

Resilience, adaptation and adaptability?

CURDS Working Paper.

A later version was published: Pike A, Dawley S, Tomaney J. [Resilience, adaptation and adaptability](#). *Cambridge Journal of Regions, Economy and Society* 2010, **3**(1), 59-70

Abstract:

The resilience of places in response to uncertain, volatile and rapid change has emerged as a focus of academic and policy attention. This paper aims to contribute to understanding and explaining the resilience of places. Drawing upon evolutionary Economic Geography, the concepts of adaptation and adaptability are developed in a framework based upon agents, mechanisms and sites. In contrast to equilibrium-based approaches, this approach can better capture the geographical diversity, variety and unevenness of resilience and address questions of what kind of resilience and for whom.



Andy Pike, Stuart Dawley, and John Tomaney

Centre for Urban and Regional Development Studies (CURDS),
School of Geography, Politics and Sociology,
Claremont Bridge,
Newcastle University,
Newcastle Upon Tyne,
England,
NE1 7RU.

Tel: +44 0191 222 8016

<http://www.ncl.ac.uk/curds/>

E- mail: Prof Andy Pike: andy.pike@ncl.ac.uk

I Introduction

Resilience has emerged as a notion seeking to capture the differential and uneven ability of places to react, respond and cope with uncertain, volatile and rapid change. Existing and new phenomena have configured risks for localities and regions including financial system instability and collapse, utility network disruption, dangerous climate change, extreme weather events, rapid demographic flows, terror campaigns, bio-hazards, social and political unrest. Increased interdependence and permeability between places internationally has further exposed localities and regions to such risks, sometimes amplifying their resonance and reinforcing their vulnerabilities. As an emergent rubric in this changing context, resilience is attracting burgeoning academic and policy attention in the US (Foster 2007a; Pendall *et al.* 2007) and in Europe (CLES 2008; Colbourne 2008; Edwards 2009; Folke *et al.* 2002).

Our central aim is to contribute to understanding and explaining the resilience of places. The paper is organised in the following parts. First, we discuss how existing multi-disciplinary research on resilience is characterised by multiple conceptualisations and limited theorisation as well as fragmentation across different starting points and foci. Second, we outline the emergent research on the spatial and territorial aspects of resilience that takes equilibrium-based approaches. These perspectives are focused upon adjustment to single or multiple equilibria and provide inadequate explanations of the geographical differentiation of resilience. Third, drawing upon evolutionary work in economic geography, we define and develop the concepts of adaptation and adaptability. A preliminary analytical framework based upon agents, mechanisms and sites is then outlined to demonstrate how adaptation and adaptability can deepen our understandings of the causal explanations of the resilience of places. We show how this

approach is better able than equilibrium-based work to capture the geographically diverse, varied and uneven resilience of places. Last, we address a neglected aspect of the existing literature on resilience. This section uses the tensions between adaptation and adaptability to examine the normative, political and policy questions involved in framing and contesting the question of what kind of resilience and for whom. We draw upon ongoing comparative research on 'old industrial regions' to illustrate our arguments. As places in the vanguard of early 19th Century industrialisation and latterly in parts of Newly Industrialising Countries facing maturity, their predicament is particularly relevant to considerations of resilience, adaptation and adaptability. Such places have faced prolonged challenges involving long-term and uneven processes of de-industrialisation and transition toward service-dominated economies, often punctuated by shocks that have accelerated and/or inflected trajectories of change (see, for example, Bluestone and Harrison 1982; Birch and Mykhnenko 2009; Birch *et al.* In Press; Cooke 1995; Grabher 1993; Hassink and Shin 2005; Hudson 2005; Rodríguez-Pose *et al.* 2001). This body of work demonstrates the failures of equilibrium-based accounts to provide convincing explanations and remedies for their persistent economic and social concerns.

We conclude, first, that the notion of resilience should not be rejected because of its multiple meanings and lack of conceptual clarity across disciplines and fields. Rather, we emphasise how its conceptual elasticity provides the basis for fruitful cross-disciplinary dialogue and theorising. Second, we emphasise the value of evolutionary approaches in Economic Geography as the basis for further developing the concepts of adaptation and adaptability to explain the geographical differentiation and unevenness of resilience over time and space. Reflecting on the policy implications of our analysis, we raise the possibility of 'diversified specialisation' in which strong economic advantages are dispersed across key activities and we emphasise the importance of territorial institutions

enabled to read, lead, co-ordinate and promote adaptive capacities in response to economic uncertainty, instability and disruption.

II Resilience and equilibrium-based economic approaches

Existing literatures on resilience span several disciplines and are fragmented across different starting points and foci ranging from the individual to the spatial. Psychology and psychiatry focus upon the individual and their resilience during life course transitions and events (Kaplan 1999). In ecological systems, resilience is related to system functioning rather than the stability or otherwise of its component populations and maintenance or loss of steady states (Adger 2000). For Adger (2000: 347), social resilience is "...the ability of communities to withstand external shocks to their social infrastructure". Work connecting ecological and social resilience has noted its multiple definitions and temporal dimensions, drawing upon eco-system notions to interpret resilience as "...the buffer capacity or the ability of a system to absorb perturbations, or the magnitude of disturbance that can be absorbed before a system changes its structure by changing the variables and processes that control behaviour" (Adger 2000: 347). Such approaches recognise that although resilience is "...widely used in ecology...its meaning and measurement are contested" (Adger 2000: 347). Engineering resilience focuses upon the vulnerability of people and places to hazardous environments and natural disasters, forecasting the likelihood of catastrophic events and systemic breakdowns and their social and economic implications (Vale and Campanella 2005). Conceptions from across the disciplines give resilience particular and different meanings. Systems theory is commonly utilised to understand the relationships and interactions between component elements that underlie the presence or absence of resilience in relation to exogenous as well as endogenous perturbations. Emphasis is typically placed upon the return or displacement to single or multiple equilibria and upon

internal and external factors that either strengthen or threaten systems, either contributing to or weakening their resilience.

