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Systemic Shock and Bordering: Comparative Analysis of the Vulnerability and Resilience of Cross-Border Governance in Europe and North America

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Abstract. The comparative analysis of border regions in the context of systemic shock-induced processes of centralization and rebordering facilitates the understanding contemporary borders' specificities and commonalities. The COVID-19 pandemic afforded border scholars unique quasi-experimental conditions for such analysis since governments of most countries worldwide implemented analogous policies and measures to reduce the spread and impact of the pandemic. In particular, measures restricting cross-border mobility disrupted the daily life routines and practices of border people and, more generally, the stability of border regions through different forms and degrees of rebordering. Hence, the pandemic put regional capacities and governance structures to the test to deal with uncertainty and risk and incited reactions from regional actors concerned with restoring stability and normalcy. Using the concept of resilience as an analytical lens, this paper examines the responses of local actors in the Spain-Portugal and U.S.-Mexico border regions to systemic shock and the contribution of these responses to cross-border regional resilience.
Keywords: systemic shocks; border resilience; COVID-19; bordering; cross-border governance.

[es] *Shock* sistémico y fronterización: análisis comparativo de la vulnerabilidad y resiliencia de la gobernanza transfronteriza en Europa y América del Norte

Resumen. El análisis comparativo de las regiones fronterizas en el contexto de procesos de centralización y refronterización inducidos por shocks sistémicos facilita la comprensión de las especificidades y puntos en común de las fronteras contemporáneas. La pandemia de COVID-19 brindó a los estudiosos de la frontera condiciones cuasiexperimentales únicas para dicho análisis, ya que los gobiernos de la mayoría de los países del mundo implementaron políticas y medidas análogas para reducir la propagación y el impacto de la pandemia. En particular, las medidas que restringían la movilidad transfronteriza

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alteraron las rutinas y prácticas cotidianas de la población fronteriza y, en términos más generales, la estabilidad de las regiones fronterizas a través de diferentes formas y grados de refronterización. Por lo tanto, la pandemia puso a prueba las capacidades regionales y las estructuras de gobernanza para hacer frente a la incertidumbre y el riesgo y provocó reacciones de los actores regionales preocupados por restaurar la estabilidad y la normalidad. Utilizando el concepto de resiliencia como lente analítica, este artículo examina las respuestas de los actores locales en las regiones fronterizas España-Portugal y Estados Unidos-México al shock sistémico y la contribución de estas respuestas a la resiliencia regional transfronteriza.
Palabras clave: shocks sistémicos; resiliencia fronteriza; COVID-19; fronterización; gobernanza transfronteriza.

[pt] *Shock* sistêmico e fronteirização: análise comparativa da vulnerabilidade e resiliência da governança transfronteiriça na Europa e na América do Norte

Resumo. A análise comparativa das regiões fronteiriças no contexto de processos de centralização e re-fronteirização induzidos por choques sistémicos facilita a compreensão das especificidades e pontos comuns das fronteiras contemporâneas. A pandemia da COVID-19 proporcionou aos estudiosos das fronteiras condições quase experimentais únicas para tal análise, uma vez que os governos da maioria dos países do mundo implementaram políticas e medidas análogas para reduzir a propagação e o impacto da pandemia. Em particular, as medidas que restringiram a mobilidade transfronteiriça perturbaram as rotinas e práticas da vida quotidiana das pessoas fronteiriças e, de um modo mais geral, a estabilidade das regiões fronteiriças através de diferentes formas e graus de re-fronteirização. Portanto, a pandemia testou as capacidades regionais e as estruturas de governança para lidar com a incerteza e o risco e incitou reações dos intervenientes regionais preocupados com a restauração da estabilidade e da normalidade. Utilizando o conceito de resiliência como lente analítica, este artigo examina as respostas dos atores locais nas regiões fronteiriças Espanha-Portugal e EUA-México ao choque sistêmico e a contribuição destas respostas para a resiliência regional transfronteiriça.
Palavras-chave: shocks sistêmicos; resiliência fronteiriça; COVID 19; fronteirização; governança transfronteiriça.

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Introduction

The wave of contagion and fear that shadowed the discovery of the SARS-CoV-2 virus at the end of 2019 was followed by a global wave of bordering in the spring of 2020 when international borders were broadly closed as a reaction to a threat perceived as external. In almost all countries, territorial boundaries were resurrected and retooled as governments resorted to the *cordon sanitaire* as the tool of choice to shield their citizens against an ominous external threat (Alden, 2020; Aponte Motta

& Kramsch, 2020; Nossem, 2020; Peyrony, Rubio, & Viaggi, 2021; Radil, Castan Pinos, & Ptak, 2021; Romero, 2020). The trigger of such a response was the declaration of emergency by the World Health Organization (WHO) on March 11, 2020, and the realization by the international community that the world was confronting a threat of unpredictable proportions (WHO, 2020). In addition to the mere reintroduction of conventional border controls, new forms of bordering – the "ongoing geopolitical claiming, appropriating, and demarcating of a territorial here that is being differentiated in space from an imagined there" (van Houtum, 2021) –, quickly propagated worldwide. A strong state was offered and broadly accepted as a solution to the perceived chaos (Lara-Valencia & Laine, 2022). Communities were suddenly pushed into isolation from one another, "locking down" people into their territorial borders. At the same time, central governments tried to contain the pandemic and maintain the functionality and viability of their economies. Centralization meant that local actors were relegated to marginal positions in the decision-making process even when they could play a critical role in mobilizing expertise and resources during the crisis. It also meant decoupling from international cooperation as countries prioritized national health and security despite the transboundary nature of the threat (Nossem, 2020). In most countries, confusion about the sourcing of the danger, uncertainty about its consequences, and the unpredictability of its amplification induced stigmatization and scapegoating, connecting certain national origins, ethnicities, and social groups with the spread of the virus (Capano, Howlett, Jarvis, Ramesh, & Goyal, 2020; Casaglia, 2021).

Whether we talk about the global scale of the threat or focus on the disruption and potential reversal of regional and local processes and realities that we assumed immutable, the epochal significance of the pandemic for border communities is indisputable. Since the 9/11 terrorist attacks, no other event has revived territorial borders and sent territorialist shockwaves across the world as the COVID-19 pandemic. The pandemic triggered debates about the adequacy of international cooperation to address global-scale shocks. The surge and spread of nationalism, autarchism, and xenophobia were seen as a force capable of stalling and even unraveling the levels of connectivity, interdependency, and mobility delivered by globalization to many border regions worldwide (Alden, 2020). These same forces were perceived as threats to multilevel governance structures and practices supporting cross-border cooperation in these regions and were also seen as harbingers of centralist top-down border regimes (Lois, Cairo, & García de las Heras, 2021; Radil *et al*., 2021; Sharma *et al*., 2021).

