and 2021 (around February to June). A strong correlation with the COVID-19 infection waves can be seen here (cf. Duvernet, 2021 for the first infection wave; Chilla et al., 2022 and Gareis & Kurnol, 2023 for the first three infection waves). Denmark and France are the only countries where border controls were in place throughout the overall study period. Furthermore, the management of German border-regional controls differs significantly. While in some border regions, no controls in the direction of Germany were established (DE-BE, DE-NL, DE-PL), in the DE-AT border region, for example, controls towards Germany were performed over an extended period.

### The COVID-19 pandemic’s sectoral impacts

The question ‘*In which fields were your border region particularly affected?*’ examines the direct sectoral impact of the COVID-19 pandemic on the respective border region. Thus, this question serves to operationalize the vulnerability and resistance of sectoral cross-border linkages. Table 4 presents the sectors most affected by the pandemic in percentages of responses per border pair. Multiple responses were possible for this question. The table illustrates the values in total and for each border region. We categorized the answers into generic sectoral terms. The individual keywords per generic term are listed in the methods section.

**Table 4.** Evaluated answers from the first Delphi survey to ‘*In which fields were your border region particularly affected?*’ (in %)

Generic term	Overall (n=204)	AT-DE (n=24)	BE-DE (n=11)	CH-DE (n=26)	CZ-DE (n=50)	DK-DE (n=18)	FR-DE (n=14)	LU-DE (n=12)	NL-DE (n=6)	PL-DE (n=43)
Economy	34.3	29.2	36.4	30.8	34.0	27.8	42.9	16.7	50.0	41.9
Social	21.6	16.7	0	34.6	30.0	16.7	7.1	8.3	16.7	18.6
Mobility	17.2	20.8	27.3	15.4	14.0	16.7	21.4	41.7	0	11.6
Legal	9.3	8.3	18.2	11.5	4.0	5.6	14.3	25.0	33.3	4.7
Tourism	8.3	16.7	0	7.7	10.0	27.8	0	8.3	0	0
Health	6.9	8.3	18.2	0	4.0	5.6	7.1	0	0	14.0
Education	3.4	0	0	0	4.0	0	7.1	0	0	9.3

204 participants answered this question. According to these experts, the German border regions were most affected by the COVID-19 pandemic in terms of their economy (34.4%), with social services (21.6%) and the mobility sector (17.2%) following in second and third place respectively. Other sectors were mentioned less across all border pairs. In seven of nine border pairs, ‘economy’ was the most frequent response. Other terms were mentioned even more frequently only in DE-CH (the social sector) and in DE-LU (the mobility sector). The DE-LU case represents the large socio-economic differences between the two countries and the resulting high cross-border commuting rates.

The regional patterns are very diverse. For example, the generic term ‘legal’ was mentioned far more than average (9.3%) in the border regions DE-NL (33.3%) and DE-LU (25%). Here, the experts referred to different regulations of quarantine policies or varying legal competencies in the cross-border multi-level systems – so-called ‘juridical mismatch’. The high level of commuting

and spatial integration between two border regions, especially in the German-Luxembourg border area, underlines the need for possible border crossing according to the Schengen Agreement. New COVID-19 specific rules and laws complicate daily cross-border connections with far-reaching consequences for the labor market and trade relations.

In the DE-DK border region, tourism was mentioned more often than the average (8.3%), comprising 27.8% of the answers. One reason for this may be the increased cross-border integration in the interest of tourism between the two countries. The economic relevance of tourism is also high due to the North Sea and Baltic Sea connections. The shortage of guests during the pandemic was thus a serious handicap.

The experts in the Delphi study mentioned various reasons for their use of generic term 'social'. For example, the awakening of old prejudices against the bordering country and the resulting animosities were addressed in various border regions, especially in the border regions with 'new' EU countries (cf. Renner et al. 2022). Some experts exaggeratedly described how some people, who considered the virus 'bad', saw it as entering their country mainly through the 'neighbor'. Hence, in some cases, border commuters from one's own country were also seen as 'bad', since they would be 'bringing in' the virus from the neighboring country. It was clear that the border was once again strongly felt in many areas of daily social life; it will take some time for these prejudices to be 'forgotten' again.

In conclusion, border-regional differences in vulnerability underline the specificity of border regions. There is, therefore, a need for border-specific adaptation mechanisms for future crises.

### **The COVID-19 pandemic as a catalyst for cross-border cooperation?**

In the first Delphi survey, the following question addressed the development of cross-border cooperation during the COVID-19 pandemic, operationalizing the short-term adaptability of cross-border governance: *'In your opinion, have the experiences from the pandemic led to increased cross-border cooperation in your border region (e.g., ad-hoc cooperation on health issues, joint lobbying against border closures, new networks or institutions)?'* Figure 4 illustrates the relative response distribution of all the border-regional experts' answers. The graph includes the values from all nine border regions as well as the cumulative values.

Overall, about 40% of the experts stated that the pandemic has had a 'moderate' impact on galvanizing increased cross-border cooperation. Additionally, about 25% attested that the crisis has had a 'strong' impact and about 10% assumed a 'very strong' influence. At the same time, 17% thought that there was no crisis impact on future cross-border governance 'at all'. One of ten experts voted for 'don't know'. In other words, about 75% of the experts believe that the crisis has led to increased cross-border cooperation, meaning the short-term adaptability of cross-border governance is seen as rather strong. This description of the 'catalyst function' of the pandemic was complemented by numerous freeform responses. For example, the respondents pointed out that during the crisis, the high relevance of cross-border cooperation was acknowledged by media and the political establishment, and new channels of communication were created. The need for higher political awareness of cross-border topics at the national level was mentioned; this could provide more short-term options for cross-border cooperation in the future. Overall, as the effects of the crisis demonstrate, border-regional concerns could be better 'heard' at the national level.