Recently attention has turned specifically to consider spatial and territorial aspects of resilience in local and regional development and planning in the US, originating in the response of regions and metropolitan areas to shocks such as 9/11, Hurricane Katrina and plant and military base closures (see, for example, Foster 2007a; Hill *et al.* 2008). Our aim here is not to provide a systematic review and critique of existing approaches because this work is being undertaken in this Themed Issue (References, This Issue) and elsewhere (Foster 2007a; Pendall *et al.* 2007; Swanstrom 2008). Instead, our focus is on the explanatory weaknesses of equilibrium-based approaches and their emphasis upon adjustment to single or multiple equilibria. These approaches are ill-equipped to explain the geographical diversity, variety and unevenness of the resilience of places. To date, this type of work has been focused at the national level. Here, resilience is interpreted as the ability of nation states to avoid disturbance of their equilibrium position through avoiding, withstanding or dampening the effects of shocks by diversification and/or macro-economic stability (Briguglio *et al.* 2007; Duval *et al.* 2007).

Latterly, this economic equilibrium-based framework has been utilised in considering the “resilience metaphor” for regions and metropolitan areas (Pendall *et al.* 2007: 2). Single equilibrium-based accounts interpret “...the most natural meaning of regional economic resilience” as “...the ability of a regional economy to maintain a pre-existing state (typically assumed to be an equilibrium state) in the presence of some type of exogenous shock” and the “...extent to which a regional or national economy that has experienced an external shock is able to return to its previous level and/or growth rate of output, employment or population” (Hill *et al.* 2008: 3). Resilience here is understood as whether or not and to what degree and in what time frame a spatial unit can return to its

pre-shock position and level of output or employment. Such accounts are undermined by their limiting assumption of adjustment through the free and flexible operation of factor markets and return to a single equilibrium state. The framework jumps scales of analysis from the national to the regional and metropolitan without discussion of whether or not resilience can or should mean the same things at different geographical levels.

Other accounts of resilience have drawn from institutionalist readings of evolutionary ideas such as path dependence that emphasise closed systems, stable system structures over time and accidents of history and chance events in stimulating development trajectories (David 2001). Pendall *et al.* (2007: 2), for example, note the interest in path dependency to understand “multiple equilibria and the persistence of sub-optimal ones”. Hill *et al.* (2008: 4) interpret path dependence as predicated on multiple equilibria “not all of which are efficient (in a static and/or dynamic sense)” and may lock a regional economy into “a level or growth path of economic performance that is sub-optimal”. For Hill *et al.* (2008: 4), this “...suggests a concept of regional economic resilience in which resilience is the ability of a regional economy to avoid becoming locked-into such a low-level equilibrium or, if in one, to transition quickly to a ‘better’ equilibrium”. Such approaches are bound by their assumptions of adjustment to multiple equilibria and their readings of evolutionary economics derived from the behaviour of individuals and organisations are scaled-up to apply to spatial entities such as metropolitan areas and regions.

Our aim of better understanding and explaining the resilience of places confronts several issues. First, there is a multitude of meanings of resilience and lack of conceptual and theoretical clarity across a range of disciplines. Basic definitional questions therefore remain unresolved and the theorisation of causal agents, relationships and mechanisms is under-developed. Second, current work on resilience is dominated by economic

approaches based largely upon neo-classical theory and adjustment toward single or multiple equilibria. This work provides thin abstractions and a somewhat reductionist and limiting frame with which to interpret the geographical differentiation and unevenness of the resilience of places facing volatile and uncertain changes. Third, the spatial scope of emergent resilience research is limited to the region and the metropolitan area with little or no engagement with other geographies or contemporary territorial and relational readings of space and place. Last, the political economies of power in contemporary engagement with resilience have been neglected. This gap raises the prospect that resilience becomes a useful but under-specified metaphor amongst policymakers in the context of uncertain and disruptive change. Without scrutiny and reflection, echoing Lovering's (1999) concerns, this situation again risks policy leading conceptual and theoretical development and analysis in unhelpful ways.

II Insights from evolutionary Economic Geography

Recent work on evolution in Economic Geography provides ways of tackling the conceptual, theoretical, analytical and political concerns raised by current geographical treatments of resilience. From heterodox roots in evolutionary and institutional economics and political economy, the evolutionary approach to economic change eschews neo-classical notions of adjustment and convergence mechanisms toward a balanced equilibrium or movement between multiple equilibria (Boschma and Martin 2007, Grabher 2009). Evolutionary analysis emphasises the path dependent unfolding of trajectories of change, shaped by historically inherited formal and informal institutions, whereby economic geographies are marked by diversity and variety (Boschma and Martin 2007, Martin and Sunley 2006). As Grabher and Stark (1997: 535) put it "Evolution...does not proceed along a single grand avenue toward perfection but along

multiple paths which do not all lead to optimal change”. In its political-economic variant (Goodwin 2004; Jones 2008), evolutionary Economic Geography emphasises the integral role of socio-spatial relations between the social agents of capital, labour, the state and civil society and power and politics in shaping and, in turn, being shaped by pathways of change (MacKinnon *et al.* 2009; Sunley 2008). In reading the economic landscape as a “complex adaptive system” (Martin and Sunley 2006: 573), evolutionary Economic Geography can illuminate our understanding and explanation of the geographical differentiation of the resilience of places.

