
Guest editorial: The resilience of clusters and cluster policies

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Background and motivation

More than three decades after Michael E. Porter's seminal "Competitive Advantage of Nations" (Porter, 1990), the competitive environment has changed substantially. The Great Recession of 2008/2009 and ensuing policy responses put an end to a sustained phase of relative macroeconomic stability and rapid globalisation. The financial crisis and the turbulences that followed gave rise to a new wave of enquiry into the drivers or *resilience* that allow regions to withstand, and recover from, such external shocks, or which even enable the region to gain from such shocks by initiating new growth paths (Simmie and Martin, 2010; Martin and Sunley, 2015). In parallel, the digital transformation continues to push technological boundaries, reviving assertions such as the death of distance or the end of geography from the early days of the internet (Cairncross, 1997; O'Brien, 1992). The pandemic and the return of geopolitics put a brake on hyper-globalisation, potentially strengthening clusters in advanced economies through reshoring (Somoza Medina, 2022). The demands on clusters to contribute to addressing all these challenges are rising (European Commission, 2022; Franco *et al.*, 2021). But what determines if clusters prove helpful or harmful in times of crisis, and how can experiences from the crisis inform the evolution of cluster policies?

Conceptually, resilience has often been assumed to be the "Achilles heel" of clusters. Regions with strong clusters might benefit from their well-established economic performance benefits (e.g. Porter, 2003; Ketels and Protsiv, 2021; Grashof and Fornahl, 2021), but they could also be more exposed to sector-specific shocks in these fields or to the natural demise of these clusters along their life cycle (Kim *et al.*, 2023; Menzel and Fornahl, 2010). At the same time, clusters might have structures, processes or institutions in place which could provide firms with better opportunities to pivot and react to shocks, e.g. based on strong trust-based social networks (Becattini, 1990, 2011).

A number of recent papers have empirically tested the relative response of clusters to external shocks (e.g. Li *et al.*, 2022). Some find no systematic difference in how firms located either within a cluster or not are affected by an external shock (Behrens *et al.*, 2020; Campi and Dueñas, 2022). Another study conversely finds that firms located in clusters have been better able to deal with the downturn during the great financial crisis than firms in other locations (Delgado and Porter, 2021). Based on two comparative case studies in China, Gong *et al.* (2022) showed that a local institutional innovation – the Industrial Chain Chief Model – helped to increase regional resilience of firms in clusters by reconfiguring and reshaping production networks.

Wrobel (2015) observed that employment in cluster firms developed better than in non-cluster firms during the 2008 financial crisis. From interviews in cluster firms, he concludes that regional embeddedness in networks as well as a high level of solidarity between cluster firms positively moderated the effects of the crisis. For instance, qualified personnel was temporarily transferred to another firm within the regional cluster or new orders were acquired from firms within the cluster and firms with free capacities were recommended to other firms. Furthermore, the paper concludes that membership in formal clusters appears to be advantageous for firms because openness and commitment is channelled through formal structures. This supports the cursory evidence that many cluster organisations saw a significant surge of interest from their members

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during the pandemic, being one of the trusted places for business leaders to get support and discuss options.

The concern about the impact of crises on clusters and the broader economy has also led to a significant refocusing of economic policy on creating resilience (European Commission, 2022). There is also a sense that the combination of crises and the structural transformation due to technological changes and new societal demands might have a deep impact on the profile and geographic footprint of clusters. For cluster initiatives and cluster policies, this raises the question of whether they need to change direction in response to these new challenges.

Resilience might then be one of the additional societal objectives that cluster organisations are expected to pursue, beyond their traditional role in driving economic outcomes like job creation, export growth and higher rates of productivity and innovation. Porter and Kramer (2011) proposed an interesting conceptual approach to these questions in their work on *creating shared value* (CSV). Cluster organisations could be a key platform to support such shared value by enhancing resilience and more broadly integrating societal and/or environmental value creation into their value proposition (Kramer and Pfitzer, 2016). This, in turn, injects new ideas into cluster policies, initiatives and management organisations (Wilson, 2019).

Contributions in this Special Issue

The contributions in this special issue address the resilience of clusters and cluster policies alike. By investigating the influence of specialisation and sectoral composition on the resilience of German regions during the Great Recession and that of ambidexterity on the resilience of clusters, two contributions shed new light on how clusters strengthen the resilience of regions. The other two papers illustrate the potential of CSR and the digital transformation to rejuvenate cluster policies.

The contribution by *Fatih Celebioglu* and *Thomas Brenner* aims at explaining the effects of innovation, specialisation, workforce qualifications and sectoral structure on the resilience of German regions facing the Great Recession in 2008/2009. To achieve this, the authors apply quantile regressions to calculate the effects of various variables on regional economic resilience. To measure resilience, the authors distinguish between resistance and recovery, as they are known to be driven by different factors (Pudelko *et al.*, 2018). Furthermore, they differentiate between manufacturing and services and also include a local shift measure to account for effects not explained by the sectoral composition. Their results confirm that locations with employment growth before the crisis and with a favourable industry structure show better employment dynamics during and after the crisis. Furthermore, the authors find evidence for a positive influence of innovativeness, workforce qualification, the share of the service sector and specialisation on the economic resistance of regions. Related variety (Content and Frenken, 2016) turns out to be positively associated with both resistance and recovery, while the share of the manufacturing sector shows a positive relationship with recovery only.

