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Regional resilience: theoretical and empirical perspectives

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Introduction

This edition of *Cambridge Journal of Regions, Economy and Society* is devoted to examining regional resilience and assessing its underlying theoretical foundations, the empirical evidence that may lie behind it and importantly what it may have to offer the formulation of policy. The articles in this issue explore the concept from a variety of angles and demonstrate why it has emerged as a popular, albeit contested, concept in environmental studies and the social sciences.

We acknowledge that one reason for the popularity of the term 'regional resilience' is its malleability; it can mean different things to different people. As the term originated in environmental studies, it described biological capacity to adapt and thrive under adverse environmental conditions. At the other end of the spectrum, in economics, resilience has been defined in terms of return to a fixed and narrowly defined equilibrium (as measured by employment, for example) or, in the more liberal version, multiple equilibria. In the social sciences, more generally, however, the term regional resilience has become popular because of its association with regional adaptation and so has strong connections with evolutionary economics and evolutionary economic geography.[1]

One obvious question is why the concept has become so popular at this historical moment. The processes it encompasses (rebound, adaptation and recovery) certainly are not new in any fundamental sense. The attention to resilience may be, however, a response to a generalized contemporary sense of uncertainty and insecurity and a search for formulas for adaptation and survival. In this respect, the fashionable use of the concept may originate both from an increased sense of risk (economic and political as well as environmental) and from the perception that processes associated with globalization have made places and regions more permeable to the effects of what were once thought to be external processes. The intersection of an economic crisis and an environmental crisis has enhanced the perceived sense of vulnerability and, hence, stimulated the search for new paths to 'resilience' (Hudson, 2010; Pike et al., 2010).

Despite its currency, however, the question of 'regional resilience' is, at base, a very old and enduring question: why do some regions manage to overcome short-term or long-term economic adversity to maintain a high quality of life for regional residents while others fail. As Hassink (2010) describes, this question is fraught with both methodological and philosophical difficulties but remains a subject of interest because of its significance and because of the multiple variables at play in the region.

For some, the idea of 'resilience' should be thrown out in favour of concepts that are more meaningful within disciplinary contexts. For others, however, regional resilience provides an umbrella under which to explore multiple disciplinary perspectives on critical and disputed concepts. This discussion is useful in and of itself because it serves to clarify differences in broader conceptual frameworks, especially as they treat time, space, institutions and agency. In other words, an interdisciplinary discussion helps clarify the assumptions underlying different perspectives on regional change and how to measure it.

In addition, as people from different disciplinary perspectives present their ideas on how to measure resilience and what a resilient region looks like, we also get a much clearer picture of what 'the region' means in different fields and which of the numerous variables affecting regional paths are considered significant. Rather than being taken for granted, what we mean by 'region' also has to be interrogated.

The papers in this issue demonstrate that regional resilience can provoke a debate among economists, political scientists, planners and geographers in a way that concepts closely tied to a disciplinary discourse (such as governance for political scientists, equilibrium for economists or lock-in or path dependency for economic geographers) cannot. It also suggests ways in which historical events—environmental disasters and the financial crisis—can shake up our thinking and make us question some of our basic assumptions and measures of success and failure.

We hope that this issue on regional resilience illuminates the diversity of our understanding and denies us the convenient notion that we are ever talking about the same thing. At the same time, this kind of multidisciplinary conversation sparks new ideas and connections and produces, if not agreement, then a richer conceptual terrain all around.

The definitional dilemma: time, space and process

One critical divide among the authors writing about regional resilience can be traced to how they treat time and space. In equilibrium approaches, time is measured in moments (pre-shock, shock and post-shock) and the region is an action 'container' that bumps up against other regions but is on its own course for good or ill. Most of the authors contributing to this issue, although not all, adopt a different, evolutionary, approach to understanding regional change: one rooted in the idea that space is constructed via human action and social relations. Regions are manifestations of those actions and are in a constant process of transition. For these authors, political and economic processes, such as those that lead to investment in one neighbourhood or region and disinvestment in another, are at the core of regional resilience. They create capacity, including governance capacity, and determine how vulnerable a region is to events outside the control of regional residents.

