

**From Resilient Regions to Bioregions: An Exploration of Green
Post-Keynesianism**

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ABSTRACT

This paper develops an answer to the question of what constitutes a resilient region (Bristow, 2010) by arguing that the resilient region can be seen as a prototype bioregion. The transition from a proto-bioregion to a bioregion, and thus from proto-bioregionalism to bioregionalism proper, is examined. The paper begins with a review of the existing literature on regional resilience. The authors then explore the possible heterodox theoretical underpinnings of this approach, drawing on post-Keynesian, Marxian and green economy concepts. The paper's final section extends the theory to a bioregional conclusion, and discusses the policy approaches that might be applied to extend a resilient region into a bioregion.

Keywords: bioregion; green economy; resilient regions; post-Keynesian

JEL classifications: P16, R1, Q57, B50

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1. Introduction

Resilient regions (Bristow, 2010) and bioregions (Cato, 2012b) are, we would argue, intimately linked ideas. Though the idea of a bioregion long predates the resilient region, a bioregion can be seen as an evolution of a resilient region, or the resilient region as a prototype bioregion. Moreover, the resilient region develops naturally into a bioregion as the region's population becomes more aware of the benefits of economic localization and more prepared to accept limits on extra-regional economic and social activity because of this. In the era of climate change, neoliberalism and globalization are in need of critical reappraisal in terms of their environmental impact, as well as their social and economic impacts on the majority world. In this paper we intend to make the case for regional resilience as an intermediate step between a (neoclassical) capitalist regional economy and a green regional economy that retains a regulated and constrained market economy.

Regional resilience is an idea that is ripe for discussion in the context of Western economies that are struggling to adjust to a dramatic decrease in rates of economic growth globally and the uncertainty brought by the politics of austerity around the developed world. In this context, the oligopolistic global domination of a handful of global corporations may be seen as a threat to livelihoods; the drive for profit interpreted as a drive to enrich a small class of capital owners at the expense of the workers in ex-industrial regions (Groud et al., 2012); the drive for frictionless economic migration can be seen to undermine communities and social bonds. There is a new readiness to discuss the 'bringing home' of manufacturing and production (Bowman et al., 2013), and of the local ownership of local business geared to providing non-exploitative local employment as much as to profit maximisation.

Bioregionalism is an approach to life that has wider and deeper philosophical implications, and is intended to underpin a critical questioning of contemporary lifestyles and their social and economic costs. Supporting bioregionalism means promoting a change to a self-reliant regional economy that imports only that which is necessary and unavailable in the region; that restricts international and extra-regional travel according to the principle of 'trade subsidiarity'; that means a complete overhaul of contemporary patterns of consumption. Arguing for a bioregional approach to provisioning means shifting the terms of debate from one about quantity of material consumption to one about quality of life.

Such a complete overhaul of consumer behaviour, characterized by Jackson (2009) as an attempt to encourage ‘flourishing within limits’, cannot be achieved instantly. We see regional resilience as capturing the essential incremental changes that mark the route to bioregionalism, ensuring that consent is gained and enthusiasm developed for the bioregional project. As the advantages of creating reliable employment locally through delocalizing production, developing economic resilience by promoting local ownership, and localizing consumption by localizing the supply chain, becomes clearer, the discussion of bioregionalism will seem less abstract and more attractive beyond the environmentalist debate. Developing bioregionalism through resilient regions, rather than moving directly from capitalist region to bioregion, will also allow bioregional policy and practice to be tested and to evolve beyond the current set of abstract ideas.

The next section of this paper is used to introduce the concept of a resilient region and to explain regional resilience in the context of economic resilience. In the third sections we make an attempt to ground the notion of regional resilience with respect to heterodox economic fields including post-Keynesian economics and a Marxian economic analysis of capitalism and its crisis tendencies, and relating regional resilience to sustainable development and green economics. In the fifth section we focus on the links between a resilient region and a bioregion, by considering the resilient region as a proto-bioregion, and examining how a bioregion can grow out of the heterodox analysis of resilient regions.