Seen through the lens of the personal and the quotidian, it is indisputable that the bordering created by COVID-19 dislocated the livelihood of many border communities, fueling strong rejection, avoidance, or accommodation (Nossem, 2020). Amidst the crisis, border communities were forced to reassess their sociopolitical positionality continuously in the national and international contexts as the conditions supporting their stability and viability were changing rapidly and adversely. To remain viable entities, border communities had to cope with the uncertainty of the pandemic and constantly adjust to the amplification of risk and disruption produced by the geopolitical border. Agnew's distinction between borders as "geopolitical spaces" and as "dwelling spaces" highlights the deep character of the tension and even contradiction between centrist and local views of the border (Agnew, 2020).

From a policy perspective, two challenges border regions confronted are of particular concern. One is the level of vulnerability and resilience experienced by communities embedded in an environment whose stability is contingent on the bordering level yet marked by a varied set of geographic, historical, and cultural vectors inducing intermingling and amalgamation. The second is the meaning and resignification of interdependence, interconnection, and cross-border identity considering the scale and cascading consequences of a crisis that started as a health emergency but spread across society because of the implications of restrictions on mobility over production, consumption, work, and community life in general.

This article uses a comparative analysis of two border regions in Europe and North America to address three interrelated questions: How did local actors in border regions respond to systemic shocks that altered cross-border mobility and threatened transborder social practices? To what extent these responses were coping actions intended to resist disruptive shocks or adaptive efforts contributing to enhanced forms of resilience? What variations and patterns are observable across regions, and what factors are correlated with the nature of bordering and dominant governance structures?

1. Crisis, bordering and resilience

Over the past two decades, the field of border studies has been populated by research exploring the implication of iconic disruptive events (i.e., the 9/11, the 2015 refugee crisis, and the COVID-19 pandemic) on bordering and the strength of cross-border societal practices and processes. Therefore, the conceptual triad of crisis, bordering, and resilience has become a dominant feature of current border studies. This section provides a working definition of these concepts, while unveiling their analytical connections.

1.1. Crisis, shocks and resilience

Crises are times when a sudden change, real or imagined, can disrupt and even represent a turning point in the normal operation and progression of social and natural systems (Rigaud *et al*., 2020). Border regions and crises are intimately linked concepts, as demonstrated by the co-occurrence of the terms in an increasing number of publications and reports. The security crisis narrative pushed by nationalistic views in the U.S. (Bissonnette & Vallet, 2021; Casaglia, 2021), the humanitarian crisis triggered by massive refugee flows in Europe and North America (Prokkola, 2019), and the global supply chain and mobility crises caused by the COVID-19 pandemic (Hippe & Chilla, 2021; Li, Zhang, Lo, Tan, & Yang, 2022) are a few examples of the near-continuous sequence of recent and unexpected events upsetting routine interactions and social systems in border regions worldwide.

A common assumption about the nature of crises is that they are finite and transitory processes. Accordingly, although crises can be of varying intensity and duration, they are not permanent and are triggered by events with a generally identifiable onset and end time. On the contrary, Boin, Ekengren, and Rhinard (2020) call attention to a type of crisis with an unclear beginning and end that might not follow a linear trajectory and include phases of rapid risk escalation and de-escalation and

poses a seemingly lingering disruptive nature (i.e., COVID-19). This type of slow-burning crisis, conversely to traditional, discrete crises, can potentially undermine the legitimacy of public institutions because of their unpredictability, intractability and disruptive nature (Boin *et al*., 2020).

Although the event or mix of events generating the crisis is temporarily distinct, they are generally unforeseen and external, so they are perceived by society as unexpected and destabilizing shocks that put the endurance of people and systems to the test. Hynes *et al*. (2020) remind us that crises cause shockwaves reproduced and amplified by the interconnectedness and nested character of natural and social systems. This is illustrated by the origin and propagation of COVID-19, which started with the jump of a virus from animals to humans and spread rapidly through the mobility channels connecting communities and places across the world (Hynes *et al*., 2020). Further, an event that ignited a health crisis escalated into a global systemic crisis through its cascading effects on production, consumption, and social and political systems.

A well-known fact about crises is that the disruptive effects and reactions they trigger are unevenly distributed within and across scales. Individuals, organizations, regions, or nations can be impacted and respond differentially to a crisis, depending on their ability to absorb or manage the effect of single, recurring or slow-burning shocks (Boschma, Coenen, Frenken, & Truffer, 2017).

The concept of resilience is often invoked to describe the ability of a system to recover from and adapt to unexpected and disruptive events. With pioneering applications in physics and engineering, the concept describes the ability of materials to absorb sudden energy shocks without losing their structural qualities. From these fields, the idea gradually migrated toward psychology and ecology and, more recently, towards socio-spatial studies, where it is gaining ground rapidly (Li *et al*., 2022; Martin, 2011; Martin & Sunley, 2014; Vecino, Murias Fernandez, de Miguel Dominguez, & Martinez Roget, 2016). In the field of border studies, interest in the concept was stimulated by the finding that crises and other shocks produce distinct dynamics in border regions vis-a-vis non-border regions (Lara-Valencia, Wong-González, & Brugés, 2023; Paül, Trillo-Santamaría, Martínez-Cobas, & Fernández-Jardón, 2022).

Because of its origin, the concept and its applicability in border studies remain the subject of significant debate (Prokkola, 2019). The central concern is the obvious overlaps of the concept of resilience with other ideas with a more solid theoretical substrate, such as vulnerability and adaptation (Hassink, 2010; Martin, 2011). Some authors also question the usability of the concept because of the difficulties involved in its operationalization and measurement (Faulkner, Murphy, & Scott, 2020; Sensier, Bristow, & Healy, 2016). However, this has not stopped its application and its acceptance as a framework for the analysis of societal change induced by exogenous or endogenous processes that result in a shock on border regions (Hippe, Bertram, & Chilla, 2023; Li *et al*., 2022; Prokkola, 2019; Richardson & Cappellano, 2022). In general terms, the resilience of border regions can be characterized as the capacity to resist, recover, and adapt to shocks that create disturbance and disrupt cross-border interactions and other conditions that support a way of life dependent on the border.

