



# Mapping Economic Resilience: Literature review

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with Elizabeth Cox for nef

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# 1

## Understanding resilience

The term 'resilience' has emerged as an analytical concept in a variety of disciplines including ecology, engineering and psychology and, more recently, in a range of other social sciences, including economics, economic geography, regional studies and sustainable development. The recent surge of interest in the concept can perhaps be traced to a growing awareness of the fragility of social, economic and ecological systems in the light of the shocks or threats posed by global phenomena such as climate change, resource scarcity and global financial volatility and crises (Young *et al.* 2006; Adger and Brown 2008). In the economic sphere, the financial crisis of 2008–09 has fundamentally challenged many of the assumptions of neo-classical economics, in particular notions of general equilibrium and the efficiency of markets, which has opened up an intellectual space for more heterodox approaches to understanding the economic resilience of localities, regions or states.

Rather than a comprehensive review of resilience literature, this review is intended to identify key themes relevant to the concept of economic resilience. It is organised as follows:

- Section 2 sets out three conceptions of resilience found across different academic disciplines.
- Section 3 focuses on the concept of resilience as an adaptive process, and considers this in the context of socio-economic systems.
- Section 4 considers some criticisms of the concept of resilience as an adaptive process.

# 2

## Three conceptions of resilience

Three main conceptions of resilience can be identified in the literature:

- single equilibrium or 'steady state' notions of resilience;
- multiple equilibria notions;
- evolutionary or 'complex adaptive systems' models of resilience.

### SINGLE EQUILIBRIUM

The intellectual roots of the term 'resilience' lie in ecology, and in particular the work of C.S. Holling who, in a seminal paper based on observations of predator behaviour, defined resilience as the capacity to continue to exist in a domain in the face of change. He proposed that 'resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist' (Holling 1973: 17).

This notion of resilience focuses on a steady state with a single equilibrium point where the resistance to a disturbance and the speed of return to the pre-existing equilibrium are the variables for measuring resilience (Pimm 1984; Berkes and Folke 1998; Adger 2000). This concept of resilience has also been described as 'engineering resilience' (Pendall *et al.* 2010). Equilibrium based approaches have been applied to natural disasters, forecasting the likelihood of catastrophic events and systemic breakdowns and their social and economic implications (Vale and Campanella 2005 in Pike *et al.* 2010). In psychology,

similar equilibrium approaches to resilience have been used to describe an individual's capacity to function during key life-transitions and events (Kaplan 1999 in Pike *et al.* 2010).

In the economic sphere, there are parallels between single equilibrium models of resilience and neo-classical economic assumptions of the market economy being in a general state of equilibrium measured by such macro-economic variables as the level of (full) employment, inflation and output or economic growth (Simmie and Martin 2010: 29). A shock or disturbance to the economy moves it off its equilibrium growth path but the neo-classical assumption is that self-correcting market forces and adjustments eventually bring it back into a longer-term equilibrium position.

## MULTIPLE EQUILIBRIA

The single equilibrium notion of resilience is limited by its assumption that 'systems' (whether they be ecological, social or economic) revolve around a single steady state. Neo-classical economics, for example, has been widely criticised for this assumption, which itself rests upon assumptions around the role of free markets and perfect information in enabling rapid returns to equilibrium. Such an approach also ignores the existence of different economic scales (e.g. region, nation, global economy) and the important role of markets and the State at these scales (Pike *et al.* 2010: 61).

In nature, ecologists, including Holling (1973), have argued for a more sophisticated understanding of resilience that incorporates the notion of 'multiple equilibria'. This sense of resilience emphasises conditions where disturbances can project a system from one equilibrium to another (Folke 2006). In these models, the analytical focus on speed of return to a single equilibrium is replaced by a focus on explaining the length of residence in a particular 'basin of attraction' (Holling 1973). In this multi-equilibrium model, systems are seen as 'complex, non-linear and self-organizing and permeated by uncertainty and discontinuities'. Resilience in this context is a measure of robustness and buffering capacity of the system to changing conditions (Berkes and Folke 1998: 12).