2. The Resilient Region: An Introduction

The concept of a resilient region is most clearly defined by Bristow (2010) in her seminal paper on re’place’-ing regional competitiveness. This paper built on her previous paper (Bristow, 2005) on competitiveness, and appeared in a Special Issue of the *Cambridge Journal of Regions, Economy and Society* (Christopherson et al., 2010) on the resilient region. The concept of regional resilience is closely related to, and built on, the more specific idea of economic resilience (Simmie and Martin, 2010) which is itself derived from the concept of ‘resilience’ as used in the physical, engineering and ecological sciences, and has found its way into such disciplines as psychology and organization science. Reggiani et al. (2002) argue that the notion of (economic) resilience: “should be a key topic in the study of the dynamics of spatial economic systems, especially concerning how such systems respond to shocks,

disturbances and perturbations” (Martin, 2012). Regional resilience is a broad concept that is used “to capture the differential and uneven ability of places to react, respond and cope with uncertain, volatile and rapid change” (Pike, Dawley and Tomaney, 2010). These definitions differ in that the former discusses regional economic resilience and the latter deals with the resilience of the economy, society, and even the ecology of a region.

Hassink (2010) is critical towards the use of the (economic) resilience framework to understand “why some regional economies manage to renew themselves, whereas others remain locked in decline.” This is because “the resilience framework seems to stress more the recovering of existing industrial structures (adjustment) rather than the promotion of adaptation and renewal” and, more generally, the concept can be accused of “fuzziness” (Pendall et al., 2010), or at least of lacking a clear definition. Nonetheless, resilience, in both senses, can be a useful property for a region. The economic resilience of a region consists of four interconnected *dimensions* (Martin, 2012, p.12) that concern the region’s economic growth performance. Each of these dimensions addresses different aspects of the region’s economic structure including its relative competitiveness, its innovation system, skill base, entrepreneurial culture, institutions, and economic governance:

- resistance, or low sensitivity of reaction of regional economy to a recessionary shock;
- renewal, where regional economy renews its growth path or shifts to a new path;
- recovery, or the ability of the regional economy to recover from an economic shock;
- and
- re-orientation, or the adaptability of the regional economy to change.

It is not hard to see why economic resilience should be a desirable quality in a regional economy. In particular, though the concept requires some development before it can explain why some regions are more resilient than others, resilience moves beyond discussion of economic equilibrium and equilibria which dominates the (neoclassical) economics literature.

Regional resilience (Hudson, 2010) is an even more interesting concept, which encompasses and extends the idea of economic resilience. In this context, resilience is seen as a socio-ecological property that considers natural and social systems together with the economy - the region’s ability to experience positive economic success that is socially inclusive, works

within environmental limits and which can ride global economic punches (Ashby et al., 2009). Furthermore, resilience extends beyond the economic dimensions described above to social and ecological resilience, and their interaction with the economy. The resilient region (Bristow, 2010) is a region that has resilience in terms of its economy, society and ecology in the face of both short-term shocks and long-term change, with economic resilience dependent upon social and ecological resilience, and with a focus on a strong society that is an antidote to the hegemony of competitiveness. It is damaging when one-size-fits-all competitiveness policies are foisted upon regions with little regard for local contexts and no clear vision for the regional economy and society beyond narrow sets of economic performance measures. Moreover, it is suggested that neoliberal regional development strategies, often focusing on increasing competitiveness, actually erodes the resilience of the regions (Hudson, 2010) that they are - at least avowedly - aiming to develop, ending up making those regions more vulnerable than they were before being developed.

Resilient regions require diversity in the types of business, institutions and sources of energy, food and sources of employment, corresponding to the resistance dimension of economic resilience. For example, a regional economy structured around a few large manufacturers or built on the financial sector is not resilient, as any shock in these sectors could severely damage the regional economy. Resilience also suggests the need to localize and shorten food supply-chains: a shock which stops outside supplies from being shipped into the region can be compensated for if the local food production culture is strengthened and the range of businesses owned by local people is diversified, as most of what is needed can be provided locally (Bristow and Wells, 2005; Hopkins, 2008). Resilient regions require the capacity to re-organise in the event of a shock such that they can supply their core needs without the need to rely on a mutually dependent relationship with the wider world beyond an ethic of networking and information sharing (Hopkins, 2008; Korhonen, 2001). The need for localization of food supply-chains and diversity in business is more generally characterised by an emphasis on small-scale, localized activities that are embedded in the capacities of the local environment, and aware of and adapted to its limits.