Grabher and Stark’s (1997: 534) evolutionary conceptualisation of post-socialist transformation is instructive in distinguishing the concepts of adaptation and adaptability. They question the conventional argument that “Economic efficiency will be maximised only through the rapid and all-encompassing implementation of privatization and marketization” towards optimal, equilibrium outcomes. Instead, they claim that “...although such institutional homogenization might foster *adaptation* in the short run, the consequent loss of institutional diversity will impede *adaptability* in the long run”. This is because homogenization would limit “...the search for effective institutions and organizational forms to the familiar Western quadrant of tried and proven arrangements” likely to cause negative lock-ins in post-socialist countries and to restrict them to “...*exploiting* known territory at the cost of forgetting (or never learning) the skills of *exploring* for new solutions” (original authors’ emphasis). Here, adaptation is defined as a movement toward a pre-conceived path in the short-run, characterised by strong and tight couplings between social agents in place. Whereas adaptability is defined as the dynamic capacity to effect and unfold multiple evolutionary trajectories, through loose and weak couplings between social agents in place, that enhance the overall responsiveness of the system to unforeseen changes.

Our intention, then, is to deploy these specific definitions of adaptation and adaptability as central causal concepts in explaining the geographically uneven resilience of places. Under these definitions, adaptation and adaptability can be seen as in tension with each other as explanations of different kinds of resilience. In contrast to the equilibrium-based view that interprets resilience as a generic feature and quality of a closed system, adaptation and adaptability are dialectically related in an inherent tension within a more open system that has to be accommodated or brought into balance by social agents. In old industrial regions, for example, adaptation can explain a form of resilience based upon the renewal of a pre-conceived and previously successful development path in the short-term. Conversely, adaptability can explain a different kind of resilience. This variety emerges in the longer term through the conscious social agency of abandoning any pre-conceived or previously successful paths in favour of searching for and effecting multiple related and/or new development trajectories. This different kind of resilience carries attendant (at least initial) uncertainties, economic inefficiencies and political unpopularity. In explaining the differentiated resilience of places, adaptation and adaptability can be alternative explanations. Or, the concepts might be complementary in explaining the different forms of resilience of different sets of economic activities and interests in any particular place.

For old industrial regions, cases of adaptability where new paths are effected are evident but relatively rare. Commonly cited examples include: the transition in Massachusetts, USA, from declining textiles 'rustbelt' to emergent high-technology complex around Route 128 (Harrison 1984); the reconfiguration of the coal and steel complex in the Ruhr, Germany, toward clean coal and environmental technologies (Grabher 1993); and, the restructuring of traditional industries in the Basque Country and consumption-oriented urban regeneration in Bilbao (Gonzalez 2006). More typical for old industrial regions are experiences of weaker adaptation shaped by entrenched path dependency and

protracted decline, including the continued economic weaknesses and long-run marginalisation of North East England (Hudson 2005) and the post-transition rationalisation of steel and attempts to construct new economic growth paths in Małopolskie, Poland (Dawley *et al.* 2008). Feyrer *et al.* (2007) too demonstrate how in the late 1970s and early 1980s auto and steel-dominated localities in the US regained 'pre-shock' employment levels within five years but ended up being displaced onto low growth development paths. Each kind of experience demonstrates differing kinds and degrees of resilience. Informed by evolutionary notions of path dependency, the concepts of adaptation and adaptability are more able than an equilibrium-centred view to tackle the legacies of history and context in explaining the differentiated resilience of old industrial regions.

Informed by path dependency, adaptation and adaptability can address effectively issues of the timing and nature, rate and duration of change. For example, episodes when little or nothing appears to change in a place in a specific time period are conceived not as stable single or multiple equilibria amongst phenomena but as relative stasis and/or stability within unfolding paths of change. Further, a temporal distinction between 'shocks' and 'slow burn' disturbances can be made:

...system shocks include disasters (e.g. Hurricane Katrina, California earthquakes, the Philadelphia yellow fever epidemic) and, to a lesser extent, plant closings in cities that are heavily dependent upon those plants. Shocks, can, of course, recur, even every year, as when Florida experiences repeated hurricanes or southern California bursts into flame in the late summer. Shocks can also be of the positive variety, such as when a region wins a bid for the Olympic Games or learns of success in luring a major new economic investment to the community. Examples of 'slow burns' (or 'slow moving challenges') include deindustrialization,

urban sprawl (which usually occurs 'below the radar'), prolonged population growth, and global climate change (Pendall *et al.* 2007: 13).

We would add the need to address the extent to which the disturbance is anticipated or not and whether it is a high probability-low risk or low probability-high risk occurrence. A further recognition is the magnitude of perturbations and their subsequent resonance to capture potential 'after-shocks' and second, third and so on order effects. Indeed, 'shocks' (exogenous and/or endogenous) are often closely intertwined with the unfolding of broader, longer run and 'slow burn' processes of change. In old industrial regions the demise of particular economic activities may produce the 'shock' events of rationalisation and job loss due to factory, mine or office closures but such moments need to be contextualised as embedded within deep seated processes of de-industrialisation and attendant economic, social, political, ecological and cultural changes (Hudson 2005; Pike 2005). This more supple approach to the nature of change over time and the blurring between single event and process-based change moves our understanding beyond the existing work on resilience that focuses only on relative changes in pre- and post-shock economic indicators such as growth and employment. We accept, however, the methodological and analytical challenges this kind of thinking raises.