Hassink (2010) rejects the concept of regional resilience altogether as leading to a misapprehension of the processes of regional change because of its neglect of the longue duree in regional adaptation. Pike et al. (2010) are also highly critical of equilibrium approaches but distinguish the concept of resilience, in effect trying to rescue it from its association with easily measured, short-term, 'pop-up' recovery.

In the course of grappling with the concept of regional resilience and defining it in a meaningful way, the authors in this issue raise an underlying but rarely asked question: how are the causes behind systemic shock understood and interpreted? The interpretation of the causes—the story that is told about why an adverse regional event occurred—is critical to what will be considered successful adaptation or resilience.

How do we understand regional risk?

The explanation for an adverse event or increased risk of adversity is a more complex question than it appears on the surface. An environmental and civic disaster such as Hurricane Katrina in New Orleans is unquestionably a disastrous 'event'. And the resilience of the region can be measured by an equilibrium-based rebound in tourist expenditures or employment.

As documented in successful lawsuits, however, the potential for a significant disaster from a hurricane (an occasional but likely event in the region) had been predicted and written about for many years. Despite these predictions, investments to support the port of New Orleans' interests over those of the residents raised the risk of catastrophe for the residents and the city. So, in evaluating the capacity for resilience in response to the 'shock' of Hurricane Katrina in New Orleans, an evolutionary approach would go beyond the event, the shock of the hurricane itself, to incorporate an analysis of the causal path that decreased the potential for resilience. In this case, how did the projects undertaken by the US Army Corps of Engineers to reshape the port to make international shipping easier and more profitable eliminate the wetlands that provided the city with natural protection from potential hurricane damage?

If a resilient region, in environmental and economic terms, is one that retains the capacity to recover from external shocks, how did long-term decisions made by extra-regional actors decrease the regional capacity for resilience? The incorporation of path-dependent causes within the concept of regional resilience changes the way resilience is both measured and defined. It recognizes how longer-term political decisions contributed to the deterioration of physical capacity for regional resilience and distributed risks of adverse consequences between residents and international shippers and carriers. This is not to suggest that analysts working within an equilibrium framework do not recognize the causes of an adverse regional event but that their moment-to-moment measurement does not allow for incorporating an analysis of causes for regional vulnerability into the concept of resilience. As Simmie and Martin (2010) suggest:

> A regional economy that is hardly affected by a shock is much more likely to recover, and more quickly, than a regional economy that is severely weakened or disrupted by the shock. That is to say, should resilience also refer to the sensitivity or vulnerability of a regional economy to shocks?

A second, but closely related, problem affecting how we define and measure regional resilience is a consequence of the 'atomization' of the region. Although regions are often portrayed as autonomous spatial units, they exist in a multi-scalar action space in which political and economic actors are making decisions that have consequences for what is located where.

So, trade policy, for example although adopted at a national scale, affects the structure of incentives that drive firm location decisions. Trade protections may maintain industries in regions even when there are lower cost competitors in other (international) regions. Trade liberalization may wipe out entire regional industries or result in a new international (and regional) division of labour. In another example, national deregulation of industries may reduce the costs of capital, transport or communication, changing the way in which company managers think about how to accumulate capital. Ultimately, the kind of globalization that was implemented in the USA and UK made the national economy more 'open' but also exposed regions to the risks associated with being incorporated into global markets.

The consumption and housing booms in the USA and UK that have driven these economies since at least the 1990s were a product of this 'openness' and permeability, riding on cheap capital and low-price imported consumer goods. The opportunity to profit from activities connected with this boom (real estate development, retail and transportation) limited capital for investment in regional industries focused on manufacturing, which would have diversified those economies. It also drove public investment in infrastructure towards large-scale national infrastructure investment (such as those connected to the major ports). The construction of a 'throughput' economy undermined regional distinctiveness and comparative advantage, opening more regional economies to precipitous downturns when consumption declined (Christopherson and Belzer, 2009).