This economically and socially resilient activity should replace “expensive, large and sometimes predatory or invasive infrastructures, business and bureaucracies. Entire towns or even regions can be vulnerable to the debilitating stasis caused by over-dependence on key

industrial sectors in structural decline such as coal mining, steel and shipbuilding in previous monoculture places.” (Bristow, 2010). This implies that there should be diversity in all areas of business in terms of the range of goods produced, and also in the range of sellers and service providers so that no one sector or company becomes locally dominant. Such requirements for a region’s economic structure mean that each economic sector would comprise of a wide range of small-scale businesses, and that there is always some spare capacity to adapt in the event of structural change and industrial decline. “In turn, this also implies that resilience is characterised by dispersion rather than centralized control over systems” (Bristow, 2010). The development of regional resilience requires localized production, trading and exchange, as discussed above, but also the mutual use of local assets, capacities and resources as well as social resilience in the form of “a healthy core or supporting economy of family, neighbourhood, community and civil society, strong in reciprocity, co-operation, and sharing such as collaboration in the delivery of essential services, care provision and caring of families” (Hopkins, 2008; Jackson, 2009; Simms, 2008). Regional resilience also enshrines a measure of respect for the environment in the sense that regional development is responsive to local ecological limits and environmental capacity. A resilient region would contain a healthy, dynamic local economy with businesses that are competitive in the local context and successful, achieved in a manner that sees virtuous interrelationships between competition, environment and distribution.

Having described the formal properties of a resilient region, we shall continue this section by exploring what this might mean in practice. Creating a resilient region must encompass the drive for a low-carbon, sustainable and eco-friendly approach to economic development, and it should also be compatible with plans for energy independence from clean, renewable sources (Bristow, 2010) – these must be explicit goals, as well as the natural outcome of resilience. Creating resilience will also mean focusing on the well-being of society through promoting equality and community partnership, co-operative ownership of production and social enterprise; focusing on the availability of regular, well-paid jobs. Fostering economic resilience means creating an economy that is resilient to change by virtue of being less dependent upon globally footloose activities, having greater economic diversity, and having a determination to prioritise and effect more significant structural change. This translates to a regional economy that is uniquely adapted to its regional context, and that will grow and is

poised to take advantage of opportunity; but can also adapt to circumstances and roll with the punches of an unpredictable global economy (Hudson, 2010). This resilient economy will exhibit a high degree of self-reliance, so that the region can draw on its own resources for much of the food and manufactured goods that it needs, as well as being partly self-sufficient in clean energy production. More raw materials will be sourced locally, and when goods are consumed in the region it will most often be as a result of payment to local labour power and local people.. The economy must also be considered as being embedded within wider social and environmental conditions so that all three issues will be recognised as being inextricably linked and regional development takes place within local ecological limits. Economic resilience (Pike, Dawley and Tomaney, 2010) thus translates to positive social and environmental outcomes as well – it involves accepting that there is no point in blindly chasing economic growth if it damages society or the environment, thereby undermining future prospects for the economy.

Such regional economic resilience (Martin, 2012) demands a broad-based economy, rather than a damaging focus on a handful of industries, where a high proportion of the capital required for production (in all sectors) is sourced within the region and where the opportunities in the region are fully recognised and realised (Bristow, 2010). These opportunities, which are unique to each region, should be developed under local ownership for local benefit, supporting the re-orientation of the economy to a more diverse base. Such re-orientation can also be achieved by helping small businesses to adapt to the strengths and capacities of the local environment, and micro-production which is rooted in the local community alongside medium-sized and larger enterprises, with the purpose of developing localized supply chains that will enable sustainable production and consumption.

Resilience can only be achieved through an active focus on equality in society (Bristow, 2010), so that any positive economic outcome is necessarily socially inclusive encouraging greater closure of the economy (Hudson, 2010). This is particularly true for the development of skills for labour power and human capital, linking economic resilience to education and to fairness in society. Inclusivity also requires fair remuneration for manual workers and fair working conditions, especially for those who are employed in less desirable service-sector jobs. The focus on equality and social welfare will mean an emphasis on mutuality; a shift away from a growth-focused philosophy and damaging emphasis on productivity and

competitiveness will allow an alternative emphasis on territorial justice and development logic focused on rights to satisfaction of human needs. This will lead to strong supporting networks of family, community and civil society, working with the private and public sectors to build a strong and sustainable economy and society for the resilient region.

Civil society networks can also be built through the use of local currencies (Seyfang, 2001) and other hybrid local alternative currencies (North, 1999) such as a Local Exchange Trading System (LETS) as discussed by Bristow (2010). This would mean ensuring that the local public sector accept payment in them and encouraging the private sector to do likewise, and enabling people to spend them for goods and services procured locally (Seyfang, 2005). For example, credit unions could issue money in the local currency backed by the national currency and held in the credit unions, supplemented by savers' deposits. An element of local currency in circulation could be backed by Time Banks (Seyfang, 2004), allowing those who are performing valuable services without financial reward to receive an economic benefit. This element would intentionally lose value between economic years to encourage spending, thus economic stimulus. Consumer demand could be localized by allowing consumers to collect local 'loyalty points' for each pound spent on local goods, in the same way that supermarkets ensure customer loyalty with points that add up to discounts over time. Thus the expansion of credit unions, mutual societies, time banks, community currencies and local 'loyalty points' can be used to develop civil society and encourage the development of enterprises that share strong values of care, cooperation and collaboration.

