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Regional economic resilience: A scoping review

Jesse Sutton 

Department of Geography and Environment, Western University, London, ON, CA

Alessia Arcidiacono  and **Gianpiero Torrasi**

Department of Economics and Business, University of Catania, Corso Italia, Italy

Robert Nutifafa Arku 

Department of Geography and Planning, University of Toronto, Toronto, ON, CA

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Abstract

Since the late 2000s, the concept of regional economic resilience has become the new buzzword in economic geography. Despite considerable attention, a common sentiment in the literature is that regional economic resilience is an underdeveloped and fuzzy concept. Therefore, this paper conducted a scoping review of 168 articles on the concept of regional economic resilience from 2000 to 2022 to assess its present conceptual state. The paper finds that the notion of regional economic resilience has become a well-developed concept and does not bear the markers of a fuzzy concept anymore. A conceptual framework is advanced.

Keywords

Resilience, regions, determinants, conceptual framework, scoping review

1 Introduction

Since the late 2000s, the notion of regional economic resilience (RER) has become the new buzzword in economic geography (Martin and Sunley, 2015). The increased attention paid to RER in academia and policy arenas is mainly due to the perception that regional economies have become more vulnerable to economic shocks in an increasingly integrated global economy and thus, there is a need to safeguard regions from such disturbances (Christopherson et al., 2010; Hudson, 2010; Martin and Sunley, 2015; Modica and Reggiani, 2015). Precisely, this perception was intensified after the 2008 Great Recession, the effects of which were widespread but geographically uneven (Sensier et al., 2016; Sutton

and Arku, 2022b; Wolman et al., 2017). The heterogeneous effects of the recession on regions raised an important question that economic geographers and regional scientists aim to answer: *why are some regions able to resist, recover from, and reorient their economies in the face of shocks while others are not?* Attempts to answer this question have resulted in the rapid conceptual development of resilience and its determinants (Evenhuis, 2017; Hu and Hassink,

Corresponding author:

Jesse Sutton, Department of Geography and Environment, Western University, 1151 Richmond St, London, ON, N6A 5C2, CA.

Email: jsutto22@uwo.ca

2020; Martin, 2012; Pendall et al., 2010; Pike et al., 2010; Simmie and Martin, 2010; Sutton and Arku, 2022a; to list a few). The notion of RER will undoubtedly attract even further attention due to the economic impact of the COVID-19 pandemic and the following 2020 economic crisis.

Despite the rapid conceptual development, a common sentiment in the resilience literature is that the concept is still underdeveloped, requiring further work to cultivate a comprehensive conceptual framework. At the heart of this critique is that RER is a fuzzy concept requiring greater conceptual clarity (Bristow and Healy, 2020; Dawley et al., 2010; Hassink, 2010; Pendall et al., 2010). Markusen (1999) characterizes fuzzy concepts as those that possess various definitions and are difficult to operationalize. As such, fuzzy concepts have weak analytical rigour and explanatory power and are largely detached from policy advocacy. This critique is, however, not uncommon for relatively new and developing concepts. Lagendijk (2003) notes that new and fuzzy concepts, such as resilience, become mature and rigorous over time as researchers and scholars engage with the concept in academic conversation and debate, as well as through in-depth conceptual review. These types of scholarly engagement has been abundant with the concept of RER. Yet, the sentiment of RER possessing an underdeveloped conceptual framework and being a fuzzy concept persists. For instance, Crespo et al. (2017:271–72) argue that ‘the conceptual framework behind regional resilience is still underdeveloped’. Martin and Sunley (2015:1) note, ‘There is still considerable ambiguity about what, precisely, is meant by the notion of regional economic resilience’ and ‘about how it should be conceptualized’. Also, Hu and Hassink (2020: 56) state that ‘Despite a few insightful conceptualizations, the notion [of resilience] has suffered from fuzzy definitions and incoherent understandings’.

The resilience literature would greatly benefit from a more coherent and comprehensive understanding of the current conceptual state of RER.¹ In providing such an overview, the sentiment that RER is underdeveloped and is a fuzzy concept can be evaluated. Therefore, this paper conducts a scoping review to systematically assess the existing literature

on RER and provide a synopsis. To undertake such a task, the scoping review is guided by the following research questions: What is resilience in the context of regional economies? What are shocks? What are the determinants of regional economic resilience? What are the methodological challenges to examining regional economic resilience? What is the value of examining regional economic resilience? What are the critiques of regional economic resilience? In answering the research questions, the paper’s objective is not only to provide a comprehensive and in-depth overview of RER but also to develop a robust conceptual framework.

The conceptual framework advanced in this paper is grounded in critical realism – ontologically and epistemologically – advocating the incorporation of regional context in empirical studies of RER as well as the identification of underlying causal mechanisms (Gong and Hassink, 2020). Context is considered the bedrock of economic geography, being at the very root of the subdiscipline (Asheim, 2020; Rodriguez-Pose, 2011; Sunley, 1996). As such, critical realism is typically implicitly or explicitly employed as the underlying paradigm of empirical and conceptual work in economic geography as it is context-sensitive while acknowledging reality exists independently of human consciousness (Gong and Hassink, 2020; Sayer, 1992; Yeung, 2019).

The following paper is structured as follows. Section 2 presents the paper’s methodology. Section 3 gives an overview of the results. Section 4 provides a comprehensive and in-depth overview of RER. Section 5 discusses the current conceptual state and presents the conceptual framework advanced in this paper. Section 6 offers a research agenda and concludes.

II Methodology

Scoping reviews differ from traditional literature reviews as they attempt to identify all articles on a topic through a systematic process. This process minimizes selection, publication, and data extraction bias. Scoping reviews are conducted for various reasons but with the overall intent to provide a synopsis of a topic (Munn et al., 2018). The methodology for this review follows the framework provided by the Joanna Briggs Institution, and the

reporting guidelines follow the PRISMA-scoping review guidelines (Peters et al., 2020; Tricco et al., 2018). The systematic process underpinning the scoping review consists of three main steps – establishing inclusion and exclusion criteria, identifying data sources and conducting a search strategy, and screening articles – which will be discussed in the following subsections.

I Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were established, a priori, to identify and include the most relevant articles on RER for review. There are three inclusion criteria. First, only peer-reviewed published articles are included in this review, excluding books, newspapers, grey literature, and other sources. Second, articles need to focus specifically on regions' economic resilience. Third, only articles that focus on the spatial unit of regions, defined as functional geographies that operate under the national government but across municipalities or include the greater area of municipalities (i.e., suburbs and surrounding rural areas, towns, and cities), were included.² The only exclusion criterion for this review is that policy-oriented articles on RER are excluded because the paper's objective is to examine the overall conceptual state of resilience as it pertains to regional economies and not in regard to resilience policies.

2 Information Sources and Search Strategy

This scoping review conducted a sensitive search strategy to identify peer-reviewed articles on RER from the following six databases: Geobase, Scopus, Web of Science, EconLit, Oxford Bibliographies, and Google Scholar. The search strategy has three parameters. First, the search date is restricted to articles published between 2000 and 2022. The lower limit of 2000 is chosen because the concept of resilience did not gain considerable attention in the literature until the early 2000s (Martin and Sunley, 2020). Second, the search was restricted to articles published in English due to language barriers. Third, due to the sheer volume of articles that incorporate the concept of resilience (i.e., initial search results of 17,000), the databases searched were limited to journals that are 'regional' in nature, such as Papers

in Regional Science, Regional Studies, Economic Geography, and the like, as determined by the authors in consultation with a librarian.

In particular, a three-step search strategy was employed following Peters et al. (2020), which was initiated on 31 July 2021. The first step was a limited search of Web of Science and Scopus databases to identify key search terms used in articles' titles, abstracts, and standardized index terms. The key search terms identified were 'regional economic resilience', 'economic resilience', and 'regional resilience'. The second step was a search of articles' titles, abstracts, and standardized index terms for all six databases specified above, using the key search terms identified in step one. The second step was conducted to identify all relevant peer-reviewed published articles. The third step is a hand search of the reference lists of all identified, relevant articles to comb for additional articles not found via the six databases.

On 4 April 2022, a final search of the same databases (i.e., repeating steps two and three) was conducted using the same key search terms to identify any additional articles released since the initial search date.³

3 Selection Process

The selection process for this review consists of three stages (see Figure 1). First, articles are screened for duplications (based on citation or title) and incomplete citations. Any duplicates and incomplete citations were removed.⁴ Second, articles' titles and abstracts are filtered based on the pre-determined inclusion and exclusion criteria. Articles that did not satisfy the criteria were removed. Third, the full-body text of articles underwent the same process taken in the second step, with ineligible articles being removed based on the criteria. The selection process was conducted using Covidence software.

III Results

I Study Search and Selection

The initial literature search on 31 July 2021, and the final search on 4 April 2022, of databases and reference lists using the key search terms, identified a total of 2,629 articles. Figure 1 illustrates the

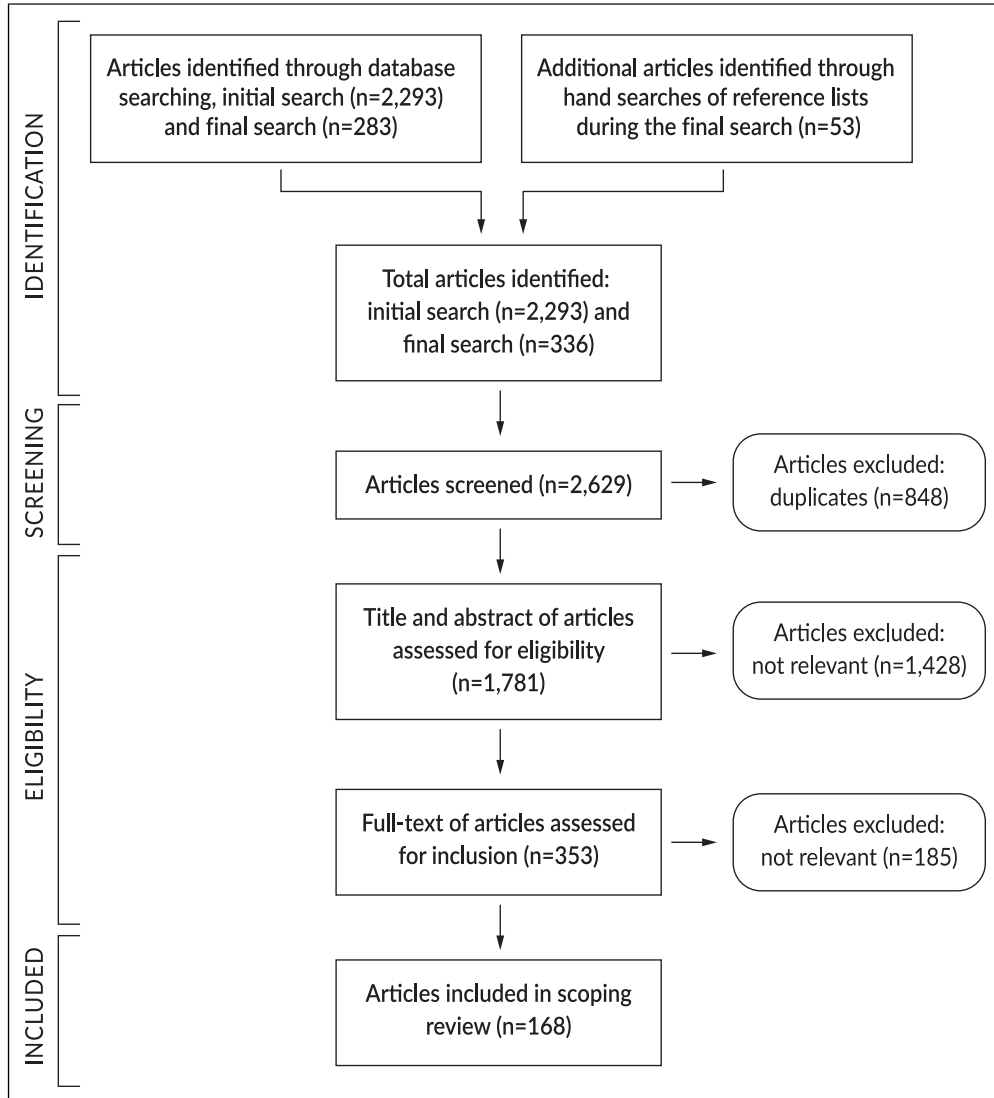


Figure 1. PRISMA flow chart.

selection process for this review. From the identified articles, 848 duplicates were removed during the screening process. The 1,781 remaining articles' titles and abstracts were screened for relevance based on the studies' inclusion and exclusion criteria, in which 1,428 articles were excluded as they did not satisfy the criteria. Of the remaining 353 articles, the full text was filtered through the inclusion and exclusion criteria, and 185 were excluded as they did

not meet the criteria. A total of 168 articles were identified that satisfied all the inclusion and exclusion criteria, and thus they form the base of this review.

2 Study and Methodological Characteristics

The study and methodological characteristics are reported in [Table 1](#). The majority (52.98%) of articles were published or released between 2015 and 2019.

The continent of Europe has been the main focus of the RER literature, with 63.69% of articles examining regions in this continent. In contrast, only 1.20% of the examined articles focused on regions in the continent of Africa or South America. Evolutionary resilience was examined or discussed by 70.83% of articles, then engineering resilience was the next most frequently examined or discussed (36.91%). Also, most articles on RER (80.95%) have been empirical papers. Statistical modelling was the most common methodology employed (56.62%) to examine RER, with a substantive proportion of empirical studies employing a sensitivity or resilience index, popularized by [Martin \(2012\)](#) and [Fingleton et al. \(2012\)](#) for the former and [Martin et al. \(2016\)](#) for the latter. The majority of articles used employment (63.97%) to assess RER. Notably, 19.05% of studies addressed RER on conceptual grounds (32 in total). This evidence indicates that although RER literature has a large empirical base, it also has experienced considerable attention conceptually. Articles on RER drastically increased in 2010 and have experienced a rapid increase since. The main focus of the articles has been on the 2008 Great Recession. Nevertheless, with the onset of the COVID-19 pandemic, articles on the following 2020 economic crisis have started to emerge.

IV Review

This section provides a synopsis of RER. The findings from the scoping review are structured around five major themes to address the paper's research questions. The five major themes are RER (types of resilience, dimensions of resilience, and regions' reaction to shocks), shocks (types, origins, and nature of shocks), determinants of resilience, methodological challenges for examining resilience, and the value of RER as a concept and common critiques. It is important to note that the synopsis provided is based on the reviewed articles.

1 Regional Economic Resilience

The notion of resilience was popularized by Ecologist C. S. Holling in 1973 ([Martini, 2020a; 2020b; Rose, 2007](#)).

Table 1. Study and methodological characteristics.

Study characteristics (<i>n</i> = 168)	Count (%)	N
Year of publications		
2000–2004	0.60	1
2005–2009	1.80	3
2010–2014	17.26	29
2015–2019	52.98	89
2020–2022	27.38	46
Continent		
North America	13.69	23
South America	0.60	1
Europe (incl. UK)	63.69	107
Australia	1.19	2
Asia	4.76	8
Africa	0.60	1
Multiple continents	0.60	1
Not applicable ^a	14.88	25
Type of resilience examined^c		
Engineering resilience	36.91	62
Ecological resilience	27.38	46
Evolutionary resilience	70.83	119
Transformative resilience	1.19	2
Multiple types	26.19	44
Type of paper		
Empirical paper	80.95	136
Discussion paper	19.05	32
Methodology^b		
<u>Quantitative studies</u>		
Resilience index ^c	6.62	9
Sensitivity index ^c	17.65	24
Statistical modelling ^c	56.62	77
Shift-share ^c	10.29	14
<u>Qualitative studies</u>		
Case study ^c	11.77	16
Interviews ^c	2.94	4
Prominent indicators^{b,c}		
Employment	63.97	87
Population	3.68	5
Firm entry and/or exit	2.94	4
Gross domestic product	34.56	47
Income	11.03	15
Productivity	4.41	6
Multiple indicators	39.71	54

^aRegional context in general.

