



# Human Behaviour and Economic Development:

*Culture, Psychology and the Competitiveness of  
Britain's Regions and Localities*

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# **Human Behaviour and Economic Development:**

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*Regions and Localities*

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# Executive Summary



1. Many studies continue to find considerable and persistent differences in economic competitiveness and development across localities and regions. These differences are not always easily explained even when accounting for human capital and knowledge production.
2. This report finds that the underlying community culture and aggregate personality psychology of regions and localities in Britain are determining factors of the level of economic competitiveness found in these places.
3. The interplay between culture and psychology in form of the psychocultural behaviour of localities and regions helps to shape their long-term competitiveness trajectories.
4. Regions and localities that have relatively atomised behavioural environments with high levels of individual commitment tend to enjoy competitiveness benefits. Similarly, places with high rates of cultural diversity and extravert individuals have relatively high levels of competitiveness.
5. Regions and localities that tend to be culturally socially inclusive with a significant number of people with amenable and agreeable personality traits experience relatively low rates of competitiveness.
6. An analysis of competitiveness performance for the 11 mainland regions of the UK shows that London is by far the highest performer, followed by South East England. These are the only two regions to perform above the UK average. The regions of Wales, North East England, and Yorkshire and the Humber significantly underperform.
7. With regard to community culture, as measured by engagement with education and employment, localities around the South East, the East of England and the East Midlands show the greatest engagement. In contrast, localities in Yorkshire and Humber, the North East, Scotland and Wales are the least engaged.
8. There is a particularly marked North-South divide with regard to a community culture that is collective in its nature. Localities in Wales, Scotland, North East, and North West are the most culturally collective. Localities in the South West, East of England and the South East are the least collectively oriented communities.
9. Social cohesion is highest in the localities of North East England, followed by Scotland, Wales and the North West. At the other end of the spectrum, London, South East England and the West Midlands are the least socially cohesive, and therefore the most socially diverse.
10. The relationship between social cohesion and economic competitiveness across local authority districts shows a significant negative association, which suggests that localities with more diverse community cultures tend to be more economically competitive.

11. Individuals with the most extravert personalities tend to be clustered in and around London, with high densities of individuals exhibiting behaviours that can be regarded as 'open' tending to be found in urban areas of the south of Britain.
12. As with extravert behaviour, an open personality psychology is positively associated with economic behaviour at the local level, which suggests that having people with the 'right' personality in a locality may be an important influence on its long-term competitiveness and economic development.
13. At the regional level, Wales, Scotland, and North East England have the highest rates of inclusive amenability, with London having by far the lowest rate, and there is a significant negative relationship between rates of inclusive amenability and economic competitiveness.
14. In general, places portraying behaviour that tends to be agreeable and cohesive are not always best situated for generating the highest rates of competitiveness and economic performance, and whilst such culture and psychology may have significant positive attributes with regard to social development, they do not always appear to be the 'right' ingredients for stimulating economic growth and development.
15. Behaviour based on individual commitment and diverse extraversion shows strong geographical differences across Britain, with these forms of behaviour most commonly found in the south of the nation.
16. The highest quality of local government is largely found in London and South East England. Localities in Wales, South West England and Scotland have, on average, the least effective local governments, which in an age of austerity is likely to become further accentuated.
17. Overall, competitiveness is associated with greater extraversion, openness, emotional stability (low neuroticism) and lower agreeableness and conscientiousness. Inclusive amenable psychocultural behaviour - which is related to more tightly bonded, friendly, caring, hardworking and rule abiding characteristics - is less likely to promote competitiveness.
18. Diverse extraversion, on the other hand, is the form of behaviour which appears to have the strongest positive relationship with competitiveness, and its extravert, emotionally stable and more open profile is significantly correlated with economic performance.
19. Cosmopolitanism and outwardly facing behaviour tends to foster greater economic strength and competitiveness, and begins to hint at the possibility that some regions and localities often in the north and more peripheral parts of Britain possess the 'wrong' type of behaviour when it comes to catalysing economic development.

# 1. Introduction



Many studies continue to find considerable and persistent differences in economic competitiveness and development across cities and regions (for a review see Huggins and Thompson, 2017). These differences are not always easily explained even when accounting for human capital and knowledge production (Obschonka et al., 2015). This remains the case despite the burgeoning theoretical literature on urban and regional competitiveness and related areas such as economic growth and resilience (Harris, 2017; Martin and Sunley, 2017). In recent years, a new emphasis on behavioural traits has entered the equation in terms of efforts that seek to explain regional and urban differences in economic performance and development, with studies such as Tabellini (2010) finding a connection between culture and institutions and the economic development of regions, whilst others such as Huggins and Thompson (2015a; 2016a) find a link between socio-spatial community culture and a noted driver of economic performance, i.e. entrepreneurial activity. Similarly, the recent inclusion of personality traits within the rubric of spatial studies on economic performance and development outcomes is a recognition of a growing research stream in psychology that utilises large personality sets in order to show the distinctiveness and meaningfulness of personality differences across cities and regions (Rentfrow et al., 2013; 2015; Obschonka et al., 2015; 2016).

Based on thinking from behavioural economics, it has been suggested that within cities and regions individual decision-making results from local influences experienced through situations that equate to the dominant cultural traits embedded within the local communities where these 'influences' are formed (Storper, 2013). Behavioural economics concerns the integration of psychological theories of behaviour as a means of explaining economic action (Mullainathan and Thaler, 2000; Camerer and Loewenstein, 2004; Borghans et al., 2008; Cartwright, 2014). Such theories have increasingly shown the limits of rational-choice theories in explaining economic, as well as social, action and the underlying decision-making processes of individuals in determining such action (Hodgson, 2013). Drawing on Simon's (1955, 1982) notion of 'bounded rationality', behavioural economics suggests that the minds of individuals are required to be understood in terms of the environmental context in which they have evolved, resulting in restrictions to human information processing, due to limits in knowledge and computational capacity (Kahneman, 2003).

As a result of these theoretical insights, it is clear that whilst urban and regional competitiveness and development theories are largely rooted in explanations based on the location, agglomeration and organization of firms, industries and capital (Maskell, 1998; Fritsch and Mueller, 2004; Gordon and McCann, 2005), there is a move toward a (re)turn to addressing the role of individual and collective behaviour in determining urban and regional development outcomes (Francois and Zbojnik, 2005; Jokela, 2009; Obschonka et al., 2013b). A number of concepts relating to the behaviour of individuals and groups of individuals have taken an increasingly central role in shaping an understanding of why some places are better able to generate higher rates of development and growth, and avoid the low-road development trajectories, and associated higher rates of inequality, found in weaker cities and regions (Streeck, 1991; Tabellini, 2010; Tubadji, 2013; Soto-Oñate, 2016).

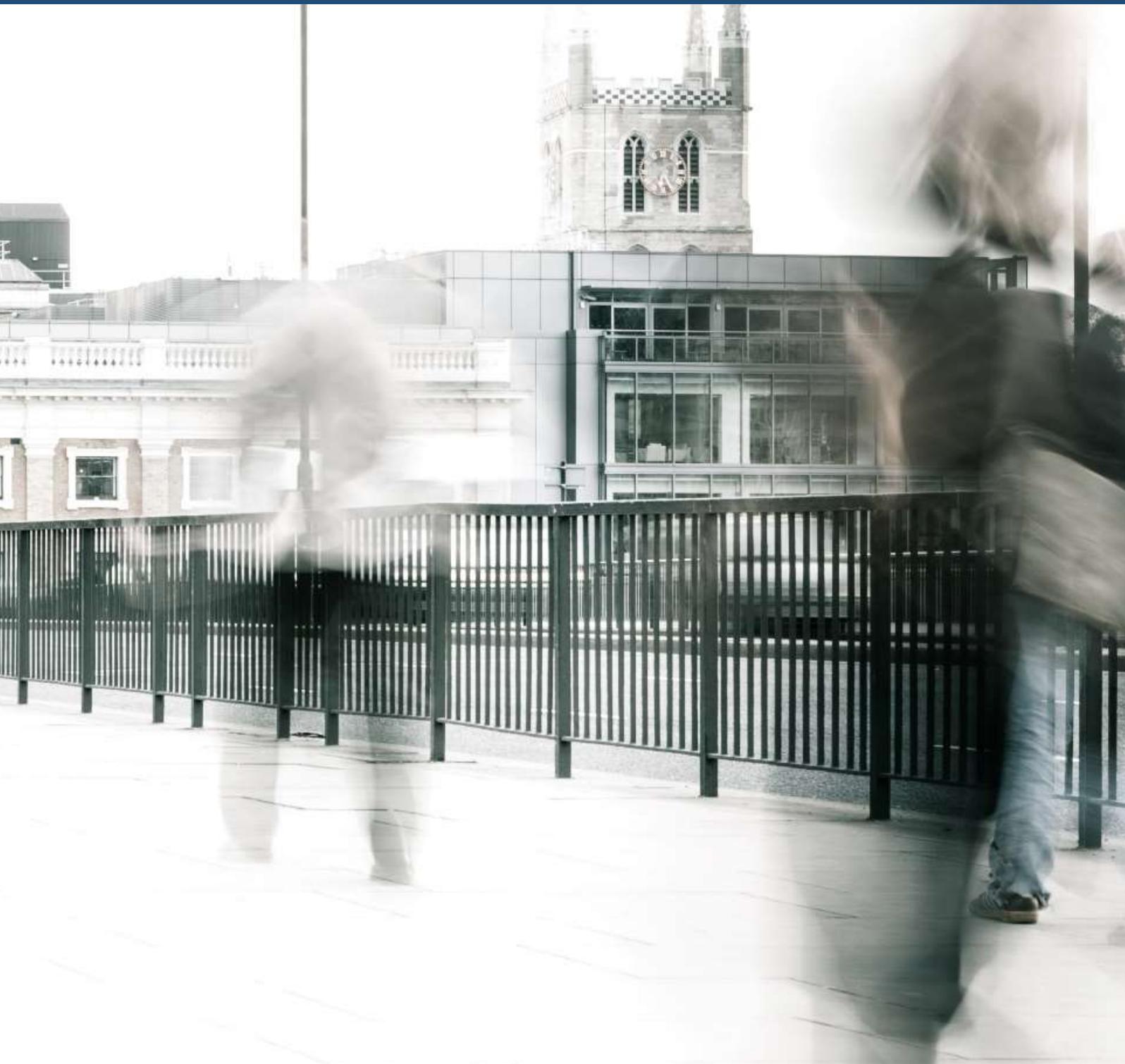
In parallel with the adoption of ideas from behavioural economics, the more general rise in importance given to cultural values in urban and regional development theory has led to the emergence of a 'new sociology of development' that entwines the role of geography with factors relating to individual and collective behaviour (Sachs, 2000). As Clark (2015) argues, human behaviour is fundamental to the social sciences in terms of understanding what people do, where and why they do it, and the costs and benefits of this behaviour. In order, therefore, to understand the 'aggregate' differences in socio-economic activities and performance there is a need to explore how these differences stem from the experiences and actions of individual actors (Ariely, 2008; Storper, 2013).

Fundamentally, within certain strands of the literature - and specifically that within the field of economic geography - there have been calls to better understand the role of 'microprocesses' on 'macrostructures' within cities and regions, as well as the impact of macrostructures on these microprocesses (Peck, 2005; Maskell and Malmberg, 2007; MacKinnon et al., 2009). One of the aims of this report, therefore, is to argue that the roots of behavioural differences across cities and regions are co-determined by two key factors combining microprocesses and macrostructure, namely: socio-spatial community culture and personality psychology. In essence, it is the interaction of these two factors that forms the behavioural intentions of individuals and the psychocultural behaviour of cities and regions. Given this, a further aim of the report is to argue that psychocultural behaviour is crucial to explaining differences in local and regional competitiveness.

In order to address these issues, the report initially seeks to present a conceptualisation of the notion of local and regional competitiveness (section 2). It then examines the existing

literature to suggest how community culture and personality psychology traits co-determine the psychocultural behaviour of localities and regions (sections 3-5). Empirical data for Great Britain is analysed to examine whether this is the case and whether the distribution of psychocultural behaviour varies across regions and localities, as well as whether any particular forms of culture, psychology personality, and psychocultural behaviour are associated with competitiveness differentials. Section 6 presents the methodological approach underlying a multivariate regression analysis of the British data and section 7 presents the results of this analysis. In the concluding section (8), it is proposed that psychocultural behaviour impacts upon local and regional development by influencing the sources of competitiveness such as the type and efficacy of institutions and capital generation and deployment within these places.

## 2. Competitiveness



It has been argued that the urban and regional competitiveness discourse can be set within the context of theories concerning regional economic growth (Huggins et al., 2014). Furthermore, it is suggested that the concept of regional competitiveness – which includes cities and urban regions, and models related to its measurement, can be positioned within theories that attempt to understand and determine the means through which economic development occurs across regions. In general, the competitiveness of regions is generally understood to refer to the presence of conditions that enable firms to compete in their chosen markets and enable the value these firms create to be captured within a particular region (Begg, 1999; Huggins, 2003).

Regional competitiveness, therefore, is considered to consist of the capability of a particular region to attract and maintain firms with stable or rising market shares in an activity, while maintaining stable or increasing standards of living for those who participate in it (Storper, 1997). Given this, competitiveness may vary across geographic space, as regions develop at different rates depending on the drivers of growth (Audretsch and Keilbach, 2004). As Martin (2005) outlines, concern with competitiveness has filtered down to the regional, urban and local levels, particularly the role of regionally based policy interventions in helping to improve competitiveness. In many advanced nations, these interventions form part of a strategic framework to improve productive and innovative performance.

Regional competitiveness models are usually implicitly constructed in the lineage of endogenous growth frameworks whereby deliberate investments in factors such as human capital and knowledge are considered to be key drivers of growth differentials. Regional competitiveness, therefore, is defined by some scholars as the difference in the rate of economic development across regions, and the capacity and capability of regions to achieve future economic growth relative to other regions at a similar stage of economic development (Huggins et al., 2014). Indeed, the success of regions will clearly be related to their capacity and capability to achieve economic growth, and understanding how and why such growth occurs is central to a number of research streams. Furthermore, competitiveness relates to the ability of an economy to provide its population with sustainable and rising standards of living, as well as high rates of employment (European Commission, 2001). This emphasis on sustainable competitiveness is particularly marked in

work that seeks to measure the competitiveness of urban regions and cities (Kresl, 1995; Ni and Wang, 2017).

As discussed elsewhere, competitiveness may take a number of definitions (Huggins and Thompson, 2017; Harris, 2017) and include both measures based on outcomes and the inputs that generates these outcomes (Aiginger, 2006; Aiginger and Figo, 2017). The empirical analysis presented in this report draws on data from the *UK Competitiveness Index* (UKCI), which was developed as a composite measure capturing three sets of factors - inputs, outputs and outcomes – across regions and localities of the UK (Huggins, 2003; Huggins and Thompson, 2016b). Competitiveness inputs are principally the factors of production that generate goods and services and drive economic activity and outputs, in particular the human capital factors at the heart of endogenous growth theories. Inputs are not an end in themselves but provide the means to achieve outputs and long-term outcomes.

The input factors used in the UKCI reflect those key inputs associated with greater competitiveness including: business start-up rates; number of businesses per head of population; proportion of working age population with NVQ level 4 (higher education) qualifications or above; and the proportion of businesses classed as knowledge-based. Output and outcome factors are those associated with revealed competitiveness indicating the extent to which a locality or region is enjoying the benefits associated with higher standards of living, which it is suggested should be the ultimate aim of economic development (Storper, 1997). The output factors used in the UKCI capture the extent to which inputs are converted into outputs and include: gross value added per head; productivity per hour worked; and employment rates. The outcome factors are more directly associated with the population's welfare in terms of gross weekly pay and unemployment rates.