To build a resilient region, as argued by Bristow and her fellow theorists, policymakers must make a conscious decision to localise the economy, and to reject the global flow of commodities and capital. Whilst no explicit restrictions are placed on these flows, the production of a variety of locally-sourced alternatives, by a range of local producers, for local consumption is encouraged and incentivized.

3. The Theoretical Underpinnings of Resilient Regions: a Heterodox Analysis

Regional resilience runs counter to mainstream (neoclassical) economic theory which says that, given two regions - one capital-rich but lacking in labour, and the other capital-poor but with plentiful labour - capital migrates from the rich to the poor region, and labour moves

from where it is plentiful to where it is scarce, with this process continuing until both regions converge on a steady-state where both have the same output, factor productivities, wages, and rents (Capello, 2006). That is, this empirically questionable theory focuses on the “importer region”. The regional implications of Keynesian economic theory are likewise focused on inter-regional trade, and the positive effect of exports, and a strong export base, on growth in a region. Economic growth is attributed to changes in the saving rate and technological change. There is little room for regional resilience, and its divergence from globally footloose economic activity, in either model, although Keynes wrote at a time when most capital was domestically constrained and famously thought it for the best that it should remain that way. This section develops from these basic points to reflect on the heterodox theoretical backgrounds to regional resilience.

Regional resilience can be seen to embody a partial answer to the Marxian analysis (Goldstein and Hillard, 2009) of the capitalist economy. The Marxian analysis discusses two tendencies in capitalism: a tendency for the rate of profit to fall, and a tendency to over-accumulation. These tendencies lead to a crisis of capital where there is overproduction. Regional resilience makes it harder for large businesses to accumulate a lot of capital, as diversity and local ownership is favoured, so that the commercial environment encourages small business and intra-regional capital flows. This means that no crisis of overproduction is likely to originate within the region, whilst the region is sheltered from a crisis originating outside as a result of the domestic anchoring of capital through the co-operative nature of productive assets and community asset ownership more widely. Crisis also ensues when capitalist firms use profit strategies that fail to: “maintain over time the material and social conditions of their own production, for example, by neglecting work conditions ... degrading soils ... or turning their backs on decaying urban infrastructures” (O’Connor, 1998, p. 242). Regional resilience enshrines the environmental stewardship and social management necessary to avert such a crisis of social context necessary for perpetuating itself.

The Marxian analysis then feeds into a post-Keynesian understanding of the resilient region. Post-Keynesian economics is based on a set of presuppositions (Lavoie, 1992) that are highly relevant to regional resilience. Firstly, individuals are seen as social entities that are influenced by their environment and society, as opposed to the methodological individualism of neoclassical economics. Resilient regions also presuppose this organicism in the

consideration of individuals, and focus on social prosperity as a result. Secondly, post-Keynesians are interested in the need to create the necessary conditions that will allow for production and wealth, in contrast to the neoclassical focus on the efficient allocation of scarce resources. Hence in Keynesian theory production supersedes exchange as the primary motivator, as is also the case for regional resilience. Finally, post-Keynesian economists question both the efficiency and the fairness of market allocation, favouring regulation and “the visible hand of management” (Chandler, 1977) above free markets. A resilient region would also follow this regulatory approach.

The principle of effective demand (Keynes, 1936), saying that the production of goods adjusts to the demand for goods, is at the heart of post-Keynesian economics (Lavoie, 2009), suggesting that the economy is demand-determined rather than being constrained by supply or given factor endowments. This notion also has great relevance for the resilient region where the suggestion is that the production of goods within that region will adjust to the demand for goods within the region, especially where policies are followed to discourage inter-regional trade so that effective demand is focused within the region. In short, resilient regions are demand-led, rather than supply-led, so that, given a demand for a certain type of good in the region, the productive capacity of the region will extend to its supply using resources from that region.