^bThis section only includes empirical articles (*n* = 136).

^cNon-exclusive categorization.

Since then, the concept has been adopted by many fields, such as psychology, environmental management, engineering, among others, to examine how systems, individuals, and objects respond to disruptions (Cellini and Torrisi, 2014; Martin and Sunley, 2015; Modica and Reggiani, 2015). Following suit, the concept of resilience has also been adopted into the subdiscipline of economic geography, becoming part of the conceptual and analytical lexicon in examining the geography of disruptions. The notion of resilience garnered great interest among economic geographers due to the heterogeneous responses of regional economies to the 2008 Great Recession; however, the notion has received continued attention due to growing socio-economic and environmental uncertainty. Specifically, scholars and commentators have become progressively concerned with regions' resilience as regions have become more vulnerable to external shocks due to their heightened interconnectedness with the global economy (Christopherson et al., 2010; Hudson, 2010; Ostarkova and Stanickova, 2021; Ringwood et al., 2019; Stanickova and Melecky, 2018).

It is often remarked that there is no universal definition of RER (e.g., see Martin and Sunley, 2015). Based on the review, however, it is clear that RER has developed a general definition, frequently defined as *the ability of regional economies to resist and adapt to or transform in the face of shocks and subsequently recover to maintain or improve their pre-shock economic performance.*⁵ This definition is either explicitly or implicitly employed by many studies investigating RER.

The increased focus on RER has produced a more robust and clear understanding of the concept. Scholars have found that RER possesses four main attributes: dynamic, multifaceted, multi-dimensional, and multi-factor. RER is a dynamic concept, which will be discussed below (subsection 4.4). Notably, however, regions' resilience changes over time and depends on the shock experienced. Just because a region is resilient to one shock does not guarantee that it will be resilient to the next or that it will be resilient to other types of shocks (Doran and Fingleton, 2018; Gong et al., 2020a; Sensier et al., 2016). Contributing to this dynamism, the determinants of resilience exhibit spatial and temporal dynamics, see subsection 4.6 (Annoni et al., 2019;

Bishop and Shilcof, 2017). Thus, resilience needs to be contextualized within regions' economic landscape and with respect to their position in the global economic hierarchy (Ray et al., 2017). Currently, this would require researchers and commentators to have an intimate understanding of the region(s) they are examining, including the type of economic activities they house and their current level of development within the global economy that is characterized, in a simplistic sense, by many advanced economies shifting towards the knowledge and service economy, and many developing economies industrializing.

RER is also multifaceted. That is, resilience refers both to regions' performance in the face of shocks as well as their underlying capacity to resist, adapt to, or transform in the face of shocks (Evenhuis, 2017; Psycharis et al., 2014). The performance aspect of resilience focuses on whether regions were resilient (or non-resilient) to disruptions or how resilient regions are in comparison to one another. The resilience performance of regions is usually evaluated using a benchmark or counterfactual – that is, regional economies' pre-crisis levels or rates (benchmark), or their national economy's response (counterfactual). The empirical literature has primarily focused on this aspect of resilience as it enables scholars and commenters to rank and evaluate regions' performance and identify empirical regularities among resilient economies. The underlying capacity aspect of regions' resilience refers to how and why regional economies were resilient (or non-resilient) to shocks. Although this aspect of resilience has received little attention, it arguably provides the most insightful information on RER – identifying causal mechanisms – and policy implications for regional economies.

In addition, RER is multi-dimensional. Due to its cross-fertilization across many fields (Frohlich and Hassink, 2018), scholars have teased out and highlighted the various dimensions of resilience: preparation, vulnerability, resistance, robustness, and recovery (Foster, 2007; Martin and Sunley, 2015; Masik and Grabkowska, 2020; Pendall et al., 2010; Sanchez-Zamora and Gallardo-Cobos, 2019). The multi-dimensional aspect of RER will be discussed in more depth in subsection 4.3. Finally, RER is multi-factor in that a wide array of determinants influences regions' resilience.⁶ In

subsection 4.6, the determinants of resilience will be examined in greater length.

2 Types of Regional Economic Resilience

The literature on RER is rich and diverse. The etymology of resilience originates from the Latin word *'resilire'*, which means to rebound or leap back to an elastic position following a disturbance (Modica and Reggiani, 2015). However, the types of resilience examined in the literature have expanded beyond its etymological roots of *'bounce back'*, with scholars identifying four main types of resilience (Table 2).

The first type of resilience is engineering resilience and stems from resilience's etymology. Engineering resilience refers to the ability of regional economies to *'bounce back'* from shocks to a pre-shock equilibrium, emphasizing the speed at which they recover (e.g., see Hundt and Holtermann, 2020; Wang and Wei, 2021; Zhou et al., 2019). The second type of resilience is ecological resilience, which refers to regional economies' ability to absorb shocks and maintain their current equilibrium by undergoing minimal structural and/or functional change. This type of resilience emphasizes the stability of systems in the face of shocks. However, once the magnitude of a shock surpasses the threshold a regional economy can absorb, which is unique to each region, the economy will

be shifted to a new and typically less favourable equilibrium (Capello et al., 2015; Wang and Scorsone, 2020; Wilson, 2018; Yamamoto, 2011).

The third type of resilience is termed evolutionary resilience and focuses on the notion of adaptability. This type of resilience emphasizes the ability of regional economies to *'bounce forward'* by adapting parts of their structure and functions when experiencing shocks, resulting in economies either maintaining their current growth path or developing a new and more favourable one (Bristow and Healy, 2018b; Reggiani et al., 2002; Webber et al., 2018; Wink, 2012, 2014). The fourth type of resilience is transformative resilience, which refers to regions' ability to create a new reconfiguration of their structure and functions when they become untenable due to a shock, resulting in regional economies developing a more favourable post-shock growth path (Banica et al., 2020; Chapple and Lester, 2010).

Simply put, the first two types of resilience employ an equilibrium approach, suggesting that regional economies are in an equilibrium state and that they return to that state (i.e., single equilibrium) or shift to a new equilibrium state (i.e., multiple equilibria) following a shock. This equilibrium approach to resilience has been heavily criticized by scholars, especially evolutionary economic geographers (Christopherson et al., 2010; Dawley et al., 2010;

Table 2. Types of regional economic resilience.

Type	Definition	Approach	References
Engineering resilience	The ability of regional economies to <i>'bounce back'</i> from shocks to a pre-shock equilibrium	Equilibrium approach (single equilibrium)	(Fingleton et al., 2012; Martin and Sunley, 2015; Ringwood et al., 2019)
Ecological resilience	The ability of regional economies to absorb shocks and maintain their current equilibrium by undergoing minimal structural and/or functional change	Equilibrium approach (multiple equilibria)	(Brown and Greenbaum, 2017; Holling, 1973; Modica and Reggiani, 2015)
Evolutionary resilience	The ability of regional economies to <i>'bounce forward'</i> by adapting parts of their structures and functions in response to shocks	Adaptive approach (partial adaption)	(Bristow and Healy, 2014; Dawley et al., 2010; Martin, 2012; Sutton and Arku, 2022a)
Transformative resilience	The ability of regional economies to create new reconfigurations of their structures and functions in response to shocks	Adaptive approach (full adaption)	(Banica et al., 2020; Chapple and Lester, 2010; Gong et al., 2020a; Trippel et al., 2022)

Source: Adapted from Martin and Sunley (2020), but based on the reviewed articles.

Gong and Hassink, 2017; Hassink, 2010; Pike et al., 2010; Simmie and Martin, 2010), who state that regional economies are marked by constant change and, thus, do not operate in any equilibrium state. Furthermore, scholars suggest that the equilibrium approach cannot explain uneven economic development. The latter two types of resilience employ an adaptive approach (i.e., evolutionary perspective) to resilience, suggesting that regional economies (i.e., the economic actors that comprise them) constantly adapt to their changing economic landscape and are never in a stable state. In short, the adaptive approach emphasizes how multiple elements interact to produce dynamic feedback effects making a system more or less adaptable. The adaptive approach is favoured among economic geographers because it more aptly characterizes the behaviour of regional economies (Bristow and Healy, 2014).

3 Dimensions of Resilience

Building on the adaptive approach to resilience, scholars emphasize that RER consists of five inter-related dimensions: preparation, vulnerability, resistance, robustness, and recoverability (Table 3).⁷ Preparation occurs between shocks, but typically with the aim to be resilient to the type of shock last experienced. It should be noted that preparation tends to be the most intense immediately after a shock has occurred. Preparation refers to the intentional or unintentional efforts exerted (or lack of efforts exerted) by economic actors, such as firms, practitioners, policymakers, community organizations, and educational institutions, to shape the factors (i.e., determinants) that are perceived to influence their regions' resilience to future shocks. Vulnerability refers to the

susceptibility of regional economies to shocks.⁸ Resistance refers to the sensitivity of regional economies to shocks and the extent of the impacts. Robustness refers to the extent to which regional economies adapt their structure and functions during and following shocks.⁹ Recoverability refers to the extent regional economies recover from shocks.

Although separate, the dimensions are interrelated as each influences the preceding dimensions. For instance, regions' preparation for shocks (i.e., to enhance their resilience) affects their vulnerability. Likewise, regions' robustness influences their recovery. How regions progress through these five dimensions determines their resilience to shocks.

The robustness dimension provides a point of contention in the RER literature. Robustness is equated to regions' adaptive capacity, referring to adaptation and/or adaptability. To differentiate between these two concepts, scholars typically rely on Grabher's (1993) conceptualization and Grabher and Stark's (1997) further elaboration. That is, adaptation is the ability of regions to adjust their current growth path in the short run, while adaptability is the ability of regions to create a new growth path in the long run. Scholars argue that there is a trade-off between these two concepts (Hu and Hassink, 2017), that engaging in one hinders regions' ability to engage in the other (e.g., Pike et al., 2010). Furthermore, scholars typically conceptualize the relationship between these two concepts and their role in RER differently, creating conceptual ambiguity. To sidestep the tension between adaptation and adaptability and their conceptual ambiguity in the resilience literature, scholars either refer to these concepts interchangeably or mention one and not the other (e.g., Evenhuis, 2017). Put simply, the role of adaptation and adaptability in RER requires greater conceptual clarity.

Table 3. Dimensions of regional economic resilience.

Dimensions of resilience	Description
Preparation	The degree to which regional economies prepare for shocks
Vulnerability	Regional economies' susceptibility to shocks
Resistance	The sensitivity of regional economies to shocks once impacted
Robustness	The ability of regional economies to adapt to shocks
Recoverability	The ability of regional economies to recover from shocks

Source: Adapted from Martin and Sunley (2015), but based on the reviewed articles.

4 Regions' Resilience Performance and Reaction to Shocks

Research has found that regions exhibit heterogeneous resiliency to shocks (Groenewold, 2020; Ray et al., 2017; Ringwood et al., 2019; Sensier et al., 2016). The asymmetric resilience behaviour remains constant when comparing regions within and between countries. Scholars have characterized regions' resilience performance in various ways, but at the core of all these classifications, regions have ultimately three outcomes: recovered, recovering, or declining. That is, regions can be (1) non-resistant but have since recovered; (2) non-resistant and in the recovery process; and (3) non-resistant and still declining. This classification, as well as others in the literature, are based on a pre-determined time frame in which regions' resilience is measured against. As the length of time regions are examined is expanded, more regions will be categorized in the first category. In contrast, the shorter the timeframe is, the more regions will be categorized in the latter two categories. Therefore, the timeframe in which regions are examined is crucial for providing an accurate depiction of RER. However, no generally accepted timeframe exists for examining regions' economic resilience. Instead, scholars' temporal analysis of regions' resilience varies, with some examining resilience in the short-term and others examining resilience in the long term. Furthermore, the timeframe that constitutes the 'short-term' and 'long-term' also varies from study to study.

The spatiotemporal distribution of shocks (i.e., the time in which regions are affected by shocks) also varies (Sensier et al., 2016; Sensier and Devine, 2020). When deciding whether to account for the spatiotemporal distribution of shocks, scholars must consider the geographic scope of analysis. Assuming that all regions examined are affected simultaneously is more appropriate – for shocks of a global nature – if they are within the same country. This is because regions within the same country experience the same degree of economic openness to the global economy and, therefore, are more likely to be affected by exogenous shocks within a similar time period. However, if regions across different countries are being examined or when regions examined are in the

country in which the shock originated, then it is more appropriate to account for the spatiotemporal distribution of shocks to provide a more accurate account of RER, especially as different countries experience varying degrees of economic openness due to different international trade agreements and tariff and non-tariff barriers. Simply put, some countries might be affected at different times by shocks, and thus, regions' resilience in different countries will be categorized incorrectly if the spatial-temporal distribution of shocks is not accounted for, making some seem less (more) resilient when they are exposed to the shock later (earlier) than other regions.

Regions' resilience to shocks also shapes their resilience to future shocks. This is known as the 'recursive process of resilience' in which regions' past resilient behaviour influences their evolution and, subsequently, their ability to respond to future shocks (see Gong et al., 2020b; Martin and Sunley, 2015). The underlying logic is that more resilient regions typically exit the shock better equipped – through such mechanisms as institutional learning or adapting their structure and functions – and better positioned (i.e., more productive and competitive) to address future shocks when they arise. However, the recursive process of resilience is non-deterministic but is meant to illustrate how regions' resilience can positively or negatively shape their internal characteristics (e.g., industrial structure) that influence their resilience to future shocks. Thus, just because a region is resilient to one shock does not guarantee it will be resilient to the next. Furthermore, regions' reactions to shocks change based on the nature of the shock experienced, as they can be resilient to one type of shock (e.g., recession) but not another (e.g., pandemic). Regions' resilience in this framework is not static but dynamic.

5 Shocks

Shocks are inherent aspects of economic systems (Dawley et al., 2010; Hudson, 2010; Ringwood et al., 2019). They are defined as sudden major disruptions to localities' economic activities that can either originate endogenously, such as major plant closures or natural disasters, or exogenously, such as

Table 4. Types of shocks.

Types of shocks	Description	Example
Economic shocks	Disrupts the demand for economic activities	2008 great recession, 2020 economic crisis
Institutional shocks	Changes the economic landscape due to shifts in external competition, altering global supply chains and production patterns	Brexit, NAFTA
Organizational shocks	Changes the economic landscape due to shifts in external competition, altering global supply chains and production patterns	Changes in labour laws
Environmental shocks	Disrupts the supply chain by halting production	Earthquakes, floods, forest fires
Man-made shocks	Disrupts the supply chain by halting production	Terrorist attacks
Technological shocks	Changes the economic landscape by altering global supply changes and production processes	Steam engine, blockchain technology
Epidemic shocks	Disrupts the supply chain by halting production	The COVID-19, SARS, ebola pandemics

Source: Adapted from [Sutton and Arku \(2022a\)](#).

recessions or pandemics ([Boschma, 2015](#); [Evenhuis, 2017](#); [Martin and Sunley, 2015](#)).¹⁰ Literature highlights seven broad categories of shocks: economic, institutional, organizational, environmental, man-made, technological, and epidemic ([Table 4](#)). The effects of shocks can be largely isolated or contained to a region, as in the case of natural disasters, or can propagate through the global economy, as in the case of the 2008 Great Recession or the 2020 economic crisis.

The global economy over the past three decades has had an increasingly turbulent economic landscape, forcing regional economies to contend with various shocks (e.g., major plant closures, Dotcom Bubble in the late 1990s, the 2008 Great Recession, and the 2020 Economic Crisis). However, shocks are not experienced homogeneously among regional economies, with some regions being more adversely impacted than others due to the nature of the shock and regions' inherent and inherited resources and capabilities. The nature of shocks refers to the type of shock and its intensity and duration ([Gong et al., 2020a](#); [Sensier et al., 2016](#)). When shocks hit regional economies, they have immediate negative effects, such as job losses, increased unemployment, business closures, decreases in output, lowered tax base, etc. In addition, shocks can have hysteretic effects on regional economies' long-term growth path. That is, shocks can permanently alter regions'

growth trajectory, either positively or negatively, with some regions exiting a shock with a less (more) favourable growth path. Therefore, shocks and how regions respond to them contribute to uneven regional development.