At the border-regional level, most border regions similarly agree that the crisis has functioned as a 'catalyst' for cross-border cooperation. In the German border regions with Belgium, France, Luxembourg, and the Netherlands, the option 'not at all' was not selected at all, meaning agreement is high in these border regions. An exception is the DE-DK border region: in this case, two

divergent groups emerge. The choices ‘not at all’ (50%) and ‘strongly’ (40%) received a similar number of responses. At the same time, the other options were barely mentioned. A ‘catalyst function’ is thus neither rejected nor confirmed. The reasons for this become clear in the open answers. In this border region, regional communication channels function reasonably well; simultaneously, multi-level communication from the regional to the national level seems to face obstacles. Especially in crisis periods, coordination between the levels is crucial and quick decision making is required. During the pandemic, it became clear that these communication channels are not sufficiently in place, resulting in a negative impact on cross-border regional cooperation. Moreover, existing collaboration has now been set back years, as the border is ‘on people’s minds’ again.

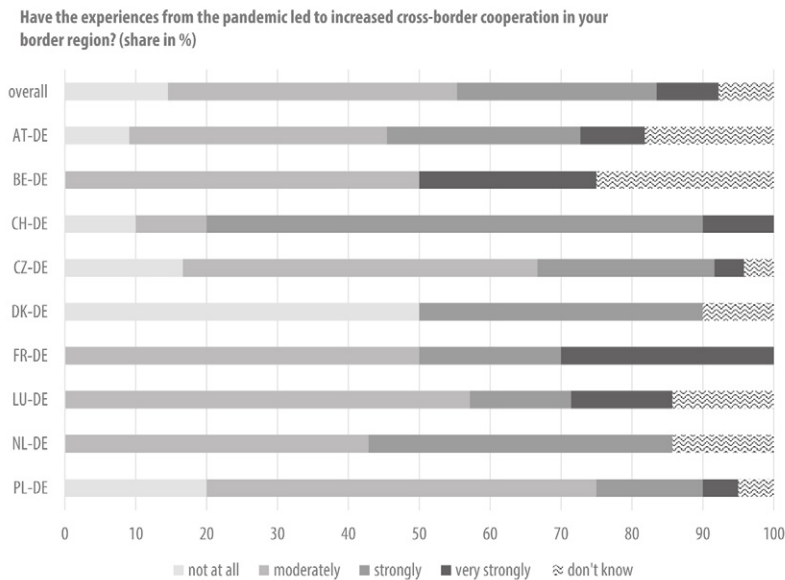


Figure 4. Evaluated answers from the first Delphi survey, investigating the adaptability perspective (in %)

### Lessons learnt for border-regional resilience

The findings from the first Delphi round indicate that German border regions were highly affected by the COVID-19 pandemic. Many experts reflected on the future and stressed the relevance of preventive measures looking to future crises. Based on these insights, we addressed the following question in the second Delphi survey: *‘In the first round of this Delphi study it was often mentioned that it is important to prepare for crises and not only to react to them. What does this mean in concrete terms for your border area, and what preventive actions should be taken in the future?’*. This question operationalizes the long-term perspective of recovery and learning from the crisis. The survey responses are categorized by generic terms (the individual keywords per generic term are listed in the methods section). For this question, multiple answers were possible. Table 5 presents the percentage distribution of responses from all German border regions combined as well as each border region individually.

In total, we received 162 responses to this question. More than a quarter of the answers from all border regions can be assigned to the generic term ‘being resilient’. On the one hand, the experts focused on crisis prevention, implying that it is necessary to identify border-regional risk factors and establish crisis-proof governance structures. An important point here is the clarification of re-

sponsibilities: on both sides of the border, it should be well-known which person to consult after a shock event, as rapid coordination and joint approaches to solutions are necessary. On the other hand, the experts raised the need for simulations of possible disaster scenarios, discussing how pilot cross-border crisis management could eliminate potential deficits for diverse scenarios. Moreover, ‘learning from past crises’ is crucial. Established governance structures should be sustained and already-solved problems recalled. Learning from other border regions’ ‘best practices’ in dealing with shocks and crises should also improve border region-specific problem-solving.

**Table 5.** Response patterns from the second Delphi round: *‘In the first round of this Delphi study it was often mentioned that it is important to prepare for crises and not only to react to them. What does this mean in concrete terms for your border area, and what preventive actions should be taken in the future?’* (in %).

Generic term	Overall (n=162)	AT-DE (n=25)	BE-DE (n=12)	CH-DE (n=14)	CZ-DE (n=39)	DK-DE (n=5)	FR-DE (n=18)	LU-DE (n=13)	NL-DE (n=4)	PL-DE (n=27)
Being resilient	26.5	40.0	50.0	28.6	17.9	20.0	27.8	15.4	0	29.6
Contact / communication (channels)	22.2	4.0	16.7	21.4	30.8	20.0	11.1	30.8	0	40.7
National border awareness / regional competencies	10.5	12.0	0	7.1	10.3	20.0	22.2	7.7	0	11.1
Harmonization / neighbor knowledge	9.3	8.0	0	7.1	15.4	0	0	30.8	25.0	3.7
Joint analysis and (rescue) exercises	8.6	4.0	0	28.6	7.7	0	11.1	0	50.0	7.4
Keep border open	6.8	12.0	16.7	0	10.3	20.0	0	0	25.0	0
Cross-border healthcare	5.6	0	8.3	0	5.1	0	16.7	23.1	0	0
Crisis unpredictable	4.3	8.0	16.7	7.1	2.6	20.0	0	0	0	0
Strengthen cross-border structures	3.7	4.0	0	0	0	0	5.6	7.7	0	3.7
Other	2.5	8.0	8.3	0	2.6	0	5.6	0	0	3.7