The methodology used to construct the UKCI is based on the natural log of individual indicators, which reduces the effect of outliers. Indices are created with the UK average taking a value of 100, and within each factor the individual indicators are given equal weighting. Given that there is no theoretical reason to give a greater weighting to any one of the factor indices, the final UKCI measure is the average of the three component indices. To account for the impact of logging the data, the composite scores are 'anti-logged' through exponential transformation. This is achieved by calculating the exponential difference between the mean logged and un-logged index of the fifty localities nearest the

overall UK mean of 100. Figure 1 shows the significant variation in economic competitiveness across the nation, with London and parts of the greater south east region dominating in terms of performance.

Figure 1: UK Competitiveness Index

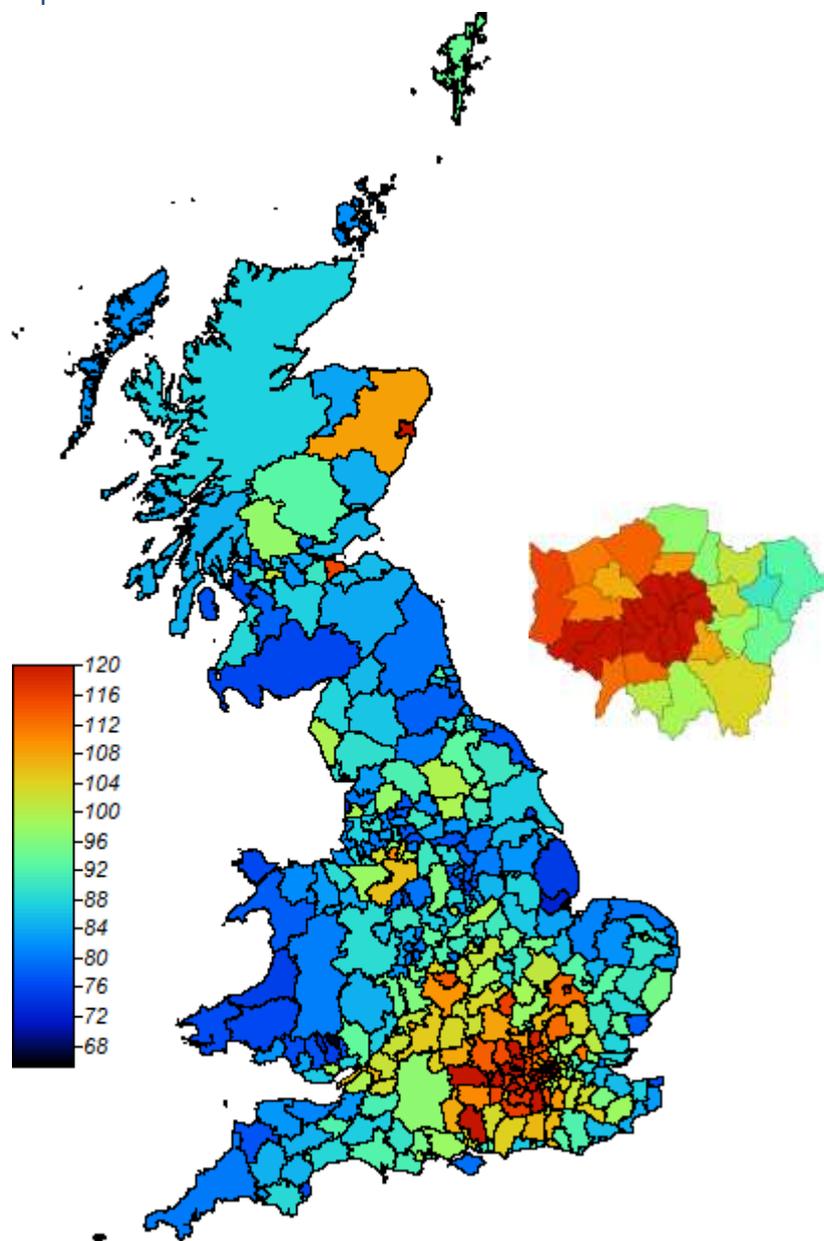
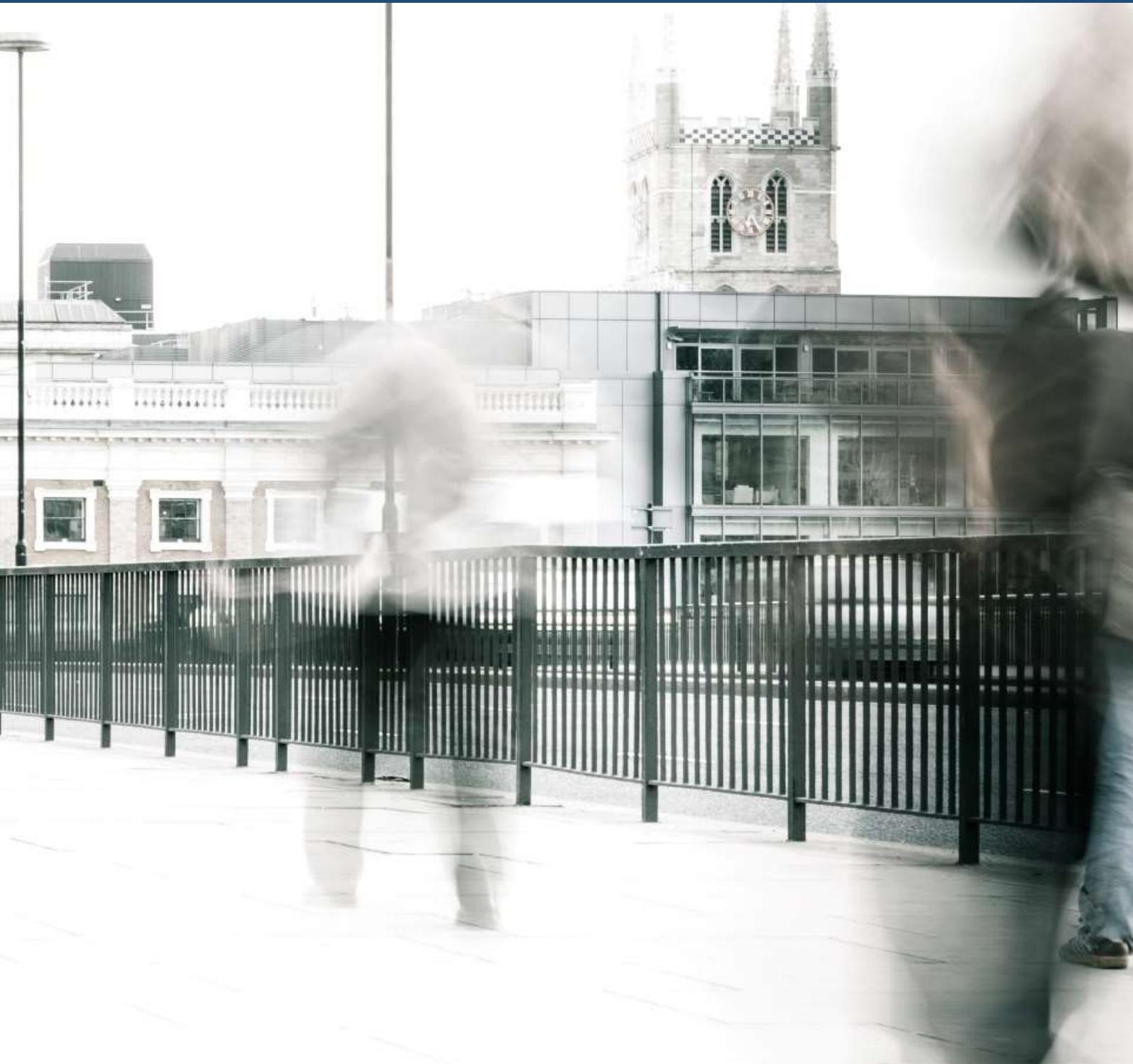


Table 1 presents the breakdown in competitiveness performance for the 11 mainland regions of the UK. London is by far the highest performer, followed by South East England. These are the only two regions to perform above the UK average. The regions of Wales, North East England and Yorkshire and the Humber significantly underperform, highlighting the ongoing North-South divide with regard to economic competitiveness and development.

Table 1: Economic Competitiveness by Region (UK = 100)

Rank	Region	UKCI
1	London	119.8
2	South East	103.3
3	East of England	95.8
4	South West	92.3
5	Scotland	92.2
6	North West	89.0
7	East Midlands	88.1
8	West Midlands	87.5
9	Yorkshire and Humber	86.3
10	North East	82.6
11	Wales	81.9

# 3. Community Culture



The concept of culture generally refers to the way in which people behave, often as a result of their background and group affiliation. Guiso et al. (2006, p. 23) define it as ‘those customary beliefs and values that ethnic, religious and social groups transmit fairly unchanged from generation to generation’. Rather than concerning individual behaviour, it relates to shared systems of meaning within and across ascribed and acquired social groups (Hofstede 1980). Van Maanen and Schein (1979) suggest that culture can be defined by the values, beliefs, and expectations that members of specific social groups come to share, while Hofstede (1980) refers to it as the collective programming of the mind, which distinguishes one group or category of people from another. Socio-spatial community culture refers to the broader societal traits and relations that underpin places in terms of prevailing mind-sets and the overall way of life within these places (Huggins and Thompson, 2015a; 2016a). Therefore, it principally constitutes the social structure and features of group life within cities and regions that can generally be considered to be beyond the economic life of such places.

Fundamentally, culture consists of the overarching or dominant mind-sets that underlie the way in which cities and regions function; that is, the ways and means by which individuals and groups within communities interact and shape their environment. The decisions of individuals within these cultures, therefore, may have arbitrary coherence as individuals try to ensure they are consistent with personal and collective cultures as well as past decisions (Ariely, 2008; Knott et al., 2008). At a national level, the World Values Survey (WVS) has allowed researchers to investigate differences in culture based on scales such as traditional versus secular-rational, and survival versus self-expression (Inglehart and Welzel, 2010). These cultural dimensions have been found to relate to a wide variety of measures of development (Guiso et al., 2006), both narrowly economically defined as well as in terms of broader development measures (Pike et al., 2007). In order to examine the relationship between competitiveness and community culture this report draws upon the community culture measures developed by Huggins and Thompson (2016a). Within this work, five dimensions of community culture are captured: engagement with work and education; social cohesion; feminine and caring activities; adherence to social rules; and collective actions. Each of these is discussed in more detail below.

Engagement with work and education draws upon Weber’s (1930) consideration of the impact of ‘work ethic’ on economic outcomes and the importance of education as a

cultural feature of places (Tabellini, 2010). Both of these may be associated with self-sufficiency and making an appropriate contribution to society (Brennan et al., 2000; Becker and Woessmann, 2009). Male economic activity rates and the inverse of the proportion of the population without formal qualifications and school absenteeism rates are used to capture the underlying culture associated with engaging in these activities (Durand, 1975).

The notion of social cohesion draws on the literature that has highlighted the importance of social capital in achieving various economic outcomes (Putnam, 1993), such as entrepreneurship (Davidsson and Honig, 2003; Williams et al., 2017), and innovation (Camps and Marques, 2014; Murphy et al., 2016). This may be achieved through aiding knowledge transmission, reducing economic profiteering, and encouraging collective action (Callois and Aubert, 2007). However, as Olson (1982) suggests, it should also be noted that social associations linked with the promotion of particular interests may have a detrimental effect and raise inequality. Other empirical studies show that it is often the distinction between bridging and bonding social capital that is important, with the former boosting income and the latter having a neutral effect (Hoyman et al., 2016).

Bonding social capital may increase trust and informational flow within a group, but also isolate the group from outside ideas (Granovetter, 1973). As group similarity may help boost the likelihood of such trust being developed (Easterly and Levine 1997; Aghion et al. 2004), indicators used here (and in previous studies) to measure social cohesion include: ethnic similarity; religious similarity; as well as a more direct measure of identification with the wider population. i.e. the proportion of the population perceiving themselves as a national of the resident country. It has been suggested that less socially cohesive and diverse communities may benefit from access to new ideas and inward flows of human capital, resulting in novel ways of deploying available resources (Portes and Landolt, 2000; Florida, 2002; Levie, 2007). To capture these flows of human capital, gross migration rates for regional and local areas and the proportion of migrants born in Great Britain are used as indicators.

Hofstede (1980) defines some national cultures as more masculine or feminine in nature based on measures of greater or lesser competition and individuality, a pattern that others have shown is still present in advanced societies (Shneor et al. 2013). Female involvement in economic activities could be highly influential given that men and women prioritise outcomes of different kinds (Parasuraman et al., 1996). Where roles regarding employment and household production are more traditionally split, as captured by the

economic activity of women, a more masculine approach to the economic activity might be expected to dominate. Also, business activities including entrepreneurship and new venture creation are frequently identified with masculine competitive and individualistic cultures (Bennett and Dann 2000; Bruni et al. 2004). However, such approaches do not necessarily yield the highest levels of broader well-being, in part because of upwardly adjusting reference points (Layard, 2006) - although some empirical studies have found positive relationships between economic competitiveness and broader well-being (Huggins and Thompson, 2012). Female employment that is part-time facilitates more flexible working that may allow for broader outcomes to be achieved, and is included as an indicator of feminine cultural attributes (Hundley 2001). Similarly, caring activities, in terms of the proportion of the population providing caring activities for free, is used as an indicator of femininity.

Social conventions are important in helping to coordinate activities that boost efficiency (Rodríguez-Pose and Storper, 2006; Lorenzen, 2007). Where adherence to such conventions and rules is relatively low, delinquent behaviours can become the norm (Kearns and Forrest, 2000), hindering economic activities. A knock-on effect is that where areas become associated with such behaviours, residents can suffer from a stigma effect, hindering their ability to participate in wider economic and social activities (Atkinson and Kintrea, 2001). However, some studies have suggested that particular activities such as entrepreneurship can be born of frustration (Noorderhaven et al., 2004), and are positively associated with rule breaking at a younger age (Obschonka et al., 2013a). The indicators included in this study to capture breaches of rules and accepted behaviour are: non-sexual violent crimes; crimes by deception; alcohol related deaths and underage conceptions – which are all measured as a proportion of the relevant population.

There is some debate as to whether more individualist cultures or those that facilitate collective activities best promote economic development (Thomas and Mueller, 2000; Kirkman et al., 2006; Hayton and Cacciotti, 2013; Wennberg et al., 2013). As discussed above in relation to masculinity-femininity, competitiveness may be associated with individualistic behaviour, but collective approaches may still be successful when directed outwards towards competition with other groups (Greif, 1994; Casson, 1995; Ettliger, 2003). To capture a preference for collective activities, the indicators used are the proportion of votes cast for left of centre political parties and trade union membership as a proportion of the workforce.

With regard to community culture as measured by engagement with education and employment, Figure 2 shows that localities situated in the South East, the East of England and the East Midlands show the greatest engagement. In contrast, localities in Yorkshire and Humber, the North East, Scotland and Wales are the least engaged, which is confirmed by the regional rankings shown in Table 2.