The resilient region can also be seen as reflecting many of the principles of post-Keynesian consumer choice theory (Lavoie, 2004): producing locally-produced goods is the boundedly rational choice (Simon, 1957); depends on the principles of satiable wants (Georgescu-Roegen, 1966) where needs are met at some finite threshold and more of that good brings no additional satisfaction; and the subordination of needs (Lancaster, 1972) amongst consumers where hierarchies of need are constructed with the most essential being satisfied; and always pays due regard to heredity, where present-day consumer choices are affected by past choices, by planning with the region’s social and cultural past in mind.

Firms in resilient regions can be understood, through the post-Keynesian theory of the firm (Canale, 2004), to be operating in oligopolistic markets where a small number of firms dominate and firms are interdependent (price-takers) who must plan for the long-term. Regional resilience is set up in order to ensure that the region does not become dependent on

footloose activity in the dominant firms, with local ownership and diversity in business ensuring that firms remain tied to the region rather than being simply elements of the national economy. Furthermore, the post-Keynesian firm in a resilient region could set its own cost-determined prices (Kalecki, 1971) – setting prices according to the cost of production, rather than to clear the market. The same is true for a closely related Sraffian analysis of wages (Sraffa, 1960), where wages are administered to satisfy the needs of labour rather than set by supply and demand, and there is a limit below which wages cannot fall.

Verdoorn (1949) posited a relationship between the growth of output and the growth of productivity, which is known as Verdoorn's Law. According to the law, faster growth in output increases productivity, due to increasing returns to the levels of input. Verdoorn noted that, in the long run, a change in the volume of production of 10% tends to be associated with an average increase in labour productivity of 4.5%. This suggests that productivity growth is not explained fully by technological improvement. Thus strong growth in labour productivity and output become mutually re-enforcing. This type of cumulative causation is at the heart of much of post-Keynesian economics. Verdoorn's Law thus makes the case for focusing on the development of labour and human capital in a resilient region because an improvement in productivity resulting from this focus will lead to an increase in the quantity of, or an improvement in the quality of, output in the region.

Circular cumulative causation (CCC) is the main post-Keynesian antithesis to the mechanistic analogy and stable equilibrium of the social and economic system in mainstream (neoclassical and Keynesian) economics (Berger, 2009), building on Verdoorn's contribution. Kaldor (1970) envisioned economics without determinate equilibria - non-equilibrium economics - so that no economic system converges on an unique point regardless of initial conditions and that this can be determined from the data. In this case, history matters a great deal, as the initial conditions become very meaningful, as opposed to the neo-classical growth model where regions with different initial conditions can still converge on the same equilibrium. As such Kaldor's view denies a necessary ameliorative trend in development and anticipates the danger of poverty. Though not the first to examine such models, Kaldor's exposition is perhaps the one with the greatest explanatory potential. The theory of CCC is concerned with growth and dynamics in an economic system, and not an optimal allocation of fixed resources as in the neoclassical case. There are indivisibilities and increasing returns, endogenous technological

change, external economies and endogenous consumer preferences, making this a complete theory. Increasing returns constitute the engine of growth, according to Kaldor (1981), due to the division of labour or specialisation in production.

An earlier CCC model by Myrdal (1957) assumes an investment function depending on demand, and increasing returns. In this two-region model, the richer region has higher levels of (exogenous) production, and so strong demand for labour. Labour then flows from the poor region to the rich region. This creates more demand in the rich region, promoting investment and attracting further capital. Agglomeration economies also arise, ending up in increased productivity for the region. In the case where one of these regions is a resilient region, labour flow to the other region is low, because the region is built around the concept of self-reliance and thus produces much of what it consumes, requiring the much of region's population as labour input.

The case for regional resilience can be built around the notion of CCC and the virtuous circle of development in a region whereby a larger local market - whether through in-migration, import and export duties, or simply encouragement to 'buy local' - leads to increased local investment and thus improved capital stock in the region, resulting in increased productivity and output, leading to an even bigger local market. In the context of this virtuous circle, the need for a diverse business environment in a resilient region can be traced to the need for a larger local market - local producers can sell more locally if their goods are strongly differentiated, whilst a demand shock in one sector is less likely to have negative effects if there is sectoral diversity. Likewise in the case of local ownership, as local ownership and management are likely to be more responsive to regional economic conditions and more ready to invest and improve capital stock within the region. This case can be extended by considering a resilient region that decides to limit trade with other regions. Such a scenario would result in an increased market size as demand is redirected to sources within the region, so that effective demand is identical to notional demand in the region. This can then lead to a virtuous circle entirely within the region.