Towards an analytical framework: Agents, mechanisms and sites

To develop the potential of the concepts of adaptation and adaptability to explain geographically uneven resilience, an analytical framework can begin by distinguishing agents, mechanisms and sites and their inter-relationships. This focus remedies the existing equilibrium-based work's emphasis upon abstract notions of adjustment from which social agency has been evacuated. Who or what is adapting or being adapted

foregrounds the agency of actors and their relationships to structures. 'State-managed regions' (Hudson 1989) facing protracted decline, for example, have attempted to shape the adaptation or adaptability undermining or promoting their resilience in the context of politics and changes in national state structures and the agency of government in policy and spending priorities. Agents within places do not simply react to external forces and pressures emanating from higher spatial scales; actors are typically implicated to greater or lesser degrees in constructing and reproducing such structures and tendencies through their agency.

Relations between agents are integral to thinking through the mechanisms of adaptation and adaptability explaining the differentiated resilience of places. Grabher and Stark (1997: 542) conceive of 'adaptive capacities' to refer to the differential abilities of places to adapt and emphasise the causal importance of a rich diversity of organizational forms, strong and weak ties between social actors within social networks and the learning of search skills. Loose couplings directly and indirectly connecting social agents are considered "...crucial for the adaptability of networks" because they allow elements to adapt and modify in response to contingency without disrupting the whole system, offer wider bases of local knowledge and accommodate more novelty and mutation (Grabher and Stark 1997: 538). Grabher and Stark (1997: 538) acknowledge, however, that loose coupling may not only be positive for network adaptability because it can also "...result in a cacophony of orientations, perceptions, goals and world-views that confounds even minimal cohesiveness".

As mechanisms shaping adaptation or adaptability, evolutionary Economic Geography emphasises the importance of 'lock-in'. Grabher (1993) identifies various kinds of lock-in, comprising functional, cognitive and political, whereby economic, social and institutional outlooks, relationships and configurations in place ossify over time, undermining

previous growth paths and inhibiting adaptive behaviours. Such lock-ins can overlap and become inter-dependent, even self-reinforcing, in particular places over time. The branch plant economy is characteristic of the kind of historically accumulated lock-ins that skew and reproduce particular kinds of development in old industrial regions denuded of higher level and strategic functions capable of fostering the adaptability of responding more effectively to change (Firn 1975; Richardson *et al.* 2000). How places interpret and address lock-ins is central to the geographically differentiated adaptation and adaptability explaining resilience. In West Münsterland, for example, a degree of adaptability explained the re-direction of its development paths by successfully connecting textiles producers to new markets for industrial and medical applications (Hassink 2007). In contrast, Mecklenburg-Vorpommern, experienced less success in the adaptation of its shipbuilding and engineering specialisations in the context of fierce international competition and the lock-ins of entrenched vested interests in the local, regional and federal state, capital and labour (Eich-Born and Hassink 2005). In an evolutionary framework lock-ins are not inevitable end-points, however. Martin and Sunley (2006) usefully identify several 'de-locking' mechanisms capable of providing the basis of adaptability: marshalling technological developments; drawing upon innovation and novelty generated by heterogeneous economic agents; importing and embedding external resources; diversification; and, wholesale upgrading of the economic structure. Such ideas suggest that places can enhance their adaptive capacities if they can develop collective understanding and strategies to recognise and overcome the lock-ins that may be constraining their adaptability to disruptive changes.

Related variety informs mechanisms of adaptation and adaptability in its focus upon how existing paths are shaped and how paths are destroyed and created anew (Martin and Sunley 2006). Variety, heredity and selection condition the degree of heterogeneity of economies and the knowledge and capability of economic actors in framing possibilities

for the generation of novelty in response to rapid and/or slow changing environments (Frenken and Boschma 2007). Homogenous and narrowly based economies with ignorant and incapable economic actors, for example, suggest weak adaptive capacity. Conversely, heterogeneous and diversified economies with knowledgeable and highly capable economic actors confer potentially stronger adaptive capacity. This echoes the argument that diversified economies are more adaptable because they act as a 'shock absorber', dissipating negative effects across an array of economic activities and places rather than concentrating and reinforcing them. Within old industrial regions, related variety presents a challenging potential mechanism for the adaptation or adaptability for shaping existing specialisations and comparative strengths in traditional economic activities toward emergent and growing markets. Traditional maritime engineering specialisations on Tyneside, for example, focused upon shipbuilding and, later, oil and gas extraction equipment fabrication. The resilience of this regionally embedded sector has been supported by its adaptability in evolving to engage market shifts toward mobile and sub-sea extraction technologies, ship conversion and repair and pipeline technologies, shaped by business and local authority co-operation (Whitehirst 2007). Related variety configures geographically uneven resilience, however, in confronting the spatially differentiated patterns of inherited assets and skills. How, for instance, can places respond if their principal economic advantages are low relative factor costs?