Although shocks are typically thought of as a negative occurrence, the literature emphasizes that there are also positive effects, such as the previously mentioned positive hysteretic effects. Shocks, in this sense, are seen as 'windows of opportunity' for which regional economies can enhance their long-term growth trajectory if they are able to adapt their economic functions and structure ([Banica et al., 2020](#)). For example, a shock can de-lock a region (i.e., its economic actors) from outmoded forms of production, providing an opportunity for it to adapt its functions, by producing products that are higher up the quality ladder in its supply chain, and/or structure, by engaging in new and emerging markets, enhancing its long-term growth path. This window of opportunity is especially important for regions with a sub-optimal growth path prior to the shock or those locked-in to an outmoded form of production. The idea of shocks being windows of opportunity is akin to [Schumpeter's \(1942\)](#) notion of gales of creative destruction. Furthermore, while shocks always have, to varying degrees, an immediate negative effect on regional economies, they can also have immediate positive effects, such as

increased entrepreneurship, public investment, and intra- and interregional collaboration.

6 Determinants of Resilience

No regional economy is shockproof; however, there are a handful of determinants that influence the impact of shocks and how regions respond to them. The determinants of resilience refer to the myriad of underlying factors, including external forces, conditions, and relationships, that collectively influence regional economies' resilience (Di Caro and Fratesi, 2018; Martin and Sunley, 2015). More precisely, the determinants of resilience are dynamic, multi-scalar, and spatially dependent, stemming from an array of socio-economic and political-institutional factors that vary depending on economies' inherent and inherited resources, capabilities, and characteristics. Interestingly, the determinants that enhance regions' resilience during turbulent times also tend to be the determinants that enhance their growth potential and/or competitiveness during stable times (e.g., human capital, agglomerations, entrepreneurship, and innovativeness). Thus, the determinants of resilience play a vital role in enhancing the overall economic well-being of regional economies. Furthermore, the determinants shine a light on *why some regions are more resilient than others* and also help explain the uneven development of regional economies.

The determinants of resilience are dynamic for several reasons. First, the dynamic nature stems from the fact that the determinants may differ depending on the type of shock experienced. For instance, the factors that enhance regional economies' resilience to natural disasters may differ from those that enhance regions' resilience to recessions. Second, the determinants of resilience will differ for economies based on their economic structure and functions. An exemplar is human capital, as it may hinder single-industry regions' resiliency as these industries typically base their survival on low labour costs and, thus, have an economic landscape that may be hampered by greater portions of human capital as opposed to knowledge-based regional economies. Third, the determinants of resilience also evolve in concert with the global economic landscape. For example, the determinants prevalent during the

industrial era, such as having a strong manufacturing base, are not the same during the post-industrial era (i.e., based on knowledge and specialized services). It is important to note that the set of factors, including inherent and inherited resources, capabilities, and characteristics, present in a particular region, which influences its resilience, tends to develop in a place- and path-dependent manner. Hence, regions' local factors will differ, partly explaining the varying resilient and developmental behaviours.

However, regions' resilience is not solely determined by endogenous factors but is also influenced by the larger socio-economic political-institutional landscape in which they are embedded (e.g., see Giannakis and Papadas, 2021). In other words, the determinants of resilience are multi-scalar. Specifically, institutional settings, governance structures, and policies that are cultivated, developed, and established, respectively, by upper-level governments and organizations, such as national governments or international organizations, affect regional economies' resilience. Further, economies' resilience is also influenced by broader macroeconomic processes (e.g., currency value, interest rates, and foreign direct investment) as well as global value chains and global production networks.

To further complicate the matter, regional economies' resilience is influenced by spatial spillovers from neighbouring regions due to spatial dependencies (e.g., see Pontarollo and Serpieri, 2020b). Thus, regional factors can enhance or hinder the resilience of other regional economies nearby – in either relative or absolute terms. For example, one economy may benefit from the high proportion of human capital in an adjacent economy due to the interregional mobility of the labour force and experience increased resilience. In some instances, larger regions may drain smaller regions' human capital (i.e., backwash effect) through interregional mobility by providing greater employment opportunities, thus, hindering smaller economies' resilience. Another example is that a regional economy may benefit from knowledge spillovers from neighbouring economies, especially those specializing in knowledge-based activities, such as the technology or finance sectors. What defines spatial factors, in comparison to endogenous factors, is that

they have spillover effects on neighbouring regions. That is, any endogenous factor can be considered a spatial factor as long as it has a spillover effect; however, the spatial effect may differ from the effect of the endogenous factor (i.e., localized effect).

Both the multi-scalar and spatial aspect of the determinants of resilience demonstrates that economies are not contained or isolated entities but are marked by their openness and interconnectedness, influenced and affected by external forces and actors (as argued by [Jacob, 1969](#); [Martin and Sunley, 2007](#); [Massey, 1993](#)). Additionally, these aspects underscore that location matters (as discussed in [Florida, 2016](#); [Glaeser, 2011](#)). In summation, the dynamic, multi-scalar, and spatially dependent nature of the determinants of resilience emphasizes that they are temporally and context-sensitive and should be examined as such.

Since the 2008 Great Recession, numerous empirical studies have been conducted on regions' economic resilience. The large empirical base highlights that a broad range of underlying internal and external factors influences regions' economic resilience. [Table 5](#) provides an overview of select factors. It is important to note, however, regions' overall resilience is ultimately determined by local and external actors' collective, but uncoordinated, responses to shocks (see [Bristow and Healy, 2014](#)). In short, economic actors operate within the political and institutional confines of regional economies, producing its overarching reaction and hence resilience to shocks. Therefore, regions' economic resilience to shocks is not pre-determined simply by possessing an optimal set of factors but relies heavily on actors' actions, behaviours, and decisions.

Due to the complex nature of regional economic systems, their interconnectedness, and their embeddedness in multi-scalar structures, local actors' ability to engage in resilience-building behaviour is difficult. In fact, many factors that enhance regions' resilience tend to be out of local actors' control, determined at multi-scalar levels (e.g., upper-level policies and global actors), by neighbouring economies (i.e., spatial dependencies), or by external agents (e.g., international corporations). Further, there is no silver bullet to the determinants of resilience due to its dynamic (i.e., context-specific)

nature; rather, there is a broad group of regularities that generally enhance regions' economic resilience. Local actors (e.g., economic development partitioners, local officials, and policymakers) in regional economies need to take stock of their resources and capabilities and then identify where they need to, and are able to, develop their economy to be more resilient. At the risk of oversimplification, regions in mature economies should aim to foster a conducive economic landscape that enables them to thrive in the 'New Economy'. To do so, local actors should focus on enhancing their knowledge base, technology coherence, innovative capacity, human capital, and entrepreneurship, as well as diversifying their economy into higher-value and specialized activities. In contrast, regions in developing economies should generally aim to identify their competitive position and build on it, especially in more resilient and high-growth sectors, while simultaneously trying to diversify their economic base.

7 Methodological Challenges for Examining Regional Economic Resilience

Various methodological approaches have been implemented to investigate the resilience of regions ([Martin and Sunley, 2015](#); [Toth, 2015](#)).¹¹ Although this is not an exhaustive list, common methods include case studies, indices, and statistical models ([Modica and Reggiani, 2015](#)).¹² In particular, economic geographers advocate the coupling of comparative case studies and quantitative analysis when examining RER. However, there is a general lack of qualitative research in the resilience literature, resulting in a heavy quantitative focus.

When undertaking an empirical examination of RER, there are 10 major methodological challenges: (1) identifying the nature of the shock; (2) detecting when a shock has occurred; (3) determining a time frame in which resilience is to be revealed; (4) deciding the type of resilience that will be examined; (5) choosing if overall resilience will be examined and/or if specific dimensions will be assessed; (6) deciding the scale of analysis; (7) selecting a resilience indicator; (8) choosing a reference point or state to measure and judge RER; (9) deciding the analytical focus of resilience (i.e., performance or

Table 5. Determinants of regional economic resilience.

Determinants of resilience	Rationale	References
Structural composition	Different sectors are affected differently by shocks. More vulnerable and pro-cyclical sectors will reduce the resilience of regions. For example, manufacturing, tourism, and construction tend to have a negative effect, while technology, finance, service, and public sectors tend to have a positive impact. Specific sectors can enhance regions' dynamism and, thus, resilience	(Brown and Greenbaum, 2017; Giannakis and Bruggeman, 2020; Lagravinese, 2015; Martin and Sunley, 2015; Martini, 2020a, 2020b; Ray et al., 2017; Romao, 2020; Watson and Deller, 2021)
Industrial structure	Different industrial structures are affected differently by shocks. A diversified economic base has a risk-spreading effect and enhances regions' ability to adapt their economy. However, a specialized economic base reduces regions' resilience as shocks spread throughout the economy, and there are fewer opportunities to adapt their economic base	(Boschma, 2015; Brakman et al., 2015; Brown and Greenbaum, 2017; Di Caro, 2015; Goschin, 2019; Masik and Rzyski, 2014; Romao, 2020)
Human capital	Skilled labour enhances regions' resilience by being more adaptable to shocks than unskilled labour, as well as being more transferable within their sector. Furthermore, firms are more likely to hoard skilled labour during shocks, thus, enhancing the resilience of regions	(Cappelli et al., 2021; Clark et al., 2010; Crescenzi et al., 2016; Di Caro and Fratesi, 2018; Giannakis and Bruggeman, 2017a; Huang, 2021; Martin and Sunley, 2015; Masik and Rzyski, 2014; Palekiene et al., 2015; Pizzuto, 2020)
Entrepreneurism	Entrepreneurs enhance regions' resilience to shocks by increasing their adaptive capacity and ability to develop new growth paths	(Bishop and Shilcof, 2017; Fieldsend, 2013; Huang, 2021; Obschonka et al., 2016; Rizzi et al., 2018; Toth, 2015; Williams and Vorley, 2014)
Policy	Policies play a vital role during the preparation dimension of resilience. However, it does little during the shock period. Specifically, policies can enhance the adaptive capacity of regional economies in the long run through industrial cluster development, R&D subsidies, flexible labour policy, etc. Overall, policies tend to primarily enhance regions' resilience by fostering or facilitating the development of other factors that influence regional resilience	(Bailey and De Propris, 2014; Clark et al., 2010; Eraydin, 2016; Gong et al., 2020a; Masik, 2018; Masik and Rzyski, 2014; Palekiene et al., 2015; Psycharis et al., 2022)
Institution and governance	Quality institutions and governance structures can play a strong preparation role in regions' resilience by enhancing their capacities and abilities, as well as influencing the structure of their economy. Also, it can increase regional resilience by producing more effective coordinated responses to shocks	(Bailey and De Propris, 2014; Bristow and Healy, 2014; Clark et al., 2010; Evenhuis, 2017; Ezcurra and Rios, 2019; Gong et al., 2020a; Palekiene et al., 2015; Pike et al., 2010)

(continued)

Table 5. (continued)

Determinants of resilience	Rationale	References
Social cohesion/ Social capital	Social capital and social cohesion improve regions' collective and united response to shocks and, thus, increase their adaptive capacity and ability to develop new growth paths, enhancing their overall resilience	(Masik, 2014; Murua and Ferrero, 2019; Petrakos and Psycharis, 2016; Sabatino, 2019; Toth, 2015)
Knowledge-base	More extensive and diverse knowledge bases enhance economies' innovative and adaptive capacities during and following shocks by providing a greater pool of knowledge to draw on and, thus, increasing their resilience	(Bishop, 2019; Bishop and Shilcof, 2017; Evenhuis, 2017; Sedita et al., 2017)
Technology coherence	Technology coherence improves economies' adaptive capacity via knowledge spillovers, enabling them to generate new growth paths, improving their overall resilience to shocks	(Boschma, 2015; Cappelli et al., 2021; Evenhuis, 2017; Rizzi et al., 2018; Rocchetta and Mina, 2019)
Innovative capacity	Regions with a greater innovative capacity are more adaptive and hence, resilient to shocks because they have a greater propensity to create new products and improve production processes, resulting in new growth paths and more competitive regions	(Bristow and Healy, 2018b; Clark et al., 2010; Crescenzi et al., 2016; Di Caro and Fratesi, 2018; Huang, 2021; Pizzuto, 2020; Rizzi et al., 2018; Rocchetta and Mina, 2019; Toth, 2015)
Export-oriented economies	More export-oriented regions are able to generate revenue from other localities to sustain their growth and enhance their recovery, and enable regions to adjust better to shocks	(Chapple and Lester, 2010; Masik and Ryzski, 2014; Petrakos and Psycharis, 2016; Tsiapa, 2019)
Competitiveness	More competitive regions are more resilient because they can better resist and react to shocks due to their dynamic nature	(Di Caro and Fratesi, 2018; Fratesi and Rodríguez-Pose, 2016; Palekiene et al., 2015; Pizzuto, 2020)
Agglomeration economies	Agglomeration economies enhance regions' resilience by improving regions' reactions and responses to shocks via knowledge spillovers	(Di Caro and Fratesi, 2018; Fratesi and Perucca, 2017; Petrakos and Psycharis, 2016)
Labour force make-up	Economies with a larger share of older adults and routine (unskilled) and temporary foreign workers are less resilient because they are less able to adapt to shocks	(Crescenzi et al., 2016; Kitsos and Bishop, 2018; Lagravinese, 2015; Lewin et al., 2018)

Source: Adapted from Evenhuis (2017), but based on findings from the reviewed articles.

Note: The determinants and their explanations are based on empirical studies largely in Europe and in response to the 2008 Great Recession; thus, this should be kept in mind as they may have different effects in different contexts as well as for different types of regions.

underlying capacity of resilience); and (10) determining the appropriate measures for the determinants of resilience. Table 6 provides an overview of each challenge.¹³ These challenges highlight the plurality of methodological approaches to examining RER.

Certain methods might prevail depending on the type of resilience (i.e., ecological, engineering,

evolutionary, and transformative) examined (see Evenhuis, 2017). Indeed, for the equilibrist approaches (i.e., ecological and engineering resilience), quantitative methods might be more appropriate as they focus largely on the resistance and recovery dimensions of resilience. In doing so, equilibrist approaches concentrate on resilience's

Table 6. Major methodological challenges to examining regional economic resilience.

Major challenges	Questions that need to be addressed
1. Nature of the shock	What type of shock has occurred? Is it endogenous or exogenous? What was the duration of the shock? How intense was the shock? How does this type of shock specifically impact regional economies?
2. Detecting the occurrence of shocks	How is a shock detected (e.g., two consecutive quarters of decline in GDP)? Is a uniform time frame for shocks applied to all regions, or is the spatiotemporal distribution of the shock accounted for?
3. Timeframe of resilience	Is resilience examined in the short- or long-term? How is the time frame determined (e.g., the average recovery time of regions from previous shocks, a pre-determined length such as 4 years, or the recovery period equals the undetermined time until the next shock occurs)? Why is the time frame chosen the most appropriate?
4. Type of resilience	What type of resilience is examined (i.e., engineering, ecological, evolutionary, and/or transformative)? Why is this type of resilience chosen the most appropriate?
5. Depth of analysis	Is resilience, as an overarching concept, examined (i.e., one measure that indicated the overall resilience of a region)? Are specific dimensions of resilience examined (i.e., preparation, vulnerability, resistance, adaptability, and/or recovery)?
6. Scale of analysis	Are regions defined at a more granular or aggregated level? Why is the chosen scale of analysis the most appropriate? Does the region represent administrative boundaries or an economically functioning area?
7. Resilience indicator	What is the most appropriate indicator(s) to examine resilience (e.g., employment, unemployment, output, income, GDP per capita, population, firm birth, etc.) based on the shock and the study's objectives and/or research questions? What normative assumptions are being made about the importance of resilience (e.g., resilience for whom) based on the indicator used?
8. Reference point	What reference point is being used to determine if regions are resilient? Is a reference point determined in relative terms (e.g., compared to the national economy) or absolute terms (e.g., counterfactual or pre-shock levels or rates)?
9. Analytical focus	Is the resilience performance (i.e., resilience outcome) of regions being examined, the regions' underlying resilience capacity being assessed, or both?
10. Measuring determinants	Are contemporary measures of the determinants of resilience being used? If not, are the contemporary measures being used as robustness checks? Why is the measure of the determinants being used the most appropriate?

performance aspect. Regarding adaptive approaches (i.e., evolutionary and transformative), mixed methods might be more appropriate. In particular, qualitative methods (e.g., case studies and interviews) are important for uncovering the exact mechanisms underlying regions' robustness, which are not readily observable through quantitative methods. In this sense, adaptive approaches focus on the underlying capacity of regional economies to be resilient to shocks and regions' resilience performance. In summation, the type of resilience examined naturally calls for certain methods to be employed.