Based on this definition, a good number of studies have focused on analyzing the capacity of border regions to resist the impact of shocks and how this capacity is

reflected in the maintenance of its basic functions despite disturbances and fluctuations (Hynes *et al*., 2020; Kajta & Opiłowska, 2022). For instance, Prokkola (2019) uses a resilience approach to study the impact and coping mechanisms of two European border regions to the mobility shocks created by the geopolitical tension created by the annexation of the Crimean Peninsula by Russia in the spring of 2014 and the asylum-seekers crisis of 2015. The association between regional convergence and resilience is studied by Hippe *et al*. (2023), who concluded that European border regions are more sensitive to disruption. Yet, their adaptability allows them to recover more rapidly from an external shock than non-border regions. Other studies have emphasized the resistance of border economies to mobility shocks caused by border closures (Lara-Valencia, 2021; Paül *et al*., 2022) or the impact of the disruption of supply chains for regions highly integrated into global markets (Li *et al*., 2022). Several studies have explored the challenges for cross-border cooperation and coordination (Lara-Valencia & García-Pérez, 2021) and the coping strategies of professional and business networks (Richardson & Cappellano, 2022) in the context of the COVID-19 pandemic.

The emphasis of some studies applying a resilience framework is on the speed and level of recovery in the aftermath of an external shock (Rigaud *et al*., 2020). This narrow view of resilience is challenged by an emerging line of research examining long-term adaptability as an expression of a border region's ability to "bounce forward" rather than "bounce back" (Boschma *et al*., 2017). Adaptability is a central concept in the development of the so-called evolutionary approach to resilience that emphasizes the change and adjustment of institutional structures and regional governance, for example, through the adoption of policies that transfer authority and resources for territorial management from the national to the subnational scale (Díaz-Lanchas & Mulder, 2021; Magro & Valdaliso, 2019). From the evolutionary perspective, some studies examine the role of global production networks and extra-regional linkages as a mechanism for knowledge transfer and innovation associated with regional resilience (Li *et al*., 2022; Richardson & Cappellano, 2022), while others assess the capacity and quality of cross-border cooperation and governance (Hippe *et al*., 2023; Lara-Valencia & García-Pérez, 2021).

1.2. A perspective of bordering

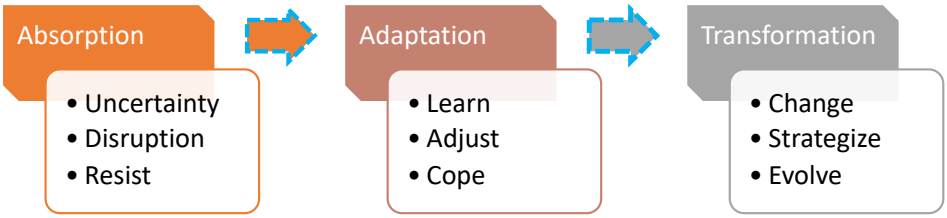
The bordering triggered by the COVID-19 pandemic has been at the center of recent border resilience analysis. These analyses recognize bordering as a process of spatial differentiation involving social and material forces fighting over the definition of a "here and there" that territorializes the "we and them" along national vectors (van Houtum, 2021). Border scholars generally differentiate two distinct moments of bordering: "debordering" and "rebordering" (Lois & Cairo, 2011; van Houtum, 2021). Debordering, on the one hand, induces cross-border mingling as the rigid controls and narratives of othering lose legitimacy and the separating function of borders fades. Rebordering, on the other hand, expresses revived impulses toward fortifying the "state" apparatus to regulate and control cross-border flows amidst discourses concerned with external threats to the nation's security, integrity, and viability. Therefore, bordering relates to the geopolitical and material boundary but also to societal narratives and practices, exalting its dualistic and fluctuating symbolism as a fortress or gateway.

However, this dichotomic representation of bordering does not fully capture its processual complexity (van Houtum, 2021). As an expression of complex historical and power dynamics, bordering is an open-ended process with no clear-cut ends and constant shifts in direction. As a result, debordering and rebordering are not elements of a zero-sum game and often occur simultaneously. Of course, there are times when the relationship between social forces clearly favors one at the expense of the other. But even in this scenario, debordering or rebordering tendencies do not unfold without triggering contestation and resistance from those opposing their consequences. In this regard, a study of the responses to the systemic shock of the COVID-19 pandemic should, therefore, surmise that debordering and rebordering are intimately linked, and when one dynamic is mobilized, the other remains a potentially powerful force that can unfold if social and political conditions are adequate. Such forces have different understandings of border society's diversity and complexity, and their interplay can render bordering scenarios reflecting territorial or collaborative views on how to deal with a crisis.

2. Research Approach

By scrutinizing the action of local actors to confront the impact of external shocks on issues of the highest priority for the crossborder agenda, we aim to shed light on how border communities in disparate regional contexts deal with events that shift border equilibriums abruptly and threaten the ability of communities to interact across the border. We aim to show that the comparative analysis of regional change resulting from a systemic shock of global scale is an approach that enables us to understand better the specificities and commonalities of contemporary borders.

Figure 1. Border resilience scenarios



Source: the authors.

Analytically, the data is explored using the framework provided by understanding border resilience as a process comprising three possible scenarios: absorption, adaptation, and transformation (see Figure 1). The first scenario, absorption, occurs at the onset of a crisis when people and organizations in the border region decide to mobilize existing capacities and resources to deal with the initial disruption and uncertainties and withstand the shock without significant loss of functionality and outside assistance. In this stage, social practices and routines remain unchanged and local actions are oriented to resist and restore pre-crisis conditions and functionality.

Adaptation occurs during the second scenario, where local actors devise ways to cope with disruption exceeding endogenous capacity to deal with the risk of devastating losses, damages, or diminished viability. Adaptation involves learning, as well as the flexibility to adjust and mobilize external resources. During this scenario, regional actions are guided by the continuous assessment of ongoing conditions and constraints and stimulated by perceived opportunities and imagined futures. Therefore, this scenario can be considered a threshold between "bouncing back" goals or "bouncing forward" aspirations. The third scenario is more aligned with the concept of evolutionary resilience, in which exposure to shock triggers a looking forward response as local actors see the crisis as an opportunity to enact change and improve their future position relative to their pre-crisis status. More than simple adaptation, transformation is at the core of regional actions, emphasizing the potential of approaching the border as a resource.