Again, parallels can be drawn across other disciplines. In psychology, it is widely recognised that trauma or stress can result in permanent changes to human functioning, whether it be 'making you stronger' or a lowering of functioning, as with chronic stress (Pendall *et al.* 2010). In economic geography, institutional economics and political science, the concepts of 'path dependency' and 'lock-in' refer to alternative equilibria or trajectories (usually sub-optimal) that national or regional economies follow as a consequence of specific contexts, historical circumstances or policies. This may include deregulation, the strength of trade unions or the co-existence of certain types of firm (Hassink 2010; Simmie and Martin 2010). This concept of lock-in is examined further in the context of socio-economic systems in Section 3.

Hassink refers to the notion of 'institutional tissues', which consist of 'things that pattern behaviour such as norms, rules, and laws' (Hassink 2005 in Pendall *et al.* 2010: 75), including organisations such as political administrations at all spatial scales, and large

enterprises. Institutional economists also describe lock-in as a situation when the cost of switching from one technology to another is significantly higher than the short-term benefits. For example, the investment required to switch from fossil fuels to renewable energy sources to address climate change could be seen as a problem of this type (Hart 2009 in Pendall *et al.* 2010).

## ADAPTIVE

Equilibrium based approaches to resilience view it as a property of a system to return to a pre-existing state or be in a new state. An alternative view is to see resilience as the capacity to support a process of evolution of a system over time. This kind of adaptive systems thinking also has its roots in ecological science, where the concept of the 'adaptive cycle' describes four phases of a process of evolution that require different levels of resilience (capacity to adapt) over time (Pendall *et al.* 2010; Holling 1992; Holling and Gunderson 2002):

- 1 A **renewal/re-organisation** phase, with high levels of innovation, restructuring and uncertainty. Reorganisation is both a time of crisis and an opportunity for learning and strengthening the ability to respond to future change. As such, resilience is described as high during this phase because of the multiple trajectories that are possible depending on external forces.
- 2 A **growth/exploitation** phase, accompanied by rapid growth and the seizing of opportunity. Resilience is described as high in this phase but on the decrease.
- 3 A **stability/conservation** phase – a time of stability, certainty and increased rigidity with low resilience.
- 4 A **decay/release** phase – a time of collapse, uncertainty and 'creative destruction' with resilience low but increasing as the cycle returns to the reorganisation phase.

Adaptive cycles of particular ecosystems do not exist in a vacuum but are influenced by other adaptive cycles at different scales and time periods. They are 'nested' within larger systems and feedback from these systems will affect the length and strength of the four cycles. A forest, for example, is at once a sub-system of a larger ecological system and a super-system within which multiple sub-systems of flora, insects, birds and soil exhibit adaptive cycles (Pendall *et al.* 2010: 78).

The concept of multiple scales of activity interacting in this fashion has been described as 'panarchy' in the socio-ecological resilience literature. Gunderson and Holling (2002) chose the term specifically to avoid the term 'hierarchy' which is 'burdened by the rigid top-down nature of its common meaning' (Holling *et al.* 2002: 74). In a panarchy, there are different scales at which adaptation occurs but the higher and larger scales are not privileged; indeed panarchy celebrates fast-moving decentralised structures that are the source of system adaptability.

## SUMMARY

Many authors, mainly economic geographers or institutional economists, argue that the adaptive, or evolutionary, concept of resilience is superior to equilibrium approaches when applied to economic regions (Christopherson *et al.* 2010; Simmie and Martin 2010; Cox and Johnson 2009). The argument is that economic regions must be understood in terms of the variables of time and space, both of which are constructed via human action and social relations. Regions are 'manifestations of political and economic processes constituted by human action and as such should be understood as being in a constant process of transition' (Christopherson *et al.* 2010: 4). Simmie and Martin (2010: 41) argue that economic regions are never in equilibrium because they are comprised of firms, organisations and institutions that are continually changing and adapting to their economic environments in the face of a 'restless capitalism'. These changes are increasingly driven by the creation, acquisition and commercial exploitation of new knowledge.

This literature review will focus on this adaptive notion of resilience to develop an understanding of economic resilience.

# 3

## Application to socio-economic systems: Key themes

### **RESILIENCE OF SOCIAL AND ECONOMIC SYSTEMS**

Resilience has become a key concept in socio-ecological systems literature and there appears to be some consensus in this field around the three definitions outlined above. Common patterns can be identified between resilience concepts applied to social-economic systems (Gunderson and Holling 2002; Berkes *et al.* 2003).