8 Value and Criticisms of Regional Economic Resilience

The adoption of the concept of resilience in economic geography has provided greater insight into regional economies. The concept focuses our attention on a "different aspect of the performance of regional economies, compared to other aspects such as growth, competitiveness, or sustainability" (Evenhuis, 2017: 10). In particular, the concept of resilience holds particular interest for economic geographers and regional scientists for five main reasons. First, regional economies experience the

brunt of shocks. That is, the effects, both negative and positive, are worked out at the regional level. Second, shocks have adverse direct and long-lasting impacts on the livelihood of regional residents, such as increased homelessness, job loss, mental illness, reductions in wages, reduced standard of living, amongst others. Third, shocks can have severe and permanent impacts on regions' long-term growth trajectory (i.e., hysteric effect), resulting in permanently lower growth levels or rates. Fourth, shocks and regions' responses to them, contribute to the uneven development of regional economies. Fifth, the concept can support the development of robust policy interventions aimed at safeguarding regions from the adverse effects of shocks in an increasingly volatile and shock-prone landscape. In short, the concept of resilience focuses our attention on the heterogeneous impacts of shocks and regional economies' varying responses to them, all of which help explain uneven economic development – which lies at the heart of economic geography (James et al., 2018; Martin, 2021; Yeung, 2019).

Despite the growing popularity of the notion of resilience in economic geography since the late 2000s, it has also been heavily critiqued (e.g., see Hassink, 2010; MacKinnon and Derickson, 2013). Specifically, the literature highlights six main critiques. First, RER is critiqued as being an underdeveloped and fuzzy concept that requires further conceptual clarity and development. Second, scholars argue that the concept of resilience is ill-suited to be incorporated into the analysis of regional economies as socio-economic systems are fundamentally different from ecological and physical systems from which the concept originates. Third, the concept of resilience has been criticized as being a neoliberal construct, promoting self-reliance and the need to accommodate market forces, thereby neglecting the state's accountability when examining regional economic issues. Fourth, the concept is criticized as being more descriptive than explanatory (i.e., there is a lack of rigorous explanations behind regions' responses to shocks). Fifth, some scholars criticize the concept as being useless, stating that economic geography already has concepts that can explain regional resilience, such as path dependence, variety, and lock-in. Sixth, some scholars argue that

the concept has primarily focused on the economy's industrial structure and generally neglects the role of agency, such as that undertaken by the state as well as internal and external economic actors, coming close to structural functionalism. The purpose of this subsection is to highlight the value that RER brings to economic geography, as well as the main critiques against it. Martin and Sunley (2017) have addressed most of these critiques. The present paper aims to investigate the validity of the first critique noted, that resilience is an underdeveloped and fuzzy concept.

V Discussion

I The Current Conceptual State

Over the past two decades, the notion of resilience has gained a steady foot-hold in economic geography. Scholars have conceptually advanced the notion of RER, creating a well-developed concept with almost every aspect of resilience being clearly conceptualized. This is not to say that more work is not needed, but the sentiment of being underdeveloped does not hold. Likewise, it is apparent that RER no longer bears the markers of a fuzzy concept, according to Markusen's (1999) definition (i.e., possesses various definitions and is difficult to operationalize). First, the concept possesses a common definition. Scholars generally define RER as the ability of regional economies to resist and adapt to or transform in the face of shocks and subsequently recover to maintain or improve their pre-shock economic performance. The common definition demonstrates that researchers are examining the same phenomenon. The confusion typically stems from discussions surrounding the four types of resilience (i.e., engineering, ecological, evolutionary, and transformative resilience), as each has its own interpretation. As reflected in the common definition of RER and will be further discussed below, the four types of resilience bring analytical focus to specific types of resilience employed by regions (i.e., the encompassing economic actors) (Sutton and Arku, 2022a). Therefore, the four types of resilience should not be misconstrued as RER possessing various definitions but indicate the types of resilience regions employ.

Second, RER is not difficult to operationalize, as evident by the number of empirical articles that make up the bulk of this review. Most articles reviewed measured regions' resistance and recoverability to shock in a similar fashion, that is, by investigating whether regions were resilient to a shock based on benchmarks or counterfactuals. Despite fewer studies measuring the preparation, vulnerability, and robustness dimensions of resilience, mixed methods, such as descriptive statistics and case studies, are generally employed or advocated to operationalize these dimensions (see [Evenhuis, 2017](#)). For notable examples of case studies, see [Cowell \(2013\)](#), [Simmie and Martin \(2010\)](#), and [Wolfe \(2010\)](#). In addition, [Sutton and Arku \(2022a\)](#) emphasize that the robustness dimension can be measured by examining the degree of structural and functional change that occurs in regions over the shock and recovery periods, which in turn identifies the type of resilience regions employed.

Fuzzy concepts have difficulty answering the question, "*How do I know it when I see it?*" ([Markusen, 1999](#): 870). RER, however, does not have such identity issues, being readably observable empirically. In other words, (non)resilient regions are easily identifiable. In summation, criticisms of fuzziness are no longer valid for the concept of RER. The conceptual development of RER has grown due to continual academic engagement, debate, and critical review and retheorizing over the past two decades, as [Legendijk \(2003\)](#) suggests typically characterizes the conceptual development of new concepts. Although RER does not possess the markers of a fuzzy concept anymore, this does not suggest that there is no room for conceptual advancement. In fact, 'good' concepts are constantly retheorized in an iterative manner, improving our conceptual understanding based on new evidence and information ([Gong and Hassink, 2020](#)).

Furthermore, the iterative process of retheorizing RER has been and will continue to be an enduring theme in the resilience literature. This is because resilience is a boundary concept, facilitating the exchange of knowledge across disciplines ([Brand and Jax, 2007](#); [Martin, 2021](#)). Due to its interpretive flexibility, resilience is able to maintain a strict definition and core identity in each discipline while

being commonly discussed in sufficiently vague terms to allow scholars from different disciplines to exchange and combine knowledge ([Star and Griesemer, 1989](#)) through sharing common syntactic, semantic, and pragmatic boundaries ([Carlile, 2004](#)). The interpretative flexibility of resilience is evident in the concepts use in various disciplines (e.g., engineering, ecology, economics, and so on), yet each discipline (or subdiscipline) holds its own definition. [Figure 2](#) on page 1769 of [Frohlich and Hassink \(2018\)](#) perfectly visualizes resilience as a boundary concept, illustrating its interpretative flexibility. Overall, such boundary concepts allow for greater knowledge integration from other subdisciplines and disciplines. As knowledge is imported, new insights can potentially lead to further conceptual developments of RER. In fact, the integration of resilience thinking from other disciplines, such as the idea of complex adaptive systems from ecology ([Pendall et al., 2010](#)), has already greatly aided the conceptual development of RER in economic geography over the past two decades. In short, one should expect RER to continue experiencing conceptual advancements and, thus, retheorizing.

2 A New Conceptual Framework

The conceptual framework advanced in this paper is grounded in critical realism. The framework only illustrates the resilience process and how it shapes regions' long-term growth paths and resilience to future shocks. Such a framework should be applied to specific regions, incorporating local context and uncovering underlying causal mechanisms ([Sayer, 1992](#); [Yeung, 2019](#)).

Furthermore, the conceptual framework employs an evolutionary perspective of RER, emphasizing that regional economies are in a constant state of uncertainty and change, rejecting equilibrist notions ([Dawley et al., 2010](#); [Hassink, 2010](#); [Simmie and Martin, 2010](#)) that cannot account for uneven economic development ([Pike et al., 2010](#)). Thus, engineering and ecological resilience hold an evolutionary interpretation in this framework and are redefined below. Incorporating concepts from other theoretical frameworks (e.g., mainstream economics) into an evolutionary perspective has value as it can

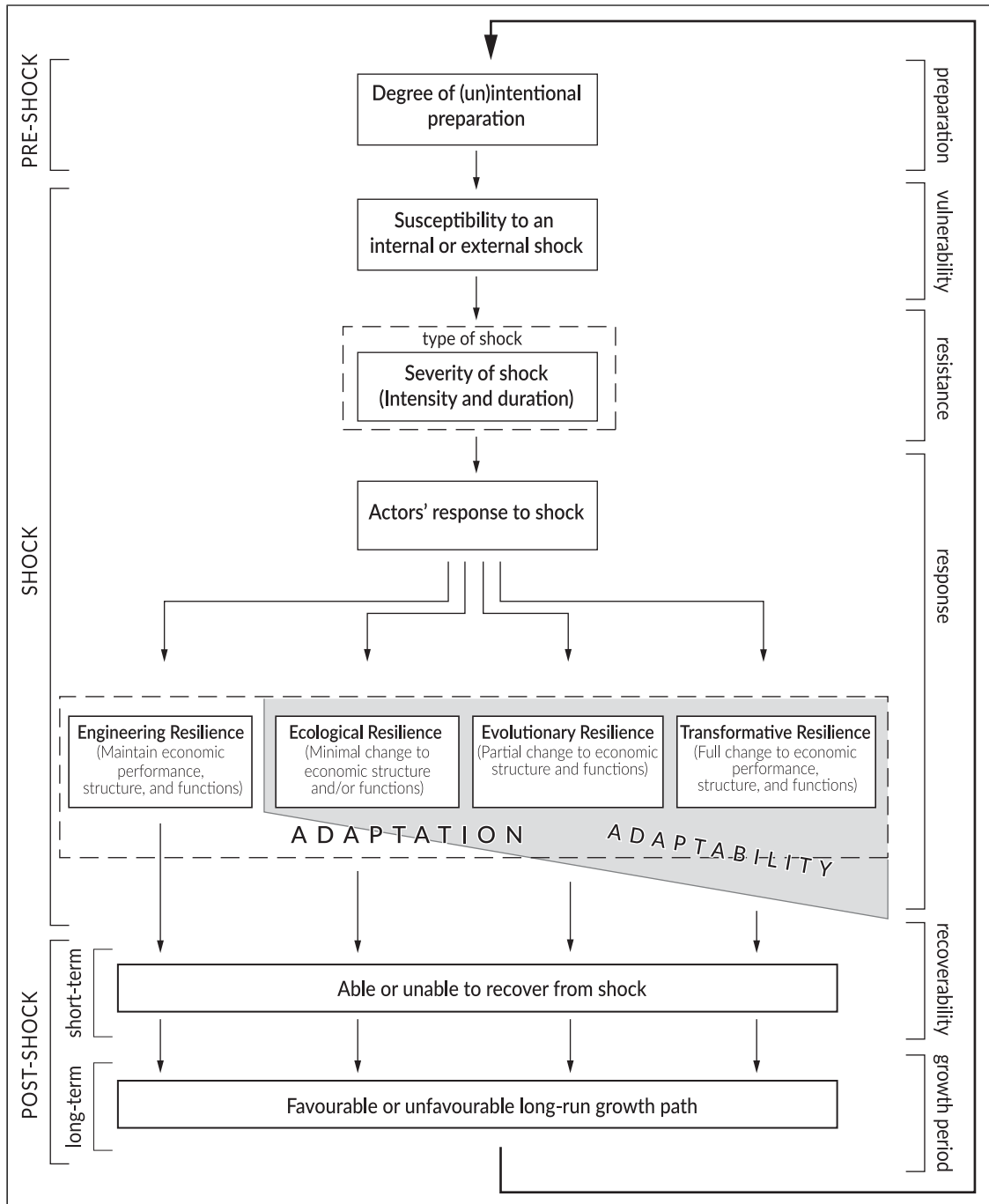


Figure 2. The process of resilience.

drive theoretical and explanatory innovation, as noted by scholars calling for integrated pluralism in economic geography (Barnes and Sheppard, 2010; Hassink et al., 2014; Martin, 2021; Sheppard and Plummer, 2007; Van Meeteren et al., 2016). Moreover, the conceptual framework presented in Figure 2 builds on the scoping review above and, in particular, on several notable conceptual papers, such as Bristow and Healy (2014), Hu and Hassink (2020), Martin and Sunley (2015), and Sutton and Arku (2022a). The framework does not deviate from the review in regard to conceptualizing shocks or the determinants of resilience. How this framework diverges is outlined below.

Resilience is a dynamic, multifaceted, and multi-factor process that refers to the ability of regional economies to resist, adapt to, or transform in the face of shocks and subsequently recover to maintain or improve their post-shock economic performance. Further, the resilience process is also multi-dimensional, consisting of five interrelated dimensions: preparation, vulnerability, resistance, response, and recoverability (Figure 2). Preparation refers to the intentional or unintentional efforts exerted (or lack of efforts exerted) by economic actors to shape the determinants that influence their resilience to future shocks (Cowell, 2013; Davoudi et al., 2013). Vulnerability refers to the susceptibility of regional economies to shocks. Resistance refers to the sensitivity of regional systems to economic shocks and the extent of the impacts (Martin and Sunley, 2015). Response refers to the type of resilience that regional economies employ during shocks. Recoverability refers to the extent regional economies recover from shocks. How regions progress through these five dimensions determines their resilience to shocks (Martin and Sunley, 2015).

In response to shocks, regional economies can employ four types of resilience: engineering, ecological, evolutionary, and transformative (Sutton and Arku, 2022a). The type of resilience employed is determined by the collective but uncoordinated actions and behaviours of internal or external actors that operate in the region (Bristow and Healy, 2014). Specifically, the degree of structural and functional change actors produce determines the type of resilience employed. Engineering resilience occurs when

actors (i.e., as a collective whole) do not adapt their regions' structure and functions to any significant degree but rather anticipate that the region will simply 'bounce back' from a shock. Ecological resilience occurs when actors attempt to absorb shocks by engaging in minimal structural and/or functional change. Evolutionary resilience occurs when actors attempt to 'bounce forward' by adapting a portion of their structure and functions to enhance their overall competitive position in the global economy. Transformative resilience occurs when actors create new reconfigurations of their structures and functions in response to shocks (Sutton and Arku, 2022a).

The type of resilience employed by actors is influenced by the nature of the shock, specifically its intensity and duration (Martin and Sunley, 2020). The less severe and the quicker a shock is felt, the less impact that the shock will have on a regional economy, reducing the need for actors (i.e., firms, institutions, political leaders, and so on) to adapt. Regional economies will likely employ engineering or ecological resilience for shocks that are less severe and shorter in duration. In contrast, the more severe and longer the duration a shock is felt, the more impact that the shock will have on a regional economy, forcing actors to adapt to their changing economic landscape. Regional economies will likely employ evolutionary or transformative resilience for shocks that are more intense and longer in duration.

Although it is influenced by the nature of the shock experienced, the type of resilience employed ultimately depends on the overall response of actors that operate in the region (Bristow and Healy, 2014; Martin and Sunley, 2015). As in any aspect of the economy, actors play a central role, as they 'are the conscious agency whose action – intentional or otherwise – can produce concrete outcomes' (Yeung, 2019: 236). Or, as simply noted by Cox (2013: 11), 'Change occurs because people act'. Actors' ability to respond to shocks is determined by a variety of endogenous factors (e.g., regional resources and capabilities) that characterize their economic landscape as well as various spatial relations. The spatial relations refer to the multi-scalar factors (e.g., international institutions, multinational corporations, and free trade agreements) and spatial factors (e.g., outmigration and knowledge diffusion) that

influence regional activities and conditions. In short, actors interact with their economic landscape, building on local resources and capabilities and introducing external resources to shape their regions' structure and functions, all while being aided or constrained by spatial relations (Bristow and Healy, 2020; Sutton and Arku, 2022a).