The recent awareness of the limitations of these national policies has also highlighted their implications for regional resilience, defined in this instance as ability to withstand the shock of an economic crisis. In the USA, a list of metropolitan regions least affected by the economic crisis contains a surprising (to some) number of old industrial cities. These cities' resilience is related to their diversified economies, including small advanced manufacturing industries as well as educational and health institutions. In addition, because they were poor candidates for super-profits in housing, they avoided the speculation and mortgage fraud that resulted in deep financial losses in the consumption belt cities from California and Las Vegas to Georgia and Florida.

During the consumption boom times, the old industrial cities were castigated as locked into old ways of thinking and their low growth rates compared unfavourably with those of the consumption belt cities. Ironically, perhaps they are now portrayed as resilient in the face of national economic crisis.

What this suggests is that what looks like and is portrayed as regional success in one era does not necessarily look the same when conditions change. This gives us the opportunity for a fresh look at questions about regional growth and decline. This fresh look requires that we not be 'locked in' to ways of looking at space and place.

Measures of success: adjustment, adaptation, convergence, equilibrium

A resilient region is not just economically successful but maintains economic success over the long term in face of the inevitable adaptation required by changes in international competition, shifts in consumer demand and other such 'shocks' to the system. As we have suggested, the success of a region can be measured by current and past economic growth, employment rates, standards of living and quality of life. The difficulty is in judging, at any point of time, whether such success will be maintained in the future and in particular whether the region will prove resilient in the face of economic recession or other challenges. One way to make this difficult prediction is to examine which regions have proved resilient in the past and to learn lessons from how such resilience was achieved.

The argument of the papers in this issue is, in general, that it is wrong to see resilience in terms of an ability, following an economic shock, to return to the previous equilibrium growth path. The idea of an equilibrium growth path is, in itself, of questionable validity or usefulness, but certainly once any such path has been disrupted, the idea that it is still there in theory, waiting to be rediscovered, is decidedly unhelpful. Slightly more realistic is the idea of multiple equilibria, whereby if the previous growth path disappears for whatever reason, there may be one or more alternative growth paths that the region may achieve through industrial restructuring and repositioning. But even here, while such multiple equilibria models might be useful for modelling purposes, it is unlikely that the real world bears much resemblance to such a story.

Instead, the concepts of adjustment and adaptation are generally regarded as more useful in analysing regional resilience. For an economically successful region, the likelihood of such success being sustained over the long term will depend crucially on its ability to adapt to changing circumstances over time and to adjust to external shocks as and when these occur.

The question then becomes, what factors enable a region to adjust and adapt over time?

The answer is likely to lie in a number of areas, with the relevant importance of each factor being different across regions and over time, but the sort of factors that appear to have been helpful in the past would include:

- A strong regional system of innovation (on which, see Clark et al., 2010; Howells, 1999).
- Strength in factors that create a 'learning region' (Archibugi and Lundvall, 2001).

- A modern productive infrastructure (transport, broadband provision, etc.).
- A skilled, innovative and entrepreneurial workforce.
- A supportive financial system providing patient capital.
- A diversified economic base, not over-reliant on a single industry.

The list could be added to, and the above factors are not exclusive, in that a skilled workforce will contribute towards the capability of being a learning region and likewise would be part of any successful Regional System of Innovation. Thus, to the above, whether as additional factors or as contributory factors to the broad categories, could be added successful universities with strong links between the universities and the regional economies; close collaborative relations between companies and with other organizations, locally and globally; high levels of trust among and between economic actors; companies adopting High Commitment Work Systems involving not just a skilled workforce but one that is consulted, involved, motivated and committed; a diverse economic basis in terms of ownership structures (with cooperatives, mutuals and co-owned companies as well as public limited companies) and with strong corporate governance arrangement that includes risk assessment and management; and a supportive regional government promoting the above factors, actively networked nationally and internationally, combining regional industrial policy and innovation policy into regional innovation strategies (on which, see Michie and Oughton, 2001).