In considering economic resilience, it is important to emphasise social qualities – the human dimension. In particular, people provide capacities absent in systems without humans, including anticipating and planning for crises, modifying ecological properties and potential responses to these through technology, and enhanced abilities for learning and management (Gunderson 2009; Berkes and Folke 1998). Drawing on concepts of personal resilience from psychology literature, we can identify an interplay between personal resilience and the resilience of social systems. It is conceivable that developing personal resilience can also be a strategy for having an impact on resilience of a community or area.

It flows from this that the capacity to adapt is endogenous to society. Socially constructed limits to adaptation have been described by Adger *et al.* (2008) as comprising: values (what is important to society), knowledge (how and what we know), risk (how and what we perceive), and culture (how we live).

Resilience can broadly be defined as the ability of a system to cope with external shocks as they arise. But what does 'cope' actually mean? The literature

suggests three elements, and the following is based upon and adapted from Holling 1973, Carpenter *et al.* 2001, Adger *et al.* 2004, Adger and Brown 2008 and Walker and Salt 2006.

### **1 The ability of a system to retain its basic function whilst absorbing disturbance and undergoing change and reorganisation.**

This is not the same as the single equilibrium conceptions of resilience set out in Section 2, as the system is undergoing change rather than returning to the pre-existing state, although it is more consistent with the multiple equilibria notion. The timescale of the disturbance in question is important. Pendall *et al.* (2010: 81) suggest that quite different approaches should be used for 'shocks' than for 'slow-burn' phenomena. In the case of the former, for example the impact of a hurricane, we might expect key indicators such as employment to resume either their pre-shock levels or their pre-shock trajectories. In contrast, for slow-burn challenges such as deindustrialisation, the focus should not be upon equilibrium but on relative, historical change – so, for example, the rate of job loss, changes in income over time or the integration of immigrants into the regional economy. The point of reference is the 'constantly changing recent past'.

### **2 The degree to which the system is capable of 'self-organisation'.**

The ability of a socio-economic system to self-organise is related to the extent to which reorganisation is endogenous rather than forced by external drivers. Self-organisation is enhanced by a common intention (Cox and Johnson 2009) and the presence of social networks that facilitate innovative problem solving (Carpenter *et al.* 2001: 765).

### **3 The degree to which the system can innovate and learn in face of disturbances.**

Research by Pelling *et al.* (2008) has shown that adaptive capacity arises out of 'social learning', which is embedded in social relationships and relational qualities such as trust, learning, and information exchange. This is based on the theory that social ties of everyday social interaction may be a community's best resource in maintaining a capacity to change collective direction.

Economic resilience cannot be isolated from social and ecological resilience, as these systems are interdependent.

Resilience to ecological system shocks is often the product of systemic learning from past crisis events (Grove 1997; Berkes 2008). National mechanisms for disaster/crisis management in the UK show evidence of adaptive learning from shortcomings revealed each time they are put into practice (Rogers 2011; Gunderson 2009). Young *et al.* (2006: 311) argue that reflexivity is a central attribute of the adaptive capacity and the resilience of social systems, and there will be a disparity between the capacity of social systems to respond to environmental disturbance and to rebuild resilience, when compared with biophysical systems.

Bartley (2008) explored why some 'deprived' communities are more resilient than others to external shocks, for example a sudden loss of employment opportunities. The findings suggest that it is social capital that holds a community together in such circumstances. Cahn (2000) offers a broader insight into those aspects of a community that support resilience. The core economy is made up of human resources embedded in the everyday lives of individuals (time, wisdom, experience, energy, knowledge, skills), and in the relationships between individuals (love, empathy, reciprocity, teaching and learning). Cahn argues that it is the core economy that underpins the market economy, through activities such as raising children, caring for people, feeding families, maintaining households, and building friendships, social networks and civil society. These are largely un-commoditised, un-priced and unpaid functions (Stephens *et al.* 2008) that are essential to supporting resilience at the individual and community level. The resilience of individuals is also found to be affected by their most significant relationships; types of schooling or training available; job opportunities and the social and legal barriers that limit choices (Bartley 2008).

Overall, this implies that in order to create the conditions for successful adaptation and enhanced resilience, which create socially just outcomes at the national to local level, it is necessary to redress inequalities such as income, health and education, in addition to supporting growth of the core economy thorough action at the institutional and macro levels.