The collective response of actors operating in a region can result in the region maintaining or (minimally, partially, or fully) changing its structure and/or functions. These responses can result in adaptation and/or adaptability. Although adaptation and adaptability have traditionally been conceptualized as separate processes in constant tension, with regions engaging in one or the other (e.g., see Grabher, 1993; Grabher and Stark, 1997; Pike et al., 2010), Hu and Hassink (2020) demonstrate that these processes co-exist and co-evolve. As such, Hu and Hassink (2020: 59) redefined adaptation as 'an ongoing and never-ending process, by which a regional economic system responds to a succession of challenges and disturbances, in order to fit to its varying environment'. Adaptation in this framework focuses on maintaining the current structure and functions while allowing opportunities for regional dynamics. Adaptability is redefined as 'the ability to create new and/or change old actors, institutions and resources in a regional economy, which involves an action of innovation. It is a result of adaptation in which some actors intentionally or unintentionally adapt to environments', striving 'for alternative modes of doing things, rather than maintaining the existing functions and structures' (Hu and Hassink, 2020: 59).

When regions employ engineering resilience, they solely engage in adaptation, while regions that employ ecological, evolutionary, and transformative resilience engage in adaptation and adaptability, yet to varying degrees in regard to the latter. Although the full outcome of these processes will be realized over the long term, adaptation and adaptability (when they ensue) influences the recoverability of regions in the short term but do not guarantee their resilience. This creates a paradoxical situation for regional economies as regions can be considered non-resilient yet, through the processes of adaptation and adaptability, create a new and robust growth path in the

long run. Similarly, regions can be considered resilient but not adapt their structure and functions, reducing regions' ability to develop an optimal growth path in the long run. This paradoxical situation highlights potential tensions that can arise between adaptability and resilience (Bristow and Healy, 2018a; Martin et al., 2015).

To complicate the matter further, just because regions engage in the process of adaptability does not automatically guarantee they will develop an optimal growth path in the long run. Adaptability can occur, for example, with the emergence of a new industry in a region, but if the industry does not take root and grow significantly, the region will not develop a new growth path. Moreover, the relationship between adaptability and adaptation is also important for regions' resilience and long-term growth trajectory as they can be hindered or enhanced by an oppositional or complementary relationship, respectively, (see Hu and Hassink, 2020). The importance of adaptability is not so much that adaptability occurs but the type of adaptability that occurs and if it creates robust and substantive change.

It is important to note that there is no correct type of resilience that regions should employ to be resilient and develop an optimal growth path. The appropriate type of resilience for regions to employ depends on their current economic landscape. For instance, it might be more appropriate for regions engaged in outmoded forms of production to employ evolutionary or transformative resilience, while it might be more appropriate for regions engaged in knowledge-based industries to engage in engineering or ecological resilience. In short, the most appropriate type of resilience for regions to employ is context-sensitive.

Overall, due to the differences, particularities, and variations in regions' endogenous factors and spatial relations, as well as the varying responses of actors that operate in each region to shocks, regions experience heterogeneous resilience. Further, the varying responses of regions in turn shape their long-term growth trajectories and resilience to future shocks (Boschma, 2015; Doran and Fingleton, 2018; Martin and Sunley, 2015; Sutton and Arku, 2022a; Webber et al., 2018) in a non-deterministic and dynamic manner (Supplement Online).

VI Research Agenda and Conclusion

I Research Agenda

To continue the conceptual development of RER, this paper proposes a research agenda. First, research on RER has to move past examining empirical regularities and overemphasizing processes to uncover the underlying causal mechanisms of regions' resilience, which are not readily observable through quantitative approaches. In the resilience literature, this will require scholars to employ mixed methods, especially incorporating case studies, to reveal regions' resilience capacity, shifting attention away from primarily assessing regions' resilience performance. In addition, the overemphasis on processes in the resilience framework (e.g., recursive process, adaptation, and adaptability) obfuscates the causal mechanisms of its encompassing phenomenon (Markusen, 1999). Particularly, there remains ambiguity surrounding the underlying causal mechanisms (i.e., specific actions of agents and institutions that led to concrete outcomes) that result in adaptation and adaptability in the context of RER. This process-based focus is, however, not unique to the resilience literature but has been rampant throughout economic geography and regional studies (Markusen, 1999; Yeung, 2019).

Second, empirical inquiry into RER has been typically acontextual. That is, regions tend to be treated homogeneously regardless of their size, economic performance, and industrial structure, thereby neglecting the different inherent and inherited capabilities, resources, and limitations of regions being assessed. The acontextual focus of research on RER is surprising given that much work, implicitly or explicitly, in economic geography is underpinned by critical realism, which emphasizes the importance of context (Gong and Hassink, 2020; Sayer, 1992; Yeung, 2019). A consequence of the typical acontextual examination of RER is that the determinants of resilience are implicitly suggested to uniformly influence all types of regions, ignoring the fact that some determinants may be more applicable to certain types of regions than others. Therefore, more attention needs to be paid to the type of regions being examined by such means as categorizing regions by their internal capacity and resources (e.g., urban and rural regions). Such categorizations, using meaningful criteria, can help identify the set of

determinants that enhance the resilience of particular types of regions. Building on the first point of the research agenda, categorizing regions when empirically examining their resilience can uncover demi-regularities, which are causal mechanisms that explain outcomes in specific contexts (Lawson, 1997).

Third, empirical investigation into resilience tends to be aspatial, despite some notable exceptions (see Ezcurra and Rios, 2019; Pontarollo and Serpieri, 2020b, 2021).¹⁴ A key focus of economic geographers is to account for place, space, and scale in various regional phenomena (Gong and Hassink, 2020); however, in most statistical models of RER, regions are often treated as contained and closed systems through employing aspatial models. Thus, spatial and hierarchical models must be employed to investigate the multi-scalar and spatial factors underlying RER. In doing so, researchers can provide greater insight into regions' resilience and other regional phenomena. Currently, there is a limited conceptual understanding of the factors that exert a spatial and hierarchical influence on regions' resilience as well as the nature of these influences.

Fourth, more empirical studies on RER need to examine regions' resilience in the continents of North America, South America, Australia, Asia, and Africa. Currently, most research in the resilience literature is Eurocentric. Investigating the resilience of regions outside Europe can provide a more holistic understanding of RER and its determinants, as these regions possess unique socio-economic and political-institutional landscapes as well as comprise varying positions in the global economy. The narrow focus on European regions in the resilience literature reflects a general trend in economic geography, which James et al. (2018: 1363) suggest 'has seemingly weakened the wider analytical purchase of [economic geography]'. Furthermore, embedding the concept of RER into new local contexts globally can help advance the conceptual development of resilience by providing novel insight (Gong and Hassink, 2020).

2 Conclusion

Despite the common sentiment among scholars that RER is an underdeveloped and fuzzy concept, its current conceptual framework does not validate these criticisms, as illustrated through the scoping review

and the advanced conceptual framework. RER has developed into a more rigorous and mature concept as scholars have critically engaged with the notion. However, more work still needs to be done (see research agenda). As scholars continue to critically engage with the notion of RER, the conceptual framework presented in this paper should be updated or retheorized in an iterative process to continually develop a more rigorous and refined concept (Gong and Hassink, 2020).

Overall, this paper has provided a much-needed synopsis of the RER literature over the past two decades, offering an analytical and conceptual base for future research to build upon. The paper has addressed its six research questions in each section of the scoping review. The first question asked was, ‘*what is resilience in the context of regional economies?*’ to which the review found that RER has four main attributes – it is dynamic, multifaceted, multi-dimensional, and multi-factor – and refers to the ability of regional economies to resist, adapt to, or transform in the face of shocks and subsequently recover to maintain or improve their post-shock economic performance. The second question asked was, ‘*what are shocks?*’ The review found that shocks are inherent aspects of economic systems, referring to sudden major disruptions to localities’ economic activities that can either originate endogenously or exogenously. The third research question was, ‘*what are the determinants of regional economic resilience?*’ Stemming from the review, the paper found that the determinants of resilience are dynamic (i.e., temporally and context-sensitive), multi-scalar, and spatially dependent and refer to the underlying factors that collectively influence regional economies’ resilience. The fourth research question was, ‘*what are the methodological challenges to examining regional economic resilience?*’ The paper found 10 methodological challenges to examining the resilience of regions that scholars should consider (see Table 6). The fifth research question was, ‘*what is the value of examining regional economic resilience?*’ Stemming from the review, the paper found that the concept of RER focuses our attention on the heterogeneous impacts of shocks and regional economies’ varying responses to them, all of which help explain uneven economic development. In addition, the review

highlighted five reasons why RER is important for economic geographers and regional scientists to examine. The sixth and last research question was, ‘*what are the critiques of regional economic resilience?*’ The review found that there are six main critiques of RER in the resilience literature, with the primary critique being that RER is a fuzzy concept requiring conceptual development. However, as illustrated in this paper, RER no longer bears the markers of a fuzzy concept.

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ORCID iDs

Jesse Sutton  <https://orcid.org/0000-0003-3254-577X>
 Alessia Arcidiacono  <https://orcid.org/0000-0003-1747-2189>
 Robert Nutifafa Arku  <https://orcid.org/0000-0002-2018-886X>

Supplemental Material

Supplemental material for this article is available online.

Notes

1. A preliminary search of the databases was conducted on 30 July 2021, to search for any previous scoping reviews on the subject; however, no scoping reviews, or systematic reviews, have been conducted on RER to date.

2. Since several studies included a variety of localities (i.e., regions and countries or regions and cities), only studies where the majority met this article's definition of a region were included.
3. For a complete search strategy of one or more database(s), please contact the corresponding author.
4. The authors searched for the complete citation of incomplete ones and added them if they were found; if not, they were removed.
5. For examples of regional economic resilience definitions that roughly follow suit, see (Cellini and Cuccia, 2019; Chacon-Hurtado et al., 2020; Crespo et al., 2014; Cuadrado-Roura and Maroto, 2016; Drobniak, 2017; Dube and PoleSe, 2016; Eraydin, 2016; Eriksson and Hane-Weijman, 2017; Faulkner et al., 2020; Giannakis and Papadas, 2021; Goschin and Constantin, 2021; Hennebry, 2018, 2020; Hundt and Holtermann, 2020; Lang, 2012; Lapuh, 2016; Laubscher, 2017; Lee et al., 2021; Muštra et al., 2017, 2020; Pinto et al., 2019; Rios and Gianmoena, 2020; Simmie, 2014; Talamo and Sabatino, 2021; Tsiapa et al., 2018; Ubago Martínez et al., 2019; Ženka et al., 2021).
6. For an overview of the determinants, see the following articles (Bailey and Turok, 2016; Benedek and Lembcke, 2017; Brooks et al., 2016; Brozzi et al., 2015; Cheng and Zhang, 2020; Christofakis et al., 2019; Compagnucci et al., 2022; Courvisanos et al., 2016; Davies, 2011; Di Caro, 2017; Di Pietro et al., 2021; Diodato and Weterings, 2015; Duschl, 2016; Fuller, 2022; Fusillo et al., 2022; Giannakis and Bruggeman, 2017b; Kakderi and Tasopoulou, 2017; Kitsos et al., 2019; Lee and Wang, 2022; Lester and Nguyen, 2016; Lungová, 2016; Markowska, 2015; Mikheeva, 2021; Navarro-Espigares et al., 2012; Oprea et al., 2020; Petach et al., 2021; Pudelko et al., 2018; Rocchetta et al., 2022; Svoboda and Klementova, 2014; Zhikharevich et al., 2021).
7. See the following articles for examples of the dimensions of resilience Martin and Sunley (2015), Masik and Grabkowska (2020), and Sanchez-Zamora and Gallardo-Cobos (2019).
8. There has been some debate regarding the inclusion of vulnerability as a dimension of resilience, with some scholars suggesting it should be a separate concept. A large portion of the literature incorporates vulnerability as a dimension because it is integral to regional economies' ability to mitigate the impacts of shocks.
9. The resilience literature uses several interchangeable terms to refer to robustness, such as adaptability and reorientation.
10. Shocks are in contrast to slow-burning pressures. For this review, only shocks will be examined because slow-burning pressures are equated to everyday economic change and thus, should not be included in the analysis of resilience, which studies shocks, until the pressures hit a tipping point and become a shock (Martin and Sunley, 2020).
11. For examples of qualitative methods, see Papadopoulos et al. (2019) and Williams and Vorley (2014). For examples of quantitative methods, see Antonietti and Boschma (2021), Bondonio and Greenbaum (2018), Bonnet (2010), Cainelli et al. (2019a, 2019b), Dokic et al. (2016), Fingleton et al. (2012, 2015), Giannakis and Bruggeman (2020), Martini (2020a), Rose and Liao (2005), Sagan and Masik (2014), Stognief et al. (2019), and Turgel et al. (2021).
12. In particular, various types of resilience indices, specifically Martin's (2012) sensitivity index and Martin et al.'s (2016) resilience index, have been used to capture the regions' resilience. For example, see Cainelli et al. (2019a, 2019b), Han and Goetz (2019), Hudec et al. (2018), Lagravinese (2015), Martini (2020a), Oliva and Lazzarotti (2018), Rocchetta and Mina (2019), Rota et al. (2020), and Sabatino (2019).
13. See the following articles for examples of how studies have had to grapple with the challenges of examining regions' economic resilience (Angulo et al., 2018; Cellini and Torrisi, 2014; Chapple and Lester, 2010; Cowell, 2013; Dube and PoleSe, 2016; Evenhuis, 2017; Ezcurra and Rios, 2019; Faggian et al., 2018; Martin et al., 2016; Pinto et al., 2019; Sensier et al., 2016).
14. For more examples of spatial and hierarchical models in the resilience literature, see Giannakis and Bruggeman (2020), Giannakis and Mamuneas (2022), Pontarollo and Serpieri (2020a), Salvati et al. (2017), and Watson and Deller (2021).