Hudson's definition is consistent with the above discussion and captures the intersection between economy, society and environment as follows:

> For socio-ecological systems, resilience requires consideration of three properties: the amount of change that a system can undergo while retaining its structure and functions, the degree to which it can reorganise, and the degree to which it can create and sustain the capacity to learn and adapt. Adaptability—the capacity of actors in the system to influence resilience—is critical in such systems (Hudson, 2010, 2).

Wolfe (2010)'s study of two cities concludes that:

> The most effective strategies for regional resilience rely on acquired levels of civic capital and the existing endowment of regional institutions to chart new paths forward … Among the factors that determine their effectiveness are the ability to build on specialized regional assets, including public and private research infrastructure, as well as unique concentrations of occupational and labour market skills; the presence or absence of 'civic capital' at the regional and local level; and the ability of local firms and entrepreneurs to adjust their business strategies in response to changing economic circumstances. Path dependence plays a role in determining the outcomes, but that role is contingent; it is framed by the strategic choices of local actors and the degree to which local institutional structures constrain or support the realization of their goals.

Thus, one might say that regions make their own resilience, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past.

The role of regional governance

Perhaps one of the reasons why the concept of resilience has proved so popular is that in seeking to understand the factors that affect the ability of regional economies to respond to change, and to recover from quite significant shocks that originate from 'without', it inevitably begs questions about the factors that influence the endogenous development of a region and, thus, the formulation of policy and appropriate governance structures that can enable, accommodate and facilitate change.

One thing that most researchers seem to agree on is that it would seem unwise to rush too quickly to identify policies and relevant governance structures that somehow enhance the capacity of regions to be resilient. Pendall et al. (2010) argues against any easy 'upload' into the policy domain and warns of a tendency for Markusen 'fuzziness'. However, Hassink, while highly critical of what the resilience framework adds to our understanding of the factors leading to the capacity for adaptation and renewal compared to what is already on offer from evolutionary economics, believes that it is precisely the ''neglect of state and policy at several spatial levels in the resilience framework that is deeply problematic''.

Bristow (2010) points out that those responsible for formulating regional policy seem to be preoccupied with regional competitiveness and view the concept of resilience through that lens. This is unfortunate since such an approach leads to a narrow and perhaps limited view of what resilience may have to offer, as a way of understanding the forces shaping regional change and in guiding the formulation of policy. Moreover, since competitiveness is associated so heavily with the promotion of economic growth, there is also a tendency to consider resilience in the same way and ignore the contribution it can make to understanding more about the determinants of regional sustainability and key interfaces between environmental and economic development.

A desire to refocus the debate has led many authors in this issue to argue that a better appreciation of what the concept of resilience has to offer can be gained from considering it from the perspective of evolutionary economics and how regions adapt to change given their history. Such an approach recognizes the importance of knowing more about how regions mobilize their assets, including those available from their public and private knowledge infrastructure. As Bristow argues, this enables resilience to play more to concepts of sustainability, localization and diversification (particularly in seeking new economic structures) and thus avoids the rather 'place-less' interpretation that so often results from a focus on competitiveness alone and one that has already been heavily criticized in the study of regional competitiveness (Kitson et al., 2004). As a number of authors emphasis in this issue the contribution that resilience can make to regional adjustment is perhaps best understood when it is related to the innate characteristics of a place-something on which a competitiveness-based approach may offer only a limited perspective (Kitson et al., 2004).

The attraction of resilience as a 'withstanding force' to change from without is heightened by the belief that it conveys a holistic approach to economic adjustment, involving people, institutions and 'context-specific' resources, which are fundamental to their survival. To some authors, resilience has been closely allied with enhanced self-reliance and the desire for greater regional closure (Hudson, 2010).