Under this framework, cross-border governance is considered an intermediary structure between an external, independent shock and certain outcomes a border community identifies as desirable. As suggested by Boin (2019), the community's resilience depends on the capacity and responsiveness of governance structures to mitigate disruption of pre-crisis outcomes and practices or strengthen local capacity to improve outcomes and enhance cross-border crisis-management capabilities.

3. Case Studies in Europe and North America

The research strategy used in this study allowed us to explore personal narratives in interaction with prevalent collective discourses and social practices in the context of the COVID-19 crisis. To this end, we triangulated information obtained through in-depth interviews, discussion groups, and a systematic review of online information platforms (Buttolph, Reynolds, & Mycoff, 2020; Creswell & Creswell, 2018).

First, we conducted a systematic review of online news outlets and official websites, looking for press releases, public announcements, and documents that would account for decisions made by municipal authorities and non-governmental regional actors concerning the pandemic and the border closure. The review covered the period from January 2020 to August 2022, and the search was performed using the terms "COVID-19," "coronavirus," or "pandemic," in combination with the names of the four border cities of interest. The aim was to identify and document the spectrum of concrete and commensurable actions undertaken by national and regional actors to contain the spread of the coronavirus or mitigate the impact of such actions on border communities. The actions identified through this procedure were compiled with the help of a standardized form created to record the types of actions, the actors involved, the field of activity, and the level of cross-border activity involved. This procedure resulted in a timeline depicting the events marking the unfolding of the crisis at the local scale and produced a comprehensive map of individuals and organizations involved in its handling.

Then, in-depth interviews were performed between June and December of 2022 to obtain the personal narratives of key regional actors. The interview participants were selected using a critical case sample approach (Patton, 2001). This approach allowed us to identify a small number of cases likely to produce the most information about the phenomenon of interest. We relied on the map of actors produced during

the review described above to find the critical cases. The map of local actors was used to select those individuals and organizations with the most mentions in regional newspapers because of their central role in articulating local responses to the border closure. In the Tui-Valença region, five interviews were conducted among representatives of the European Grouping of Territorial Cooperation–Miño River, Eixo Atlantico, and the mayors of the Eurocities of Tui (Spain)-Valença (Portugal), Tomiño (Spain)-Villa Nova de Cerveira (Portugal), and the Council of As Neves (Spain). In the Ambos Nogales area, three interviews were conducted with a representative of the Mexican Consulate in Nogales, Arizona, the director of the municipal health office in Nogales, Sonora, and a public health advocate and researcher based in Tucson, Arizona. During this stage, informal conversations were established with other regional actors to contrast and complement narratives.

Lastly, in the summer of 2023, a discussion group was held with the leadership and staff of the European Grouping of Territorial Cooperation-Galicia-Northern Portugal in Pontevedra, Spain. This discussion provided a broader perspective of the pre-crisis status of cross-border cooperation and cohesion in the region, which was instrumental in contextualizing local responses to the border crisis triggered by the COVID-19 pandemic.

Table 1. Differences and similarities between Tui/Valença and Ambos Nogales

	Tui, ES	*Valença, PT*	*Nogales, US*	*Nogales, MX*
Total Population	16,860	13,427	19,770	261,137
Population density	68 person/km^2	117 person/km^2	366 person/km^2	6,758 person/km^2
Population growth	10.6%	-9.3%	-5.39%	22.9
Border crossing	18,415 vehicles/day		11,379 vehicles/day	
	~1,500 cross-border workers/day		~3,500 cross-border workers/day	
Major cross-border governance mechanisms	European Group of Territorial Cooperation–Miño River, European Group of Territorial Cooperation-Galicia-Northern Portugal, Eixo Atlantico, Eurocity Tui-Valença		Ambos Nogales Binational Health Council Border Liaison Committee	

Sources: AECT Rio Minho (2019), GNP-AECT (2023), INEGI (2023), U.S. Census (2023), Spain-Ministerio de Transporte, Movilidad y Agenda Urbana (2022) and U.S. Department of Transportation (2023).

The decision to focus on Tui, Spain-Valença, Portugal, and Nogales, USA-Nogales, Mexico (Ambos Nogales) is based on the fact that both areas are the locus of intense cross-border interaction and interdependence. Hence, the disruption created by the border closure is large vis-à-vis other cities in their respective border regions. Additionally, the two city pairs are embedded in contrasting institutional contexts, a variation that provides a way to make explicit border specificities and commonalities. Table 1 shows some elements of contrast between the cities in each border region and between the border regions themselves. Tui/ Valença integrates a relatively small, low-density border with a past extending for centuries (Domínguez Castro & Varela Álvarez, 2015). The two cities, separated by the Miño River, are linked by two international bridges that play a strategic role in the transborder flows

connecting Spain and Portugal. On the other hand, Ambos Nogales are two cities that emerged together in the late 19th century to evolve into an asymmetrical urbanization with a larger and denser Mexican side. The two cities are connected through two international border crossings that support an intense flow of goods and people between Mexico and the United States.

Both regions have accumulated substantial cross-border social capital because of an expansive and active collaboration network involving local governments, regional universities, citizen groups, and business organizations. In the case of Tui/ Valença, cross-border governance is highly institutionalized due to the integration policy framework supported by the European Union. Cross-border cooperation has prioritized the consolidation of the eurocity and focused on an assortment of local initiatives to promote joint spatial planning, shared services, sustainable tourism, economic innovation and sustainable mobility (AECT Rio Minho, 2019; Lois, Cairo, & Limon, 2022; Marques da Costa & Costa, 2019). Ambos Nogales, on the other hand, provides an interesting case study because of its long history of collaboration and initiatives promoting environmental protection, community health and reducing health disparities across the border (Lara-Valencia, Coronado, *et al*., 2023). Over time, cross-border cooperation in Ambos Nogales has materialized in a stable yet informal system of governance, allowing the exchange of information and resources and promoting non-hierarchical forms of coordination across the border.

4. Tui-Valença

4.1. They split us into two cities

With two international bridges, Tui-Valença concentrated 50% of the vehicular land crossings between Spain and Portugal in 2018, and it is the most dynamic area for tourism, shopping, and labor mobility between the two countries (AECT Rio Minho, 2019). Although many of these flows are external to the region, local communities heavily engage in cross-border activities. In a recent survey, more than half of the residents of Tui and Valença reported crossing the border at least once a week for work, recreation, or shopping (Carballo Lomba, 2016).