References

- Angulo AM, Mur J and Trivez FJ (2018) Measuring resilience to economic shocks: an application to Spain. *The Annals of Regional Science* 60(2): 349–373. DOI: [10.1007/s00168-017-0815-8](https://doi.org/10.1007/s00168-017-0815-8)

- Annoni P, Dominicis L and Khabirpour N (2019) Location matters: a spatial econometric analysis of regional resilience in the European Union. *Growth and Change* 50(3): 824–855. DOI: [10.1111/grow.12311](https://doi.org/10.1111/grow.12311)
- Antonietti R and Boschma R (2021) Social capital, resilience, and regional diversification in Italy. Oxford University Press UK, 30, pp. 762–777. *Industrial and Corporate Change* 3.
- Asheim BT (2020) Economic geography as regional contexts' reconsidered – implications for disciplinary division of labour, research focus and societal relevance. *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography* 74(1): 25–34. DOI: [10.1080/00291951.2020.1732457](https://doi.org/10.1080/00291951.2020.1732457)
- Bailey D and De Propriis L (2014) Recession, recovery and resilience? *Regional Studies*. Taylor and Francis 48: 1757–1760.
- Bailey D and Turok I (2016) Resilience revisited. *Regional Studies*. Taylor and Francis 50: 557–560.
- Banica A, Kourtit K and Nijkamp P (2020) Natural disasters as a development opportunity: a spatial economic resilience interpretation. *Review of Regional Research* 40(2): 223–249. DOI: [10.1007/s10037-020-00141-8](https://doi.org/10.1007/s10037-020-00141-8)
- Barnes TJ and Sheppard E (2010) 'Nothing includes everything': towards engaged pluralism in Anglophone economic geography. *Progress in Human Geography* 34(2): 193–214. DOI: [10.1177/0309132509343728](https://doi.org/10.1177/0309132509343728)
- Benedek J and Lembcke AC (2017) Characteristics of recovery and resilience in the Romanian regions. *Eastern Journal of European Studies* 8(2): 95–126.
- Bishop P (2019) Knowledge diversity and entrepreneurship following an economic crisis: an empirical study of regional resilience in Great Britain. *Entrepreneurship and Regional Development* 31(5–6): 496–515. DOI: [10.1080/08985626.2018.1541595](https://doi.org/10.1080/08985626.2018.1541595)
- Bishop P and Shilcof D (2017) The spatial dynamics of new firm births during an economic crisis: the case of Great Britain, 2004–2012. *Entrepreneurship and Regional Development* 29(3–4): 215–237. DOI: [10.1080/08985626.2016.1257073](https://doi.org/10.1080/08985626.2016.1257073)
- Bondonio D and Greenbaum RT (2018) Natural disasters and relief assistance: Empirical evidence on the resilience of U.S. counties using dynamic propensity score matching. *Journal of Regional Science* 58(3): 659–680. DOI: [10.1111/jors.12379](https://doi.org/10.1111/jors.12379)
- Bonnet N (2010) The functional resilience of an innovative cluster in the Montpellier urban area (south of France). *European Planning Studies* 18(9): 1345–1363. DOI: [10.1080/09654313.2010.492580](https://doi.org/10.1080/09654313.2010.492580)
- Boschma R (2015) Towards an Evolutionary Perspective on Regional Resilience. *Regional Studies* 49(5): 733–751. DOI: [10.1080/00343404.2014.959481](https://doi.org/10.1080/00343404.2014.959481)
- Brakman S, Garretsen H and van Marrewijk C (2015) Regional resilience across Europe: on urbanisation and the initial impact of the Great Recession. *Cambridge Journal of Regions, Economy and Society* 8(2): 225–240. DOI: [10.1093/cjres/rsv005](https://doi.org/10.1093/cjres/rsv005)
- Brand FS and Jax K (2007) Focusing the Meaning(s) of Resilience: Resilience as a Descriptive Concept and a Boundary Object. *Ecology and Society* 12(1): 23.
- Bristow G and Healy A (2014) Regional Resilience: An Agency Perspective. *Regional Studies* 48(5): 923–935. DOI: [10.1080/00343404.2013.854879](https://doi.org/10.1080/00343404.2013.854879)
- Bristow G and Healy A (2018a) Conclusion and recommendations. In: *Economic Crisis and the Resilience of Regions*. Cheltenham: Edward Elgar Publishing, pp. 144–152. DOI: [10.4337/9781785364006.00013](https://doi.org/10.4337/9781785364006.00013)
- Bristow G and Healy A (2018b) Innovation and regional economic resilience: an exploratory analysis. *The Annals of Regional Science* 60(2): 265–284. DOI: [10.1007/s00168-017-0841-6](https://doi.org/10.1007/s00168-017-0841-6)
- Bristow G and Healy A (2020) *Handbook on Regional Economic Resilience*. Edward Elgar Publishing. Available at: DOI: [10.4337/9781785360862](https://doi.org/10.4337/9781785360862) (accessed 28 January 2022).
- Brooks C, Vorley T and Williams N (2016) The role of civic leadership in fostering economic resilience in City Regions. *Policy Studies*. Taylor and Francis 37: 1–16.
- Brown L and Greenbaum RT (2017) The role of industrial diversity in economic resilience: An empirical examination across 35 years. *Urban Studies*. SAGE Publications Ltd 54: 1347–1366. DOI: [10.1177/0042098015624870](https://doi.org/10.1177/0042098015624870)
- Brozzi R, Lapuh L, Nared J, et al. (2015) Towards more resilient economies in Alpine regions. *Acta Geographica Slovenica*. Anton Melik Geographical Institute 55: 339–350. DOI: [10.3986/AGS.916](https://doi.org/10.3986/AGS.916)
- Cainelli G, Ganau R and Modica M (2019a) Does related variety affect regional resilience? new evidence from Italy. *The Annals of Regional Science* 62(3): 657–680.
- Cainelli G, Ganau R and Modica M (2019b) Industrial relatedness and regional resilience in the European union. *Papers in Regional Science* 98(2): 755–778.

- Capello R, Caragliu A and Fratesi U (2015) Spatial heterogeneity in the costs of the economic crisis in Europe: are cities sources of regional resilience? *Journal of Economic Geography* 15(5): 951–972. DOI: [10.1093/jeg/lbu053](https://doi.org/10.1093/jeg/lbu053)
- Cappelli R, Montobbio F and Morrison A (2021) Unemployment resistance across EU regions: the role of technological and human capital. *Journal of Evolutionary Economics* 31(1): 147–178. DOI: [10.1007/s00191-020-00693-5](https://doi.org/10.1007/s00191-020-00693-5)
- Carlile PR (2004) Transferring, translating, and transforming: an integrative framework for managing knowledge across boundaries. *Organization Science* 15(5): 555–568. DOI: [10.1287/orsc.1040.0094](https://doi.org/10.1287/orsc.1040.0094)
- Cellini R and Cuccia T (2019) Do behaviours in cultural markets affect economic resilience? An analysis of Italian regions. *European Planning Studies* 27(4): 784–801. Routledge: 784–801. DOI: [10.1080/09654313.2019.1568397](https://doi.org/10.1080/09654313.2019.1568397)
- Cellini R and Torrisi G (2014) Regional resilience in Italy: a very long-run analysis. *Regional Studies* 48(11): 1779–1796. DOI: [10.1080/00343404.2013.861058](https://doi.org/10.1080/00343404.2013.861058)
- Chacon-Hurtado D, Kumar I, Gkritza K, et al. (2020) The role of transportation accessibility in regional economic resilience. *Journal of Transport Geography*. Elsevier 84: 102695.
- Chapple K and Lester TW (2010) The resilient regional labour market? the US case. *Cambridge Journal of Regions, Economy and Society* 3(1): 85–104. DOI: [10.1093/cjres/rsp031](https://doi.org/10.1093/cjres/rsp031)
- Cheng L and Zhang J (2020) Is tourism development a catalyst of economic recovery following natural disaster? an analysis of economic resilience and spatial variability. *Current Issues in Tourism*. Taylor and Francis 23: 2602–2623.
- Christofakis M, Gaki E and Lagos D (2019) The impact of economic crisis on regional disparities and the allocation of economic branches in Greek regions. *Bulletin of Geography. Socio-Economic Series* 44(44): 7–21. DOI: [10.2478/bog-2019-0011](https://doi.org/10.2478/bog-2019-0011)
- Christopherson S, Michie J and Tyler P (2010) Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society* 3(1): 3–10. DOI: [10.1093/cjres/rsq004](https://doi.org/10.1093/cjres/rsq004)
- Clark J, Huang H-I and Walsh JP (2010) A typology of ‘innovation districts’: what it means for regional resilience. *Cambridge Journal of Regions, Economy and Society* 3(1): 121–137.
- Compagnucci F, Gentili A, Valentini E, et al. (2022) Asymmetric responses to shocks: the role of structural change on resilience of the Euro area regions. *Applied Economics* 54: 4324–4355. DOI: [10.1080/00036846.2022.2030045](https://doi.org/10.1080/00036846.2022.2030045)
- Courvisanos J, Jain A and K Mardaneh K (2016) Economic Resilience of Regions under Crises: a Study of the Australian Economy. *Regional Studies* 50(4): 629–643. DOI: [10.1080/00343404.2015.1034669](https://doi.org/10.1080/00343404.2015.1034669)
- Cowell MM (2013) Bounce back or move on: regional resilience and economic development planning. *Cities* 30: 212–222. DOI: [10.1016/j.cities.2012.04.001](https://doi.org/10.1016/j.cities.2012.04.001)
- Cox KR (2013) Notes on a brief encounter: critical realism, historical materialism and human geography. *Dialectics in Human Geography* 3(1): 3–21. DOI: [10.1177/2043820613485041](https://doi.org/10.1177/2043820613485041)
- Crescenzi R, Luca D and Milio S (2016) The geography of the economic crisis in Europe: national macroeconomic conditions, regional structural factors and short-term economic performance. *Cambridge Journal of Regions, Economy and Society* 9(1): 13–32. DOI: [10.1093/cjres/rsv031](https://doi.org/10.1093/cjres/rsv031)
- Crespo J, Suire R and Vicente J (2014) Lock-in or Lock-out? How Structural Properties of Knowledge Networks Affect Regional Resilience. *Journal of Economic Geography* 14(1): 199–219.
- Crespo J, Boschma R and Balland P-A (2017) Resilience, networks and competitiveness: a conceptual framework. In: *Handbook of Regions and Competitiveness*. Edward Elgar Publishing. Available at: https://www.elgaronline.com/view/edcoll/9781783475001/9781783475001_00019.xml (accessed 28 January 2022).
- Cuadrado-Roura JR and Maroto A (2016) Unbalanced regional resilience to the economic crisis in Spain: a tale of specialisation and productivity. *Cambridge Journal of Regions, Economy and Society* 9(1): 153–178. DOI: [10.1093/cjres/rsv034](https://doi.org/10.1093/cjres/rsv034)
- Davies S (2011) Regional Resilience in the 2008–2010 Downturn: Comparative Evidence from European Countries. *Cambridge Journal of Regions, Economy and Society* 4(3): 369–382.
- Davoudi S, Brooks E and Mehmood A (2013) Evolutionary Resilience and Strategies for Climate Adaptation. *Planning Practice and Research* 28(3): 307–322. DOI: [10.1080/02697459.2013.787695](https://doi.org/10.1080/02697459.2013.787695)

- Dawley S, Pike A and Tomaney J (2010) Towards the resilient region? *Local Economy*. SAGE Publications Ltd 25: 650–667. DOI: [10.1080/02690942.2010.533424](https://doi.org/10.1080/02690942.2010.533424)
- Di Caro P (2015) Recessions, recoveries and regional resilience: evidence on Italy. *Cambridge Journal of Regions, Economy and Society* 8(2): 273–291. DOI: [10.1093/cjres/rsu029](https://doi.org/10.1093/cjres/rsu029)
- Di Caro P (2017) Testing and explaining economic resilience with an application to Italian regions. *Papers in Regional Science* 96(1): 93–113.
- Di Caro P and Fratesi U (2018) Regional determinants of economic resilience. *The Annals of Regional Science* 60(2): 235–240. DOI: [10.1007/s00168-017-0858-x](https://doi.org/10.1007/s00168-017-0858-x)
- Di Pietro F, Lecca P and Salotti S (2021) Regional economic resilience in the European Union: a numerical general equilibrium analysis. *Spatial Economic Analysis* 16(3): 287–312.
- Diodato D and Weterings ABR (2015) The resilience of regional labour markets to economic shocks: exploring the role of interactions among firms and workers. *Journal of Economic Geography* 15(4): 723–742. DOI: [10.1093/jeg/lbu030](https://doi.org/10.1093/jeg/lbu030)
- Dokic I, Frohlich Z and Rasic Bakaric I (2016) The impact of the economic crisis on regional disparities in Croatia. *Cambridge Journal of Regions, Economy and Society* 9(1): 179–195.
- Doran J and Fingleton B (2018) US metropolitan area resilience: insights from dynamic spatial panel estimation. *Environment and Planning A: Economy and Space* 50(1): 111–132. DOI: [10.1177/0308518X17736067](https://doi.org/10.1177/0308518X17736067)
- Drobnik A (2017) Economic resilience and hybridization of development—A case of the Central European Regions. *Regional Statistics* 7(01): 43–62.
- Dube J and Polese M (2016) Resilience revisited: assessing the impact of the 2007/09 Recession on 83 Canadian regions with accompanying thoughts on an elusive concept. *Regional Studies* 50(4): 615–628. Routledge: 615–628. DOI: [10.1080/00343404.2015.1020291](https://doi.org/10.1080/00343404.2015.1020291)
- Duschl M (2016) Firm dynamics and regional resilience: an empirical evolutionary perspective. *Industrial and Corporate Change* 25(5): 867–883.
- Eraydin A (2016) Attributes and characteristics of regional resilience: defining and measuring the resilience of Turkish regions. *Regional Studies* 50(4): 600–614.
- Eriksson RH and Hane-Weijman E (2017) How do regional economies respond to crises? The geography of job creation and destruction in Sweden (1990–2010). *European Urban and Regional Studies* 24(1): 87–103. DOI: [10.1177/0969776415604016](https://doi.org/10.1177/0969776415604016)
- Evenhuis E (2017) New directions in researching regional economic resilience and adaptation. *Geography Compass* 11(11): e12333. DOI: [10.1111/gec3.12333](https://doi.org/10.1111/gec3.12333)
- Ezcurra R and Rios V (2019) Quality of government and regional resilience in the European Union. Evidence from the Great Recession. *Papers in Regional Science* 98(3): 1267–1290. DOI: [10.1111/pirs.12417](https://doi.org/10.1111/pirs.12417)
- Faggian A, Gemmiti R, Jaquet T, et al. (2018) Regional economic resilience: the experience of the Italian local labor systems. *The Annals of Regional Science* 60(2): 393–410. DOI: [10.1007/s00168-017-0822-9](https://doi.org/10.1007/s00168-017-0822-9)
- Faulkner J-P, Murphy E and Scott M (2020) Developing a holistic vulnerability-resilience model for local and regional development. *European Planning Studies* 28(12): 2330–2347. Routledge: 2330–2347. DOI: [10.1080/09654313.2020.1720612](https://doi.org/10.1080/09654313.2020.1720612)
- Fieldsend AF (2013) Rural renaissance: an integral component of regional economic resilience. *Studies in Agricultural Economics* 115(2): 85–91.
- Fingleton B, Garretsen H and Martin R (2012) Recessionary shocks and regional employment: evidence on the resilience of U.K. Regions. *Journal of Regional Science* 52(1): 109–133. DOI: [10.1111/j.1467-9787.2011.00755.x](https://doi.org/10.1111/j.1467-9787.2011.00755.x)
- Fingleton B, Garretsen H and Martin R (2015) Shocking aspects of monetary union: the vulnerability of regions in Euroland. *Journal of Economic Geography* 15(5): 907–934.
- Florida R (2016) *The Rise of the Creative Class: Revisited*. Basic Books.
- Foster KA (2007) Snapping back: what makes regions resilient? snapping back: what makes regions resilient? *National Civic Review* 96(3): 27–29. DOI: [10.1002/ncr.184](https://doi.org/10.1002/ncr.184)
- Fratesi U and Perucca G (2017) Territorial capital and the resilience of European regions. *The Annals of Regional Science*. Berlin/Heidelberg: Springer Berlin Heidelberg, 60, pp. 241–264. DOI: [10.1007/s00168-017-0828-3](https://doi.org/10.1007/s00168-017-0828-3)
- Fratesi U and Rodríguez-Pose A (2016) The crisis and regional employment in Europe: what role for sheltered economies? *Cambridge Journal of Regions,*