Considering resilience from within an evolutionary economics framework enables the development of a number of valuable research areas and the exploration of the implications for governance structures and the formulation of policy. Thus, for Bristow, it means understanding more about how regions can encourage 'transformative development from below' and thus diversity, modularity (the capacity to reorganize in event of shocks that limit transport options) and connection with the outside world in ways that expand their options for adjustment rather than constrain them. Avoiding an excessive reliance on a dominant industry is of relevance here and is something that has attracted considerable interest from economic historians (see Checkland, 1981).

For Simmie and Martin (2010), in the face of an economic environment characterized by the forces of 'restless' capitalism, resilience should be related to 'adaptive ability' since 'it is the differential ability of a region's or locality's firms to adapt to change and shocks in competitive, market, technological, policy and related conditions that shape the evolutionary dynamics and trajectories of that regional or local economy over time'. In their paper, they explore trade-offs or conflicts between connectedness and resilience—the more internally connected the regional system, the more structurally and functionally rigid and less adaptive it may become.

The ecological model of 'adaptive cycles' seeks to reconcile this contradiction or conflict through the idea of 'panarchy' and Simmie and Martin (2010) apply the basic stages of this model to the two case study city-region areas of Cambridge and Swansea. They argue that over a 40-year period, the economy of the Cambridge city-region has developed by exploiting endogenously created knowledge with a key trigger being the attitudes of the universities and local authorities. This process has proved to be inherently more economically sustainable than the position in the Swansea city-region, which pursued a regional development policy based on the attraction of external foreign direct investment, particularly from electronics companies with headquarters in Japan and elsewhere in the Far East.

For Wolfe (2010), a key focus in the study of resilience should be on the ability of regions in the face of economic, technological and environmental challenges to engage in 'collaborative processes to plan and implement change, within the constraints endowed by their existing regional assets, including public and private research infrastructure, and the infrastructure of their regional institutions'. A theme that has received attention by a number of authors who have sought to understand the role of institutional and organizational change in the development of successful regional innovation systems (see Baxter and Tyler, 2007).

By examining the two case study core cities of Ottawa and Waterloo in the province of Ontario, Wolfe (2010) argues that the amount of resilience shown in each case is a function both of their underlying industrial structures and also crucially ''the strategic responses framed by key civic leaders working through their respective institutions for regional governance''. The importance of acquired levels of civic capital is acknowledged but so also is the presence of civic leadership and the extent to which institutions can evolve and develop strategic approaches.

How resilience relates to flexibility in the governance response is also highlighted by Pike et al. (2010) who comment that a central question remains how can regional and local institutions develop adaptive capabilities better able to read, respond and promote adaption and adaptability, especially given the turbulence and flux in the context of 'state rescaling'. Identifying the appropriate points and moments for intervention is complex and requires intelligent institutional leadership ''with a heightened sensitivity and/or preparedness for rapid and pervasive change''.

For Hudson (2010), constructing more resilient regions within a decarbonizing economy will require major changes to the shape and form of the built environment and the underlying settlement pattern of cities and their regions. If these changes are to occur, the actions and policies of a very large number of different agents of change have to be coordinated, vertically and horizontally at different spatial scales. Hudson, like Bristow (2010), highlights the recent experience of the Transition Town movement in this context.

The evidence presented in this issue suggests that the concept of resilience has much to offer in helping to understand the dynamic behind regional change. A rich array of possible governance and policy issues present themselves. The authors would concur with the observation made by Bristow in this issue that resilience has the capacity to exhibit 'viral spread' since it is an accessible concept to so many different actors, interests and geographies. As she suggests, it has the ability to ''cut across the so-called 'grey area' between academic, policy and practice discourse''. However, as many authors in this issue acknowledge, there is a need to proceed with caution and ensure that policy fixes do not exceed the capability of the research base to justify them. In this respect, much remains to be done.