While this largely confirms previous research, this paper contributes to the literature in three aspects: Firstly, instead of using regions as observation units, the authors conduct the analyses on the basis of municipalities and their surroundings. By not relying on administrative regions, they reduce the modifiable area unit problem. Secondly, the authors apply quantile regressions to detect nonlinear effects. Third, in addition to the resilience of the whole economy, the authors also study the resilience of the manufacturing and service sectors separately and examine the resilience of the local shift effect.

The ability to exploit existing resources while simultaneously exploring new opportunities originated as a concept in business administration (Gibson and Birkinshaw,

2004) but has so far only been rudimentarily tapped in cluster research. In their conceptual paper, *Michael Rothgang* and *Bernhard Lageman* explore the relevance of such ambidexterity for the resilience of clusters. To achieve this objective, they review the relevant literature and illustrate their findings with the help of a case study. Their results show that the ambidexterity of a cluster can contribute to its resilience when adverse external developments arise. Ambidexterity is thus a trait or mechanism for coping with critical situations and developments that can be activated by the cluster actors and may eventually lead to cluster resilience. Developing this capability can also be a guiding principle for a common strategy of key cluster actors, where they both exploit current strengths and explore the development of new competitive advantages. While ambidexterity does not guarantee cluster survival, it can contribute significantly to their economic resilience under adverse conditions.

In another conceptual paper, *Rudy Fernandez-Escobedo*, *Begoña Eguía-Peña* and *Leire Aldaz-Odrizola* develop the vision of a novel policy tool called the digital industrial cluster (DIC) for a future context shaped by digital economies and Industry 4.0. Their contribution reviews the literature on how industrial clusters deal with digital transformation. The review takes a particular interest in industrial clusters, information and communication technologies, Industry 4.0 and policy tools for digital agglomeration. The authors propose the DIC as a new policy tool, building its foundations on both industrial clusters and digital economies; furthermore, they compare the DIC with other policy tools based on digital agglomeration to understand the similarities, differences and advantages of the former. Finally, this paper discusses where the DIC could find its way toward implementation and what externalities could be expected from doing so.

While cluster management organisations (CMOs) have been overwhelmingly targeted as the economic goal of increasing firm-level productivity, policymakers are starting to experiment with a broader use for cluster policies that seek to also tackle social goals in approaches aligned with the concept of CSV. However, there remains a gap in conceptual understanding around the specific roles that CMOs might play in overcoming the barriers faced by small- and medium-sized enterprises (SMEs) for CSV. Bridging this gap presents an opportunity for cluster practitioners and policymakers in a context in which environmental and social sustainability are at the top of policy agendas.

Based on analysis of literature around the concepts of CSV and transactions cost theory, *Stéphanie Grimbert*, *James Wilson*, *Alberto Pezzi* and *Xavier Amores Bravo* define the contours of a new conceptual framework for the roles that CMOs can play in fostering collective CSV. They illustrate how the different components of the framework are reflected in emerging cluster practice in the context of the COVID-19 pandemic and a new wave of European cluster-based projects containing CSV elements. The resulting framework reconciles the concepts of clusters and CSV by explicitly positioning CMOs as intermediaries for facilitating the CSV strategies of SMEs. CMOs develop strategies that target collective CSV capabilities and address collective CSV challenges. By stressing the societal impact of CMOs alongside their economic impacts, and by enabling a categorisation of functions that can support the monitoring of CMO activities towards collective CSV strategies, the framework provides a novel basis for understanding clusters as a demand-side policy and inspiring further empirical research into the evidencing of these roles.

Policy implications

The four contributions assembled in this special issue offer valuable insights for the policy and practice of cluster development and management. *Celebioglu and Brenner's* work suggests that regional economic resilience is increased through sectoral diversification,

investment in education and the creation of high-skilled jobs. More specifically, they stress that policies should work against narrow industry specialisations and instead promote related breadth within clusters and cluster portfolios. Within given industries, their results suggest that innovative industries should be promoted to strengthen regional economic resilience. Interestingly, however, they caution against supporting only the most innovative activities within them, as they have shown to be less resilient. A balanced approach is needed, where cluster policies recognise that the most innovative activities need to be embedded in other, often less advanced, activities to be able to thrive also during shocks.

Rothgang and Lageman point towards the potential of ambidexterity for fine-tuning cluster policies. Exploiting and building on existing strengths has to be pursued alongside exploring new related fields and creating new strengths within them to achieve higher resilience. Cluster managers and their organisations must find ways to pursue these tracks in parallel. Whether individual firms are more focused on one or the other is an interesting empirical question, driven by their internal ambidexterity. *Fernandez-Escobedo et al.* explore the potential for cluster organisations to move beyond their geographic boundedness, leveraging digital technologies to create virtual networks and collaboration structures. This could increase resilience against location-specific shocks, assuming that virtual networks can overcome the benefits of proximity and drive more economic linkages across locations. Whether this conceptual idea works in practice will have to be tested in real cases.