- Economy and Society* 9(1): 33–57. DOI: [10.1093/cjres/rsv032](https://doi.org/10.1093/cjres/rsv032)
- Frohlich K and Hassink R (2018) Regional resilience: a stretched concept? *European Planning Studies* 26(9): 1763–1778. Routledge: 1763–1778. DOI: [10.1080/09654313.2018.1494137](https://doi.org/10.1080/09654313.2018.1494137)
- Fuller C (2022) Brexit, the mediation strategies of foreign corporate subsidiaries and regional resilience. *Regional Studies*. Taylor and Francis, p. 1–15.
- Fusillo F, Consoli D and Quatraro F (2022) *Resilience, Skill Endowment, and Diversity*. Evidence from US Metropolitan Areas. DOI: [10.1080/00130095.2021.2008797](https://doi.org/10.1080/00130095.2021.2008797)
- Giannakis E and Bruggeman A (2017a) Determinants of regional resilience to economic crisis: a European perspective. *European Planning Studies* 25(8): 1394–1415. DOI: [10.1080/09654313.2017.1319464](https://doi.org/10.1080/09654313.2017.1319464)
- Giannakis E and Bruggeman A (2017b) Economic crisis and regional resilience: evidence from Greece. *Papers in Regional Science* 96(3): 451–476. DOI: [10.1111/pirs.12206](https://doi.org/10.1111/pirs.12206)
- Giannakis E and Bruggeman A (2020) Regional disparities in economic resilience in the European Union across the urban–rural divide. *Regional Studies* 54(9): 1200–1213. DOI: [10.1080/00343404.2019.1698720](https://doi.org/10.1080/00343404.2019.1698720)
- Giannakis E and Mamuneas TP (2022) Labour productivity and regional labour markets resilience in Europe. *The Annals of Regional Science*. Springer. 1–22.
- Giannakis E and Papadas CT (2021) Spatial connectivity and regional economic resilience in turbulent times. *Sustainability* 13.
- Glaeser EL (2011) *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*. NY: New York: Penguin Press.
- Gong H and Hassink R (2017) Regional resilience: the critique revisited. In: Williams N and Vorley T (eds). *Creating Resilient Economies: Entrepreneurship, Growth and Development in Uncertain Times*. Edward Elgar Publishing, 206–216.
- Gong H and Hassink R (2020) Context sensitivity and economic-geographic (re)theorising. *Cambridge Journal of Regions, Economy and Society* 13(3): 475–490. DOI: [10.1093/cjres/rsaa021](https://doi.org/10.1093/cjres/rsaa021)
- Gong H, Hassink R, Tan J, et al. (2020a) 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. DOI: [10.1111/tesg.12447](https://doi.org/10.1111/tesg.12447)
- Gong H, Hassink R, Tan J, et al. (2020b) Regional resilience in times of a pandemic crisis: the case of COVID-19 in China. *Tijdschrift voor economische en sociale geografie*. Wiley Online Library 111: 497–512.
- Goschin Z (2019) Specialisation vs diversification. Which one better upholds regional resilience to economic crises? *Journal of Social and Economic Statistics* 8(2): 11–23.
- Goschin Z and Constantin D (2021) Estimating the short-term economic impact of covid-19 pandemic: a regional perspective. *GEOGRAPHIA POLONICA* 94(3): 441–457. DOI: [10.7163/GPol.0214](https://doi.org/10.7163/GPol.0214)
- Grabher G (1993) The weakness of strong ties: the lock-in of regional development in the ruhr area. In: *In the Embedded Firm*, pp. 255–277.
- Grabher G and Stark D (1997) Organizing diversity: evolutionary theory, network analysis and post-socialism. *Regional Studies* 31(5): 533–544. DOI: [10.1080/00343409750132315](https://doi.org/10.1080/00343409750132315)
- Groenewold N (2020) The response of the Australian states to a national economic shock: a statistical analysis of regional economic resilience. *Australasian Journal of Regional Studies, The* 26(2): 186–208.
- Han Y and Goetz SJ (2019) Predicting US county economic resilience from industry input-output accounts. *Applied Economics* 51(19): 2019–2028.
- Hassink R (2010) Regional resilience: a promising concept to explain differences in regional economic adaptability? *Cambridge Journal of Regions, Economy and Society* 3(1): 45–58. DOI: [10.1093/cjres/rsp033](https://doi.org/10.1093/cjres/rsp033)
- Hassink R, Klaerding C and Marques P (2014) Advancing evolutionary economic geography by engaged pluralism. *Regional Studies* 48(7): 1295–1307. DOI: [10.1080/00343404.2014.889815](https://doi.org/10.1080/00343404.2014.889815)
- Hennebry B (2018) Regional resilience in ireland and the existence of a two-tier recovery. *Quaestiones Geographicae* 37(4): 99–110. Sciendo. DOI: [10.2478/quageo-2018-0043](https://doi.org/10.2478/quageo-2018-0043)
- Hennebry B (2020) The determinants of economic resilience in rural regions. an examination of the Portuguese case. *Miscellanea Geographica* 24(1): 24–29. DOI: [10.2478/mgrsd-2020-0001](https://doi.org/10.2478/mgrsd-2020-0001)
- Holling CS (1973) Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics* 4: 1–23.
- Hu X and Hassink R (2017) Exploring adaptation and adaptability in uneven economic resilience: a tale of

- two Chinese mining regions. *Cambridge Journal of Regions, Economy and Society* 10(3): 527–541. DOI: [10.1093/cjres/rsx012](https://doi.org/10.1093/cjres/rsx012)
- Hu X and Hassink R (2020) Adaptation, adaptability and regional economic resilience: a conceptual framework. In: *Handbook on Regional Economic Resilience*. Edward Elgar Publishing, pp. 54–68. DOI: [10.4337/9781785360862.00009](https://doi.org/10.4337/9781785360862.00009)
- Huang X (2021) Immigration and economic resilience in the Great Recession. *Urban Studies* 58(9): 1885–1905. DOI: [10.1177/0042098020925407](https://doi.org/10.1177/0042098020925407)
- Hudec O, Reggiani A and Iserova M (2018) Resilience capacity and vulnerability: a joint analysis with reference to Slovak Urban districts. *Cities* 73: 24–35. DOI: [10.1016/j.cities.2017.10.004](https://doi.org/10.1016/j.cities.2017.10.004)
- Hudson R (2010) Resilient regions in an uncertain world: wishful thinking or a practical reality? *Cambridge Journal of Regions, Economy and Society* 3(1): 11–25. DOI: [10.1093/cjres/rsp026](https://doi.org/10.1093/cjres/rsp026)
- Hundt C and Holtermann L (2020) The role of national settings in the economic resilience of regions—evidence from recessionary shocks in Europe from 1990 to 2014. *Growth and Change* 51(1): 180–206.
- Jacob J (1969) *The Economy of Cities*. New York: Random House.
- James A, Bradshaw M, Coe NM, et al. (2018) Sustaining economic geography? business and management schools and the UK's great economic geography diaspora. *Environment and Planning A: Economy and Space* 50(6): 1355–1366. DOI: [10.1177/0308518X18764120](https://doi.org/10.1177/0308518X18764120)
- Kakderi C and Tasopoulou A (2017) Regional economic resilience: the role of national and regional policies. *European Planning Studies* 25(8): 1435–1453. DOI: [10.1080/09654313.2017.1322041](https://doi.org/10.1080/09654313.2017.1322041)
- Kitsos A and Bishop P (2018) Economic resilience in Great Britain: the crisis impact and its determining factors for local authority districts. *The Annals of Regional Science* 60(2): 329–347. DOI: [10.1007/s00168-016-0797-y](https://doi.org/10.1007/s00168-016-0797-y)
- Kitsos A, Carrascal-Incera A and Ortega-Argilés R (2019) The role of embeddedness on regional economic resilience: evidence from the UK. *Sustainability*. Multidisciplinary Digital Publishing Institute 11: 3800.
- Lagendijk A (2003) Towards conceptual quality in regional studies: the need for subtle critique - a response to Markusen. *Regional Studies* 37(6–7): 719–727. DOI: [10.1080/0034340032000108804](https://doi.org/10.1080/0034340032000108804)
- Lagravinese R (2015) Economic crisis and rising gaps North-South: evidence from the Italian regions. *Cambridge Journal of Regions, Economy and Society* 8(2): 331–342. DOI: [10.1093/cjres/rsv006](https://doi.org/10.1093/cjres/rsv006)
- Lang T (2012) How do cities and regions adapt to socio-economic crisis? Towards an institutionalist approach to urban and regional resilience. *Raumforschung und Raumordnung | Spatial Research and Planning* 70(4): 285–291. DOI: [10.1007/s13147-012-0170-2](https://doi.org/10.1007/s13147-012-0170-2)
- Lapuh L (2016) Measuring the impact of the recession on Slovenian statistical regions and their ability to recover. *Acta Geographica Slovenica*. Anton Melik Geographical Institute 56: 247. –266. DOI: [10.3986/AGS.764](https://doi.org/10.3986/AGS.764)
- Laubscher P (2017) The business cycle resilience of the Western Cape economy: a regional analysis of the 2009 recession and subsequent recovery. *Studies in Economics and Econometrics* 41(3): 1–24.
- Lawson T (1997) *Economics and Reality*. Milton, UK: Taylor and Francis Group. Available at: <http://ebookcentral.proquest.com/lib/west/detail.action?docID=5292777> (accessed 18 February 2023).
- Lee S and Wang S (2022) *Impacts of Political Fragmentation on Inclusive Economic Resilience: Examining American Metropolitan Areas after the Great Recession*. London, England: SAGE Publications Sage UK. 00420980211064455.
- Lee Y-JA, Kim J, Jang S, et al. (2021) Tourism and economic resilience. *Annals of Tourism Research* 87(C): 103024.
- Lester TW and Nguyen MT (2016) The economic integration of immigrants and regional resilience. *Journal of Urban Affairs* 38(1): 42–60.
- Lewin PA, Watson P and Brown A (2018) Surviving the great recession: the influence of income inequality in US Urban counties. *Regional Studies* 52(6): 781–792.
- Lungová M (2016) Resilience of the Czech regions to an external economic shock. *Studia Regionalne I Lokalne Warszawa* 17(66). EUROREG - Uniwersytet Warszawski, Regional Studies Association - Sekcja Polska: 30–47.
- MacKinnon D and Derickson KD (2013) From resilience to resourcefulness: a critique of resilience policy and activism *Progress in Human Geography*. *Progress in*

- Human Geography* 37(2): 253–270. DOI: [10.1177/0309132512454775](https://doi.org/10.1177/0309132512454775)
- Markowska M (2015) A measure for regional resilience to economic crisis. *Statistics in Transition New Series* 16(2): 293–308.
- Markusen A (1999) Fuzzy concepts, scanty evidence, policy distance: the case for rigour and policy relevance in critical regional studies. *Regional Studies* 33(9): 869–884. DOI: [10.1080/00343409950075506](https://doi.org/10.1080/00343409950075506)
- Martin R (2012) Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography* 12(1): 1–32. DOI: [10.1093/jeg/lbr019](https://doi.org/10.1093/jeg/lbr019)
- Martin R (2021) Putting the case for a pluralistic economic geography. *Journal of Economic Geography* 21(1): 1–28. DOI: [10.1093/jeg/lbaa025](https://doi.org/10.1093/jeg/lbaa025)
- Martin R and Sunley P (2007) Complexity thinking and evolutionary economic geography. *Journal of Economic Geography* 7(5): 573–601. DOI: [10.1093/jeg/lbm019](https://doi.org/10.1093/jeg/lbm019)
- Martin R and Sunley P (2015) On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography* 15(1): 1–42. DOI: [10.1093/jeg/lbu015](https://doi.org/10.1093/jeg/lbu015)
- Martin R and Sunley P (2017) Competitiveness and regional economic resilience. In: Huggins R and Thompson P (eds), *Handbook of Regions and Competitiveness: Contemporary Theories and Perspectives on Economic Development*. Edward Elgar Publishing, pp. 287–307. Available at: DOI: [10.4337/9781783475018.00020](https://doi.org/10.4337/9781783475018.00020)
- Martin R and Sunley P (2020) Regional economic resilience: evolution and evaluation. In: *Handbook on Regional Economic Resilience*. Edward Elgar Publishing. Available at: <https://www.elgaronline-com.proxy.lib.sfu.ca/view/edcoll/9781785360855/9781785360855.00007.xml> (accessed 28 January 2022).
- Martin R, Sunley P and Tyler P (2015) Local growth evolutions: recession, resilience and recovery. *Cambridge Journal of Regions, Economy and Society* 8(2): 141–148. DOI: [10.1093/cjres/rsv012](https://doi.org/10.1093/cjres/rsv012)
- Martin R, Sunley P, Gardiner B, et al. (2016) How Regions React to Recessions: Resilience and the Role of Economic Structure. *Regional Studies* 50(4): 561–585. DOI: [10.1080/00343404.2015.1136410](https://doi.org/10.1080/00343404.2015.1136410)
- Martini B (2020a) Resilience and economic structure: are they related? *Structural Change and Economic Dynamics* 54: 62–91.
- Martini B (2020b) Resilience, resistance and recoverability, regional economic structure and human capital in Italy. Are they related? *Applied Econometrics and International Development* 20. Euro-American Association of Economic Development: 47–62.
- Masik G (2014) Economic resilience to crisis. The case study of the Pomorskie region in Poland. *Economy and Business* 8: 72–83.
- Masik G (2018) An agency perspective of resilience: the case of Pomorskie region. *European Planning Studies* 26(5): 1060–1077. DOI: [10.1080/09654313.2018.1436700](https://doi.org/10.1080/09654313.2018.1436700)
- Masik G and Grabkowska M (2020) Practical dimension of urban and regional resilience concepts: a proposal of resilience strategy model. *MISCELLANEA GEOGRAPHICA* 24(1): 30–34. DOI: [10.2478/mgrsd-2019-0028](https://doi.org/10.2478/mgrsd-2019-0028)
- Masik G and Rzycki S (2014) Resilience of Pomorskie region to economic crisis. *Bulletin of Geography. Socio-Economic Series* 25(25): 129–141.
- Massey D (1993) Questions of locality. Geographical Association, 78, pp. 142–149. *Geography* 2.
- Mikheeva N (2021) Resilience of Russian regions to economic shocks. Springer, 32, pp. 68–77. *Studies on Russian Economic Development* 1.
- Modica M and Reggiani A (2015) Spatial economic resilience: overview and perspectives. *Networks and Spatial Economics* 15(2): 211–233. DOI: [10.1007/s11067-014-9261-7](https://doi.org/10.1007/s11067-014-9261-7)
- Munn Z, Peters MDJ, Stern C, et al. (2018) Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology* 18(1): 143. DOI: [10.1186/s12874-018-0611-x](https://doi.org/10.1186/s12874-018-0611-x)
- Murua JR and Ferrero AM (2019) Talking about regional resilience: evidence from two formerly rural Spanish regions. *European Planning Studies* 27(11): 2312–2328. DOI: [10.1080/09654313.2019.1615037](https://doi.org/10.1080/09654313.2019.1615037)
- Muštra V, Šimundić B and Kuliš Z (2017) Effects of smart specialization on regional economic resilience in EU. *Revista de Estudios Regionales* 100. Universidad de Málaga: 175–195.
- Muštra V, Šimundić B and Kuliš Z (2020) Does innovation matter for regional labour resilience? The case of EU regions. *Regional Science Policy and Practice* 12(5): 955–970. DOI: [10.1111/rsp3.12348](https://doi.org/10.1111/rsp3.12348)