On March 16, 2020, Spain and Portugal agreed to a partial and initial closure of land border crossings, with both countries agreeing to keep open 9 out of 64 international border crossings (Spain Ministerio de Transportes, 2022). One of the crossings that remained open was the major international bridge connecting Tui and Valença, which was subject to strict mobility control until June 30, 2020. Border enforcement at this location was conducted by the *Policía Nacional* of Spain, and the *Serviço de Estrangeiros e Fronteiras* and the *Guarda Nacional Republicana* of Portugal. Cross-border mobility was restricted to cross-border workers, family reunification, and nationals and residents returning to their country.

Although the border closure was coordinated between the national governments, its operation was not. As explained by a regional policymaker, people crossing through Tui-Valença were subject to different border control procedures: "If you were coming from Portugal, you had one, but if you were coming from Spain, you had another" (Informant 1, Spain). For some actors, the implementation of border control was primarily intended to secure the flow of commodities and less concerned

with sanitary priorities and the needs of local communities (Informant 1, Spain). The decision to leave only a few border crossings open, "saving money to national governments," was interpreted as an indication of the indifference by Madrid and Lisbon for border communities, which were left to absorb the cost of the closure by forcing cross-border commuters to travel long distances to reach their jobs and businesses and the general population limited in their ability to engage in pre-pandemic cross-border activities (Informant 1, Spain; Focus Group 1, Spain/Portugal).

A feature of the national strategy was its limited communication and transfer of information to subnational governments, which left regional and local authorities disinformed and with little capacity to intervene in the management of the emergency. Centralization and mistrust were highlighted as the main sources of discoordination, "where Madrid and Lisbon made some decisions, Galicia and Viana do Castelo others, and Tui and Valença their own" (Focus Group 1, Spain/Portugal). According to local actors, this lack of coordination and communication contrasted with the practices of information exchange and horizontal coordination common in the Tui-Valença as a result of the enormous cross-border institutional development achieved within the framework of the European Union and its policies of territorial cohesion and cross-border cooperation embodied by the eurocity model. As noted by a regional policymaker:

> *Our region has the highest labor mobility along the Spanish-Portuguese border, and its inhabitants live a shared reality regardless of their residence. There is a clear and permanent willingness to cooperate. That is the reason why we participate in a constant dialogue intended to create a coherent and comprehensive vision through joint work and the consolidation of cross-border planning instruments* (Focus Group 2, Spain/Portugal).

Thus, one of the first reactions to the decisions taken by national authorities in Spain and Portugal was the organization of the Eurocities on the Miño River to "resist" the closure of border crossings mainly because the measure marginalized local communities and ignored the progress of regional governance structures. During the first weeks of the "hard confinement" in Spain and Portugal (March-April 2020), the political leaders of Tui-Valença, Tomiño-Vila Nova de Cerveira and Salvaterra do Miño-Monção, as Eurocities members of the European Grouping of Territorial Cooperation Rio Miño (Rio Miño EGCT) began to implement a series of coordinated actions aimed at demanding significant involvement in the decision-making processes on border strategies in the fight against the coronavirus. Undoubtedly, this was the first moment of truly cross-border collective awareness on the part of the Eurocities that acted as a single entity demanding their national governments' solutions adapted to the social and economic reality of the border (Informant 1, Spain).

A second border closure was agreed between January 31 and April 30, 2021. This time, the border closure brought a new circumstance for Eurocities on the Miño River since Spain had begun the territorialization process of pandemic management, which consisted of developing intervention models in each of the autonomous communities under the coordination of the central government (Mattei & Del Pino, 2021). However, the border management model continued to depend on national directives. In the case of Portugal, something similar happened, although with greater room for maneuver on the part of cities since there was no level of regional government with which the central government shared the management of the crisis. In any

case, Lisbon remained responsible for managing Portugal's borders. As noted by an elected officer, management asymmetries and centralism by the two governments increased the frustration and uncertainty of local border communities (Focus Group 1, Spain/Portugal). Consequently, the policymakers of the Eurocities, under the coordination of the Río Miño EGCT, increased their pressure and visibility efforts to demand a redefinition of both national governments`s strategies and consider their implications for cross-border Communities.

The Río Miño EGTC, in addition to providing Institutional and political coverage to all the Eurocities in the region, also developed intervention strategies derived from consultations with experts, seminars, and exchanges of experiences with other border regions of Europe. All this led to mobilizations that can be characterized as a stage of political resistance, with a broad social and economic base that managed to channel the discontent of border communities and consolidate a platform of "actionable thinking" about the post-pandemic phase.

4.2. Reclaiming a borderless territory

Tui-Valença's actors' accounts portray a situation where the pandemic is seen as an event that exposed the weaknesses of the European cross-border governance system. There is a strong feeling that the shock materialized in the border closure revealed that local efforts inspired by the idea of a borderless Europe were undervalued and disdained by the centralist disposition of Madrid and Lisbon during the pandemic. One regional policymaker describes this perception:

> *The European Commission can say many nice things, but if the nation states do not embrace them, if they are not up to the task, we, at the local level, are the ones taking on the direct impact …. Because Madrid and Lisbon do not understand the situation of border regions* (Informant 1, Spain).

From this perspective, the border closure triggered a crisis of the multilevel governance European model because municipalities and cooperative mechanisms like the EGCT and the Eurocities were decentered, and the bottom-up decision process that gave voice to regions was broken. For actors in Tui-Valença and other border municipalities in the Miño River, reestablishing the functionality of such mechanisms meant the return to normalcy, so it became their priority. However, the pandemic led to the realization that bouncing back was not sufficient as the disruption of the governance system laid bare that (1) nation-states remain powerful actors and brokers in multilevel governance; (2) the degree of functional and social integration achieved under European cohesion policies are not recognized and taken into account by central governments; (3) the construction of the transborder governance system is incomplete and vulnerable to rebordering. Rather than pursuing "bouncing back goals," regional actors seem motivated by "bouncing forward aspirations."

In the specific case of the Tui-Valença, the first of the impacts of COVID-19 was the political mobilization to resist rebordering and deepen integration because the "border is an anachronism that we overcame long ago" (Focus Group 1, Spain/Portugal) and "the pandemic demonstrated that we still far from full integration" (Focus Group 1, Spain/Portugal). This first "absorption" phase between 2020 and 2021 provoked the evolution of the Tui-Valença Eurocity within the Rio Miño EGTC. The

resistance and learning obtained by regional actors stimulated the development of new information exchange and coordination mechanisms that increased the capacity of Tui-Valença to face the challenges of abrupt turns in terms of cooperation on the Spanish-Portuguese border. A clear expression of this renewed capacity is the greater involvement of local actors in designing and implementing central governments' cross-border policies in the context of the pandemic. Other manifestations are:

- The integration of the Río Miño EGTC into the Iberian Network for Cross-Border Cooperation (REDCOT), which is part of the strategy of the Spanish government during the exercise of the Presidency of the European Union from July 1, 2023.
- The enlargement of the cross-border cooperation agenda by expanding the number of Eurocities and announcing studies and analyses to territorial areas far from the borders of Galicia-Northern Portugal (Focus Group 2, Spain).