Sites are where agents and mechanisms of adaptation and adaptability unfold their diverse and varied pathways. Existing resilience studies utilise a territorial frame based on regions and metropolitan areas and focus upon functional economic areas (see, for example, Chapple and Lester 2007). For the framework elaborated here, this spatial lens provides an overly narrow view of the diverse and varied geographies of resilience explained by adaptation and adaptability. In considering sites of adaptation and adaptability it is useful analytically to explore the ongoing tensions between territorial and

relational views of scales and networks (Hudson 2007; MacLeod and Jones 2007; Pike 2007). Sites of adaptation and adaptability are articulated and inter-related between territorially-demarcated aspects – for example economic assets tied to place and the jurisdictional reach of regulatory institutions – and relational flows and networks – for example geographically stretched contracting and investment relationships and trans-national governance institutions. For old industrial regions carving out new roles in spatial divisions of labour, for example, the recent and rapid decimation of the UK's semiconductor fabrication industry in Scotland and North East England demonstrated that the attraction and embedding of high-technology and high-skilled foreign direct investment remained vulnerable to the vagaries of extra-local corporate socio-spatial power relations and industry dynamics (Dawley 2007). Scales and territories remain relevant here to explaining this lack of adaptability and resilience. It was not a simple and rigid hierarchy of 'global' structures impacting upon the agency of 'local' actors but part of a more interdependent set of socio-spatial relationships and networks.

In conceiving of adaptation and adaptability to explain the geographical differentiation of resilience, the framework of agents, mechanisms and sites raises some analytical challenges. In existing work, classification and typology of the resilience of places has been deployed. Chapple and Lester (2007) focus on start and end status for below (stagnant, faltering) and above (transformative, thriving) average performance for cities and counties across an array of economic and social indicators. Hill *et al.* (2008: 5) identify three kinds of responses to negative economic shocks: economically resilient regions returning or exceeding their growth path within relatively short time periods; shock-resistant regions not disturbed from their growth paths; and, non-resilient regions "...unable to rebound and return to or exceed their previous path". Taking our evolutionary approach, in response to an internal and/or external perturbation we envisage three ideal-typical paths of adaptation or adaptability: 'enhanced' – whereby

output or employment is increased, for example new or reconfigured existing economic activities are stimulated and a new direction established through branching or new path creation; 'steady state/neutral' – where output or employment remains unchanged, for example when economic activities have been able to ride out the perturbation unaffected and continue on existing paths; and, 'denuded' – where output or employment is reduced, for example if demand collapses and a new less positive direction or path is established. With just these three types of paths, even after just two perturbations at two different points in time, the widening array of potential pathways experienced by places becomes evident – rising to nine potential adaptive paths. Coupled with our framework of agents, mechanisms and sites, this kind of approach is better able to address the geographically diverse, varied and uneven resilience of places.

III What kind of resilience and for whom?

Although Adger (2000: 354) identifies "...the nature of economic growth and the stability and distribution of income among populations" as important to resilience, political concerns have largely been neglected in existing work. However, central to explaining the geographical differentiation of the adaptation and adaptability explaining resilience is an understanding of how power relations, politics and the uneven contestation and co-operation between capital, labour, the state and civil society shape and are shaped by evolutionary paths. Contentious politics accompany considerations of the renewing or jettisoning of historically successful activities and development paths framed by adaptation or adaptability. Distributional and normative concerns are central to the question of what kind of resilience and for whom? As Pendall *et al.* (2007: 14) note:

Slow burns (slow-moving crises), unlike shocks, tend to be corrosive of regional unity...they can exacerbate division among constituencies who perceive that resource levels or allocations are shifting, creating winners and losers as resource supply falls out of step with demand...they can lead to flight by those who have enough resources to leave but too few to win in competitions for the regions' remaining resources, a form of regional survival of the fittest...incremental changes to the reigning institutional tissue in organizations and practices can upset the political and social balance of power, creating tensions across generations, regional tenure, ethnicity, political affiliation, and geographic location.

The ideological and political content and meaning of language is important. In the US context, resilience is imbued with American values of heroic individualism, self-reliance, distrust in government and the need for people and places to demonstrate their resilience in the face of adversity (Pendall *et al.* 2007). Indeed, the political construction of adaptation and adaptability narratives has become especially important for old industrial regions as they seek to articulate stories of recovery in the context of inter-territorial competition for investment, workers, residents and visitors. Transformative interventions have been central in attempting to construct meaningful narratives of change to convince within and outwith that places have “bounced back” and “turned a corner” (Pendall *et al.* 2007: 18). While seeking distinctiveness, such regenerative practices have involved similar material and symbolic changes, often focused on consumption-oriented services, signature architecture and public art in central urban cores (Turok 2008).

In the politics of adaptation and adaptability integral to resilience, nation states are centrally important agents in framing and narrating development paths in places. For example, through the autonomy, scope and resources they afford national, regional and

local institutions to interpret and conceive of adaptation or adaptability and the adequacy (or otherwise) of their adaptive capacities to effect change in evolutionary pathways in desired directions. Value judgements and political choices are bound up with definitions of adaptation or adaptability and decisions concerning appropriate strategies and pathways. State authority exerts powerful roles in scripting the narrative, albeit often contested, of what adaptation and adaptability could or should mean. The markedly different strategies for managing coal industry contraction in old industrial regions in the UK and Germany, for example, demonstrates how contrasting values, priorities, national and regional regulatory systems and institutional arrangements framed adaptation and adaptability capacities, strategies and paths. In the shared context of changing international energy markets and EU state aid policies, the UK followed a path of privatisation, deregulation and industrial confrontation. An adaptation trajectory was marked out of accelerated rationalisation in regions such as North East England, South Yorkshire and South Wales and post-industrial transformation and service sector growth (Pike *et al.* 2006). Whereas in Germany in the Ruhrgebiet joint decision-making involving employers, unions and public authorities promoted a very different kind of adaptation based upon active restructuring and re-orientation of existing supply chain competences toward new growth paths in new environmental technologies and renewable energy equipment encouraged by national state energy policy (Grabher 1993).