Hence, economic resilience may be improved by building social capital and understanding, for example, or by reducing vulnerability to environmental shocks. The link between economic, social and environmental system can be stated even more strongly. Cox (2008) argues that the purpose of the economy should be to enhance the well-being of citizens, in a way that is socially just and environmentally sustainable.

Well-being is a dynamic process of mutually reinforcing feedback loops, resulting from the way in which people interact with the world around them. Subjective well-being studies suggest that, in addition to experiencing good feelings, well-being involves things such as participating in activities that are meaningful and engaging and that support individuals to feel competent and autonomous. Well-being also involves individuals being able to draw on a stock of inner resources to help support a feeling of resilience in the face of changes they cannot control; a sense of individual drive and energy (vitality); a sense of connectedness to other people, and being able to draw upon supportive relationships (Aked *et al.* 2008; Michaelson *et al.* 2009).

The concepts of social justice and environmental sustainability are combined by Coote and Franklin (2009) when they define sustainable social justice as the fair and equitable distribution of social, environmental and economic resources between people, countries and generations. This has implications in terms of the access and control over resources (productive and other), and the distributional share of the impact on the planet's biocapacity resulting from the use of these resources. In the UK, in general, the poorest 10 per cent of households produce only 45 per cent as much CO<sub>2</sub> emissions from their

homes as the richest 10 per cent (Roberts 2008), implying a need for demand reduction amongst 'over-consumers' is as important as addressing under-consumption.

## SCALE: NATIONAL AND LOCAL RESILIENCE

Scale is a key concept in theories of social-ecological resilience, as we have seen. Holling's original work showed adaptive cycles operate at different scales of space and time. Resilience is to a large extent an outcome of panarchy, or the ways in which cycles at these different scales interact (Holling *et al.* 2002)

Although adaptation by fast-moving small-scale local systems may drive change at a larger scale, the reverse may also be true, with interactions between small-scale systems being inhibited by slower changing national systems. A key example of this is the phenomenon of 'carbon lock-in', where a shift from fossil fuel use by individuals, households and even local communities is blocked by social, technical and political/institutional barriers that exist at larger scales, regionally, nationally and internationally (Unruh 2000, 2002; Mitchell 2008).

The set of resilience indicators developed in a community produced local economic plan in Totnes, Devon (Hodgson and Hopkins 2010), with a focus on re-localising the production of goods and services, differed markedly from those derived from a sustainability framework that included the perspectives of a regional authority and the importance of understanding the interdependence between areas (Cox 2008).

Although a level of re-localisation of certain supply chains may be necessary to build local economic resilience by supporting diversity in the economy of an area, this does not mean that the local economy can become independent of regional and national economies, and indeed extreme localisation may in fact reduce resilience (North 2010).

In Denmark, for example, grassroots innovators played a central role in the creation of a world-leading wind energy industry (Smith 2003). Currently, over 80 per cent of Denmark's wind turbines are owned by co-operatives, local companies, or individuals (Assadourian 2008). This was facilitated by government support through feed-in tariffs, whereby renewable energy producers obtained a set price for the electricity they provided to the grid. As a result, over 20 per cent of Denmark's energy now comes from wind. Wind energy is the most commercially competitive renewable energy source. In the UK, however, it still faces a number of barriers. These include public opposition, embedding wind generators into electricity distribution networks, and land-use planning. Key to note is that local ownership and resulting local profits were key drivers of public acceptance in Denmark (Daugaard 1997; Poetter 2007).

Ostrom (1990) emphasises the importance of small-scale and fast and accurate feedback loops, arguing that smaller systems of governance, for example, are more capable of avoiding 'free riders' and collective action problems that are often associated with decisions on resources.

For Ostrom, this means clearly defined boundaries, equivalence between benefits and costs of using the resource, clear lines of accountability, minimal recognition of rights to self-organise, and long-term tenure rights to the resource. For resources that are part of a larger system, Ostrom argues for appropriate provision, monitoring and enforcement organised in multiple layers of 'nested enterprises', equivalent to the nested adaptive cycles described above as features of panarchy.