Figure 2: Community Culture – Engagement with Education and Employment

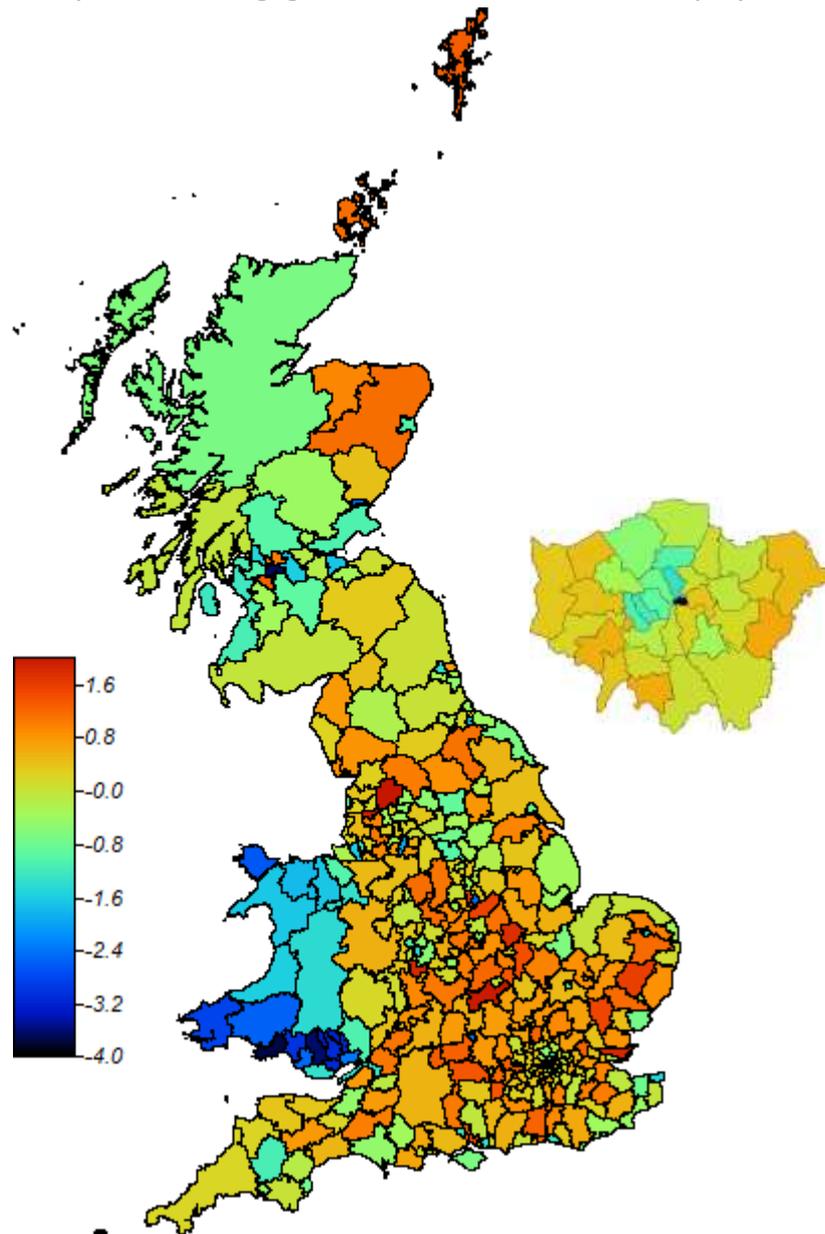
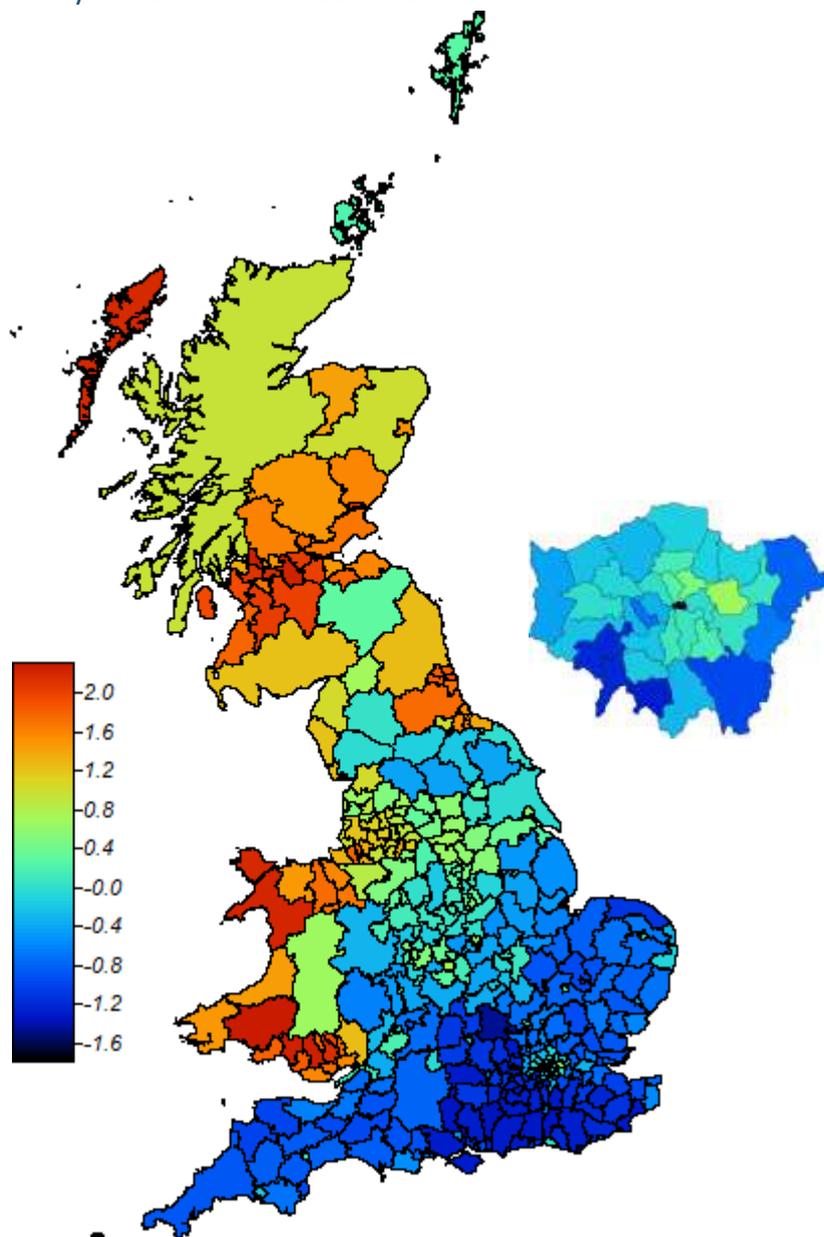


Table 2: Engagement with Education and Employment by Region

Rank	Region	Engagement with Employment and Education
1	East of England	0.44
2	South East	0.23
3	East Midlands	0.18
4	South West	0.14
5	North West	0.00
6	West Midlands	-0.08
7	London	-0.11
8	Yorkshire and Humber	-0.30
9	North East	-0.34
10	Scotland	-1.03
11	Wales	-2.55

As shown by Figure 3, there is a particularly marked North-South divide with regard to a community culture that is collective in its nature. Localities in Wales, Scotland, North East, and North West are the most culturally collective. Conversely, and shown as by Table 3, localities in the South West, East of England and the South East are the least collectively oriented communities.

Figure 3: Community Culture – Collective Activities



**Table 3: Collective Activities by Region**

Rank	Region	Collective Activities
1	Wales	1.75
2	Scotland	1.64
3	North East	1.59
4	North West	0.99
5	Yorkshire and Humber	0.35
6	West Midlands	0.13
7	East Midlands	-0.03
8	London	-0.25
9	South West	-0.62
10	East of England	-0.66
11	South East	-1.08

Alongside collective activities, another measure of the cultural bonding within local communities is the rate of social cohesion. Table 4 illustrates that social cohesion is highest in the localities of North East England, followed by Scotland, Wales and the North West. At the other end of the spectrum, London, South East England and the West Midlands are the least socially cohesive, and therefore the most socially diverse. Inverclyde (Scotland), St. Helens (North West), North Lanarkshire (Scotland), and Knowsley (North West) and Copeland (North West) have the most socially cohesive community cultures (Table 5), whilst the London boroughs of Newham, Brent, Westminster, Haringey and Tower Hamlets are most socially diverse (Table 6).

**Table 4: Social Cohesion by Region**

Rank	Region	Social Cohesion
1	North East	0.61
2	Scotland	0.55
3	Wales	0.44
4	North West	0.30
5	South West	0.17
6	Yorkshire and Humber	0.12
7	East of England	-0.05
8	East Midlands	-0.08
9	West Midlands	-0.21
10	South East	-0.22
11	London	-2.41

Table 5: Social Cohesion by Local Authority Area (Top 20 Localities)

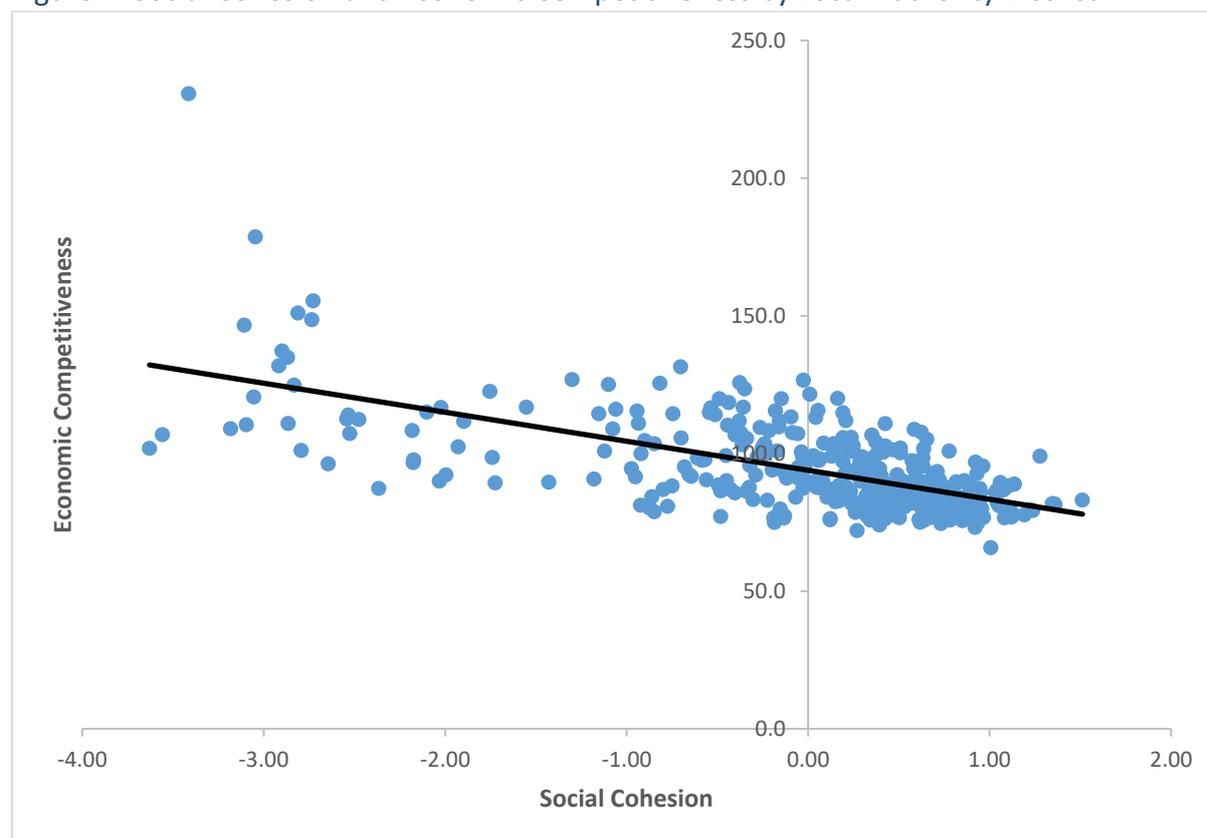
Rank	Local Authority Area	Region	Social Cohesion
1	Inverclyde	Scotland	1.51
2	St. Helens	North West	1.36
3	North Lanarkshire	Scotland	1.36
4	Knowsley	North West	1.35
5	Copeland	North West	1.28
6	Staffordshire Moorlands	West Midlands	1.24
7	Wigan	North West	1.23
8	West Dunbartonshire	Scotland	1.19
9	Halton	North West	1.14
10	East Ayrshire	Scotland	1.13
11	Barnsley	Yorkshire and Humber	1.12
12	Redcar and Cleveland	North East	1.11
13	Barrow-in-Furness	North West	1.11
14	North Ayrshire	Scotland	1.08
15	South Lanarkshire	Scotland	1.08
16	Chorley	North West	1.06
17	Sefton	North West	1.05
18	West Lancashire	North West	1.04
19	Hartlepool	North East	1.04
20	South Ribble	North West	1.03

Table 6: Social Cohesion by Local Authority Area (Bottom 20 Localities)

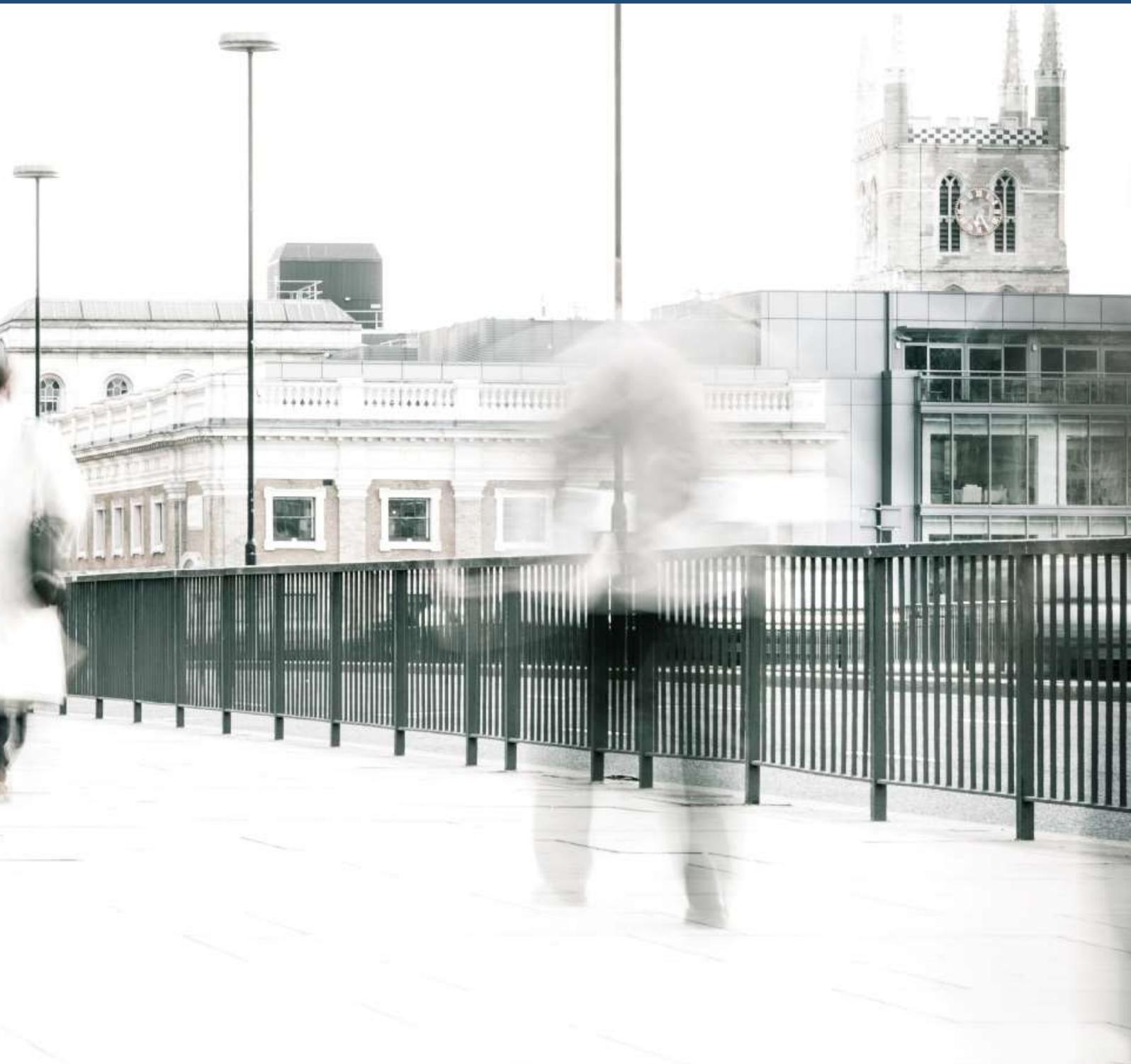
Rank	Local Authority Area	Region	Social Cohesion
374	Newham	London	-3.63
373	Brent	London	-3.56
372	Westminster	London	-3.41
371	Haringey	London	-3.18
370	Tower Hamlets	London	-3.11
369	Ealing	London	-3.09
368	Hounslow	London	-3.05
367	Camden	London	-3.05
366	Wandsworth	London	-2.92
365	Lambeth	London	-2.90
364	Southwark	London	-2.87
363	Harrow	London	-2.86
362	Hackney	London	-2.83
361	Hammersmith and Fulham	London	-2.81
360	Redbridge	London	-2.79
359	Kensington and Chelsea	London	-2.73
358	Islington	London	-2.73
357	Waltham Forest	London	-2.64
356	Barnet	London	-2.54
355	Slough	South East	-2.53

Figure 4 illustrates the relationship between social cohesion and economic competitiveness across local authority districts. It shows a significant negative relationship, which suggests that localities with more diverse community cultures tend to be more economically competitive.