We assigned more than one fifth of the responses from all border regions to the generic term ‘contact/communication (channels)’, which mainly refers to the extension and deepening of cross-border contacts and cooperation. Intensive exchange can create trust across the border, and many experts described ‘good border-regional relations’ as a resilience multiplier. And this not only applies at the regional level: establishing communication channels between cross-border actors and the national level is also fundamental. In times of crisis, the national level plays a significant role, meaning that, as stated, cross-border regional interests need to be ‘heard’ at the national level. Conversely, the experts’ pandemic experiences show that there has been a lack of awareness of cross-border regional concerns at the national level for a long time. Permanent contact points and a regular exchange at the national level could prevent such a situation. Moreover, border-regional concerns should be considered before far-reaching decisions are taken.

The findings regarding the generic term ‘national border awareness/regional competencies’ complement these impressions. Some experts mentioned increased awareness of border-regional concerns after the shock event, but they also described a lot of further potentials. For future crises, two solutions were proposed. First, border-regional actors should be more involved in decision-making that affects their border region. Second, competencies at the regional level should be strengthened. In this manner, regional solutions can be identified and the ‘long’ channels via the national capitals potentially bypassed.

The other generic terms elicited fewer responses, but important arguments nevertheless emerged from them. For example, the experts mentioned the need for a border-regional harmonization process of regulations and data monitoring. Different legal situations (regarding, e.g., quarantine regulations, border-crossing regulations, and health insurance) could be harmonized and thereby facilitate daily life in the border area. In the event of a crisis, data monitoring plays an essential role, since in some border areas, for example, it is not even known how many border commuters exist. Shared knowledge about the border partner and strengthened interlinkages in the border area would help with decisions in times of crisis and accelerate related processes. For example, in recent years, natural and ecological disasters have played an increasingly prominent role in border regions (e.g., the flood disaster in 2021 on the western borders of Germany; fish mortality in 2022 in the German-Polish border area; forest fires in 2022 in the German-Czech border area). In this context, joint risk analyses and emergency exercises were proposed. In the area of rescue services, joint training for emergencies could be implemented to preventively reduce intercultural differences.

Meanwhile, some experts also described crises as unpredictable and difficult to prepare for. It is always a ‘preparation for the unknown’. This opinion is represented to a considerably varying degree across the border regions. One explanation is heterogeneous spatial integration. While some border regions have strong cross-border links, others’ links are more limited. Moreover, cultures, languages, geomorphological settings, and forms of cooperation are highly different across regions. In general, it became clear through our study that open borders are elementary for all German border regions, not just in times of crisis. The pandemic showed that cross-border links need to be maintained, as increased cross-border cooperation is particularly necessary in times of crisis. Therefore, most border pairs most frequently mentioned the terms ‘being resilient’ and ‘contact/communication (channel)’.

Finally, the field of ‘harmonization/neighbor knowledge’ received the most responses in the DE-LU border area (30.8%; average of all regions: 9.3%). Thus, reducing legal and administrative obstacles is a critical issue here. The generic term ‘joint analysis and (rescue) exercises’ had the highest share in the DE-CH border area (28.6%; average of all regions: 8.6%). Here, joint exercises drawing on the current crisis and disaster management teams are especially relevant. Besides, common rescue equipment would simplify procedures in the event of an emergency.

## **Discussion and Conclusion**

The results of this study indicate that border regions with German involvement were highly vulnerable to the COVID-19 pandemic in the short term and, therefore, had low resistance to its effects. Border closures and controls thus strongly influenced cross-border links in the short-term. Moreover, the Delphi experts described possible long-term effects on cross-border linkages caused



by the re-emergence of 'old' cross-border stereotypes and the resurgence of 'mental' borders: 'borderless' Europe becomes bordered in times of crisis. The most significant restrictions occurred in the areas of the economy, social life, and mobility. Overall, national interests and decisions were more influential on border regions than cross-border concerns. These findings are consistent with previous research on the impact of the COVID-19 pandemic and other crises in border regions. For example, Lara-Valencia and García-Pérez (2021) similarly describe how national interests are given priority in times of crisis, while Prokkola (2019), discussing the refugee crisis, outlines the need for higher awareness of mobility shocks at the national level when planning for future crises. Our findings support the argument that border regions were the 'forgotten' regions during the COVID-19 pandemic, and our 'crisis timelines' oppose any argument for border regulations in the wake of the COVID-19 pandemic, notwithstanding its unprecedented, unpredictable nature.

Despite many border-regional similarities, there are also significant differences between the individual German border regions. When it comes to border controls, one-sided and asymmetrical relationships are evident for many border pairs. Furthermore, the border regions showed different patterns in the sectoral impact of the pandemic. This is in line with previous studies (e.g., Duvernet, 2021; Chilla et al., 2022; Gareis & Kurnol, 2023). Moreover, our results illustrate that border regions were dependent on national decisions, on which border actors had little impact. This confirms the findings of Opióła and Böhm (2022), who note a limited influence of Euroregions on national decisions. Both support the conclusion that communication channels between the cross-border and national levels need to be strengthened.