Green economics is another strand of heterodox economic theory that can contribute to theorising regional resilience. Green economics (Cato, 2009) is the economics of the real world - the world of work, human needs, the Earth's materials, and how they come together in

harmony not discord. First and foremost it treats an economy that is about use-value, over and above exchange-value and money. It is about quality, not quantity for the sake of it. This clearly positions the field within heterodox economics, in that production supersedes exchange. Green economics also values the regeneration of and respect for individuals, communities, society and ecosystems above accumulation (of either money or material), thus rejecting methodological individualism and implying a scepticism of market allocation. Green economics recognises that the environment in which we live is a set of interdependent ecosystems, and that respect for those ecosystems is part of maintaining the basis for our own society. The economy treated as one consideration for society, which in turn exists within, and is dependent on, the surrounding environment.

Green economics is hard to fit into a category on the matter of how the economy is determined. Following Lionel Robbins, neoclassical economics focuses on the allocation of scarce resources so that the economy is constrained by supply. On the other hand, there is the post-Keynesian principle of the demand-determined economy. Green economics accepts that supply constraints exist for all natural resources – in the form of planetary bounds, beyond which ecological damage occurs – but accepts that supply may be elastic up to this limit. This means that the demand for a good is a determinant of the economy – the principle of effective demand holds – up to planetary limits, beyond which the economy is constrained by supply.

Resilient regions are thus not green economies, but they are *greener* economies – a step along the way in terms of valuing the regeneration of and respect for individuals, communities, society and ecosystems. It is also possible for a resilient region to adopt the notion of *green growth* - where green growth is economic growth that causes no ecological harm. More precisely, resilient regions embody a form of sustainable development, as defined by the Brundtland Commission in 1987. Sustainability is, in a general sense, the capacity to support, maintain or endure – and in this context it is about the responsible management of natural resources and environmental stewardship that will allow our economy and society to maintain an undiminished quality of life, enabling us to do tomorrow what we do today (Brundtland, 1987). Regional resilience should be considered in this way because “A system of strengthened self-reliant local economies has long been constitutive of a sustainable society as theorised by green economists” (Cato, 2012b, p. 29).

4. From Resilient Regions to Bioregions

Green economics, as is stated above, has long been engaged in the quest to create strengthened self-reliant local economies as possible sustainable societies. However, defining these economies geographically – deciding where and within what borders the economic activity takes place – is a matter of debate. The bioregion is one possible solution - an area within which there is a high degree of coincidence in the spatial arrangement of primary resources and the environmental context. This means that the bioregion is likely to contain its own watershed boundaries, share similar geology and terrain throughout, and share similar environmental conditions that support similar ecological dynamics (Thayer, 2003). Furthermore, the bioregion's population must interact with its ecology in such a way as to enable its long-term well-being. This technical definition has been incorporated into bioregionalism, a political and cultural movement that is based on the naturally-defined bioregion, but also recognises the involvement of cultural and social phenomena in the determination of a bioregion (Alexander, 1996), so that the bioregion's population should have common social or cultural ties, such as shared language, art and religion, enabling localization. This makes it important to understand a region's history and cultural patterns before defining a bioregion. Bioregions should also have a degree of social cohesion, community co-operation and mutualism, as is discussed in green economics generally. This builds on the economic and social aims of resilient regions. In this sense, bioregions are regions, but not in the artificial way that they are usually constructed for political or economic purposes. Rather, they are natural social units structured around ecological and cultural diversity, rather than national and political parameters (Sale, 2000), and are determined by their ecology rather than arbitrary human design (McGinnis, 1990), whereas the geography of a resilient region is still a matter of administrative convenience.

From an economic perspective, bioregional boundaries are flexible, guided by the principle of subsidiarity: in the case of any individual resource or service local is a principle that trumps principles such as price or choice (Cato, 2007). This formalizes the aims of regional resilience. Bioregions are also largely self-sufficient – a state of strengthened self-reliance (Cato, 2012b) - in basic resources. This is a step beyond the self-reliance sought for in a resilient region. These principles combine with that of biocentricity - an ethical concept that, as defined by Taylor (1986: 99) recognizes the inherent value of ecosystems and the non-

superiority of humans, incorporating social justice and fairness alongside respect for other aspects of the ecosystem. It is then clear that the definition of an economic bioregion is that of a combined environmental, social, and economic entity where economic actors exist in a sustainable equilibrium with all aspects of the surrounding ecosystem, and, in doing so, mark bioregional thought as part of green economics as defined in the previous section, and more demanding in its economic, social and environmental dimensions than regional resilience and its embodied sustainable development.