If the concept of resilience is to enhance our understanding of the forces influencing the development of cities and regions and the scope for appropriate policy responses, then it is important that we avoid repeating the mistakes that seem to have been so commonly made in relation to the concept of competitiveness. That is, we should avoid assuming that the same drivers of change are at work everywhere and if we just pull the right levers, the appropriate drivers will respond and deliver required outcomes. As many authors in this issue have argued, if analysis of regional change based on the concept of resilience is to provide useful insight into policy, then it is important to consider both history and geography (appropriate scale) in determining the nature of the intervention or as Pendall et al. (2010)

suggest the space–time boundaries and the factors that have influenced their selection. There is no clear easy policy fix and as Treado (2010) suggests, we must avoid policy 'integration traps'. As Chapple and Lester (2010) argue, the considerable diversity of regional experience mitigates against one size fits all policy responses and suggest that a very diverse and rich array of possible policy responses are likely to emerge.

Endnotes

[1] See special issue of *Journal of Economic Geography* and Martin and Sunley (2006).

References

Archibugi, D. and Lundvall, B.-Å. eds. (2001) *The Globalising Learning Economy*. Oxford: Oxford University Press.

Baxter, C. and Tyler, P. (2007) Facilitating enterprising places: the role of intermediaries in the United States and the United Kingdom. In K.R. Polenske (ed.) *The Economic Geography of Innovation*, pp. 261–288. Cambridge: Cambridge University Press.

Bristow, G. (2010) Resilient regions: re-'place'ing regional competitiveness. *Cambridge Journal of Regions, Economy and Society*, **3**: 153–167.

Chapple, K. and Lester, T. W. (2010) The resilient regional labour market: the US case. *Cambridge Journal of Regions, Economy and Society*, **3**: 85–104.

Checkland, S. (1981) *The Upas Tree*. Glasgow: Glasgow University Press.

Christopherson, S. and Belzer, M. (2009) The next move: metro-regions and the transformation of the freight transport and distribution system. In N. Pindus, H. Wial, and H. Wolman (eds) *Urban and Regional Policy and Its Effects*. Washington, DC: The Brookings Institution.

Clark, J., Huang, H.-I. and Walsh, J. (2010) A typology of 'Innovation Districts': what it means for regional resilience. *Cambridge Journal of Regions, Economy and Society*, **3**: 121–137.

Hassink, R. (2010) Regional resilience: a promising concept to explain differences in regional economic adaptability? *Cambridge Journal of Regions, Economy and Society*, **3**: 45–58.

Howells, J. (1999) Regional systems of innovation? (Chapter 5). In D. Archibugi, J. Howells, and J. Michie (eds) *Innovation Policy in a Global Economy*, pp. 67–93. Cambridge: Cambridge University Press.

Hudson, R. (2010) Resilient regions in an uncertain world: wishful thinking or a practical reality? *Cambridge Journal of Regions, Economy and Society*, **3**: 11–25.

Kitson, M., Martin, R. L. and Tyler, P. (2004) Regional competitiveness—an elusive concept? *Regional Studies*, **38**: 991–999.

Martin, R. L. and Sunley, P. (2006) Path dependence and regional economic evolution. *Journal of Economic Geography*, **6**: 395–437.

Michie, J. and Oughton, C. (2001) Regional innovation strategies: integrating regional, industrial and innovation policy. *New Economy*, **8**: 164–169.

Pendall, R., Foster, K. A. and Cowell, M. (2010) Resilience and regions: building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society*, **3**: 71–84.

Pike, A., Dawley, S. and Tomaney, J. (2010) Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society*, **3**: 59–70.

Simmie, J. and Martin, R. L. (2010) The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, **3**: 27–43.

Treado, C. D. (2010) Pittsburgh's evolving steel legacy and the steel technology cluster. *Cambridge Journal of Regions, Economy and Society*, **3**: 105–120.

Wolfe, D. (2010) The strategic management of core cities: path dependency and economic adjustment in resilient regions. *Cambridge Journal of Regions, Economy and Society*, **3**: 139–152.