## GLOBALISATION AND DIVERSITY

Globalisation can be seen to have enhanced the connectedness and interdependence of socio-ecological systems and regional economies, meaning that multi-scalar approaches are more appropriate to understanding the resilience of these units than equilibrium approaches (Young *et al.* 2006). The globalisation of finance and trade, in particular, mean that policies and decisions made by multinational institutions or companies (or governments) can have direct effects on the economic trajectories of regions, de-industrialisation being an obvious example (Adger and Brown 2008). Globalisation involves 'time–space compression' (Harvey 1989) in which actions taken in one place may have direct and immediate consequences in other places worldwide.

Globalisation is also held to reduce diversity – a key tenet of the adaptive conception of resilience – in many realms, including biodiversity, language diversity, technological diversity and diversity of tastes, preferences and values (Young *et al.* 2006). This principle of diversity is highly relevant to economic resilience, in particular in local enterprises and supply chains (Conisbee *et al.* 2004), as well as to financial system resilience (Nissan and Spratt 2009; Haldane and May 2011).

Regional development policy in most developed economies is focused on competition and growth in the context of a global economy, and in particular global competition for capital and labour (Bristow 2010). A region's ability to attract foreign direct investment and skilled labour, for example, in the face of fierce global competition for jobs, is seen to be key in maintaining steady growth or full employment. These are key indicators of resilience in the equilibrium approaches described above (Simmie and Martin 2010). In contrast, the adaptive resilience approach emphasises the endogenous qualities of a region, in particular its capacity to constantly adapt to change at micro and macro levels. Terms such as 'knowledge economy', 'learning economy' or 'learning region' are used to describe the capacity of the region to innovate, and factors such as the flexibility of local or regional networks, social capital, education and innovation are seen as key characteristics (OECD 2001; Porter 2003; Moulaert and Sekia 2003).

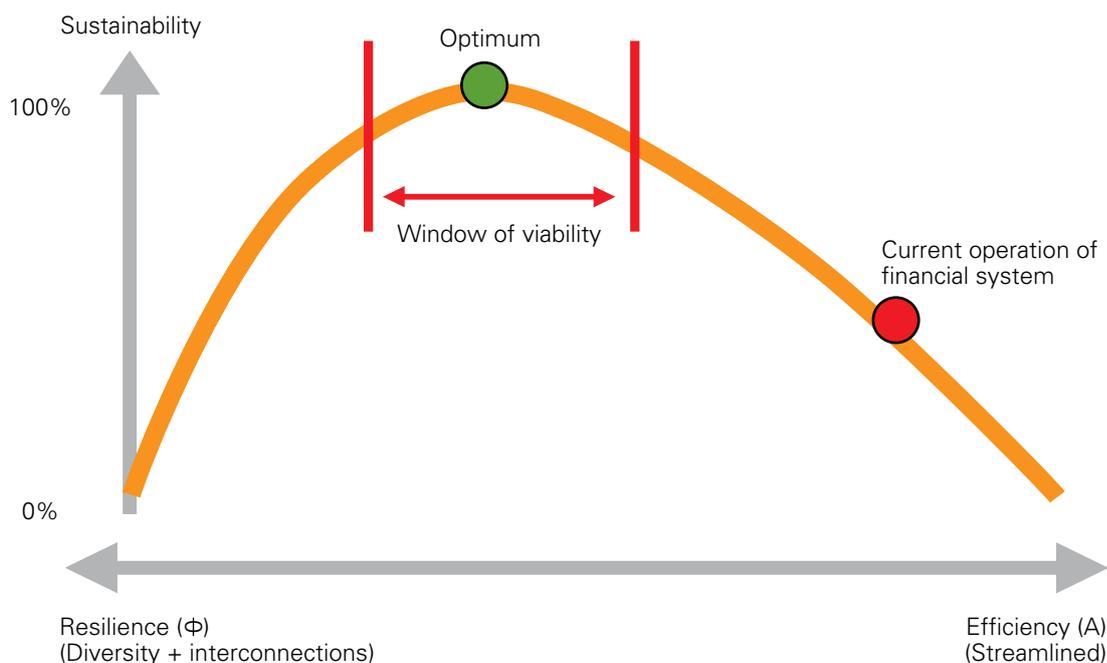
Simmie and Martin (2010) also explore the trade-offs or conflicts between connectedness and resilience. They compare the resilience of the cities of Cambridge and Swansea and suggest the more internally connected the regional system, the more structurally and functionally rigid and less adaptive it may become, thus emphasising the need for a diversity (or balance) of goods and services being produced at this spatial scale.