For many years, border regions were not in the political focus or the center of media attention. This changed with the refugee crisis of 2015 and 2016, when national borders moved into the focus of news reporting and political debates. The COVID-19 pandemic intensified this situation with border closures and ongoing border controls. These measures led to increased awareness of border regions and the need for cross-border cooperation at all political levels. As our Delphi study highlights, various crisis boards and committees were established, and bi- and trilateral agreements were arranged to improve crisis governance in border regions. Moreover, short-term adjustments like joint lobbying against border closures or the establishment of new communication channels supported the reduction of border obstacles during the pandemic. This suggests that the pandemic has indeed led to increased cross-border cooperation. Our results illustrate good short-term adaptability of cross-border cooperation in German border regions.

Furthermore, we conclude that the COVID-19 pandemic has had a 'catalyst function' for cooperation in border regions. The Delphi results demonstrate that the crisis has raised awareness of the necessity of integrated cross-border cooperation at all levels. That is a new perspective in the scientific debate on border-regional resilience, as the harmful effects of the pandemic have been the main topic of previous analysis and discussion. Based on our Delphi survey, it is not far-fetched to conclude that German border regions will see a long-term profit from the heavy crisis due to a push for border-regional resilience.

Our findings raise a relevant further research question, as they indicate the pandemic's impact on the awareness of border-regional resilience in German border regions. Namely, from a general perspective, it is of interest if the 'catalyst effect' is a COVID-19-specific phenomenon. In principle, it seems likely that the 'crisis as a catalyst' for border-regional resilience would go beyond the pandemic. It is, therefore, relevant to examine the 'catalyst function' for other shock events.

From a normative point of view, our study underlines the relevance of border-regional specific policy. The challenges of the pandemic have been recognized and proactively addressed by the border-regional actors, resulting in a positive recovery of cross-border cooperation in terms of resil-

ience. Nevertheless, the Delphi experts suggest that the national level still often has a ‘bottle-neck effect’ on border regional processes. Linking the relevance of the national level to the cross-border obstacles mentioned (e.g., multi-level-mismatch, non-harmonization of legal systems, and ‘rebordering’), we conclude that these obstacles are particularly visible in times of crises. Consequently, local lessons learnt from the pandemic need to be transferred to regional and national decision makers to better prepare border regions for future crises. This results in ‘lessons that should be learnt’ for decision-makers at all levels.

Still, the pandemic shows that the national level is necessary for effective crisis cross-border cooperation and border-regional resilience (cf. Böhm, 2021; Chilla, 2022; Haist & Novotný, 2022). Permanent contact points, border-regional risk analyses, harmonization processes, joint crisis scenarios and exercises, and strengthened regional competencies, as well as simple trust, can have ‘border-resilience-promoting’ effects. According to our Delphi findings, it is of key relevance that cross-border networking is maintained even in times of crisis. Existing border-regional governance structures need to be ‘kept alive’ and should be intensified in reaction to the pandemic. Besides, the border actors we studied are committed to a learning process and sharing best practices that have emerged during the pandemic.

Regarding adaptability and recoverability, the comparative approach illustrates numerous similarities and differences between German border regions. In particular, the long-term perspective is key for future activities in cross-border cooperation and border-regional resilience. From the border-regional perspective, it is essential to apply the pandemic’s lessons to reduce still-existing obstacles and the vulnerability of border regions. In short, we conclude that three key needs for the strengthening of border-regional resilience were highlighted by the pandemic: increased cross-border multi-level communication at all levels, permanent crisis contact points for border-regional affairs at the national level, and ongoing learning from border-regional best practices.

## Acknowledgements

The authors thank the reviewers for constructive remarks that significantly improved our paper. We would like to thank Dr. Kristina Zumbusch and Daniel Zwicker-Schwarm for their support in the Delphi study as well as Clara Fischer and Hannah Paul for their support in data collection. Moreover, we thank all experts that participated in our study.

## Funding

The results of this paper are part of the research project ‘CoBo – Cohesion in Border Regions’ which is funded by the German Federal Ministry of Education and research (FKZ: 01UG2113).

## References

Allmendinger, P., Chilla, T., & Sielker, F. (2014). Europeanizing territoriality – towards soft spaces? *Environment and Planning A*, 46(11), 2703-2717. <https://doi.org/10.1068/a130037p>