Economic development within the framework of green economics has been called green growth. The regional implications of the CCC apply regardless of the colour of growth, but to fit into the green economics paradigm growth must be green as defined above. Many green economists, including the authors, feel that ‘green growth’ is an oxymoron, and that any growth, in terms of volume of output, will have environmental consequences. However, we can define a far stricter *green development* that ensures that development is confined to human capital. Under this definition, only economic development that causes no environmental or ecological damage, whether or not it is mitigated, is green. Any other economic development is not green, including growth causing social damage such as increasing inequality or exploitation of workers. This is a necessarily strict definition, preventing a resumption of “growth-as-usual” but decorated with moves to mitigate damage. It should be noted that this definition of green development does not mean that industrial advancement – green technology and manufacturing processes – or agronomic development is not worth researching, if it can be ensured that these developments do not lead to damage to the network of ecosystems upon which society rests. However, such advances can only achieve so much, and should be pursued in tandem with social change, with an emphasis on changing patterns of supply, provisioning and consumption. Resilient regions lack this approach to economic development, keeping their focus on growth in the volume of output, but they do take a *greener* approach by introducing environmental limits and social context into the discussion.

This discussion of greenness as a social issue may seem unusual, but green economists see issues such as equitability and fairness as key to building a society that respects the environment – with an example being the economic pressure on low earners to consume unsustainably-sourced goods. Most growth is not green, even if it can be achieved without increasing energy consumption and thus GHG emissions. This is because growth involves

increases in the use of some resource. Increasing the use of any natural resource will involve some degree of environmental degradation or ecological damage. The only possible green growth is green development, or growth and developments in social resource use – ways for people to work together more effectively without being exploited, human capital growth through better education and training, and scientific innovation and new ideas, and all developments that increase the rate of production without increasing the volume of input or of output. That is, green development depends entirely on the development of society – indeed, human ingenuity is the only resource not subject to supply constraints - and not the exploitation of nature. So that green development becomes a matter of humans thinking about better ways to live and to do things. Verdoorn's Law makes a point in favour of the notion of green development in the sense that, even if growth in the volume of output is deferred, an increase in the rate of output corresponds to growth in the productivity of labour. This would result in fewer hours of work to produce the needs of society, and more time for leisure and involvement in civil society.

Business in a capitalist bioregional economy can be envisaged as a set of micro- and small-scale post-Keynesian firms that operate and are owned locally (within bioregional boundaries) and are subject to the principles of bioregionalism so that they are environmentally and socially responsible. Bioregions are then similar to resilient regions in terms of the need for smaller business and local ownership – a bioregional economy must be diverse and broad-based if the bioregion is to be self-sufficient in basic resources and strongly self-reliant. This then implies diverse and numerous local employment opportunities. Of course, whilst a bioregion should be resilient in the sense of being able to cope with an economic shock, the capacity is largely redundant, as bioregions should not be open to external economic shock, and should avoid activity, such as speculative finance, that may generate internal shocks. The friction that subsidiarity, biocentricity and extended self-reliance impose on capital accumulation makes substantial and sustained output growth impossible (James and Cato, 2014a), so it is unlikely that businesses would grow larger than is sustainable, and so dominate trade in its particular sector, or that unsustainable numbers of new firms would enter existing areas of the economy and begin squeezing profits. thus encouraging profit maximization. The business environment in a bioregion would favour competitive markets in

general, as beneficial for the economy; but a regulatory framework would ensure that negative social and environmental effects are blocked.

A bioregional economy, as adumbrated in this paper, may still be, notionally, a capitalist economy, as the accumulation of capital is still possible. James and Cato (2014a) offer a post-capitalist solution to the instability we argue as inherent to a capitalist economy, in terms of changing the relationship between capital and society, and between capital and nature. The bioregional economy (Cato, 2011) sketched out in that paper would end the exploitation of labour and society, and also of the environment, creating a “natural economy” (Luxemburg, 1913).

However, within a bioregional economy capital accumulation would be minimal in practice, even if the bioregion is not strictly post-capitalist, as the localization of most economic activity and the friction caused by the bioregional principles make production for profit difficult and dampens the motivations to and benefits from reinvesting those profits in the productive process beyond maintaining that process. These effects of localization would also hold true in a resilient region, if to a lesser extent. As such, any profits would best be spent immediately within the local economy, thus strengthening the bioregion, again extending the natural implications of resilience. This means that it is possible to consider a bioregion as a resilient region that decides to limit trade with other regions resulting, from our discussion of post-Keynesian economics, in an increased market size as demand is redirected to sources within the region, so that effective demand is much closer to notional demand in the region. The difficulty of capital accumulation also acts to counter the capitalist tendency to over-accumulation, which is still possible in a resilient region, meaning that a Marxian crisis of overproduction is scarcely possible in a bioregion. Furthermore, a Marxian crisis of underproduction is also unlikely as the principle of biocentricity prevents the bioregional economy from undermining the environment and its own resource base, which is again possible in a resilient region.