## RESILIENCE VS. EFFICIENCY

Research into ecological systems has identified that there is a trade-off between efficiency and resilience. Economics has tended to focus on maximising efficiency with little concern for resilience. However, the significance of the trade-off is that the quality of resilience should not be maximised at the expense of efficiency, but optimised at a level that strikes a balance between resilience and efficiency (Haxeltine and Seyfang 2009). Lietaer *et al.* (2012: 83) demonstrate the concept of an over-efficient and under-resilient financial system (see Figure 1). They make the case that financial systems based on monopoly fiat currencies<sup>1</sup> lack resilience to economic shocks, and in particular to 'confidence' shocks that restrict the issuance of credit by banks.

Over-emphasis has been placed on efficiency in the fairly narrow terms of neo-classical economics, i.e. larger currencies have lower transaction costs. The optimum currency scale is not necessarily the nation state; however, Mundell (1961) and Jacobs (1984) argue that the city-region is the optimum scale for currencies because it is at this level where the vital economic development dynamics of import replacement and import substitution are most efficiently carried out. From an adaptive resilience perspective, then, a city-region currency could create stronger feedback loops between different scales in the 'panarchy' of socio-economic systems. Regions with their own currencies might be better placed to adjust to de-industrialisation, for example, if their currency depreciates against neighbours who have adapted more quickly.

**FIGURE 1**  
The trade-off between efficiency and resilience.



<sup>1</sup> A fiat currency is one whose acceptability is underpinned by its use by governments as legal tender and in acceptance for payment of taxes, rather than as a result of having intrinsic value or being backed by reserves.

More generally, the focus on economic efficiency is narrow not just because it ignores resilience, but it could also be argued that apparent economic efficiency simply masks significant socio-ecological inefficiency evidenced for example by high rates of youth unemployment or the volume of food waste in developed nations. The (un)Happy Planet Index (Marks *et al.* 2006) attempts to demonstrate this by calculating how effectively economies translate planetary resources into well-being (long and happy lives), and as such redefines efficiency in terms of social and ecological outcomes.

## ADAPTATION AND ADAPTABILITY

Grabher and Stark (1997) develop the notion of 'adaptive capacities' to refer to the differential abilities of places to adapt, emphasising the causal importance of a rich diversity of organisational forms, strong and weak ties between social sectors within social networks, the learning of new skills and even re-learning of old skills. In a study of post-socialist regimes following the fall of the Berlin Wall, they distinguish between adaptation and adaptability as characteristics of resilience.

The adoption of rapid and wholesale marketisation and privatisation of industry and government by the transition economies may have helped them to adapt to the global economy in the short term but, Grabher and Stark argue, they reduced their adaptability in the longer term by reducing institutional diversity (Grabher and Stark 1997: 534). Pike *et al.* (2010) argue that this distinction is useful, suggesting we can understand adaptation as a movement towards a pre-conceived path in the short run (in this case, Western notions of economic efficiency through opening up industries to market discipline) whereas adaptability is 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' (Pike *et al.* 2010: 62).

## VALUES, ASSUMPTIONS AND FRAMING

Resilience should not be seen as a value-free quality. A resilient system could be socially unjust and ecological unsustainable. It is important to reveal underlying values and assumptions that frame any definition of resilience, or more importantly any attempt to develop it as a quality of a system.

One reason for 'fuzziness' in resilience theory when applied to socio-economic systems may be the difficulty inherent in transposing the assumed objectivity or neutrality of natural scientists to the study of human beings. Resilience theorists have been accused of failing to properly address the question of 'what kind of resilience and for whom' (Pike *et al.* 2010; Swanstrom 2008; n.b. Carpenter *et al.* 2001). In particular, criticism has focused on resilience theorists' failure to engage with or conceptualise the impact of power relations and the broader political-economic frameworks that shape socio-economic systems (Swanstrom 2008; Hudson 2010). As Pike *et al.* (2010: 66) put it, central to explaining the adaptive capacity of socio-economic systems is 'an understanding of how power relations, politics and the uneven contestation and cooperation 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.'

Resilience when applied to socio-economic systems is a socially constructed concept. Indeed, a system is an analytical construct that picks out certain sets of relationships above other important features of a complex, messy reality. Such a model can describe and analyse the same reality in a number of different ways, according to the framing, meaning the decisions about which features to emphasise or exclude.