- Blatter, J. (2004). From 'spaces of place' to 'spaces of flows'? Territorial and functional governance in cross-border regions in Europe and North America. *International Journal of Urban and Regional Research*, 28(3), 530-548. <https://doi.org/10.1111/j.0309-1317.2004.00534.x>
- Böhm, H. (2021). The influence of the Covid-19 pandemic on Czech-Polish cross-border cooperation: From debordering to re-bordering? *Moravian Geographical Reports*, 29(2), 137-148. <https://doi.org/10.2478/mgr-2021-0007>
- Böhm, H. (2022). Challenges of Pandemic-Related Border Closures for Everyday Lives of Poles and Czechs in the Divided Town of Cieszyn/Český Těšín: Integrated Functional Space or Reemergence of Animosities? *Nationalities Papers*, 50(1), 130-144. <https://doi.org/10.1017/nps.2021.51>
- Bonß, W. (2016). The Notion of Resilience: Trajectories and Social Science Perspective. In A. Maurer (Ed.). *New perspectives on resilience in socio-economic spheres* (pp. 9-24). Wiesbaden: Springer VS. [https://doi.org/10.1007/978-3-658-13328-3\\_2](https://doi.org/10.1007/978-3-658-13328-3_2)
- Boschma, R. (2015). Towards an Evolutionary Perspective on Regional Resilience. *Regional Studies*, 49(5), 733-751. <https://doi.org/10.1080/00343404.2014.959481>
- Brakman, S., Garretsen, H., & van Witteloostuijn, A. (2020). The turn from just-in-time to just-in-case globalization in and after times of COVID-19: An essay on the risk re-appraisal of borders and buffers. *Social Sciences & Humanities Open*, 2(1), 100034. <https://doi.org/10.1016/j.ssaho.2020.100034>
- Bristow, G., & Healy, A. (2014). Regional Resilience: An Agency Perspective. *Regional Studies*, 48(5), 923-935. <https://doi.org/10.1080/00343404.2013.854879>
- Bufon, M. (2011). Cross-border policies and spatial and social integration: between challenges and problems. *European Spatial Research and Policy*, 18(2), 29-45. <https://doi.org/10.2478/v10105-011-0011-2>
- Caesar, B., & Pallagst, K. (2022). Development paths for cross-border cooperation and the status quo. In K., Pallagst, A. Hartz & B. Caesar (Eds.). *Border Futures-Zukunft Grenze-Avenir Frontière: The future viability of cross-border cooperation* (pp. 16-32). Hannover: Verlag der ARL-Akademie für Raumentwicklung in der Leibniz-Gemeinschaft.
- Cappellano, F., Sohn, C., Makkonen, T., & Kaisto, V. (2022). Bringing borders back into cross-border regional innovation systems: Functions and dynamics. *Environment and Planning A: Economy and Space*, 54(5), 1005-1021. <https://doi.org/10.1177/0308518X221073987>
- Chilla, T. (2022). The domestic dimension of cross-border governance: Patterns of coordination and cooperation. *Raumforschung und Raumordnung (Spatial Research and Planning)*, 1-14. <https://doi.org/10.14512/rur.212>
- Chilla, T., & Heugel, A. (2022). Cross-border Commuting Dynamics: Patterns and Driving Forces in the Alpine Macro-region. *Journal of Borderlands Studies*, 37(1), 17-35. <https://doi.org/10.1080/08865655.2019.1700822>
- Chilla, T., & Lambracht, M. (2022). Institutional mapping of cross-border cooperation. INTERREG programme analyses with KEEP data. *European Planning Studies*. <https://doi.org/10.1080/09654313.2022.2058321>
- Chilla, T., Evrard, E., & Schulz, C. (2012). On the Territoriality of Cross-Border Cooperation: "Institutional Mapping" in a Multi-Level Context. *European Planning Studies*, 20(6), 961-980. <https://doi.org/10.1080/09654313.2012.673563>
- Chilla, T., Große, T., Hippe, S., & Walker, B. B. (2022). COVID-19 incidence in border regions: spatiotemporal patterns and border control measures. *Public Health*, 202, 80-83. <https://doi.org/10.1016/j.puhe.2021.11.006>
- Christodoulou, A., & Christidis, P. (2019). Measuring Cross-Border Road Accessibility in the European Union. *Sustainability*, 11, 4000. <https://doi.org/10.3390/su11154000>
- Christopherson, S., Michie, J., & Tyler, P. (2010). Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society*, 3(1), 3-10. <https://doi.org/10.1093/cjres/rsq004>
- Decoville, A., & Durand, F. (2019). Exploring cross-border integration in Europe: How do populations cross borders and perceive their neighbours? *European Urban and Regional Studies*, 26(2), 134-157. <https://doi.org/10.1177/0969776418756934>
- Di Caro, P. (2015). Recessions, recoveries and regional resilience: evidence on Italy. *Cambridge Journal of Regions, Economy and Society*, 8(2), 273-291. <https://doi.org/10.1093/cjres/rsu029>