Figure 4: Social Cohesion and Economic Competitiveness by Local Authority District



# 4. Personality Psychology



Personality psychology refers to one of the predominant paradigms in behavioural psychology for understanding and measuring differences in personality traits across individuals (McCrae and Terracciano, 2005; Doborico McDonald, 2008; Benet-Martinez et al., 2015). Within studies of geographical personality the measures normally considered are those associated with the so-called Big Five framework of personality traits, consisting of: (1) openness - the tendency to be open to new aesthetic, cultural, or intellectual experiences; (2) conscientiousness – the tendency to be organised, responsible, and hardworking; (3) extraversion – an orientation of one’s interests and energies toward the outer world of people and things rather than the inner world of subjective experience, and characterised by positive affect and sociability; (4) agreeableness – the tendency to act in a cooperative unselfish manner; and (5) neuroticism (cf. emotional stability) – a chronic level of emotional instability and proneness to psychological distress, whilst emotional stability is largely the opposite and concerns predictability and stability in emotional reactions, with an absence of rapid mood changes (Costa and McCrae, 1992; Goldberg, 1992; Soldz and Vaillant, 1999; Rammstedt and John, 2007; Credé et al., 2012).

In parallel with recent scholarly work in the field of socio-spatial community culture, researchers of personality psychology have found that in terms of economic prosperity there is a positive link between openness and extraversion, whilst conscientiousness displays a negative association (Rentfrow et al., 2015). Lee (2016) further finds that conscientiousness in cities and regions in England and Wales is positively associated with innovation as captured by patenting activity. Obschonka et al. (2015) include conscientiousness in their entrepreneurial index, which they find is positively linked to entrepreneurial activity. Although the majority of research on personality psychology has examined the impact of individual personality traits on a variety of outcomes, the idiographic perspective suggests that a more holistic view should be taken (Rentfrow et al., 2013). This idiographic perspective refers to understanding behaviour through a configuration of differing traits, which at a geographical level facilitates an investigation of the extent to which particular configurations of traits occur with some regularity in specific regions (Rentfrow et al., 2013). Furthermore, certain configurations of traits have been found to be good predictors of developmental outcomes such as: achievement at school (Asendorpf and van Aken, 1999; Hart et al., 2003); the development of social support networks (Caspi, 2000); older age health such as the prevalence or avoidance of strokes and

heart disease (Chapman and Goldberg, 2011); as well as the likelihood of having spells in unemployment (Caspi, 2000).

Rentfrow et al. (2013) use a cluster analysis approach to identify three psychological profiles of regions - friendly and conventional, relaxed and creative, temperamental and uninhibited - covering the 48 contiguous US states. The friendly and conventional profile is low on neuroticism and openness, but high on extraversion, agreeableness and conscientiousness. The relaxed and creative states have low extraversion, agreeableness and neuroticism, but are high on openness. The final set of states described as temperamental and uninhibited are low on agreeableness, conscientiousness and high on neuroticism. These areas display strong differences in terms of a variety of political, economic, social and health outcomes. Economically, the friendly and conventional states are those which are the least successful.

More generally, personality psychology traits are found to play an important role not only independently, but in terms of the combinations formed. Whereas community culture is a concept that manifests itself at the community level (Beugelsdijk and Maseland, 2011), other characteristics at an individual level may have an impact at the aggregate level due to their unequal distribution across places. At the individual level this report draws upon the Big Five personality measures used in Rentfrow et al. (2015). The personality trait data used in the empirical analysis was captured through the British Broadcasting Corporation's (BBC) Lab UK website. This data was used by Rentfrow et al. (2015) to map the distribution of personality traits across Great Britain. A total sample of 417,246 adults aged over 18 was obtained. At the local authority district level, the number of participants varies from 29 in the Isles of Scilly to 6200 in Birmingham. The mean number of respondents in each local authority was 1098 and the median 883. Rentfrow et al. (2015) show that the local authority subsamples are correlated with the underlying populations in terms of ethnic background, and median age.

The instrument used to collect the data is the Big Five Inventory (John and Srivastava, 1999). This consists of 44 short statements associated with the prototypical traits of the Big Five personality characteristics measured on five point Likert scales. Principal components analysis (PCA) with a varimax rotation is used to generate the five underlying measures. The components display reasonable internal consistency with Chronbach's alpha ranging from 0.77 for Agreeableness to 0.86 for Extraversion (Obschonka et al., 2015). As in

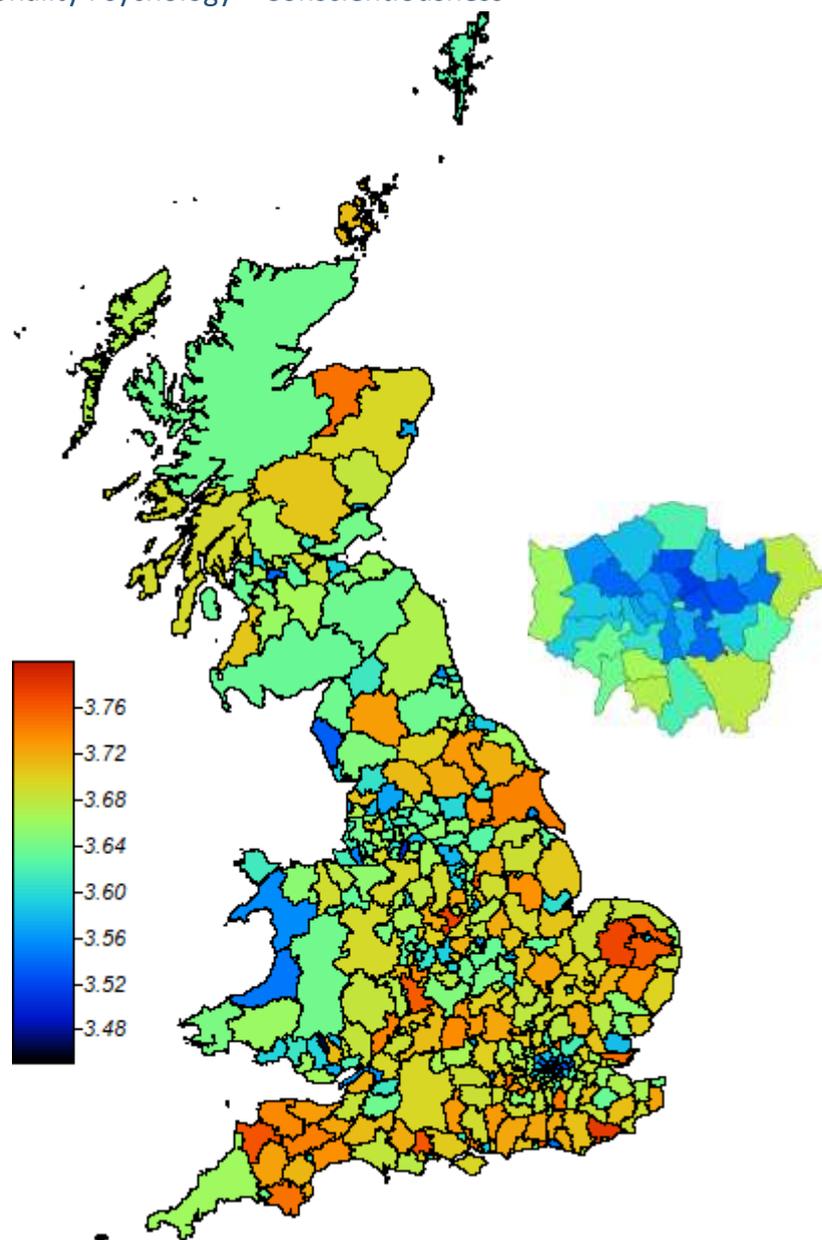
previous studies, the mean values are taken to represent the average local authority district level personality values (Rentfrow et al., 2008; Rentfrow et al., 2015; Obschonka et al., 2016).

As with community culture, particular personality traits may be more positively related to economic activities than others. Barrick et al. (2003) conduct a meta-analysis of the relationship between occupational choice and personality traits. They find that jobs requiring social interaction and avoid routinisation from machines are linked with extraversion. Artistic occupations that need to be expressive and nonconformist and original are linked to greater openness. This fits with the finding that openness and extraversion, in particular, are perceived to be beneficial in terms of achieving informational exchange (Rentfrow et al., 2015). Investigative occupations requiring curiosity, precision and methodological natures are positively associated with conscientiousness, emotional stability (lower neuroticism) and openness. Conscientiousness is also associated with conventional jobs that require data manipulation, but the avoidance of artistic tendencies (Barrick et al., 2003). Interestingly, this implies that whilst creativity is often associated with innovation, the need for precision and methodological approaches may explain why Lee (2016) finds a stronger association between innovation and conscientiousness than openness or extraversion.

Other studies have identified an entrepreneurial culture based on personality traits that show high levels of extraversion, conscientiousness and openness, and low levels of agreeableness and neuroticism (Obschonka et al., 2013b). This means that cities and regions that have a greater proportion of people with these traits may be better placed to host certain economic activities. Industries and occupations that dominate may produce feedback effects influencing personality within a particular city, locality or region through informal and formal rules, which in less competitive cities and regions may support established industries over new start-ups (Grabher, 1993), limit those entrepreneurial role models who may create the social legitimisation for entrepreneurship (Wyrwich, 2015; Kibler et al., 2014), and produce the intergenerational transmission of values associated with particular work experiences (Luster et al., 1989). These differences may be long-lasting and in the case of the UK, for example, create personality patterns unsuited to entrepreneurial endeavours in cities and regions that were once the dominant locations for large scale heavy industry (Stuetzer et al., 2016).

Figure 5 illustrates how personality psychology as measured by conscientiousness is distributed across the nation. It shows that localities in the South West, South East and East of England have a strong density of individuals reporting conscientiousness behaviour. Although levels of conscientiousness appear low in a number of localities in Wales, Scotland and the North West, we do not see a particular north-south split, particularly as many London boroughs have a relatively low proportion of people with a highly conscientiousness personality.

Figure 5: Personality Psychology – Conscientiousness



It is clear from both Figure 6 and Table 7 that individuals with the most extravert personalities tend to be clustered in and around London. With exception of small number of localities, the top 20 most extravert places are all situated in the south of the nation, with the London boroughs of Hammersmith and Fulham, Richmond upon Thames, Wandsworth, Kensington and Chelsea, and Lambeth being particular hotspots. As shown by Table 8, with the exception of Barking and Dagenham, those localities with the lowest proportion of extravert individuals – therefore constituting Britain’s most introverted localities – are situated in the north and midlands, with most introverted being Boston and Corby in the East Midlands.

Figure 6: Personality Psychology – Extraversion

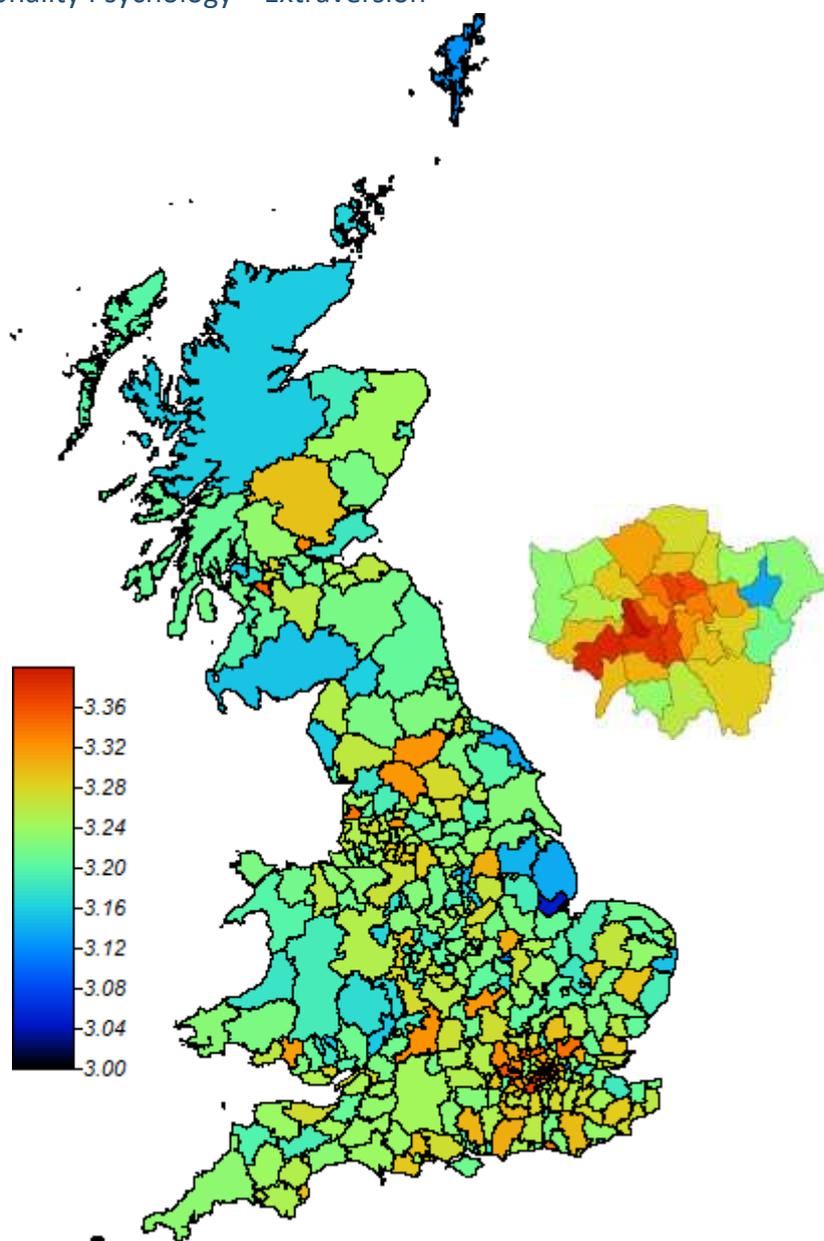


Table 7: Extraversion by Local Authority Area (Top 20 Localities)