Addressing the question of what kind of resilience and for whom? foregrounds the qualitative nature of adaptation and adaptability not just their quantitative extent. The character of adaptation and adaptability raises issues of normative values, principles and priorities and their political determination. Such dialogue is important when adaptation especially in old industrial regions is long term, even generational. Coalfield communities in the UK, for example, only regained quantitative levels of employment 20 years after the demise of the pits. But the qualitative nature of employment was markedly different

with more women working, lower wages, more service sector jobs, increased use of flexible and temporary contracts and generally poorer terms and conditions (Beatty *et al.* 2006). Thinking in terms of the adaptation and adaptability of agents, mechanisms and sites to distinguish the quantitative and qualitative dimensions of resilience encourages consideration of short-term and reactive responses to shocks and longer-term and proactive strategies. The short-term necessarily confronts the quantitative aspects of immediate challenges such as job loss with fire-fighting measures to ameliorate initial negative effects. Longer term views might better engage the qualitative concerns by stepping back and reflecting upon different ways out of immediate predicaments through paths better able to withstand reoccurrence. In practice, balancing short and long term, quantitative and qualitative concerns may be evident with the possibility of longer-term thinking in relation to 'slow burn' processes, although without the stark imperatives to act.

IV Conclusions

This paper has sought to contribute to understanding and explaining the spatially uneven resilience of places to cope with profound, uncertain and volatile change. First, our concerns with the multiple conceptualisations, limited theorisation and fragmented points of entry and foci of existing multi-disciplinary approaches to resilience were outlined. Second, we demonstrated how the equilibrium-based economic approaches that emphasised adjustment to single or multiple equilibria were inadequate to explain geographically differentiated and uneven resilience. Third, drawing from evolutionary Economic Geography, we defined and developed adaptation and adaptability as concepts able to contribute to the causal explanation of resilience. Building upon Grabher and Stark's (1997) insights, we distinguished adaptation as the geographically uneven ways in which strong and tightly connected social agents in places respond,

cope with and shape movements towards pre-conceived paths in the short-run. Inter-related and in tension or complementary with adaptation, we interpreted adaptability as the geographically differentiated capacity of loosely and weakly connected social agents in places to interpret, frame and effect multiple evolutionary trajectories over time. We utilised examples from old industrial regions to outline a preliminary analytical framework based upon agents, mechanisms and sites and identified three ideal-typical pathways (enhanced, steady state/neutral, denuded). Last, we addressed the tensions between adaptation and adaptability to examine the neglected normative, political and policy dimensions of resilience. Here, we emphasised the importance of power relations and the role of nation states in framing and responding to the question of what kind of resilience and for whom at the regional and local levels.

In conclusion, despite its somewhat chaotic (Sayer 2000) and fuzzy (Markusen 1999) current nature, we see merit in the further conceptual and theoretical development of resilience. Rather than using its shortcomings to dispense with the idea, at this stage of its development, we see value in prompting further cross-disciplinary research on the resilience of places. We have sought to demonstrate how evolutionary approaches in Economic Geography provide a means of understanding and explaining the geographically differentiated and uneven resilience of places. In contrast to the narrow explanatory frame of equilibrium-based accounts and their emphasis upon adjustment to single or multiple equilibria, we have elaborated to concepts of adaptation and adaptability in a framework organised around agents, mechanisms and sites. We intend that our contribution stimulates a constructive and reflective dialogue about more conceptually and theoretically robust notions of resilience regionally and locally.

Facing uncertainty, rapid change and resonant events, policy interest has focused upon how places can “rebound” (Hill *et al.* 2008: 3) and cultivate greater resilience, with case

analyses of places “snapping back” (Foster 2007b: 27). But how can regional and local institutions develop adaptive capacities better able to read, respond and promote adaptation or adaptability, especially given the turbulence and flux in the context of ‘state rescaling’ (Lobao *et al.* 2009)? Identifying appropriate points and moments for intervention is complex and difficult but critical in adaptation and adaptability processes when doing nothing is seldom a viable option because as the economy evolves “social agents are unable to ‘sit out’ events” (Clark *et al.* 1986: ix). Our analysis suggests, first, that the longstanding binary of specialisation versus diversification remains influential in discussions of what kinds of regional and local economies might be prone to adaptation or demonstrate adaptability. Evolutionary Economic Geography has emphasised related and unrelated variety (Frenken and Boschma 2007), promoting its importance for ‘constructing regional advantage’ amongst EU policymakers (Cooke *et al.* 2006). New notions of ‘diversified specialisation’ warrant attention to try and balance specialisation for relative competitiveness and growth in specific economic activities with sufficient diversification to prevent over-dependence upon narrow economic bases. Second, resilience underlines the need for intelligent institutional leadership with a heightened sensitivity and/or preparedness for rapid and pervasive changes. Such leadership would be capable of framing and articulating the nature of the event, crisis or slow-burn process and constructing a discursive narrative of strategic adaptation or adaptability able to enrol regional and local actors. Literally making sense of the moment with credibility and authority should not be underestimated in what can be confusing, uncertain and fearsome circumstances for people and places. Third, the cross-cutting nature of adaptation and adaptability challenges implies institutional co-ordination of multiple actors vertically across and horizontally between multiple spatial levels, from the supra-national to the local. Last, a degree of stability in institutional arrangements through having standing rather than temporary bodies would allow the construction of a knowledgeable staff and reflective set of strategies and practices. This kind of

'institutional memory' and 'permanence' (Bailey *et al.* 2008) appears central to constructing and nurturing adaptive capacity in place (Pike 2002). Affording a degree of continuity in the ability of institutions in places to interpret and make sense of disruptive challenges is preferable to any simple reactive and/or 'off-the-shelf' response.