- Dittel, J. (2023). Covid-19 als Zäsur und Chance für grenzüberschreitende Regionen am Beispiel der Großregion. In D., Brodowski, J., Nesselhauf & F., Weber (Eds.). *Pandemisches Virus – nationales Handeln* (pp. 125-148). Wiesbaden: Springer VS. [https://doi.org/10.1007/978-3-658-37719-9\\_7](https://doi.org/10.1007/978-3-658-37719-9_7)
- Durand, F., & Decoville, A. (2020). A multidimensional measurement of the integration between European border regions. *Journal of European Integration*, 42(2), 163-178. <https://doi.org/10.1080/07036337.2019.1657857>
- Durand, F., Decoville, A., & Knippschild, R. (2020). Everything All Right at the Internal EU Borders? The Ambivalent Effects of Cross-Border Integration and the Rise of Euroscepticism. *Geopolitics*, 25(3), 587-608. <https://doi.org/10.1080/14650045.2017.1382475>
- Duvernoy, C. (2021). Die Verbreitung von COVID-19 in Grenzregionen. *Inf Raumentwickl*, 2, 50-59.
- EC (2016). *Overcoming obstacles in border regions. Summary Report on the online public consultation 21 September - 21 December 2015*. Brussels: European Commission.
- EC (2017). *Boosting growth and cohesion in EU border regions. Communication from the Commission to the Council and the European Parliament*. Brussels: European Commission.
- EC (2022). *Convergence Report 2020*. European Economy Institutional Papers, 129. Brussels: European Commission.
- ESPON (2017). *ACTAREA – Thinking and Planning in Areas of Territorial Cooperation*. Retrieved from <https://www.espon.eu/actarea>
- ESPON (2022). *Cross-border public services 2.0 (CPS 2.0)*. Retrieved from <https://www.espon.eu/cps-2>
- Evrard, E., & Chilla, T. (2021). EUropean (dis)integration: implications for the Cohesion Policy. In D., Rauhut, F., Sielker & A., Humer (Eds.). *EU Cohesion Policy and Spatial Governance* (pp. 98-114). Cheltenham: Edward Elgar Publishing. <https://doi.org/10.4337/9781839103582.00016>
- Evrard, E., Chilla, T., & Schulz, C. (2014). The Delphi method in ESPON: State of the art, innovations and thoughts for future developments. In ESPON Coordination Unit, F., Holstein, S., Zillmer & K., Böhme (Eds.). *Science in support of European Territorial Development* (pp. 187-191). ESPON.
- Fedajev, A., Radulescu, M., Babucea, A. G., Mihajlovic, V., Yousaf, Z., & Milićević, R. (2021). Has COVID-19 pandemic crisis changed the EU convergence patterns? *Economic Research-Ekonomska Istraživanja*, 35(1), 2112-2141. <https://doi.org/10.1080/1331677X.2021.1934507>
- Gareis, P., & Kurnol, J. (2023). Covid-19 in Grenzregionen – Entwicklungen während der ersten, zweiten und dritten Welle und die Effekte der Grenzkontrollen. In D., Brodowski, J., Nesselhauf & F., Weber (Eds.). *Pandemisches Virus – nationales Handeln* (pp. 45-66). Wiesbaden: Springer VS. [https://doi.org/10.1007/978-3-658-37719-9\\_3](https://doi.org/10.1007/978-3-658-37719-9_3)
- Giacometti, A., Teräs, J., Perjo, L., Wøien, M., Sigurjónsdóttir, H., & Rinne, T. (2018). *Regional Economic and Social Resilience: Conceptual Debate and Implications for Nordic Regions. Discussion paper prepared for Nordic thematic group for innovative and resilient regions*. Retrieved from [https://nordregio.org/wp-content/uploads/2017/04/Resilience-Study\\_Feb-2.pdf](https://nordregio.org/wp-content/uploads/2017/04/Resilience-Study_Feb-2.pdf)
- Gong, H., & Hassink, R. (2017). Regional resilience: the critique revisited. In N., Williams & T., Vorley (Eds.). *Creating resilient economies: Entrepreneurship, growth and development in uncertain times* (pp. 206-216). Cheltenham: Edward Elgar.
- Gong, H., Hassink, R., Tan, J., & Huang, D. (2020). Regional Resilience in Times of a Pandemic Crisis: The Case of COVID-19 in China. *Tijdschrift Voor Economische En Sociale Geografie*, 111(3), 497-512. <https://doi.org/10.1111/tesg.12447>
- Goolsbee, A., & Syverson, C. (2020). *Fear, Lockdown, and Diversion: Comparing Drivers of Pandemic Economic Decline 2020*. NBER Working Paper, 27432. Cambridge, MA: National Bureau of Economic Research. <https://doi.org/10.3386/w27432>
- Gräbner, C., Heimberger, P., & Kapeller, J. (2020). Pandemic pushes polarisation: the Corona crisis and macroeconomic divergence in the Eurozone. *Journal of Industrial and Business Economics*, 47(3), 425-438. <https://doi.org/10.1007/s40812-020-00163-w>
- Häder, M. (2014). *Delphi-Befragungen: Ein Arbeitsbuch*. Wiesbaden: Springer VS. <https://doi.org/10.1007/978-3-658-01928-0>
- Haist, J., & Novotný, L. (2022). Moving across Borders: The work life experiences of Czech cross-border workers during the COVID-19 pandemic. *JCMS: Journal of Common Market Studies*, 61(1), 124-142. <https://doi.org/10.1111/jcms.13362>