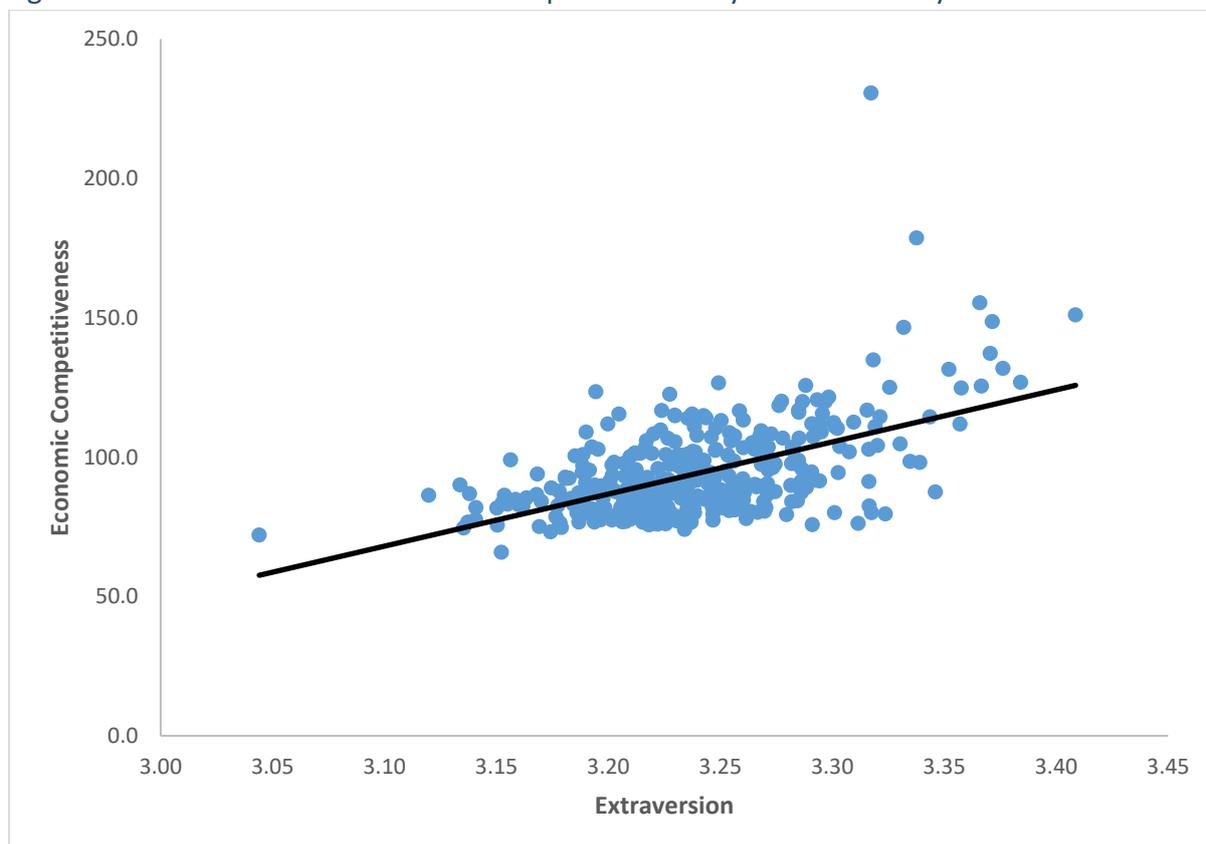
Rank	Local Authority Area	Region	Extraversion
1	Hammersmith and Fulham	London	3.409
2	Richmond upon Thames	London	3.384
3	Wandsworth	London	3.376
4	Kensington and Chelsea	London	3.372
5	Lambeth	London	3.371
6	Elmbridge	South East	3.367
7	Islington	London	3.366
8	Hackney	London	3.358
9	Three Rivers	East of England	3.357
10	Windsor and Maidenhead	South East	3.352
11	East Renfrewshire	Scotland	3.346
12	Hertsmere	East of England	3.344
13	Epping Forest	East of England	3.339
14	Camden	London	3.338
15	Fylde	North West	3.335
16	Tower Hamlets	London	3.332
17	Brighton and Hove	South East	3.330
18	South Bucks	South East	3.326
19	Clackmannanshire	Scotland	3.324
20	Wycombe	South East	3.321

Table 8: Extraversion by Local Authority Area (Bottom 20 Localities)

Rank	Local Authority Area	Region	Extraversion
374	Boston	East Midlands	3.044
373	Corby	East Midlands	3.120
372	Barking and Dagenham	London	3.134
371	East Lindsey	East Midlands	3.135
370	Scarborough	Yorkshire and Humber	3.137
369	Oadby and Wigston	East Midlands	3.138
368	Bolsover	East Midlands	3.141
367	West Lindsey	East Midlands	3.141
366	Waveney	East of England	3.150
365	Dumfries & Galloway	Scotland	3.150
364	Blaenau Gwent	Wales	3.152
363	Chesterfield	East Midlands	3.153
362	Forest of Dean	South West	3.154
361	Inverclyde	Scotland	3.155
360	Copeland	North West	3.156
359	Carlisle	North West	3.159
358	Gedling	East Midlands	3.160
357	Hastings	South East	3.162
356	Telford and Wrekin	West Midlands	3.164
355	Redditch	West Midlands	3.168

As shown by Figure 7, there is a very strong and significant positive relationship between levels of extravert behaviour and economic competitiveness across localities. This indicates that the geography of personality traits with regard to rates of extravert-introvert behaviour is strongly associated with economic performance, which is confirmed by the correlation and regression analysis presented later in this report.

Figure 7: Extraversion and Economic Competitiveness by Local Authority District



Similar to extraversion, high densities of individuals with behaviour that can be regarded as open tend to be found in urban areas of the south of Britain. As shown by Table 9, London boroughs account for the top ten twenty localities in terms of openness, led by Hackney, Islington, Kensington and Chelsea, Camden, and Southwark. Interestingly, however, many of the least open localities are also situated in the south, along with a number in the north and the midlands, with the most 'closed' places being Maldon, Rochford, and Crawley (Table 10).

Table 9: Openness by Local Authority Area (Top 20 Localities)

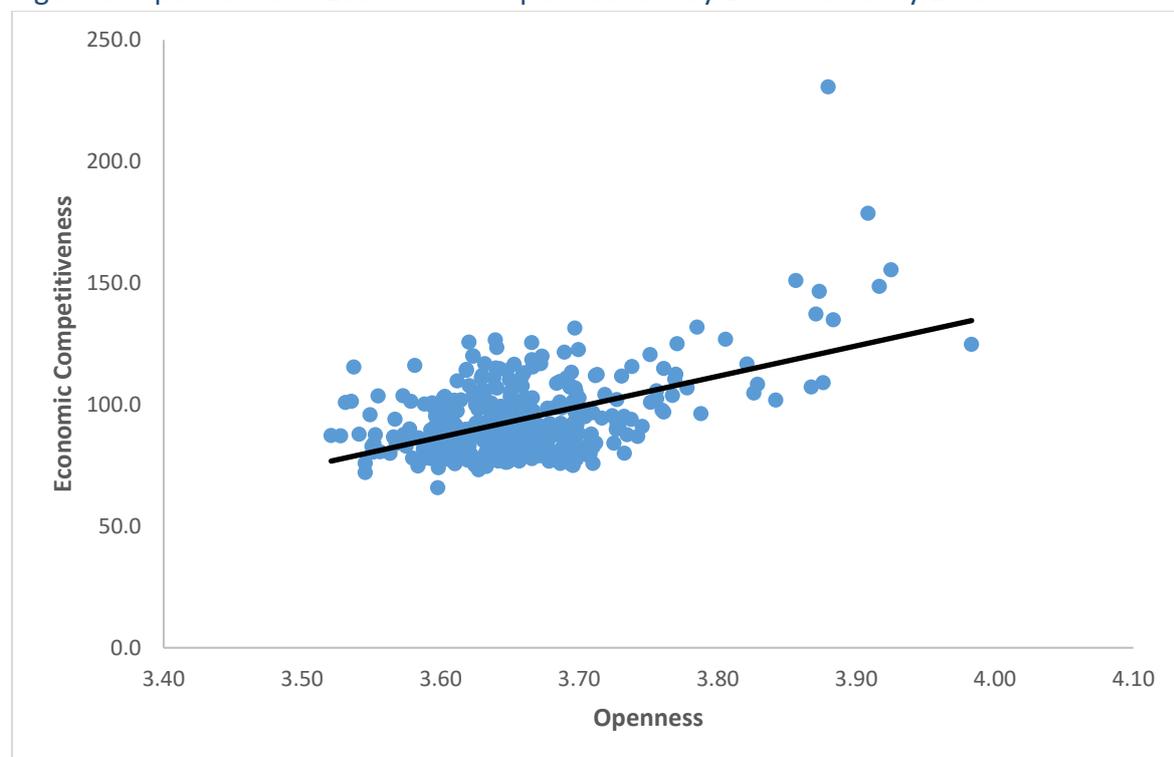
Rank	Local Authority Area	Region	Openness
1	Hackney	London	3.983
2	Islington	London	3.925
3	Kensington and Chelsea	London	3.917
4	Camden	London	3.909
5	Southwark	London	3.883
6	Westminster	London	3.880
7	Haringey	London	3.876
8	Tower Hamlets	London	3.873
9	Lambeth	London	3.871
10	Lewisham	London	3.868
11	Hammersmith and Fulham	London	3.856
12	Newham	London	3.842
13	Oxford	South East	3.829
14	Brighton and Hove	South East	3.826
15	Cambridge	East of England	3.821
16	Richmond upon Thames	London	3.806
17	Waltham Forest	London	3.788
18	Wandsworth	London	3.785
19	Brent	London	3.778
20	South Bucks	South East	3.771

Table 10: Openness by Local Authority Area (Bottom 20 Localities)

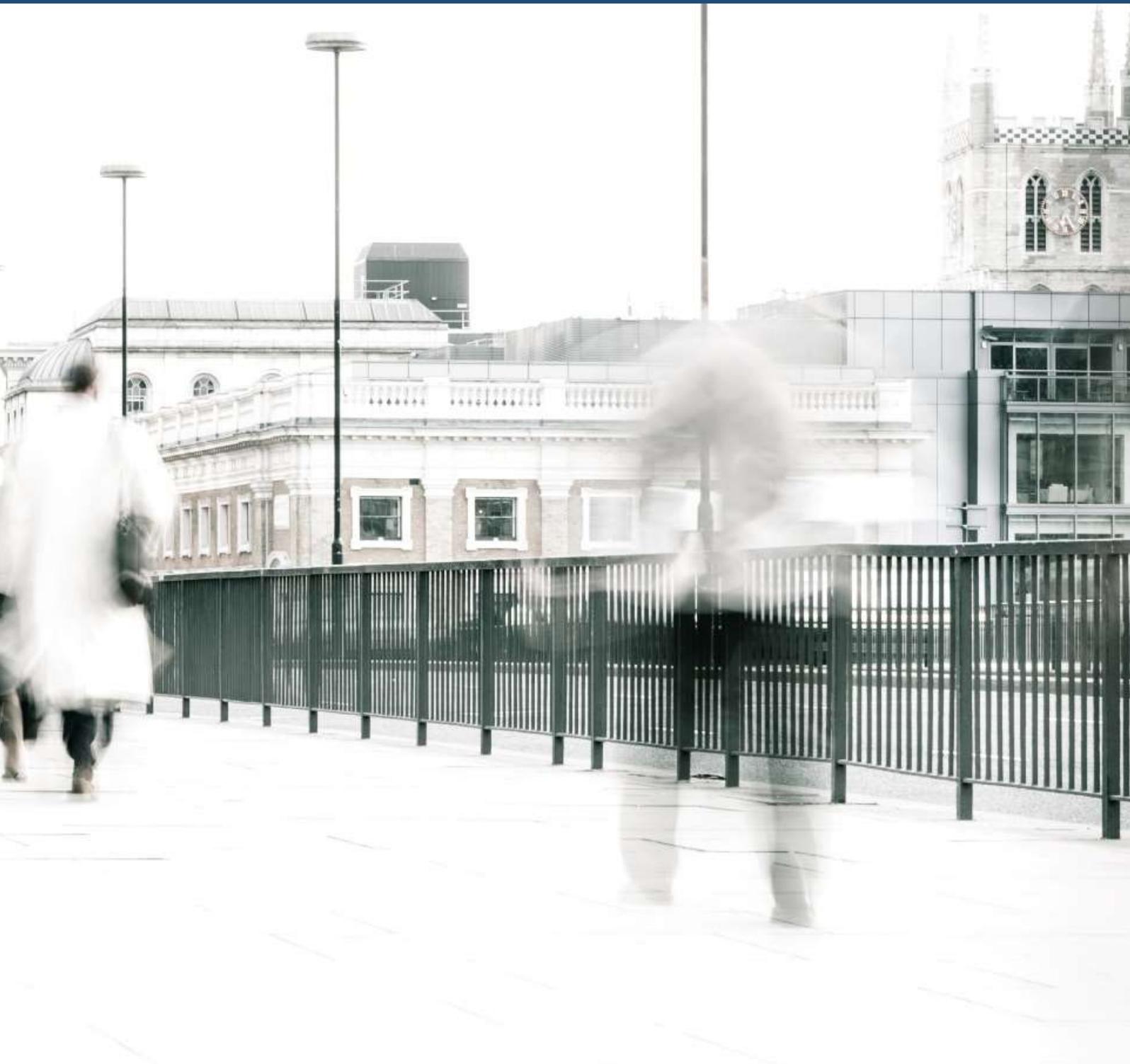
Rank	Local Authority Area	Region	Openness
374	Maldon	East of England	3.521
373	Rochford	East of England	3.528
372	Crawley	South East	3.531
371	Fareham	South East	3.536
370	Bracknell Forest	South East	3.537
369	Thurrock	East of England	3.541
368	Boston	East Midlands	3.546
367	Hyndburn	North West	3.546
366	Basildon	East of England	3.549
365	Gedling	East Midlands	3.550
364	Castle Point	East of England	3.551
363	Angus	Scotland	3.552
362	Gravesham	South East	3.553
361	Swindon	South West	3.555
360	Great Yarmouth	East of England	3.556
359	Cannock Chase	West Midlands	3.563
358	Gosport	South East	3.566
357	Bexley	London	3.567
356	North East Lincolnshire	Yorkshire and Humber	3.568
355	Eastleigh	South East	3.573

As with extravert behaviour, an open personality psychology is positively associated with economic behaviour at the local level (Figure 8). This begins to suggest that having people with the 'right' personality in your locality may be an important influence on long-term competitiveness and economic development.

Figure 8: Openness and Economic Competitiveness by Local Authority District



# 5. Psychocultural Behaviour



Although personality psychology represents a potentially powerful means of explaining the uneven development of cities and regions, it is important to highlight that personality traits in the form of the Big Five are defined without reference to any context, i.e. situation or socio-spatial community culture (Almlund et al., 2011). Indeed, a long-term perspective on development should acknowledge that the genetic – encompassing personality psychology - evolution of humans and their cultural evolution are ultimately interactive, i.e. positive and negative interactions between cultural and biological evolution may occur and give rise to cultural-genetic co-evolution (Van den Bergh and Stagl, 2003). Such co-evolutionary forces can be related to theories of ‘generation’ and ‘collective memory’, or what Lippmann and Aldrich (2016) refer to as ‘generational units’, in the form of meaningful collectives that move through time with high degrees of self-awareness.