In other words, the answers to the question, 'Resilience of what, to what?' depend on framing. For example, approaches to economic resilience framed around a requirement for economic growth look very different from those that ask how to provide the material conditions for well-being in circumstances under which growth may not be possible (Heinberg 2011). For instance, the UK's Strategic National Framework on Community Resilience stresses the importance of maintaining global food supply chains (Cabinet Office 2011: 7–8), a marked contrast with the Transition movement's emphasis on eliminating dependence on these (Hopkins 2008). The Common Cause report (Crompton 2010) highlights the importance of making framing explicit, both in order to express openly the values behind one's own position, and to oblige others to reveal what may be hidden values and agendas behind their own.

One danger with positing resilience as a 'process', as in the adaptive model, is that it neglects the role of agency and structure, an accusation also levelled at regional studies more generally by Markusen (1999: 713). The role of the state and financial and industrial elites, in particular, is perhaps under-theorised in much resilience theory (Pike *et al.* 2010; Swanstrom 2008). Pike *et al.* (2010: 66) point to the very different strategies for managing the coal industry in old industrial regions in the UK and Germany, with outcomes for regions primarily driven by (state) actors adopting contrasting political ideologies leading to contrasting regulatory and institutional arrangements. As Swanstrom (2008: 16) points out, 'we do not start from a state of nature but from a civil society in which resilience is shaped by laws, policies and very human institutions'.

There does appear to be a tension in the fact that whilst most ecological resilience theorists are happy to acknowledge that there is a key difference between socio-economic and ecological systems in terms of human beings' capacity to reflect, predict future activity, and learn, they are less prepared to themselves take or reveal normative positions in their work. Nevertheless, it is widely accepted that the goal of resilience studies in ecology is to ensure ecological sustainability – hence the many articles quoted in this review that develop policy recommendations aimed at natural resource managers (Swanstrom 2008; Hanley 1998). Sustainability in the socio-economic context, however, requires political decisions for which there will be winners and losers. The difficulty of developing an international agreement on limiting carbon emissions between developed and developing countries illustrates this only too well. Thus, the distributional

consequences of sustainability and resilience cannot be ignored (Adger 2000: 354) and should be given much more attention by resilience theorists, including through the adoption of more normative approaches when applying resilience thinking to socio-economic systems (see also Markusen 1999: 713).

The resilience theorists who have taken on more normative positions have generally argued for resilience to be more explicitly aligned in opposition to the dominant neo-liberal policy agenda that neglects both ecological sustainability and rising inequality at regional, national and global levels (Hudson 2010; Bristow 2010). Hudson (2010) and Bristow (2010) both emphasise the hegemonic dimensions of the neo-liberal project and the way it shapes policy rhetoric, resilience outcomes and processes at a macro level. One example is the restructuring of agricultural production systems in developing countries from subsistence to cash-crop production, for example from production for domestic consumption to producing exotic fruits, vegetables and flowers for sale in export markets and, more latterly, to producing crops as a source of biofuels (Hudson 2010: 15).

It is clear that regions face macro-level challenges that are beyond their control. The decline in real wages at middle and lower income levels is a national phenomenon in much of the developed world, related to the deregulation of capital flows and globalisation of production. In concluding their study of the resilience of labour markets in metropolitan areas of the United States, Chapple and Williams Lester (2010: 102) found very few examples of regions that were able to genuinely transform themselves, either through reversing path dependency or reaching a more positive equilibrium. They conclude that resilience is 'perhaps not so much about the ability to transform, but the ability to stem decline in the face of the neo-liberal settlement' (Chapple and Williams Lester 2010: 102).

If the ultimate aim of adopting an adaptive resilience lens to inform policy is to develop more sustainable socio-ecological/economic systems, then it may be necessary for resilience theorists to address broader political and structural forces that set the boundaries for actors at regional or bio-regional levels. In recognition of this Hudson defines a resilient regional economy as one that 'has a lighter environmental footprint, displays a greater degree of internal closure, is less dependent on decisions taken elsewhere and has less vulnerability to shocks emanating elsewhere' (Hudson 2010: 13). This conception acknowledges the need, particularly in the West, to define 'economic development' not solely in terms of economic growth but also in terms of de-materialising production processes, which he views as best achieved through 'selective withdrawal and increased local autonomy via developing regional resources' (Hudson 2010: 16).