- Havlíček, T., Jeřábek, M., & Dokoupil, J. (Eds.). (2018). *Borders in Central Europe after the Schengen agreement*. Cham: Springer International Publishing.
- Hippe, S., & Chilla, T. (2021). Cohesion and Resilience in Czech-German Border Regions: The Impacts of Crises. In Z., Kresa (Ed.). *Opportunities and Threats to Current Business Management in Cross-border Comparison 2021* (pp. 68-78). Chemnitz: GUC.
- Hippe, S., Bertram, D. & Chilla, T. (2023). Convergence and resilience in border regions. *European Planning Studies*. <https://doi.org/10.1080/09654313.2023.2170214>
- Hu, X., & Hassink, R. (2015). Overcoming the Dualism between Adaptation and Adaptability in Regional Economic Resilience. *Papers in Evolutionary Economic Geography (PEEG)*, 1533.
- Jakola, F., & Prokkola, E.-K. (2018). Trust Building or Vested Interest? Social Capital Processes of Cross-Border Co-Operation in the Border Towns of Tornio and Haparanda. *Tijdschrift Voor Economische En Sociale Geografie*, 109(2), 224-238. <https://doi.org/10.1111/tesg.12279>
- Jakubowski, A. (2020). Asymmetry of the economic development of cross-border areas in the European Union: Assessment and typology. *Europa XXI*, 39, 45-62. <https://doi.org/10.7163/Eu21.2020.39.6>
- Kajta, J., & Opiłowska, E. (2021). The Impact of Covid-19 on Structure and Agency in a Borderland. The Case of Two Twin Towns in Central Europe. *Journal of Borderlands Studies*, 37(4), 699-721. <https://doi.org/10.1080/08865655.2021.1996259>
- Kaucic, J., & Sohn, C. (2021). Mapping the cross-border cooperation 'galaxy': An exploration of scalar arrangements in Europe. *European Planning Studies*, 30(12), 2373-2393. <https://doi.org/10.1080/09654313.2021.1923667>
- Klatt, M., & Herrmann, H. (2011). Half Empty or Half Full? Over 30 Years of Regional Cross-Border Co-operation Within the EU: Experiences at the Dutch–German and Danish–German Border. *Journal of Borderlands Studies*, 26(1), 65-87. <https://doi.org/10.1080/08865655.2011.590289>
- Kolossov, V., & Scott, J. (2013). Selected conceptual issues in border studies. *Belgeo. Revue belge de géographie*, 1. <https://doi.org/10.4000/belgeo.10532>
- Kramsch, O., & Mamadouh, V. (2003). Crossing borders of political governance and democracy. *Journal of Borderlands Studies*, 18(1), 39-50. <https://doi.org/10.1080/08865655.2003.9695600>
- Kurowska-Pysz, J., Łazniewska, E., Böhm, H., & Boháč, A. (2022). Cross-border cooperation in the shadow of crisis – the Turów Coalmine case. *Journal of International Studies*, 15(4), 43-63. <https://doi.org/10.14254/2071-8330.2022/15-4/3>
- Lara-Valencia, F., & García-Pérez, H. (2021). Las fronteras de la pandemia: lecciones para la gobernanza y la cooperación en las ciudades de la frontera México-Estados Unidos. *Estudios Fronterizos*, 22. <https://doi.org/10.21670/ref.2104067>
- Lois, M., Cairo, H., & de las Heras, G. (2022). Politics of resilience... politics of borders? In-mobility, insecurity and Schengen “exceptional circumstances” in the time of COVID-19 at the Spanish-Portuguese border. In D.J., Andersen & E.-K., Prokkola (Eds.). *Borderlands resilience: transitions, adaption, and resistance at borders* (pp. 21-36). London: Routledge.
- Martin, R. (2012). Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography*, 12(1), 1-32. <https://doi.org/10.1093/jeg/lbr019>
- Martin, R., & Sunley, P. (2015). On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography*, 15(1), 1-42. <https://doi.org/10.1093/jeg/lbu015>
- Martin, R., & Sunley, P. (2020). Regional economic resilience: evolution and evaluation. In G., Bristow & A., Healy (Eds.). *Handbook on Regional Economic Resilience* (pp. 10-35). Cheltenham: Edward Elgar Publishing.
- Martin, R., Sunley, P., Gardiner, B., & Tyler, P. (2016). How Regions React to Recessions: Resilience and the Role of Economic Structure. *Regional Studies*, 50(4), 561-585. <https://doi.org/10.1080/00343404.2015.1136410>
- Martinho, V. J. P. D. (2021). Impact of Covid-19 on the convergence of GDP/capita in OECD countries. *Regional Science Policy & Practice*, 13(S1), 55-72. <https://doi.org/10.1111/rsp3.12435>
- Medeiros, E. (2019). Cross-border transports and cross-border mobility in EU border regions. *Case Studies on Transport Policy*, 7(1), 1-12. <https://doi.org/10.1016/j.cstp.2018.11.001>
- Medeiros, E., Guillermo Ramírez, M., Ocskay, G., & Peyrony, J. (2021). Covidfencing effects on cross-border deterritorialism: the case of Europe. *European Planning Studies*, 29(5), 962-982. <https://doi.org/10.1080/09654313.2020.1818185>