In sum, the concerted actions of the EGTC and the Eurocities achieved an objective that is difficult to attain in situations of cross-border institutional normality, that is, that the demands of the Eurocities are heard and gradually incorporated into the cross-border agendas of both states. This shift became evident in 2022 when the discourse of the autonomous government of Galicia (Xunta de Galicia) began to reflect the demands of those responsible for the Tui-Valença Eurocity. During that same year, and on the occasion of the annual summit between the governments of Spain and Portugal (Cimeira Ibérica) held in the North of Portugal, the mayors of the Eurocities and the Río Miño EGCT proposed a reorientation of community programming in the field of territorial cooperation towards border communities, their problems, needs for common public services and the mobility of cross-border workers and ordinary citizens (Informant 1, Spain).

5. Ambos Nogales

5.1. Grasping the problem

The US-Mexico border region is a unique sociopolitical space where the people and economy of one of the world's most developed nations mingle with the people and economy of a developing country. Solely through Ambos Nogales, almost $36.9 billion were traded in 2019, including maquiladoras and agribusinesses that employ most of the labor force on both sides of the border (U.S. Census, 2023). Approximately 10.4 million sanctioned "crossings" occurred across this border in the same year, meaning that on a typical day, about 28,000 human bodies traveled across the international boundary (U.S. Department of Transportation, 2023). The heavy traffic of people crossing as pedestrians or passengers is a palpable manifestation of the strong economic and social interdependence and complementarities that tie both cities. This connectivity touches almost every aspect of social life (such as employment, consumption, family, culture, and identity) to the extent that it produces a dynamic transborder space in the region.

For government and non-government actors in Ambos Nogales, the complexity and challenges of confronting the pandemic became evident from the onset and

quickly acquired the elements of a crisis. Acting as an informal and loose network, they realized that the pandemic did not conform to prior crises at the U.S.-Mexico border because its risk horizon was difficult to define, and solutions were not immediately available. As a result, the conversation on both sides of the border about what to do soon became complicated and coherent policies and actions became hard to negotiate. In Arizona, for example, Governor Doug Ducey was reluctant to declare a health emergency and authorized policies limiting the ability of local governments and the private sector to require the use of face masks in schools and businesses. His government repeatedly dismissed the severity of the pandemic just to walk back after recurrent waves of infections, hospitalizations, and deaths (Innes, 2023). Once the vaccine became available, he prohibited requiring proof of vaccination to attend public schools and enter government offices (Innes, 2023; Pitzl, 2022). These actions were challenged by local leaders and border health officers who criticized the pandemic's politicization and the disdain for epidemiological and scientific evidence in policymaking (Fischer, 2021).

Actions by the Mexican and U.S. federal governments also added to the vagueness of the context in which local actors evaluated alternatives and decided their actions. In March 2020, the United States and Mexican governments agreed to the closure of the border to non-essential travelers, which, in practice, shut the border down to Mexican nationals but left it fully open for U.S. citizens and legal residents (BBC News Mundo, 2020). As a result, mobility at checkpoints dropped to historical levels, but back-and-forth flows of cross-border workers, dual residents, and even tourists remained steady. The Mexican government seldom enforced the essential travel-only rule, including the rare event of preventing about 1,800 U.S. vehicles from entering Sonora during the U.S. Independence Day holiday (La Estrella de Tucsón, 2020). The asymmetry of the border closure and lack of enforcement by Mexican authorities generated discontent among citizen groups who protested blocking entry lanes in several checkpoints between Sonora and Arizona (AP, 2020). Their concern was the transmission of COVID-19 by people entering from the United States, who were perceived as more exposed to the disease given the higher rates of infection reported in that country and the ambiguity of the epidemiological control policies in Arizona.

In this context of uncertainty and ambiguity, border health advocates in Ambos Nogales responded initially to the emergency without a firm basis for effective action but recognizing the cross-border nature of the problem and its solutions. For example, acquiescing to the reality of cross-border interdependence, the municipal health department of Nogales, Sonora, installed in the early stage of the pandemic and despite its questionable efficacy, a sanitization tunnel to disinfect essential cross-border workers entering Mexico through the main border port of entry (Prendergast, 2020; Secretaría de Salud, 2020). However, later in the pandemic, Ambos Nogales actors responded effectively by resorting to informal cross-border cooperation and networking, allowing them to access resources to implement an innovative immunization program.

5.2. Debordering the pandemic

The US-Mexico international boundary leaves no ambiguity about territorial claims of belonging and otherness. At least since 1924, entering the U.S. territory has been

a state-sanctioned act based on rights emanating from citizenship or privilege conferred through temporary workers or visitor visas. Checkpoints along the border are the locus where these rights and privileges are exerted and sanctioned through inspection and validation. In between checkpoints crossings are deemed trespassing, and those involved illegals. In defiance of this logic, the extraordinary circumstance created by the coronavirus pandemic forced proponents of a transborder immunization program to imagine and construct a space where ineligible Mexican citizens "can be in U.S. territory without entering the country" (Informant 2, Mexico).

Dubbed the binational immunization campaign, the program intended to use a surplus of COVID-19 vaccines accumulated in hospitals and clinics in Arizona that were near expiration to immunize Mexican citizens in Nogales, Sonora (Gervasi, 2021).

As explained by several informants, the program's implementation faced some challenges. On the one hand, the vaccines were not allowed to leave the U.S., and the doctors and nurses authorized to administer them could provide care only to patients physically present in Arizona (Informant 3, USA). On the other hand, Mexican citizens could not enter the U.S. because of the border closure, and most people in need of the vaccine were probably ineligible to enter the U.S. because they lacked visas authorizing them to cross the border (Informant 4, Mexico).