In this sense, the interaction between culture and psychology forms part of the complex adaptive systems that are considered to explain economic and social outcomes, partly as a result of the individuals who inhabit such systems. If genetic and cultural factors are co-evolutionary, this suggests the need to give more emphasis to temporal dimensions – current behaviour or behaviour in the middle or distant future - when considering urban and regional development outcomes, i.e. spatio-temporal dimensions.

Studies frequently treat individual aspects of community culture and personality traits as independent, although this approach is criticised by some scholars (Klotz and Neubaum, 2016). In their study of personality traits, Rentfrow et al. (2013) argue that it is the combinations of personality traits that are important, with there being a need to take an idiographic perspective. Further, there are suggestions that the community culture and personality traits of a locality influence one another (Rentfrow et al., 2009). For example, particular types of individual may be attracted to community cultures where their personality traits are most compatible (Rentfrow et al., 2013), or alternatively community cultures may generate social norms that influence attitudes and behaviours (Hofstede, 2001; Hofstede and McCrae, 2004). Similarly, the prevailing personality traits of residents in a city, locality or region will have an influence on how community culture evolves (Florida, 2002).

To capture the combinations of community culture and personality traits that form together in cities, localities and regions across Great Britain, a Principal Components Approach can be used to integrate the community culture and personality psychology data

discussed above. A varimax approach is applied to generate uncorrelated measures suitable for inclusion in multivariate analysis. The scores are produced using the Anderson-Rubin approach, which is best suited when non-correlated factor scores are required (Tabachnick and Fidell, 2007). Three combined measures capturing different psycho-cultural behaviour are formed: *Inclusive Amenability*, *Individual Commitment*, and *Diverse Extraversion*. The results of the principal component analysis are shown in Appendix Table 1 and can be summarised as follows:

**Inclusive Amenability:**

- high in agreeableness, social cohesion, feminine and caring activities, and adherence to social rules
- low in openness

**Individual Commitment:**

- high in conscientiousness, engagement with education, and adherence to social rules
- low in collective activities

**Diverse Extraversion:**

- high in extraversion, and openness
- low in neuroticism

With regard to psychocultural behaviour that can be regarded as inclusively amenable, localities in more geographically peripheral parts of Britain tend to display higher levels of such behaviour, as shown by Figure 9. At the regional level, Wales, Scotland, and North East England have the highest rates of inclusive amenability, with London having by far the lowest rate (Table 11). The nation's most inclusively amenable local places are West Somerset, Argyll & Bute, Rother, Forest of Dean and Denbighshire (Table 12), whilst London boroughs account for all twenty of the least inclusively amenable localities, led by Tower Hamlets, Kensington and Chelsea, Westminster, Newham and Haringey (Table 13).

Figure 9: Psychocultural behaviour – Inclusive Amenability

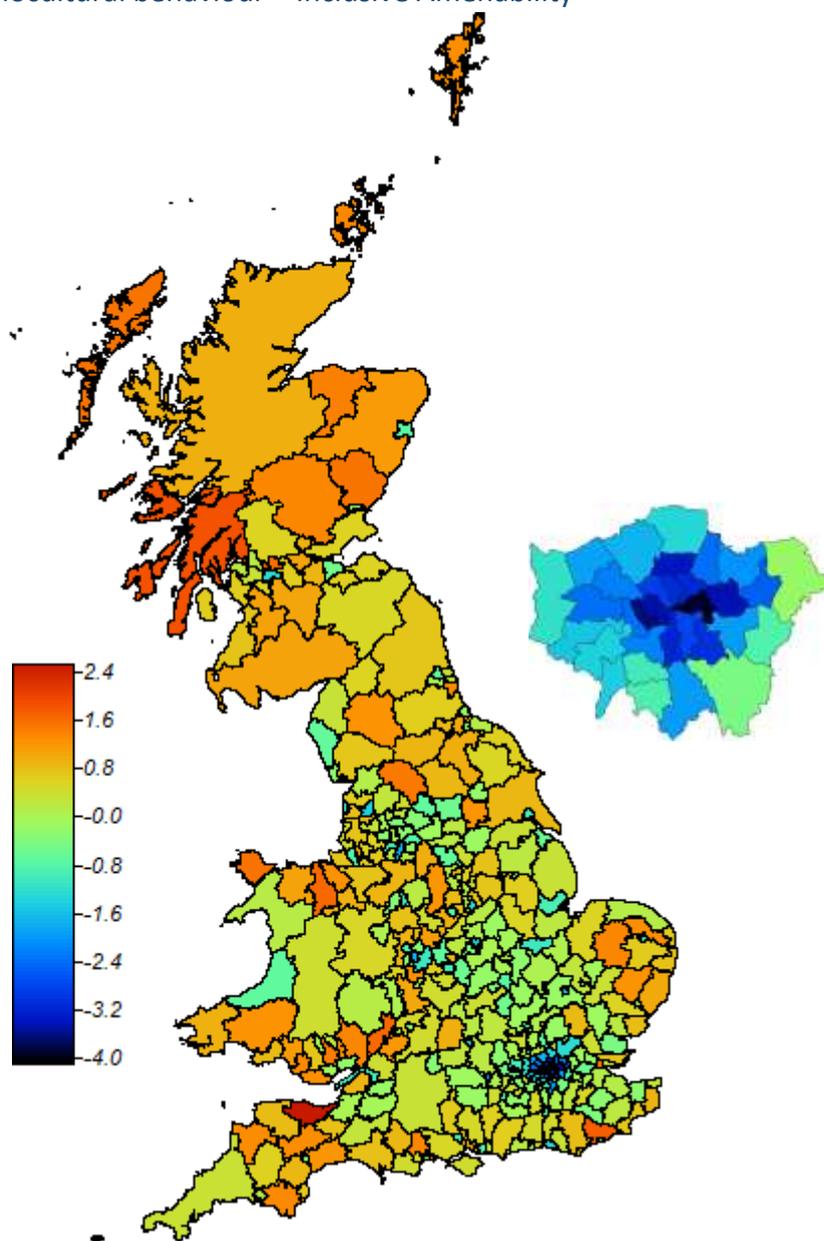


Table 11: Inclusive Amenability by Region

Rank	Region	Inclusive Amenability
1	Wales	0.71
2	Scotland	0.35
3	North East	0.35
4	South West	0.28
5	East of England	0.02
6	North West	-0.06
7	East Midlands	-0.07
8	South East	-0.07
9	Yorkshire and Humber	-0.16
10	West Midlands	-0.33
11	London	-2.24

Table 12: Inclusive Amenability by Local Authority Area (Top 20 Localities)

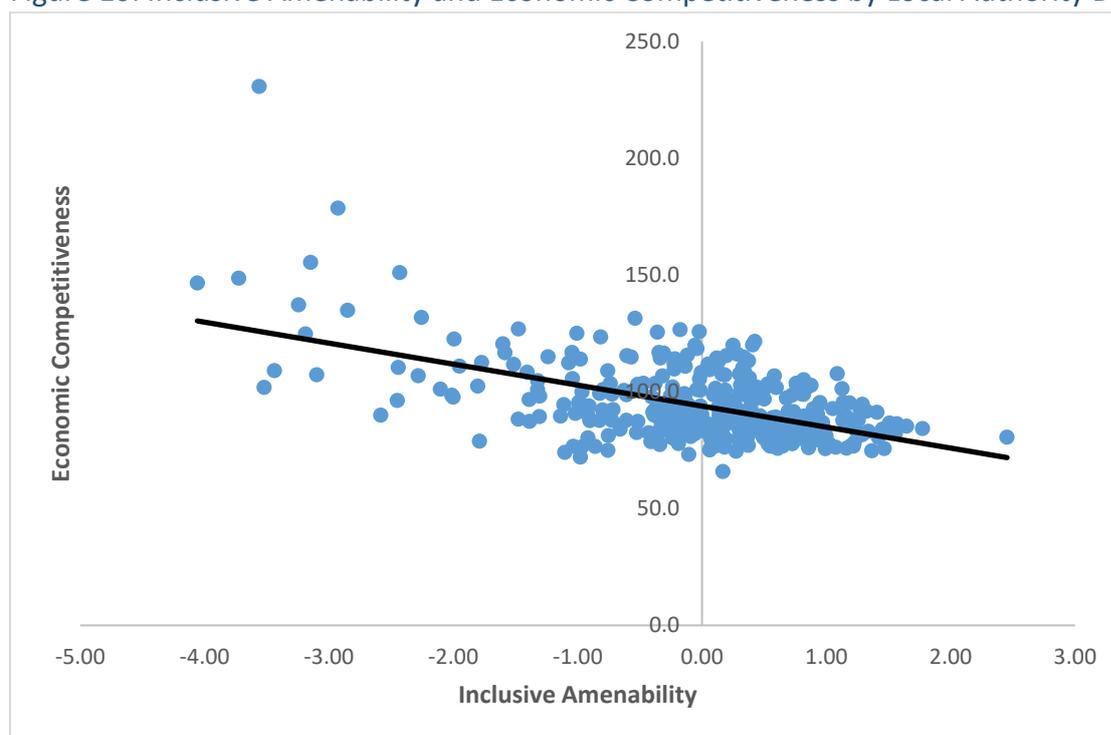
Rank	Local Authority Area	Region	Inclusive Amenability
1	West Somerset	South West	2.45
2	Argyll & Bute	Scotland	1.77
3	Rother	South East	1.65
4	Forest of Dean	South West	1.57
5	Denbighshire	Wales	1.56
6	East Dunbartonshire	Scotland	1.51
7	Anglesey	Wales	1.47
8	Angus	Scotland	1.45
9	Castle Point	East of England	1.42
10	Craven	Yorkshire and Humber	1.41
11	Caerphilly	Wales	1.37
12	Moray	Scotland	1.34
13	Christchurch	South West	1.32
14	East Dorset	South West	1.29
15	Monmouthshire	Wales	1.29
16	Breckland	East of England	1.29
17	Perth & Kinross	Scotland	1.27
18	South Hams	South West	1.26
19	Bridgend	Wales	1.25
20	Mid Devon	South West	1.23

Table 13: Inclusive Amenability by Local Authority Area (Bottom 20 Localities)

Rank	Local Authority Area	Region	Inclusive Amenability
374	Tower Hamlets	London	-4.06
373	Kensington and Chelsea	London	-3.73
372	Westminster	London	-3.56
371	Newham	London	-3.52
370	Haringey	London	-3.44
369	Lambeth	London	-3.24
368	Hackney	London	-3.19
367	Islington	London	-3.15
366	Lewisham	London	-3.10
365	Camden	London	-2.93
364	Southwark	London	-2.85
363	Barking and Dagenham	London	-2.58
362	Waltham Forest	London	-2.45
361	Ealing	London	-2.44
360	Hammersmith and Fulham	London	-2.43
359	Brent	London	-2.28
358	Wandsworth	London	-2.25
357	Redbridge	London	-2.10
356	Croydon	London	-2.01
355	Greenwich	London	-2.00

At the local level, there is a significant negative relationship between rates of inclusive amenability and economic competitiveness. This suggests that places portraying behaviour that tends to be agreeable and cohesive do not generally generate the highest rates of competitiveness and economic performance. In other words, whilst such culture and psychology may have significant positive attributes with regard to social development, such attributes do not always appear to the 'right' ingredients for stimulating economic growth and development.

Figure 10: Inclusive Amenability and Economic Competitiveness by Local Authority District



Behaviour based on individual commitment shows strong geographical differences across Britain, as illustrated by Figure 11. Localities situated in South East England, the East of England, South West England and the East Midlands have the highest concentration of this behavioural form. Although parts of London appear to have above average concentrations of these individuals, the region as a whole has, perhaps a lower density of these types of individuals from what might be expected.

The regions where this behaviour is least prevalent are Wales, Scotland, North East England and North West England (Table 14). At the local level, Rochford (East of England), Bracknell Forest, Fareham, Horsham and Tandridge (all South East England) are those places displaying the highest levels of individual commitment (Table 15). As shown by Table 16, those localities with behaviour that is the least inclined toward individual commitment consist of many in Scotland and Wales, with the lowest ranked localities being: Glasgow City; Swansea; Merthyr Tydfil; Dundee City; and Rhondda, Cynon, Taff. It is interesting that both Glasgow and Manchester feature in the bottom twenty positions, and may indicate that cities see such as these have a workforce consisting of people with this behaviour, but many of these may commute from other local authority areas.

Figure 11: Psychocultural behaviour – Individual Commitment

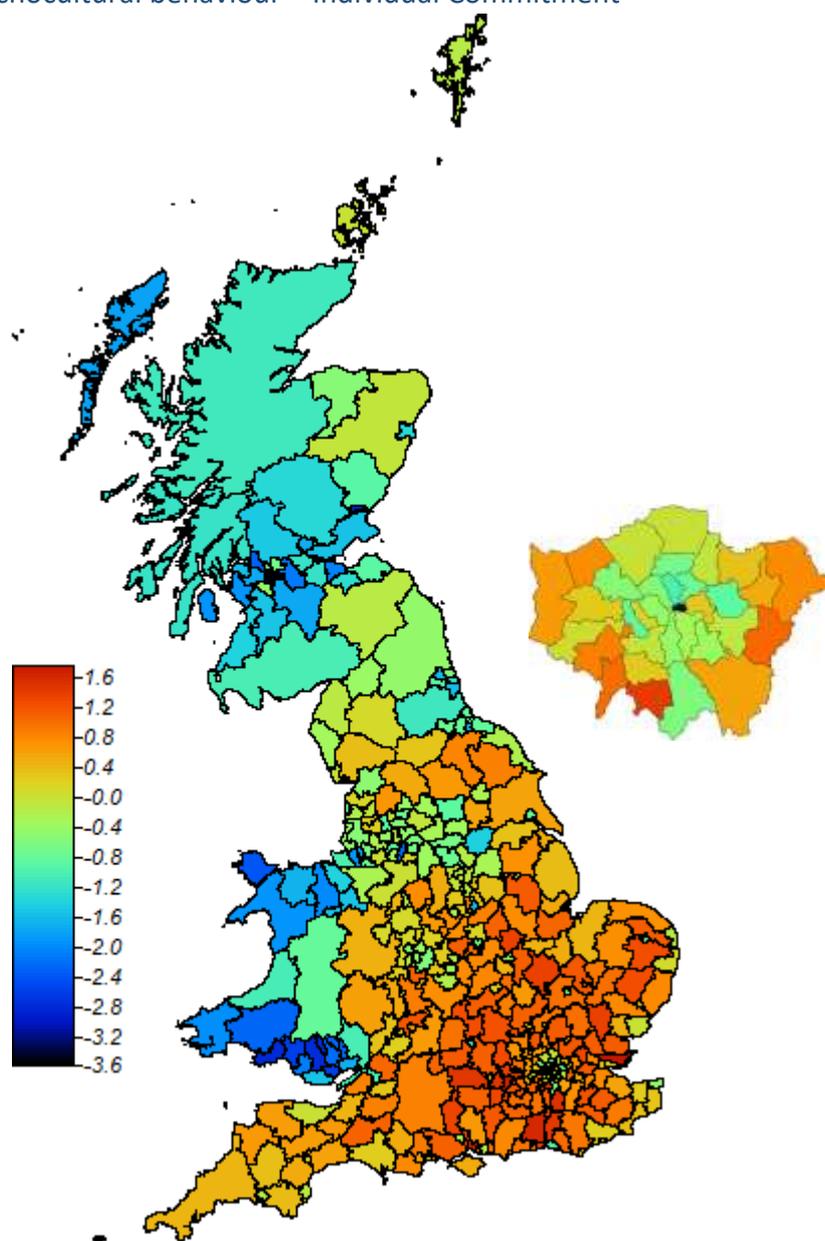


Table 14: Individual Commitment by Region

Rank	Region	Individual Commitment
1	South East	0.75
2	East of England	0.69
3	South West	0.37
4	East Midlands	0.18
5	London	-0.05
6	West Midlands	-0.06
7	Yorkshire and Humber	-0.38
8	North West	-0.66
9	North East	-1.10
10	Scotland	-1.70
11	Wales	-2.13