Shared value has been introduced as a framework for firms to drive societal goals beyond, but in alignment with, their traditional economic targets. *Grimbert et al.* explore how this approach can help cluster organisations respond to the broader political expectations for impact they face. They argue that tailored policy programs might provide incentives to accelerate the take-up of CSV by CMOs. There are interesting examples of this in Catalonia, where the cluster policy actively encourages and supports shared value activities of cluster organisations (*Pezzi et al., 2021*).

At least implicitly shocks or crises are assumed to be negative for regional development. Although this might hold true in the short run, a longer-term evolutionary perspective might lead to a different evaluation. Shocks might open up windows of opportunity to not just restore the previous growth path, but to embark on an improved trajectory that offers new business opportunities whilst simultaneously improving social and environmental conditions, including less pollution, higher levels of inclusion, new environmentally friendly products and so on (transformative resilience, *Trippl et al., 2023*). Hence, policy directed towards increasing transformative resilience induces long-term growth and solving societal problems at the same time. But this type of policy probably looks different from policies focusing on those types of resilience which leads to a return to the old growth paths.

The potential ways forward for the policy and practice of cluster development, be it digital cluster initiatives, ambidexterity or shared value, have one thing in common: they all call for more experimental policy designs and a greater openness for learning to respond to multiple societal challenges in an increasingly uncertain environment. This requires political decision-makers to overcome the well-known characteristic of human psychology of seeking certainty in proven solutions in the face of increasing uncertainty (status quo bias, *Kahneman et al., 1991*) – possibly the most fundamental challenge not only for cluster and economic development policy these days.

Research outlook

Pursuing new policies in these directions in an informed way requires *further research*. In terms of research questions, this special issue highlights the need for research in some specific directions:

- *What drives outcomes beyond GDP?* Resilience is only one of the new outcome objectives that are of interest. Robust supply chains, sustainability, social inclusion, technological sovereignty and more have become the focus of societal and thus policy interest lately. The traditional toolkit of cluster analysis has focused on the drivers of GDP, job creation and innovation. More research is required to understand the drivers of these additional outcome dimensions (Resbeut, 2021). Some might highlight a change in the relative importance of outcome drivers we understand; some might suggest new factors to be included. Furthermore, we must gain new insights how the different objectives interact with each other – are they independent, complementary or contradictory?
- *What policies are effective in improving outcomes beyond GDP?* A related question is then which policy interventions lead to higher resilience or other desired non-GDP outcomes while also enabling traditional economic outcomes. And how should CMOs implement these new policies and balance the different objectives imposed on them by their cluster firms as well as society? Celebioglu and Brenner take some steps in this direction. But more work is needed, conceptual as well as empirical, to develop a framework to support policy design. And since some of this will require experimentation with new tools, it will also require the systematic tracking of how these policies fare in practice.
- *What motivates firms to engage in these new policy efforts?* Cluster efforts aim to mobilise groups of related companies to engage in collective actions. This is straightforward if the intended outcome is higher economic performance, which they directly benefit from. It might be more challenging if the outcome is relevant to society but less obviously related to firm profitability. The CSV approach outlined by Grimbert *et al.* suggests to systematically focus on areas where the two overlap. Resilience might be in this sweet spot – many companies are interested in, for example, enhancing the resilience of their supply chains. Sustainability could be an opportunity as well, at least where the necessary measures also raise profits. Social inclusion might be more challenging, but even here firms could be motivated by unlocking new pools of human capital.

In terms of methods, the papers in this special issue provide some additional insights: Celebioglu and Brenner suggest to further enhance the potential of econometric methods for the study of regional economic resilience, stressing, in particular, the need to analyse new data on more recent crises and to include hitherto unobserved influences like labour mobility, as well as better measures of innovativeness. Beyond this econometric approach, complementary qualitative evidence will be helpful, especially case studies on the resilience of clusters (Wink, 2021).

With their explorative contribution, Rothgang and Lageman invite empirical research – especially in the form of more case studies – to identify the ambidexterity of and in clusters and to assess its implications for a cluster's performance including its resilience and transition capacity. At the level of clusters, much further research is needed to conceptualise, explain and measure ambidexterity. Assisting CMOs with the implementation of digital cluster initiatives as proposed by Fernandez-Escobedo *et al.* calls for transformative research (Bement, 2007; Mertens, 2009), feeding on mutual transdisciplinary learning between academia and practice. This may be extended to the pursuit of collective CSV by cluster initiatives, where Grimbert *et al.* explicitly call for an empirical assessment of CMO's contributions to collective CSV as a starting point for an evaluation framework.

We may conclude that there is no shortage of innovative concepts to be explored in empirical research on the resilience of clusters and cluster policies. Regarding the latter, inter- and transdisciplinary, as well as transformative cluster policy research may increase the societal relevance of academia to work towards solutions to the multiple crises and challenges we are facing these days.

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