The solution was to carve out a "third place" (Oldenburg, 1989) in Ambos Nogales. Borrowing from Soja (1996), a third place is a geography that breaks the duality of here and there by creating a space connecting healthcare providers and patients across the border. Functionally, this third place is a space providing opportunities for safe interaction between border enforcers (e.g., Customs and Border Protection Officers) and border residents in a way that softens polarization and enables the efflorescence of deep cross-border community ties. Geographically speaking, this site for safe cross-border commingling was located on the west side of the Mariposa Border Port of Entry at approximately 300m inside the U.S. territory. In a 200m^2 parking area designed to inspect southbound vehicles, U.S. doctors, nurses, and medical students were concentrated and mobilized to meet, first, industrial workers bussed from factories in Nogales, Sonora and, later, municipal employees, school children, and other Mexican citizens participating in a well-orchestrated transborder public health program.

The program followed a strict protocol designed to deliver healthcare efficiently and safely to the most people possible while satisfying all border security concerns. To participate in the program, patients had to fill out an online registration form, report to a certain place and time to be bussed across the border, get off the bus to receive the vaccine, and return to the bus and remain on it until reaching the point of departure in Nogales, Sonora. The process took approximately 90 minutes, and some days, the number of patients receiving the vaccine reached 2000 individuals (Informant 3, USA). As the Nogales, Sonora public health authorities explained, "all the buses were staffed with a nurse, and the patients had to remain in the bus for about 20-30 minutes for observation. The bus was always accompanied by an ambulance that also crossed the border". The program benefited nearly 36,000 individuals vaccinated between October 2021 and June 2022 (Informant 4, Mexico).

The program's success stemmed mainly from the participation of a group of individuals with robust recognition as legitimate conveners and intermediaries within a broad cross-border coalition formed to deal with the pandemic. Some of these

individuals were affiliated with the University of Arizona and had a long presence in the region as advocates for cross-border health collaboration. Others, like the Mexican and U.S. consulates in the area, had the capacity to engage with government and non-government actors, influence policies, and mobilize resources on both sides of the border. Working together, they set up and developed an interinstitutional structure involving U.S. Customs and Border Protection, state and municipal health authorities, maquiladoras, bus companies, emergency services, and news agencies. The combination of knowledge, recognition, and motivation embodied by this coalition allowed its members to identify opportunities to deal effectively with the COVID-19 crisis.

In the context of the health crisis, the experience of the binational immunization program highlighted the advantages of thinking of the border as an asset rather than a threat. In the first place, seeing the border as a resource allowed the coalition to avoid the waste of surplus vaccines in Arizona while increasing the supply in a community struggling to meet its immunization needs. In the second place, the program increased the immunity of a population encompassing workers producing goods essential for the health of global supply chains, including food and medical supplies for the U.S. Finally, the program immunized members of transborder families comprising dual citizens and green card holders unaffected by the border closure and engaged in a transborder lifestyle.

6. Discussion

The crisis prompted by the pandemic was uniquely complex because of its novelty, scale, unpredictability, and the uncertainty surrounding the severity of its consequences. As the Council of Europe (2020) has pointed out, crises such as this are better handled through multilevel governance because no government acting alone can prevent, contain, and manage a shock of this complexity. Theoretically, multilevel governance helps synchronize and coherently implement collective actions at different scales, in addition to bridging territorial disparities and amplifying place-based knowledge crucial during a crisis. It also boosts a region's resilience to external shocks. Neither Tui-Valença's nor Ambos Nogales's experiences during the crisis bear a resemblance to a multilevel governance situation.

In the Galicia-Northern Portugal border region, considerable progress has been accomplished in constructing the institutional scaffolding to support vertical and horizontal coordination among supranational, national, regional, and municipal governments. Yet, local leaders condemned the re-centralization and re-territorialization of border management during the pandemic and accused Madrid and Lisbon of overlooking the consequences of border closures for the highly integrated regional economy and society. They also felt sidelined because their skills and expertise on border issues were not called for, and the legitimacy of their role as interlocutors between local communities and regional and national authorities was put to the test.

The centralist management of the pandemic also tested the European cross-border governance system's robustness, showing its weaknesses and strengths. For national governments, the pandemic was fundamentally a high-stakes public health crisis, and the local and short-term impacts of the containment measures were ranked low priority in the context of a pandemic perceived as an existential threat. For Tui-

Valença's actors, the border closure demonstrated the persistence of political and administrative obstacles to the type of integration envisioned by European cooperation and cohesion programs. In the eurocity, local actors mobilized to manage the uncertainty and disruption of the pandemic but also organized to absorb the most immediate effects of the border closure. Their response to the dual threat of the pandemic and rebordering was inscribed and dictated by the institutional context created over decades of decentralization, which, on the one hand, transferred local governments the authority to handle issues of importance for local communities and, on the other, compelled them to embark in cross-border cooperation.

In contrast, cross-border governance in Ambos Nogales is informal and sustained largely by the voluntaristic disposition of individuals grouped in a loose network and with some institutional affiliations that were instrumental for the purpose of their collective action. Their actions during the pandemic were not derived from a mandate or were statutory in nature but compelled by their personal identification with the region and their capacity to access and mobilize resources needed to handle the emergency effectively. Within this network, one or two champions rallied other influential actors to coordinate efforts leveraging their organizations' social capital and institutional muscle.

Further, the involvement of each actor was bounded by the agreed scope of the action, and there was no expectation of further activity or commitment beyond the goal of providing immunization to the largest number of Mexican citizens with the vaccine surplus dispensed by the State of Arizona. As shown above, implementing the binational immunization program demanded the alignment of the agency, materiality, and temporality of various organizations ranging from federal, state, local and private entities on both sides of the border. This type of collaborative "boundary work" (Langley *et al*., 2019) was crucial to mobilizing medical, clinical, and human resources needed to deal with the pandemic in the transborder space of Ambos Nogales.

While both case studies are clearly distant institutionally as well in their capacity and resources to deal with emergencies, the way Tui-Valença and Ambos Nogales reacted to the complex crisis offers some clues to understanding the role played by bordering and different border contexts in the construction of cross-border resilience. Table 2 summarizes some of the analytical dimensions highlighted by this study.

Table 2. Analytical dimensions of cross-border resilience

	Ambos Nogales	*Tui-Valença*
Source of resilience	Mostly individuals with substantial analytical and organizational capacity and strong cross-border social capital	Mostly border-spanning institutions with highly professional staff and strong leadership.
Level of resilience	Bounce back: flexibility/creativity	Bounce forward: Resistance and political change
Context of resilience	Hard border: High interrelatedness and interdependence	Soft border: high interrelatedness and interdependency
Nature of resilience	Latent- reactive	Systemic - proactive

Source: the authors.