Table 15: Individual Commitment by Local Authority Area (Top 20 Localities)

Rank	Local Authority Area	Region	Individual Commitment
1	Rochford	East of England	1.73
2	Bracknell Forest	South East	1.60
3	Fareham	South East	1.59
4	Horsham	South East	1.56
5	Tandridge	South East	1.46
6	Wokingham	South East	1.42
7	West Berkshire	South East	1.41
8	Mid Sussex	South East	1.40
9	Sutton	London	1.35
10	Braintree	East of England	1.32
11	Huntingdonshire	East of England	1.31
12	Oadby and Wigston	East Midlands	1.31
13	Windsor and Maidenhead	South East	1.30
14	Adur	South East	1.30
15	Rutland	East Midlands	1.30
16	Test Valley	South East	1.28
17	Hart	South East	1.26
18	Brentwood	East of England	1.26
19	Eastleigh	South East	1.25
20	Epsom and Ewell	South East	1.25

Table 16: Individual Commitment by Local Authority Area (Bottom 20 Localities)

Rank	Local Authority Area	Region	Individual Commitment
374	Glasgow City	Scotland	-3.58
373	Swansea	Wales	-2.85
372	Merthyr Tydfil	Wales	-2.84
371	Dundee City	Scotland	-2.83
370	Rhondda, Cynon, Taff	Wales	-2.82
369	Neath Port Talbot	Wales	-2.66
368	Cardiff	Wales	-2.64
367	Anglesey	Wales	-2.44
366	West Dunbartonshire	Scotland	-2.35
365	Carmarthenshire	Wales	-2.32
364	Blaenau Gwent	Wales	-2.31
363	Torfaen	Wales	-2.30
362	Caerphilly	Wales	-2.28
361	Manchester	North West	-2.26
360	North Lanarkshire	Scotland	-2.16
359	Bridgend	Wales	-2.14
358	Edinburgh, City of	Scotland	-2.11
357	Denbighshire	Wales	-2.05
356	Pembrokeshire	Wales	-2.01
355	North Ayrshire	Scotland	-1.97

Diverse extravert behaviour is most commonly clustered in London and parts of South East England, as shown by Figure 12. Whilst London, South East England and South West England have the highest rates of diverse extraversion, the least diverse extravert behaviour is found in the regions of West Midlands, East Midlands and Yorkshire and Humber (Table 17). At the local level, those places with the highest levels of diverse extraversion are Hammersmith and Fulham, Elmbridge, Perth & Kinross, Richmond upon Thames and Windsor and Maidenhead (Table 18). At the other end of the scale, those places portraying the least diverse extravert behaviour are Boston, Barking and Dagenham, Barrow-in-Furness, Blaenau Gwent, and North East Lincolnshire.

Figure 12: Psychocultural behaviour – Diverse Extraversion

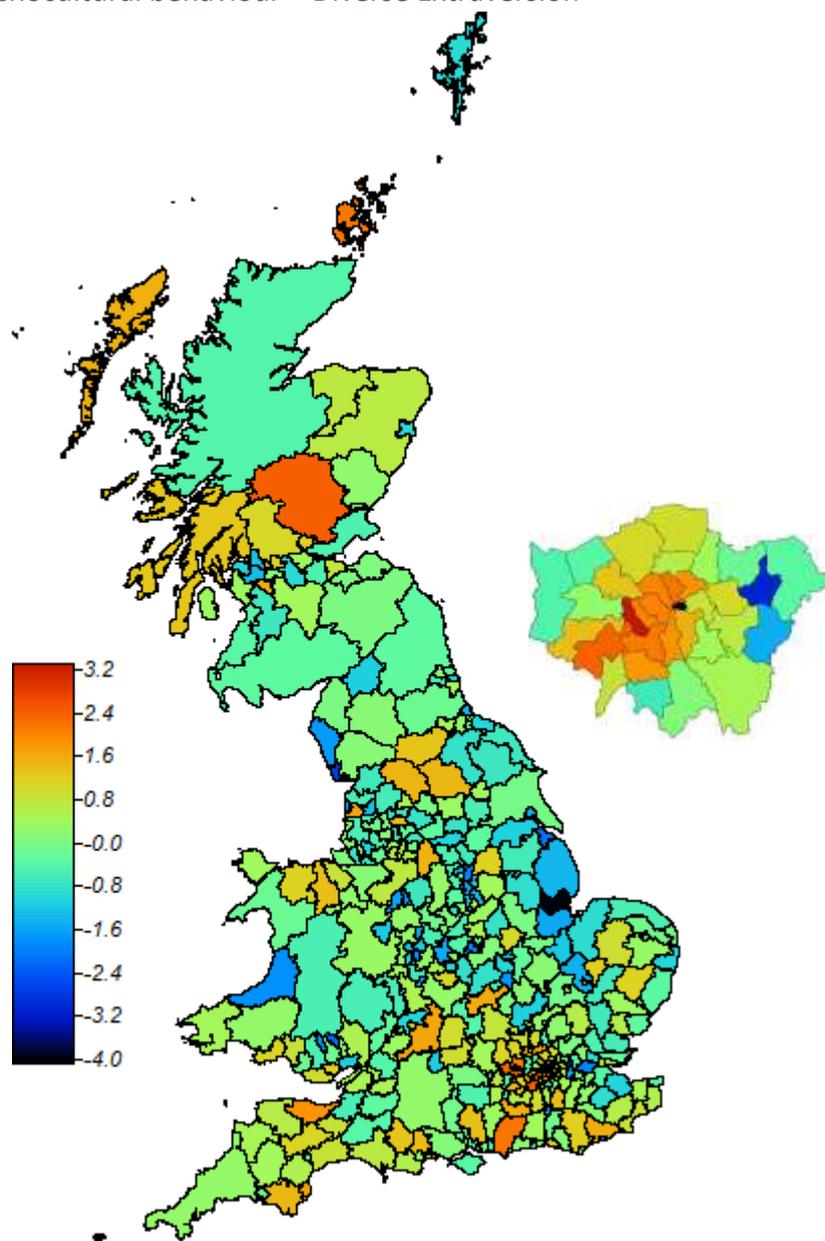


Table 17: Diverse Extraversion by Region

Rank	Region	Diverse Extraversion
1	London	0.75
2	South East	0.32
3	South West	0.28
4	Wales	0.16
5	Scotland	0.02
6	East of England	-0.09
7	North West	-0.19
8	North East	-0.26
9	Yorkshire and Humber	-0.39
10	East Midlands	-0.52
11	West Midlands	-0.55

Table 18: Diverse Extraversion by Local Authority Area (Top 20 Localities)

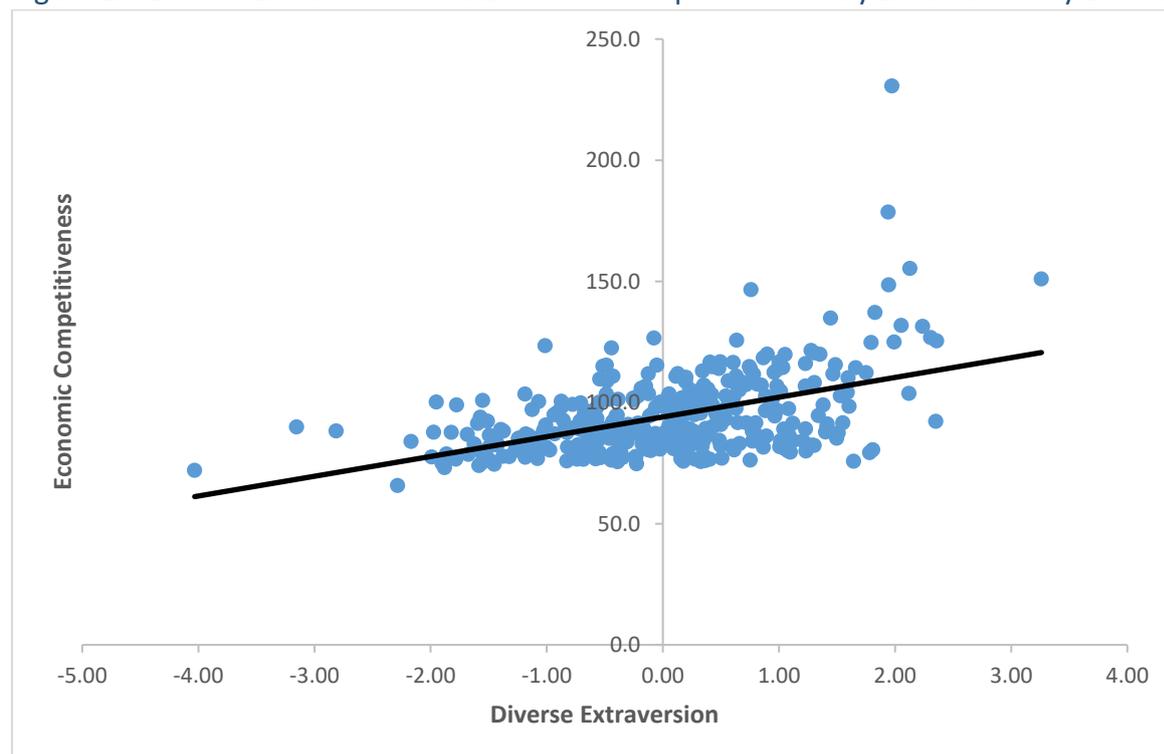
Rank	Local Authority Area	Region	Diverse Extraversion
1	Hammersmith and Fulham	London	3.26
2	Elmbridge	South East	2.36
3	Perth & Kinross	Scotland	2.35
4	Richmond upon Thames	London	2.31
5	Windsor and Maidenhead	South East	2.24
6	Islington	London	2.13
7	Chichester	South East	2.12
8	Wandsworth	London	2.05
9	South Bucks	South East	1.99
10	Westminster	London	1.97
11	Kensington and Chelsea	London	1.95
12	Camden	London	1.94
13	Lambeth	London	1.83
14	West Somerset	South West	1.81
15	Hackney	London	1.79
16	Weymouth and Portland	South West	1.78
17	Merton	London	1.75
18	Hertsmere	East of England	1.66
19	Torbay	South West	1.64
20	Fylde	North West	1.60

Table 19: Diverse Extraversion by Local Authority Area (Bottom 20 Localities)

Rank	Local Authority Area	Region	Diverse Extraversion
374	Boston	East Midlands	-4.03
373	Barking and Dagenham	London	-3.15
372	Barrow-in-Furness	North West	-2.81
371	Blaenau Gwent	Wales	-2.28
370	North East Lincolnshire	Yorkshire and Humber	-2.17
369	Bolsover	East Midlands	-1.99
368	Thurrock	East of England	-1.97
367	Blaby	East Midlands	-1.95
366	Ceredigion	Wales	-1.90
365	Merthyr Tydfil	Wales	-1.88
364	Sandwell	West Midlands	-1.86
363	Wellingborough	East Midlands	-1.82
362	Stoke-on-Trent	West Midlands	-1.78
361	Copeland	North West	-1.78
360	Oadby and Wigston	East Midlands	-1.68
359	Newcastle-under-Lyme	West Midlands	-1.67
358	South Holland	East Midlands	-1.62
357	North Warwickshire	West Midlands	-1.59
356	Blackpool	North West	-1.58
355	Bexley	London	-1.57

As shown by Figure 13, there is a positive relationship between diverse extraversion and economic competitiveness at the local level. This suggests that cosmopolitanism and outwardly facing behaviour tends to foster greater economic strength and competitiveness, and along with the other data presented above begins to hint at the possibility that some regions and localities possess the 'wrong' type of behaviour when it comes to catalysing economic development.

Figure 13: Diverse Extraversion and Economic Competitiveness by Local Authority District



# 6. Institutions



Although this study has captured informal influences on competitiveness through community culture and personality psychology, it is also recognised that formal institutions have a role to play in promoting economic development by ensuring contractual obligations are met (Knack and Keefer, 1995; Mauro, 1995; Mo, 2001; Rodríguez-Pose and Di Cataldo, 2014; Huggins and Thompson, 2014). Charron et al. (2014) develop regional measures of the quality of government for EU regions based on the World Bank's Governance Indicators national measures (Kaufmann et al., 2009) and a citizen survey gathered at the regional level (Charron et al., 2011). The citizen survey captured ratings for three public services: education, healthcare and law enforcement in terms of their quality, impartiality and corruption. It is not possible to utilise social surveys at the local level in Great Britain. Therefore, in order to extend Charron et al.'s (2011) approach, this study uses a number of complementary sources: satisfaction surveys of the police (Home Office Statistics and Scottish Policing Performance Framework), General Practitioners (NHS England, National Survey for Wales, Health - experience of GP services and Scottish Health and Care Experience Survey), measures of the quality of institutions such as complaints against the police (Her Majesty's Inspectorate of Constabulary and Scottish Policing Performance Framework), average primary school class size (Department for Education, Schools Census results and Summary Statistics for Schools in Scotland), and the proportion of schools rated as good or above (Office for Standards in Education, Children's Services and Skills (Ofsted), Estyn and School Estate Statistics). Note that for the police and health measures, these are captured at the police force and health team level, each of which includes a number of local authority areas. Likewise, the education measures are captured at the unitary authority and county level. This means that not all variation in the quality of these institutions is captured across local authority areas. However, as these largely represent the spatial level at which decisions relating to the operation of these institutions takes place, it is probable that more of the variation will be between these police forces, health teams and counties than within them.

As shown by Figure 14, the highest quality of local government is largely found in London and South East England. Localities in Wales, South West England and Scotland have, on average, the least effective local governments (Table 20), which in an age of austerity is likely to become further accentuated. Indeed, for some places the mix of poor institutions and forms of psycho-cultural behaviour that do not appear to promote economic growth and competitiveness continue to make them highly vulnerable over both the short and long-term.