- Navarro-Espigares JL, Martín-Segura JA and Hernández-Torres E (2012) The role of the service sector in regional economic resilience. *The Service Industries Journal* 32: 571–590.
- Obschonka M, Stuetzer M, Audretsch DB, et al. (2016) *Macropsychological factors predict regional economic resilience during a major economic crisis*. Los Angeles, CA: Sage Publications Sage CA, pp. 95–104.
- Oliva S and Lazzeretti L (2018) Measuring the economic resilience of natural disasters: an analysis of major earthquakes in Japan. *City, Culture And Society* 15: 53–59.
- Oprea F, Onofrei M, Lupu D, Vintila G and Paraschiv G (2020) The determinants of economic resilience. The case of Eastern European regions. *Sustainability* 12(10): 4228. DOI: [10.3390/su12104228](https://doi.org/10.3390/su12104228)
- Ostarkova J and Stanickova M (2021) How well do we know the issue of resilience? Literary research of current levels of knowledge. *Eastern Journal Of European Studies* 12: 12–42. DOI: [10.47743/ejes-2021-SI02](https://doi.org/10.47743/ejes-2021-SI02)
- Palekiene O, Simanaviciene Z and Bruneckiene J (2015) The application of resilience concept in the regional development context. *Procedia-Social and Behavioral Sciences* 213: 179–184.
- Papadopoulos AG, Fratsea L-M, Karanikolas P, et al. (2019) Reassembling the Rural: socio-economic dynamics, inequalities and resilience in crisis-stricken rural Greece. *Sociologia Ruralis*. Blackwell Publishing Ltd 59: 474–493. DOI: [10.1111/soru.12252](https://doi.org/10.1111/soru.12252)
- Pendall R, Foster KA and Cowell M (2010) Resilience and regions: building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society* 3(1): 71–84. DOI: [10.1093/cjres/rsp028](https://doi.org/10.1093/cjres/rsp028)
- Petach L, Weiler S and Conroy T (2021) It's a wonderful loan: local financial composition, community banks, and economic resilience. *Journal of Banking and Finance* 126. Available at: <http://proxy.lib.sfu.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=ecn&AN=1894811&site=ehost-live10.1016/j.jbankfin.2021.106077>
- Peters MDJ, Godfrey C, McInerney P, et al. (2020) *Chapter 11: Scoping Reviews*. Aromataris E and Munn Z (eds). Available at: <https://synthesismanual.jbi.global>
- Petrakos G and Psycharis Y (2016) The spatial aspects of economic crisis in Greece. *Cambridge Journal of Regions, Economy and Society* 9(1): 137–152. DOI: [10.1093/cjres/rsv028](https://doi.org/10.1093/cjres/rsv028)
- Pike A, Dawley S and Tomaney J (2010) Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society* 3(1): 59–70. DOI: [10.1093/cjres/rsq001](https://doi.org/10.1093/cjres/rsq001)
- Pinto H, Healy A and Cruz AR (2019) Varieties of capitalism and resilience clusters: An exploratory approach to European regions. *Regional Science Policy and Practice* 11(6): 913–933. DOI: [10.1111/rsp3.12183](https://doi.org/10.1111/rsp3.12183)
- Pizzuto P (2020) The role of regional competitiveness in shaping the heterogeneous impact of the Great Recession. *Regional Science Policy and Practice* 12(2): 267–290. DOI: [10.1111/rsp3.12196](https://doi.org/10.1111/rsp3.12196)
- Pontarollo N and Serpieri C (2020a) A composite policy tool to measure territorial resilience capacity. *Socio-Economic Planning Sciences* 70: 100669. DOI: [10.1016/j.seps.2018.11.006](https://doi.org/10.1016/j.seps.2018.11.006)
- Pontarollo N and Serpieri C (2020b) Towards regional renewal: a multilevel perspective for the EU. *Regional Studies* 54(6): 754–764. DOI: [10.1080/00343404.2019.1640357](https://doi.org/10.1080/00343404.2019.1640357)
- Pontarollo N and Serpieri C (2021) Challenges and opportunities to regional renewal in the European Union. *International Regional Science Review*. SAGE Publications Inc 44: 142–169. DOI: [10.1177/0160017620931591](https://doi.org/10.1177/0160017620931591)
- Psycharis Y, Kallioras D and Pantazis P (2014) Economic crisis and regional resilience: detecting the 'geographical footprint' of economic crisis in Greece. *Regional Science Policy and Practice* 6(2): 121–141. DOI: [10.1111/rsp3.12032](https://doi.org/10.1111/rsp3.12032)
- Psycharis Y, Panori A and Athanasopoulos D (2022) Public investment and regional resilience: empirical evidence from the Greek regions. *Tijdschrift voor Economische en Sociale Geografie* 113(1): 57–79. DOI: [10.1111/tesg.12499](https://doi.org/10.1111/tesg.12499)
- Pudelko F, Hundt C and Holtermann L (2018) Gauging two sides of regional economic resilience in Western Germany—Why sensitivity and recovery should not be lumped together. *Review of Regional Research* 38(2): 141–189.
- Ray DM, MacLachlan I, Lamarche R and Srinath K (2017) Economic shock and regional resilience: continuity and change in Canada's regional employment structure, 1987–2012. *Environment and Planning A: Economy and Space* 49(4): 952–973. DOI: [10.1177/0308518X16681788](https://doi.org/10.1177/0308518X16681788)
- Reggiani A, de Graaff T and Nijkamp P (2002) Resilience: an evolutionary approach to spatial economic

- systems. New York: Springer, p. 211–229. DOI: [10.1023/A:1015377515690](https://doi.org/10.1023/A:1015377515690)
- Ringwood L, Watson P and Lewin P (2019) A quantitative method for measuring regional economic resilience to the great recession. *Growth and Change* 50(1): 381–402. DOI: [10.1111/grow.12265](https://doi.org/10.1111/grow.12265)
- Rios V and Gianmoena L (2020) The link between quality of government and regional resilience in Europe. *Journal of Policy Modeling* 42(5): 1064–1084.
- Rizzi P, Graziano P and Dallara A (2018) A capacity approach to territorial resilience: the case of European regions. *The Annals of Regional Science* 60(2): 285–328.
- Rocchetta S and Mina A (2019) Technological coherence and the adaptive resilience of regional economies. *Regional Studies* 53(10): 1421–1434.
- Rocchetta S, Mina A, Lee C, et al. (2022) Technological knowledge spaces and the resilience of European regions. *Journal of Economic Geography*. Oxford University Press 22: 27–51.
- Rodriguez-Pose A (2011) Economists as geographers and geographers as something else: on the changing conception of distance in geography and economics. *Journal of Economic Geography* 11(2): 347–356. DOI: [10.1093/jeg/lbq034](https://doi.org/10.1093/jeg/lbq034)
- Romao J (2020) Tourism, smart specialisation, growth, and resilience. *Annals of Tourism Research* 84. Elsevier Ltd: 102995. DOI: [10.1016/j.annals.2020.102995](https://doi.org/10.1016/j.annals.2020.102995)
- Rose A (2007) Economic resilience to natural and man-made disasters: Multidisciplinary origins and contextual dimensions. *Environmental Hazards*. Taylor and Francis 7: 383–398.
- Rose A and Liao S-Y (2005) Modeling regional economic resilience to disasters: a computable general equilibrium analysis of water service disruptions. *Journal of Regional Science* 45(1): 75–112.
- Rota FS, Bagliani M and Feletig P (2020) Breaking the black-box of regional resilience: a taxonomy using a dynamic cumulative shift-share occupational approach. *Sustainability* 12(21): 9070–9097. doi: [10.3390/su12219070](https://doi.org/10.3390/su12219070)
- Sabatino M (2019) Economic resilience and social capital of the Italian region. *International Review of Economics and Finance* 61: 355–367.
- Sagan I and Masik G (2014) Economic resilience. The case study of Pomorskie region. *Raumforschung und Raumordnung*. Springer 72: 153–164.
- Salvati L, Carlucci M and Venanzoni G (2017) Recession, resilience, local labour markets: wealthier is better? *Letters in Spatial and Resource Sciences* 10(2): 177–204.
- Sanchez-Zamora P and Gallardo-Cobos R (2019) Diversity, disparity and territorial resilience in the context of the economic crisis: an analysis of rural areas in Southern Spain. *Sustainability* 11, 1743(6). DOI: [10.3390/su11061743](https://doi.org/10.3390/su11061743)
- Sayer A (1992) *Methods in Social Science: A Realist Approach*. London: Routledge.
- Schumpeter JA (1942) *Capitalism, Socialism and Democracy*. New York.
- Sedita SR, De Noni I and Pilotti L (2017) Out of the crisis: an empirical investigation of place-specific determinants of economic resilience. *European Planning Studies* 25(2): 155–180. Routledge: 155–180. DOI: [10.1080/09654313.2016.1261804](https://doi.org/10.1080/09654313.2016.1261804)
- Sensier M and Devine F (2020) *Understanding Regional Economic Performance and Resilience in the UK: Trends since the Global Financial Crisis*. National Institute Economic Review, pp. R18–R28.
- Sensier M, Bristow G and Healy A (2016) Measuring regional economic resilience across Europe: operationalizing a complex concept. *Spatial Economic Analysis* 11(2): 128–151. DOI: [10.1080/17421772.2016.1129435](https://doi.org/10.1080/17421772.2016.1129435)
- Sheppard E and Plummer P (2007) Toward engaged pluralism in geographical debate. *Environment and Planning A: Economy and Space* 39(11): 2545–2548. DOI: [10.1068/a40205](https://doi.org/10.1068/a40205)
- Simmie J (2014) Regional economic resilience: a schumpeterian perspective. *Raumforschung und Raumordnung | Spatial Research and Planning* 72(2): 103–116. DOI: [10.1007/s13147-014-0274-y](https://doi.org/10.1007/s13147-014-0274-y)
- Simmie J and Martin R (2010) The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society* 3(1): 27–43. DOI: [10.1093/cjres/rsp029](https://doi.org/10.1093/cjres/rsp029)
- Stanickova M and Melecký L (2018) Understanding of resilience in the context of regional development using Composite index approach: the case of European Union NUTS-2 regions. *REGIONAL STUDIES REGIONAL SCIENCE* 5(1): 231–254. DOI: [10.1080/21681376.2018.1470939](https://doi.org/10.1080/21681376.2018.1470939)
- Star SL and Griesemer JR (1989) Institutional Ecology, ‘Translations’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate

- Zoology, 1907-39. *Social Studies of Science*. Sage Publications, Ltd 19: 387-420.
- Stognief N, Walk P, Schöttker O, et al. (2019) Economic resilience of German lignite regions in transition. *Sustainability*. Multidisciplinary Digital Publishing Institute 11: 5991.
- Sunley P (1996) Context in economic geography: the relevance of pragmatism. *Progress in Human Geography* 20(3): 338-355. DOI: [10.1177/030913259602000303](https://doi.org/10.1177/030913259602000303)
- Sutton J and Arku G (2022a) Regional economic resilience: towards a system approach. *Regional Studies, Regional Science* 9(1): 497-512. DOI: [10.1080/21681376.2022.2092418](https://doi.org/10.1080/21681376.2022.2092418)
- Sutton J and Arku G (2022b) The importance of local characteristics: An examination of Canadian cities' resilience during the 2020 economic crisis. *The Canadian Geographer/Le Géographe Canadien* 66(4): 712-727. DOI: [10.1111/cag.12780](https://doi.org/10.1111/cag.12780)
- Svoboda O and Klementova T (2014) Correlation analysis and model of the regional economic resilience. *WSEAS Transactions on Business and Economics* 11(2): 765-777.
- Talamo G and Sabatino M (2021) Reshoring in Italy: a recent analysis. *Contemporary Economics* 12(4): 381-398.
- Toth BI (2015) Regional economic resilience: concepts, empirics and a critical review. *Miscellanea Geographica*. Faculty of Geography and Regional Studies, University of Warsaw 19: 70-75. DOI: [10.1515/mgrsd-2015-0017](https://doi.org/10.1515/mgrsd-2015-0017)
- Tricco AC, Lillie E, Zarin W, et al. (2018) PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine* 169(7): 467-473. DOI: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850)
- Trippl M, Fastenrath S and Isaksen A (2022) *Rethinking Regional Economic Resilience: Preconditions and Processes Shaping Transformative Resilience*. GEIST Working Paper Series No, p. 2022.
- Tsiapa M (2019) Adjustment mechanisms of Greek regions in export activity during the economic crisis of 2008-2012. *Papers in Regional Science* 98(2): 621-639. DOI: [10.1111/pirs.12367](https://doi.org/10.1111/pirs.12367)
- Tsiapa M, Kallioras D and Tzeremes NG (2018) The role of path-dependence in the resilience of EU regions. *European Planning Studies* 26(6): 1099-1120. Routledge: 1099-1120. DOI: [10.1080/09654313.2018.1458284](https://doi.org/10.1080/09654313.2018.1458284)
- Turgel I, Chernova O and Usoltceva A (2021) Resilience, robustness and adaptivity: Large urban Russian Federation regions during the COVID-19 crisis. *AREA DEVELOPMENT AND POLICY* 7(2): 222-244. DOI: [10.1080/23792949.2021.1973522](https://doi.org/10.1080/23792949.2021.1973522)
- Ubago Martínez Y, García-Lautre I, Iraizoz B, et al. (2019) Why are some Spanish regions more resilient than others? *Papers in Regional Science*. Wiley-Blackwell 98: 2211-2231. DOI: [10.1111/pirs.12464](https://doi.org/10.1111/pirs.12464)
- van Meeteren M, Bassens D and Derudder B (2016) Doing global urban studies: On the need for engaged pluralism, frame switching, and methodological cross-fertilization. *Dialogues in Human Geography* 6(3): 296-301.
- Wang S and Scorsone E (2020) Economic resilience after the Great Recession: an examination of unreserved fund balance in Michigan counties. *Local Government Studies* 46(5): 716-733. Routledge: 716-733. DOI: [10.1080/03003930.2019.1653285](https://doi.org/10.1080/03003930.2019.1653285)
- Wang Z and Wei W (2021) Regional economic resilience in China: measurement and determinants. *Regional Studies* 55(7): 1228-1239. DOI: [10.1080/00343404.2021.1872779](https://doi.org/10.1080/00343404.2021.1872779)
- Watson P and Deller S (2021) *Tourism and economic resilience*. Tourism Economics. London, England: SAGE Publications Sage UK.
- Webber DJ, Healy A and Bristow G (2018) Regional growth paths and resilience: a European analysis. *Economic Geography* 94(4): 355-375. DOI: [10.1080/00130095.2017.1419057](https://doi.org/10.1080/00130095.2017.1419057)
- Williams N and Vorley T (2014) Economic resilience and entrepreneurship: lessons from the sheffield city region. *Entrepreneurship and Regional Development* 26(3-4): 257-281. DOI: [10.1080/08985626.2014.894129](https://doi.org/10.1080/08985626.2014.894129)
- Wilson GA (2018) "Constructive tensions" in resilience research: critical reflections from a human geography perspective. *The Geographical Journal* 184(1): 89-99. DOI: [10.1111/geoj.12232](https://doi.org/10.1111/geoj.12232)
- Wink R (2012) Economic resilience as the evolutionary concept for post-industrial regions: the case of Leipzig and Halle. *Journal of Economics and Management* 10: 60-72.
- Wink R (2014) *Regional economic resilience: European experiences and policy issues*. *Raumforschung und Raumordnung*. Springer 72: 85-91.
- Wolfe DA (2010) The strategic management of core cities: Path dependence and economic adjustment in resilient regions. *Cambridge Journal of Regions, Economy and Society* 3(1): 139-152. DOI: [10.1093/cjres/rsp032](https://doi.org/10.1093/cjres/rsp032)

- Wolman H, Wial H, St Clair T, et al. (2017) *Coping with Adversity: Regional Economic Resilience and Public Policy*. Ithaca: Cornell University Press.
- Yamamoto D (2011) Regional resilience: prospects for regional development research. *Geography Compass* 5(10): 723–736. DOI: [10.1111/j.1749-8198.2011.00448.x](https://doi.org/10.1111/j.1749-8198.2011.00448.x)
- Yeung HW (2019) Rethinking mechanism and process in the geographical analysis of uneven development. *Dialogues in Human Geography*. SAGE Publications 9: 226–255. DOI: [10.1177/2043820619861861](https://doi.org/10.1177/2043820619861861)
- Ženka J, Chreneková M, Kokešová L, et al. (2021) Industrial structure and economic resilience of non-metropolitan regions: an empirical base for the smart specialization Policies *Land* 10. Multidisciplinary Digital Publishing Institute, p. 1335.
- Zhikharevich BS, Klimanov VV and Maracha VG (2021) Resilience of a territory: concept, measurement, governance. *Regional Research of Russia* 11(1), 1–8. DOI: [10.1134/S2079970521010135](https://doi.org/10.1134/S2079970521010135)
- Zhou D, Chen A and Wang J (2019) Impact of disaster risks on regional economic resilience in China: a case study of Wenchuan Earthquake. *Social Sciences*. Science Publishing Group 8: 245.

Author biographies

Jesse Sutton is a PhD Candidate in the Department of Geography and Environment at Western University. His research focuses on regional economic resilience, local economic development, plant closures, and spatial econometrics.

Alessia Arcidiacono has a PhD in Economics, Management and Statistics from the University of Catania. Her research focuses on regional economic resilience, decentralisation, local economic development, and applied econometrics.

Gianpiero Torrasi is an Associate Professor in the Department of Economics and Business at the University of Catania. His research interests concern decentralisation, spatial economic policy, and spatial disparities.

Robert Nutifafa Arku is a PhD Student in the Department of Geography and Planning at the University of Toronto. His research focuses on urban growth and regional development in both the global north and south.