The actors and organizations of Ambos Nogales, two border cities inserted in an external and "hard" border context, responded reactively to the impact of COVID-19 on their territories. The impetus for the binational vaccination program was to avoid the interruption of the flow of workers employed in essential activities such as transporting produce or goods assembled across the border. From this point, the program was expanded to include the workers' families and other non-essential workers from Nogales, Sonora. The broader goal was to equalize immunity levels on both sides of the border and eventually use this fact to speed up the reopening of the border and restore cross-border relations, including shopping and social mingling. Without robust and formal cross-border cooperation structures, the main source of resilience in Ambos Nogales was individuals with knowledge, expertise, and capacity to reorient institutional practices to produce a context enabling cooperation rooted in neighborliness and complementarity. Due to the region's reliance on individual actors, resilience remains a latent condition that may manifest in future crises if the right circumstances prompt transborder champions to reactivate collaboration.

Tui-Valença, two border communities embedded in highly institutionalized cross-border contexts marked by "soft" internalized borders, demonstrated how a fully developed institutional system can struggle under the pressure of centralist forces and rebordering. However, when local actors faced the system's frailties, they opted to voice their frustration and act to fill the institutional voids revealed by the crisis. A set of well-equipped regional institutions working within the European cohesion framework were mobilized to produce studies, consult with experts, and formulate strategies. At the same time, local leaders orchestrated political demonstrations and expressed their disappointment in the national media and European forums. The thrust for their action was to bring back cross-border mobility as much as to strengthen a narrative of regional cohesion and protect the institutional mechanisms that elicited cooperation and integration for more than 25 years. Ultimately, Tui-Valença's actors were committed to augmenting the region's systemic capacity for resilience by proactively expanding the cross-border governance apparatus in the Miño River.

The capabilities behind the resilience processes observed in Tui/Valença and Ambos Nogales are also different. In the Ambos Nogales context, developing and implementing ad hoc solutions was a capability deployed foremost by local actors (Duchek, 2020; Lara-Valencia, 2021). As Weick *et al*. (2005) noted, developing solutions to deal with an emergency requires a combination of sensemaking and acting. Sensemaking means that actors involved in the binational immunization program worked to create a factual map of the health emergency and a strategy to overcome any situation separating the goal of rising group immunity in Ambos Nogales and implementing a mass immunization program using Arizona's surplus vaccines. For effective sensemaking to develop, there must be recurrent feedback between insight and action, meaning that sense must continually be recreated through a process of dialogic learning. As this process brings new issues to the surface, actors mobilize additional knowledge and resources required to maintain the solution's viability or recruit new actors to expand expert problem-solving capacities. As noted earlier, the actors in Ambos Nogales operated as an informal network organized with the sole purpose of solving a specific problem. Franco *et al*. (2013) refer to these informal networks and their *ad hoc* responses as 'latent community assets' since they only become active under the pressure of emergencies and fade away after they perform

a dedicated task. Functionally, these informal networks occupy institutional voids left by formal problem-solving structures, and therefore, they are usually seen as complementary and non-threatening by government institutions. Consequently, as shown in the case of Ambos Nogales, such networks have the capacity to apply their own knowledge, influence the behavior of other actors, and access institutional resources in the actual implementation of the previously developed solution.

The capability underlying the response in Tui/Valença was developing situational awareness and identifying structural vulnerabilities to increase the region's adaptive capacity (Duchek, 2020). In the European context, actors learned that their ability to respond effectively to the crisis was curtailed by values and norms they deemed defunct and that such values and norms were actually adding to the ongoing crisis. Therefore, their response involved not only actions to absorb the impacts of the border closures but also a cultural readjustment and push to stimulate a shift in beliefs and norms governing the behavior of central actors and affecting the responsiveness of the whole transborder institutional ecosystem. The nature of their response is consistent with a perspective that simultaneously believes in the worth of existing governance structures but questions the legitimacy of certain practices. It conforms with the familiar voice/loyalty Hirschman's scenario where institutional actors "flex their muscles" to promote change and enhance institutions rather than abandoning them (Hirshman, 1970). As we learned in Tui/Valença, the first actions of the two cities' mayors and other political actors were to demonstrate their dissent by staging a protest and talking to the national media, but also by inserting their eurocity in regional initiatives, enlarging the number of Eurocities in the region, and widening their policy agenda. Therefore, in the process of resisting re-centralization and rebordering, they are producing new conditions and processes for resilience.

Concluding remarks

This study has addressed the question of how two distinct border regions responded to the system shock induced by the COVID-19 pandemic. It specifically argued that national governments reacted similarly to the challenges of the pandemic, creating quasi-experimental conditions to explore the reaction of border regions to systemic shock and that such responses can be examined within a resilience framework.

By studying the responses of two contrasting border regions to similar shock and homologous national policies, the findings of this article contribute to the existing literature on border resilience by providing detailed insights into the level of actorness and the nature of post-shock upturn accomplished along a wide gradient of historical, cultural, economic, and institutional situations. First, the case studies support the general proposition concerning the significance of cross-border dynamics and integration in defining the timing and character of the response of border communities and its implications for regional resilience. The responses of Tui/Valencą and Ambos Nogales were triggered by the immediate harm caused by the border closure to the local economy and the perceived risk of protracted disruption of a community life highly dependent on cross-border interactions. Second, their responses were also equally informed by past experiences, social values, and dominant governance practices, which altogether provided the ground for rational collective action amidst a complex situation. In both cases, there was also a collective learning curve involving

severe blind spots in the early stages of the pandemic and a gradual realization later in the game of the actual threats to the region's stability and resilience.

The influence of the pandemic shock on cross-border relations is at least twofold. On the one hand, the emergency revealed weaknesses of the existing cross-border structures as nation-states still play a decisive role in border control and policy, and subnational actors are overshadowed even in contexts with advanced cross-border governance structures like Tui/Valença. Because nation-state actors differ in their interests, priorities, and strategies vis-à-vis border communities, regional actors may find themselves in a territorial and political trap and be unable to pursue a cross-border agenda. On the other hand, the crisis might serve as a driver of change and lead to renegotiation of the strategies of cross-border cooperation. As institutions face unexpected circumstances, one can assume that they will reshape their strategies to be more resilient and better prepared for possible future challenges.

This study has also refined the existing analytical frameworks of resilience and, in this way, provided a theoretical understanding of the capacity of governance structures with varying degrees of formalization in responding to systemic shocks. Finally, it should be added that, in practice, resilience often takes highly variegated forms. Thus, further in-depth (empirical and theoretical) studies on this topic can only yield interesting results.

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