The bioregional economy embodies all the presuppositions of post-Keynesian economics with regards to treating consumers as social entities, focusing on the creation of prosperity and quality-of-life so that production supersedes exchange, consumers displaying procedural rationality within the constraints of subsidiarity, and valuing controls on market activity. In

particular, prices may be administered – so that the sale price of a good reflects the cost of production - rather than market-clearing prices set by supply and demand – as competitive markets can lead to environmentally (e.g. logging in the Amazon, or fracking in the UK) and socially (e.g. sweatshops) disastrous practices, and this administration would need to account for the principles of bioregionalism. Likewise, wages would be set to reflect the cost-of-living in the bioregion. As in green economics generally, the principle of effective demand within supply constraints applies, meaning that the economy is demand-determined within the ecological limits of that bioregion. The principles of post-Keynesian consumer choice theory also apply, with the satiation of need being particularly relevant given the necessarily limited scope for the production of a surplus. Output growth in a bioregion would be impossible, at least as regards to tangible goods, as any increase in output would require a shift in the balance of inputs, thus changing the local ecology – resulting in a stricter framework for growth than in a resilient region. Green development would be allowed, resting entirely on increases in labour productivity which, from Verdoorn's Law, would fewer hours of work to produce the needs of society, and more time for leisure and involvement in civil society. Involvement in civil society is crucial in bioregionalism, more so than in regional resilience where it is desirable and helpful. The bioregion is an aggregation of social entities, and the social cohesion and mutualism desirable in resilient regions must be formalized into worker and consumer co-operatives and other types of association, encouraged by policy.

5. Conclusion

In this paper we have considered the connections between the theoretically well established concept of the 'resilient region' and the more ecologically grounded idea of the economic bioregion. Considering the heterodox analysis of regional resilience makes it apparent to us that resilient regions can be considered as proto-bioregions, in the same way as sustainable development is an incremental step along the way to a green economy, so that the transition to a bioregional economy would involve regional resilience as an intermediate step for the change necessary to build a bioregion.

Indeed, once a region has become resilient, it can become a bioregion simply by implementing the principles of biocentricity, extended self-reliance and subsidiarity within this regionally self-reliant community economy (James and Cato, 2014b). These policies could be

implemented as a simple extension from the proto-bioregional base of a resilient region, and especially if the resilient region has continued with incremental steps to green its economy. This transitional, phased approach would allow time for economic adjustment, including altered modes of production and sourcing of natural resources in the face of subsidiarity, and wide-ranging behaviour change in terms of consumption and attitudes to nature, society and profit. This change in attitudes to profit may lead to a post-capitalist bioregion where market allocation is replaced by direct democracy (James and Cato, 2014a), but we argue here that the bioregion can exist in a capitalist form that may become post-capitalist according to the attitudes and desires of its inhabitants.

Discussion of regional resilience always includes a mention of the importance of resilience in times of economic crisis. In some papers, the focus may not be on crisis (Bristow, 2010) whilst in others (Martin, 2012) the response to economic crisis is the main topic of discussion, but the issue is always a feature of the literature. In this paper, we have not confronted the issue of resilience directly, but will close with a brief note on the topic. Taking a bioregional approach to a local economy would give that local economy an even higher level of resilience and resistance to exogenous shocks, as a bioregion is essentially a closed economy, in the technical sense that most economic activity is internal to the region, since extra-regional trade being very limited. Furthermore, taking a bioregional approach would safeguard the local economy against the arising of such ecological, and social, shocks rather than merely the economy against their worst effects. What this means is that the bioregional approach will build an economically resilient region, with the added benefit of resilience to social and environmental shocks that can trigger economic crisis. It can then be argued that a resilient region will demonstrate even greater resilience if it is transformed into a bioregion.

By clarifying the relationship between resilient regions and bioregions, as in the previous paragraph, this paper has clarified the process of building a bioregion, by taking it from being a purely hypothetical construct. This is because regions displaying resilience already exist, and schemes to strengthen local economies and civil society are already undertaken, at least to some extent. By relating the idea to the bioregional approach, and making the fully-formed resilient region a proto-bioregion, this paper makes the bioregion a real option for the future.

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