Acknowledgements

Thanks to the Editors of the Special Issue for the invitation to contribute and editorial advice and the reviewers for their valuable comments. The usual disclaimers, as always, apply.

References

Adger, W. N. (2000) "Social and ecological resilience: are they related?", Progress in Human Geography, 24, 3, 347-364.

Bailey, D., Chapain, C., Mahdon, M. and Fauth, R. (2008) Life After Longbridge: Three Years On: Pathways to Re-employment in a Restructuring Economy, Birmingham Business School and The Work Foundation: Birmingham and London.

Beatty, C., Fothergill, S. and Powell, R. (2006) "Twenty years on: has the economy of the UK coalfields recovered", Environment and Planning A, 39, 1654-1675.

Birch, K. and Mykhnenko, V. (2009) "Varieties of neoliberalism? Restructuring in large industrially-dependent regions across Western and Eastern Europe", Journal of Economic Geography, 9, 3, 355-380.

Birch, K., MacKinnon, D. and Cumbers, A. (In Press) "Old industrial regions in Europe: A comparative assessment of economic performance", Regional Studies, 43.

Bluestone, B. and Harrison, B. (1982) The Deindustrialization of America: Plant Closings, Community Abandonment and the Dismantling of Basic Industry, Basic Books: New York.

Boschma, R. A and Martin, R. (2007) "Constructing an evolutionary economic geography", Journal of Economic Geography, 7, 537-548.

Briguglio, L., Cordina, G., Bugeja, S. and Farrugia, N. (2007) Conceptualizing and Measuring Economic Resilience, Unpublished Paper, Economics Department, University of Malta.

CLES (2008) Delivering Economic Success: An International Perspective on Local Government as Stewards of Local Economic Resilience, CLES: Manchester.

Chapple, K. and Lester, B. (2007) Emerging Patterns of Regional Resilience, Working Paper 2007-13, Macarthur Foundation Research Network on Building Resilient Regions, Institute for Urban and Regional Development, University of California, Berkeley.

Clark, G. L., Gertler, M. S. and Whiteman, J. E. M. (1986) Regional Dynamics: Studies in Adjustment Theory, Allen and Unwin: Boston.

Colbourne, L. (2008) Sustainable Development Think Piece for the SDC, Sustainable Development Commission: London.

Cooke, P. (1995) Rise of the Rustbelt, St. Martin's Press: New York.

Cooke, P. et al. (2006) Constructing Regional Advantage: Principles, Perspectives, Policies, DG Research: Brussels.

David, P.A. (2001) "Path dependency, its critics and the quest for 'historical economics'" in P. Garrouste and S. Ioannides (Eds.) Evolution and Path Dependence in Economic Ideas, Edward Elgar: Cheltenham, 151-194.

Dawley, S. (2007) "Fluctuating rounds of inward investment in peripheral regions: Semiconductors in the North East of England" Economic Geography, 83, 1, 51-73.

Dawley, S., Stenning, A. and Pike, A. (2008) "Mapping corporations, connecting communities: Remaking steel geographies in northern England and southern Poland", European Urban and Regional Studies, 15, 3, 265-287.

Duval, R., Elmeskov, J. and Vogel, L. (2007) Structural Policies and Economic Resilience to Shocks, Economics Department Working Paper 567, OECD: Paris.

Edwards, C. (2009) Resilient Nation, Demos: London.

Eich-Born, M. and Hassink, R. (2005) "On the battle between shipbuilding regions in Germany and South Korea", Environment and Planning A, 37, 4, 635-656.

Feyrer, J., Sacerdote, B. and Stern, A. D. (2007) "Did the rustbelt become shiny? A study of cities and counties that lost steel and auto jobs in the 1980s", Brookings-Wharton Papers on Urban Affairs, Brookings Institution: Washington, 41-102.

Firn, J. (1975) "External control and regional development: the case of Scotland", Environment and Planning A, 7, 393-414.

Folke, C. *et al.* (2002) Resilience and Sustainable Development, Report for the Swedish Environmental Advisory Council: Stockholm.

Foster, K. A. (2007a) A Case Study Approach to Understanding Regional Resilience, Working Paper 2007-8, Macarthur Foundation Research Network on Building Resilient Regions, Institute for Urban and Regional Development, University of California, Berkeley.

Foster, K. A. (2007b) "Snapping back: What makes regions resilient?", National Civic Review, 184, Fall, 27-29.

Frenken, K. and Boschma, R. (2007) "A theoretical framework for economic geography: industrial dynamics and urban growth as a branching process", Journal of Economic Geography, 7, 635-649.

Gonzalez, S. (2006) "Scalar narratives in Bilbao. A cultural politics of scales approach to the study of urban policy", International Journal of Urban and Regional Research, 30, 4, 836-857.

Goodwin, M. (2004) "Recovering the future: a post-disciplinary perspective on geography and political economy" in P. Cloke, P. Crang and M. Goodwin (Eds.) Envisioning Human Geographies, Arnold: London, 65-80.