The circular economy develops this thinking of economies built on the sustainable use of resources (Boulding 1966; Braungart and McDonough 2002). Hudson (2010) references eco-industrial development (EID) as a potential avenue for greater exploration, a system where companies collaborate for mutual economic benefit, closing material loops via recycling, recovery or reuse of wastes and enhancing eco-efficiency via adjacent companies exchanging different kinds of by-product, based on bi-lateral commercial

agreements, driven by concerns to minimise risks and wastes and maximise profits (Scharb 2001; Stone 2002, in Hudson 2010: 18). EID also offers possibilities to achieve greater efficiency through economies of systems integration in which networks and partnerships between businesses deliver common services, transportation and infrastructure needs. Whether it is possible that such alternatives can work at a scale and speed fast enough to prevent ecological catastrophe without changes in national and international regulation and governance remains open to question. However, as Hudson (2010: 17) suggests, there is a need to develop alternative indicators of progress to GDP growth to achieve this, including measures of well-being, socio-spatial equity and the creation of socially useful work.

# 4

## Strengths and weaknesses of resilience in analysing socio-economic systems

One criticism of resilience theory is that it lacks conceptual clarity – there exist multiple definitions of the term applied in different ways to different subject areas. Pike *et al.* (2010: 61), in their review of the field in relation to regional studies, state that ‘basic definitional questions remain unresolved and the theorization of causal agents, relationships and mechanisms is underdeveloped.’ Resilience may be vulnerable to Markusen’s (1999) critique of regional studies as being overtaken by ‘fuzzy concepts’ (Pendall *et al.* 2010). A fuzzy concept is one that ‘posits an entity, phenomenon or process which possesses two or more alternative meanings and thus cannot be reliably identified or applied by different readers or scholars’ (Markusen 1999: 702).

A key test of ‘fuzziness’ is whether it is possible to answer the question ‘How do I know it when I see it?’ (Markusen 1999: 702). It is perhaps unclear how we define what counts as a ‘healthy’ or resilient socio-economic system when adopting the adaptive model described above, lacking as it does clear indicators of resilience as in equilibrium models.

In a similar vein, Hanley (1998: 248) accuses resilience theorists of laying out conditions for resilient economic systems that fail the Popperian test of refutability. He quotes characteristics of resilient systems, such as ‘effective government and other effective institutions’ with ‘effective’ defined as ‘a wide variety of institutions that sustain, by diverse mechanisms, multiple outcomes’ (Hanley 1998: 248). Such a definition is too broad or vague to be subject to empirical testing or to be useful in terms of informing policy, another weakness of ‘fuzzy concepts’ in Markusen’s (1999) view.

While this lack of theoretical or conceptual coherence creates a certain degree of confusion, it also has advantages. Wilding (2011) treats diversity of perspective as a virtue rather than a barrier, as it itself enhances resilience, and stresses the importance of feedback, diversity and modularity as components of resilience.

Wilding (2011: 30) proposes a 'resilience compass' with four main dimensions:

- 1 **Healthy people** (supporting individuals' physical and psychological well-being).
- 2 **Inclusive, creative culture** (generating a positive, welcoming sense of place).
- 3 **Localised economy** (within ecological limits: securing entrepreneurial community stewardship of local assets and institutions).
- 4 **Cross-community links** (fostering supportive connections between interdependent communities).

Each of these dimensions represents a single point of the compass, and communities can represent their resilience in terms of a circle that shows how well they are faring in relation to each of these.

The strength of resilience theory is that it enables us to conceptualise socio-economic systems in a holistic and dynamic fashion. A resilience framework encourages us to think about regions as interconnected systems with extensive feedback processes that must be understood for successful human intervention. It is this aspect that is of key importance when thinking about any intervention seeking to support economic resilience. It cannot be reduced to a list of economic activities, but also includes understanding the dynamic (interdependencies) between activities (economic and social), at different spatial scales and their subsequent social and environmental impact. In particular, the conception of resilience as an on-going process of social evolution, learning, creativity and adaptation to changing circumstances encourages a more normative approach to local economic development. It emphasises the importance of social capital and personal resilience for which the quality of social relationships, social justice, poverty and inequality are key variables in determining the resilience of the system, and hence brings social factors centre stage in considering building local economic resilience.

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