- Metzger, J., & Schmitt, P. (2012). When soft spaces harden: the EU strategy for the Baltic Sea Region. *Environment and Planning A*, 44, 263-280. <https://doi.org/10.1068/a44188>
- Muštra, V., Šimundić, B., & Kuliš, Z. (2016). *Effects of smart specialization on regional economic resilience in EU*. Retrieved from <https://www.bib.irb.hr/842329>
- Novotný, L. & Böhm, H. (2022). New re-bordering left them alone and neglected: Czech cross-border commuters in German-Czech borderland. *European Societies*, 24(3), 333-353. <https://doi.org/10.1080/14616696.2022.2052144>
- Novotný, L. (2021). Effects of 'covidfencing' on cross-border commuting: a case of Czech-German borderland. *European Planning Studies*, 30(4), 590-607. <https://doi.org/10.1080/09654313.2021.1986470>
- O'Dowd, L. (2002). The Changing Significance of European Borders. *Regional & Federal Studies*, 12(4), 13-36. <https://doi.org/10.1080/714004774>
- OECD (2014). *Guidelines for Resilience Systems Analysis: How to Analyse Risk and Build a Roadmap to Resilience*. Paris: OECD Publishing. <https://doi.org/10.1787/3b1d3efe-en>
- Opiłowska, E. (2022): The resilience of cross-border cooperation in the German-Polish borderland within a European perspective. *UniGR-CBS Working Paper*, 14. <https://doi.org/10.25353/ubtr-xxxx-44e7-2424>
- Opióła, W., & Böhm, H. (2022). Euroregions as political actors: managing border policies in the time of Covid-19 in Polish borderlands. *Territory, Politics, Governance*, 10(6), 896-916, <https://doi.org/10.1080/21622671.2021.2017339>
- Peyrony, J. (2020). Should EGTCs have competences, and not only tasks? Underlying visions of cross-border integration. In G., Ocskay (Ed.). *15 years of the EGTCs. Lessons learnt and future perspectives* (pp. 219-244). Budapest: Central European Service for Cross-border Initiatives.
- Peyrony, J., Rubio, J., & Viaggi, R. (2021). *The effects of COVID-19 induced border closures on cross-border regions: An empirical report covering the period March to June 2020*. Luxembourg: Publications Office of the European Union. <https://doi.org/10.2776/092793>
- Phelan, L., Henderson-Sellers, A., & Taplin, R. (2013). The Political Economy of Addressing the Climate Crisis in the Earth System: Undermining Perverse Resilience. *New Political Economy*, 18(2), 198-226. <https://doi.org/10.1080/13563467.2012.678820>
- Prokkola, E.-K. (2019). Border-regional resilience in EU internal and external border areas in Finland. *European Planning Studies*, 27(8), 1587-1606. <https://doi.org/10.1080/09654313.2019.1595531>
- Prokkola, E.-K. (2022). Border security interventions and borderland resilience. In D.J., Andersen & E.-K., Prokkola (Eds.). *Borderlands resilience: transitions, adaptation, and resistance at borders* (pp. 21-36). London: Routledge.
- Pupier, P. (2020). Spatial evolution of cross-border regions. Contrasted case studies in North-West Europe. *European Planning Studies*, 28(1), 81-104. <https://doi.org/10.1080/09654313.2019.1623975>
- Purkarthofer, E. (2018). Diminishing borders and conflating spaces: a storyline to promote soft planning scales. *European Planning Studies*, 26(5), 1008-1027. <https://doi.org/10.1080/09654313.2018.1430750>
- Renner, N., Miggelbrink, J., Beurskens, K., & Zitterbart, A. (2022). Schengen Borders as Lines that Continue to Separate? Media Representations of Pandemic Dimensions of Insecurity in Eastern German Border Regions to Poland. *Journal of Borderlands Studies*, 37(4), 825-846. <https://doi.org/10.1080/08865655.2022.2039265>
- Schimmelfennig, F. (2021). Rebordering Europe: external boundaries and integration in the European Union. *Journal of European Public Policy*, 28(3), 311-330. <https://doi.org/10.1080/13501763.2021.1881589>
- Scott, J. W. (2015). Bordering, border politics and cross-border cooperation in Europe. In F., Celata & R., Coletti (Eds.). *Neighbourhood policy and the construction of the European external borders* (pp. 27-44). Cham: Springer.
- Sensier, M., Bristow, G., & Healy, A. (2016). Measuring Regional Economic Resilience across Europe: Operationalizing a complex concept. *Spatial Economic Analysis*, 11(2), 128-151. <https://doi.org/10.1080/17421772.2016.1129435>
- Simmie, J., & Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3(1), 27-43. <https://doi.org/10.1093/cjres/rsp029>

- Slusarciuc, M. (2017). Milestones for the resilience of the cross-border regions. *CES Working Papers*, 9(3), 401-422.
- Sohn, C. (2014). The Border as a Resource in the Global Urban Space: A Contribution to the Cross-Border Metropolis Hypothesis. *International Journal of Urban and Regional Research*, 38(5), 1697-1711. <https://doi.org/10.1111/1468-2427.12071>
- Tarvet, R. & Klatt, M. (2023). The impact of the Corona crisis on borderland living in the Danish-German border region with a special focus on the two national minorities. *National Identities*, 25(1), 35-52. <https://doi.org/10.1080/14608944.2021.1938522>
- Turner, C., Chilla, T., & Hippe, S. (2022). Explaining cross-border cooperation patterns in the context of domestic economic development: A case study of the Upper Rhine. *Europa XXI*, 43. <https://doi.org/10.7163/Eu21.2022.43.2>
- Unfried, M. (2020). The closure of the border as a b-solution. Non-coordination of measures at the Dutch, Belgian and German border. In C., Wille & R., Kanesu (Eds.). *Borders in Perspective UniGR-CBS Thematic Issue. Bordering in Pandemic Times: Insights into the COVID-19 Lockdown* (pp. 49-51). Luxembourg-Trier: UniGR-Center for Border Studies. <https://doi.org/10.25353/ubtr-xxxx-b825-a20b>
- Weber, F. (2022). Cross-border cooperation in the border region of Germany, France, and Luxembourg in times of Covid-19. *European Societies*, 24(3), 354-381. <https://doi.org/10.1080/14616696.2022.2076894>
- Weber, F., Theis, R., & Terrollion, K. (2021). Neue Herausforderungen, alte Grenzen? Wie die COVID-19-Pandemie das deutsch-französische Verhältnis aufwirbelt. In F., Weber, R., Theis & K., Terrollion (Eds.). *Grenzerfahrungen | Expériences transfrontalières. Räume – Grenzen – Hybriditäten* (pp. 3-18). Wiesbaden: Springer. [https://doi.org/10.1007/978-3-658-33318-8\\_1](https://doi.org/10.1007/978-3-658-33318-8_1)
- Wolf, E.E. (2017). Delphi-Technik. In C., Zerres (Ed.). *Handbuch Marketing-Controlling* (pp. 91-111). Berlin, Heidelberg: Springer Gabler. [https://doi.org/10.1007/978-3-662-50406-2\\_5](https://doi.org/10.1007/978-3-662-50406-2_5)
- Wong Villanueva, J. L., Kidokoro, T., & Seta, F. (2020). Cross-Border Integration, Cooperation and Governance: A Systems Approach for Evaluating “Good” Governance in Cross-Border Regions. *Journal of Borderlands Studies*, 37(5), 1047-1070. <https://doi.org/10.1080/08865655.2020.1855227>
- Zumbusch, K., & Scherer, R. (2015). Cross-Border Governance: Balancing Formalized and Less Formalized Co-Operations. *Social Sciences*, 4(3), 499-519. <https://doi.org/10.3390/socsci4030499>