Grabher, G. (1993) "The weakness of strong ties: the lock-in of regional development in the Ruhr Area" in G. Grabher (Ed) The Embedded Firm: On the Socio-Economics of Industrial Networks, Routledge: London, 255-277.

Grabher, G. (2009) "Yet another turn? The evolutionary project in Economic Geography", Economic Geography, 85, 2, 119-127.

Grabher, G. and Stark, D. (1997) "Organizing diversity: evolutionary theory, network analysis and postsocialism", Regional Studies, 31, 533-544.

Harrison, B. (1984) "Regional restructuring and 'good business climates': The economic transformation of New England since World War II" in L. Sawers and W. Tabb (Eds.) Sunbelt/Snowbelt, Oxford University Press: New York, 48-96.

Hassink, R. (2007) "The strength of weak lock-ins: the renewal of the Westmünsterland textile industry", Environment and Planning A, 39, 5, 1147-1165.

Hassink, R. and Shin, D-H. (2005) "Guest editorial: The restructuring of old industrial areas in Europe and Asia", Environment and Planning A, 37, 571-580.

Hill, E. W., Wial, H. and Wolman, H. (2008) Exploring Regional Resilience, Working Paper 2008-04, Macarthur Foundation Research Network on Building Resilient Regions, Institute for Urban and Regional Development, University of California Berkeley.

Hudson, R. (1989) Wrecking a Region: State Policies, Party Politics and Regional Change in North East England, Pion: London.

Hudson, R. (2005) "Rethinking change in old industrial regions: reflecting on the experiences of North East England", Environment and Planning A, 37, 581-596.

Hudson, R. (2007) "Regions and regional uneven development forever? Some reflective comments upon theory and practice", Regional Studies, 41, 9, 1149-1160.

Jones, M. (2008) "Recovering a sense of political economy", Political Geography, 27, 377-399.

- Kaplan, H. B. (1999) "Toward an understanding of resilience: A critical review of definitions and models" in M. D. Glantz and J. L. Johnson (Eds.) Resilience and Development: Positive Life Adaptation, Kluwer Academic/Plenum: New York, 17-83.
- Lobao, L., Martin, R. and Rodríguez-Pose, A. (2009) "Editorial: Rescaling the state: new modes of institutional–territorial organization", Cambridge Journal of Regions, Economy and Society, 2, 1, 3-12.
- Lovering, J. (1999) "Theory led by policy: the inadequacies of the 'new regionalism' (illustrated from the case of Wales)", International Journal of Urban and Regional Research, 23, 379-395.
- MacKinnon, D., Cumbers, A., Pike, A., Birch, K. and McMaster, R. (2009) "Evolution in economic geography: Institutions, political economy and adaptation", Economic Geography, 85, 2, 129-150.
- MacLeod, G. and Jones, G. (2007) "Territorial, scalar, networked, connected: In what sense a 'regional world'?", Regional Studies, 41, 9, 1177-1191.
- Markusen, A. (1999) "Fuzzy concepts, scanty evidence and policy distance: the case for rigour and policy relevance in critical regional studies", Regional Studies, 33, 869–84.
- Martin, R. and Sunley, P. (2006) "Path dependence and regional economic evolution", Journal of Economic Geography, 6, 395-437.
- Martin, R. and Sunley, P. (2007) "Complexity thinking and evolutionary economic geography", Journal of Economic Geography, 7, 5, 573-601.
- Pendall, R., Foster, K. A. and Cowell, M. (2007) Resilience and Regions: Building Understanding of the Metaphor, Working Paper 2007-12, Macarthur Foundation Research Network on Building Resilient Regions, Institute for Urban and Regional Development, University of California, Berkeley.
- Pike, A. (2002) "Task Forces and the organisation of economic development: the case of the North East region of England", Environment and Planning C, 20, 717-739.
- Pike, A. (2005) "Building a geographical political economy of closure: The closure of R&DCo in North East England", Antipode, 37, 1, 93-115.
- Pike, A. (2007) "Whither regional studies?", Regional Studies, 41, 9, 1143-1148.
- Pike, A. Rodríguez-Pose, A. and Tomaney, J. (2006) Local and Regional Development, Routledge: London
- Richardson, R., Belt, V. and Marshall, J. N. (2000) "Taking calls to Newcastle: The regional implications of the growth in call centres", Regional Studies, 34, 4, 357-369.
- Rodríguez-Pose, A., Tomaney, J. and Klink, J. (2001) "Local empowerment through economic restructuring in Brazil: the case of the greater ABC region", Geoforum, 32, 4, 459-469.
- Sayer, A. (2000) Method in Social Science: A Realist Approach, Second Edition, Routledge: London.

Sunley, P. (2008) "Relational economic geography: A partial understanding or a new paradigm?", Economic Geography, 84, 1, 1-26.

Swanstrom, T. (2008) Regional Resilience: A Critical Examination of the Ecological Framework, Working Paper 2008-7, Macarthur Foundation Research Network on Building Resilient Regions, Institute for Urban and Regional Development, University of California, Berkeley.

Turok, I. (2008) "A new policy for Britain's cities: Choices, challenges, contradictions", Local Economy, 23, 2, 149-166.

Vale, L. J. and Campanella, T. H. (2005) The Resilient City: How Modern Cities Recover from Disaster, Oxford University Press: New York.

Whitehurst, F.C. (2007) The Use And Misuse Of Clusters in Economic Development Policy: A Case Study of Two Cluster Policy Initiatives in The North East Of England, Ph.D. Thesis, CURDS: Newcastle University.