Figure 14: Institutions – Quality of Government (excluding northern parts of Scotland)

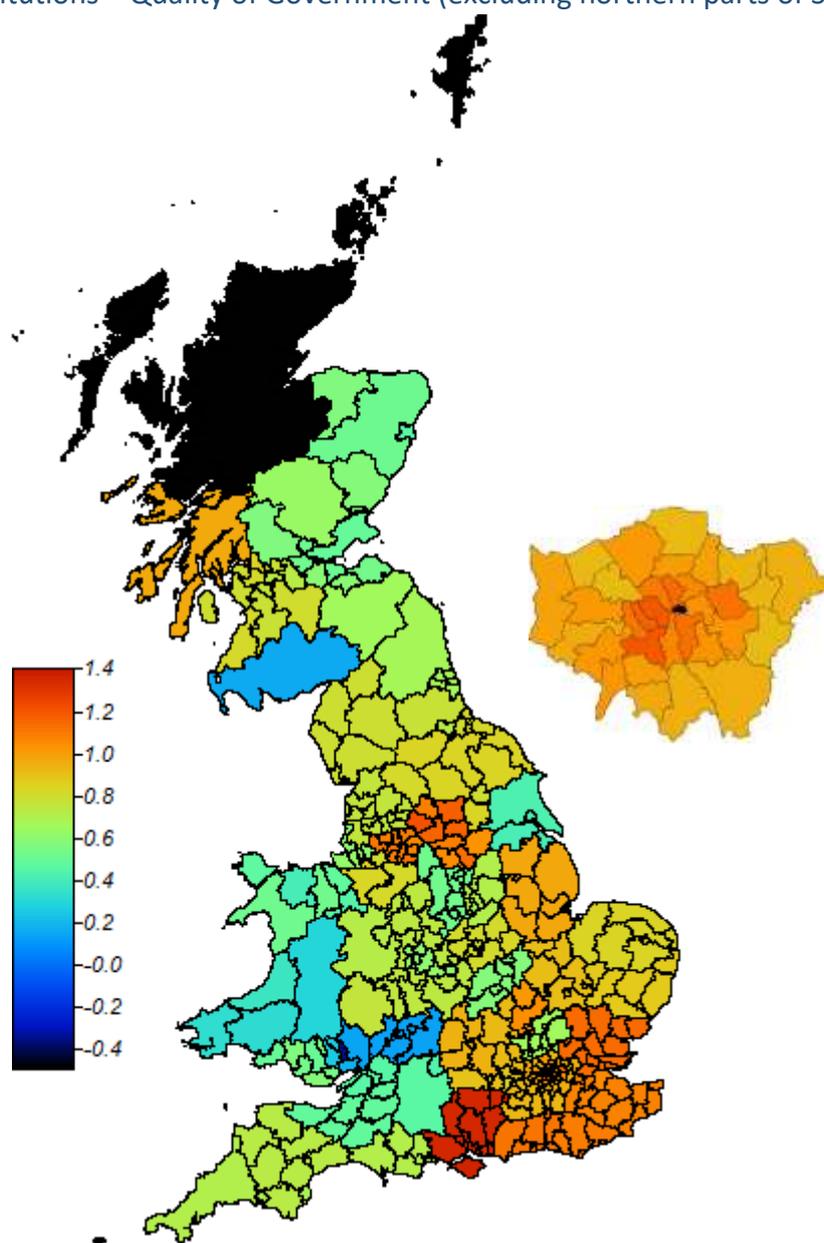
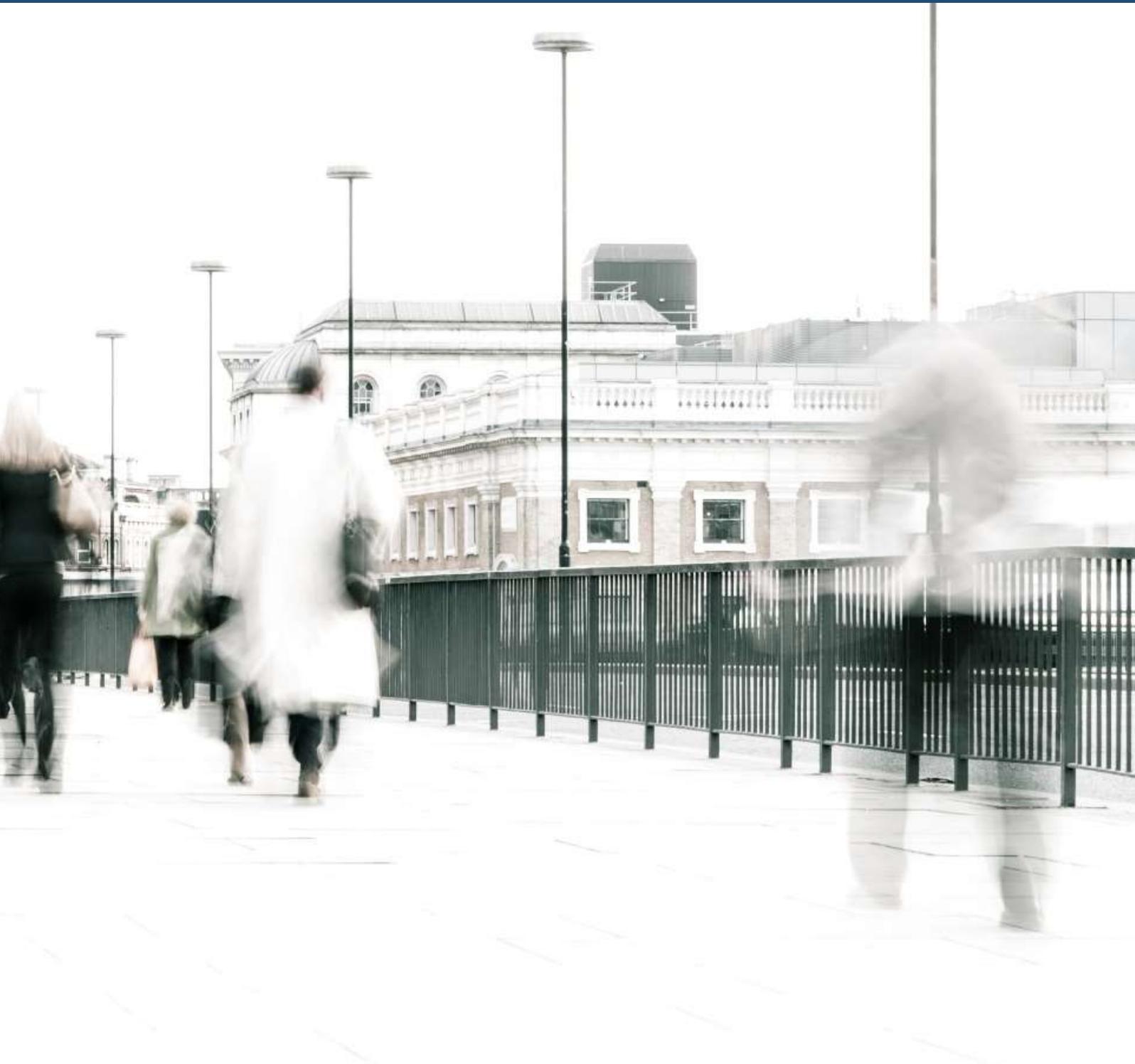


Table 20: Institutions (Quality of Government) by Region

Rank	Region	Institutions
1	South East	1.06
2	London	1.00
3	Yorkshire and Humber	0.93
4	East of England	0.91
5	North West	0.85
6	North East	0.70
7	East Midlands	0.69
8	West Midlands	0.66
9	Scotland	0.59
10	South West	0.52
11	Wales	0.39

# 7. Methodological Approach for Statistical Analysis



This report examines how city and regional competitiveness are associated with community culture, personality psychology traits and psychocultural behaviour. This section outlines the methods used to empirically examine these relationships, using the measures of Competitiveness, Community Culture, Personality Psychology and Psychocultural Behaviour outlined in the previous sections. The data used is all captured at the local authority district level across Great Britain. This level of aggregation is based on administrative responsibility rather than economic activities, which is not ideal, but provides access to a much wider variety of data than alternatives such as travel to work areas. There are 380 local authority district areas in Great Britain covering various cities and localities and the analysis undertaken here uses data from 374. The City of London and Isle of Scilly are excluded due to their atypical nature and data availability. These extremely small local authority districts, both in terms of geographical area and population, are quite unlike most other parts of Great Britain. The City of London is at the centre of London's dominant financial sector, whilst the Isles of Scilly are remote from the mainland and reliant on tourism for much of their employment. Four Scottish areas - Highland, Orkney Islands, Eilean Siar and Shetland Islands - are also excluded due to a lack of complete data for each.

In order to identify the relationships between community culture, personality traits and psychocultural behaviour with competitiveness, a multivariate approach is adopted with the study utilising regression analysis, with the general estimated equation taking the form outlined below:

$$(1) \quad COMP_{x,i} = \alpha_0 + \beta \cdot CULT_i + \gamma \cdot X_i + \varepsilon_i$$

The dependent variable ( $COMP_{x,i}$ ) is a measure of competitiveness drawn from the UK Competitiveness Index. Regressions are run for the full UKCI, but also the input, output and outcome factor indices. These are regressed on a vector of community culture or personality variables,  $CULT_i$ . As there may be close relationships between community culture and the personality measures a number of different specifications are run. These include examining the groups of community culture variables (Model A) and personality traits (Model B) separately as well as a specification with all measures included (Model C). However, as discussed above, particular community culture and personality traits may evolve in a complementary fashion, and the final group of regressions use the

psychocultural behaviour measures to capture these combinations of community culture and personality traits (Model D). To account for the other influences on competitiveness a vector of other controls ( $X_i$ ) is included in the equation. In order to control for unobserved factors at a regional level, a dummy is included to represent a local authority area being situated in one of the core regions (London, South East England, and the East of England).

Industrial specialisation and concentration are often suggested to be related to economic performance (although it has been argued that it is a weakness in some contexts). Where firms are concentrated in a particular industry, they may enjoy increasing returns from labour market pooling, industry specific non-traded inputs at lower cost and greater variety and knowledge spillovers (Krugman, 1991). Alternatively, Jacobs (1969) suggests that diversity allows the cross fertilisation of industries. To capture this, a measure based on Theil's (1972) diversity entropy index is used to analyse levels of industrial diversity, which is drawn from Fotopoulos (2014):

$$H_l = \sum_i (p_{li} / p_l) \ln(p_l / p_{li})$$

Where  $p_{li}$  is the proportion of all employment in Britain found in industry  $i$  in locality  $l$  ( $E_{li}$ ):

$$p_{li} = E_{li} / \sum_i \sum_l E_{li}$$

$p_l$  is the share of all employment in Britain found in locality  $l$ :

$$p_l = \sum_i p_{li}$$

A value of 0 indicates the presence of just one industry in the locality, higher values represent a more diverse industrial employment. In order to bound the diversity value within an interval [0, 1]  $H_l$  is divided by the natural log of the number of industries considered. The division of 15 industries employed by Fotopoulos (2014) is applied. Data on employment by industry is drawn from the Business Register and Employment Survey for 2013 (BRES).

To consider differences in the industrial structure and that of Britain as a whole, an industrial specialisation measure from Fotopoulos (2014) is formulated as follows:

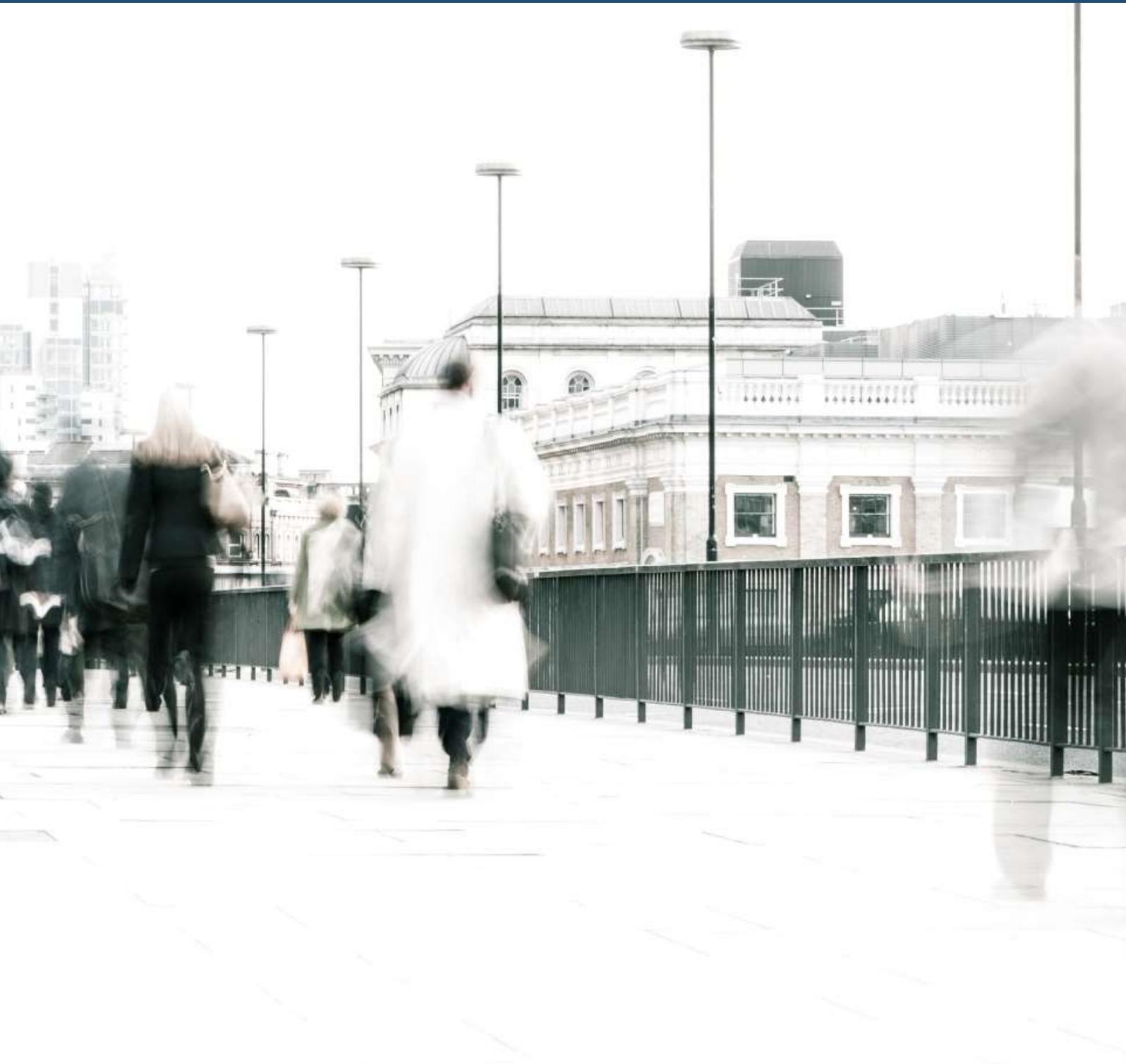
$$SPEC_l = 1/2 \sum_i (E_{li} / E_l - E_{ni} / E_n)$$

Where  $E_i$  is all employment in the locality,  $E_{ni}$  is all employment in Britain within industry  $i$  and  $E_n$  is all employment in Britain. The index has a value of 0 when the locality has the same industrial structure as that found in Britain as a whole. It takes a value of 1 when only one industry is present in the locality.

To capture the openness and connections of localities two measures are included to represent transport infrastructure in close proximity, which might reduce any reliance on local markets and provide additional agglomeration economies (Mejia-Dorantes et al., 2012; Albarran et al., 2013). Rail connections are captured by the gross number of journeys starting and ending in the locality's stations scaled by population (Department of Transport/Office of Rail Regulation). International transport connections are captured by being within 25 miles of a major airport (serving at least 4 million passengers in 2008).

To capture the benefits provided by agglomeration, population density (2013) and population growth (2007 to 2013) are included to measure influences on aggregate demand (Davidsson, 1995). This data is drawn from the NOMIS mid-year population estimates. Population density also captures the urban-rural nature of the locality, which can provide benefits in terms of a larger more specialised labour supply (Baker et al., 2005) and exchange of information and knowledge (Vernon, 1960; Delgado et al., 2010), but may also be associated with increased costs and congestion (Capello and Camagni, 2000). The last control included is the proportion of the population owning their own home, which is used to capture a potentially important source of collateral for entrepreneurs - seeking loans to finance their new ventures (Mason, 1991; Fotopoulos, 2014).

# 8. Results of the Correlation and Regression Analysis



Prior to undertaking the regression analysis, Tables 22-24 provide the correlation matrices for the UKCI variables and the control variables with the measures for: community culture (Table 22), personality traits (Table 23), and psychocultural behaviour (Table 24). Starting with the community culture variables, it can be seen that there is a positive relationship between the overall UKCI and engagement with work and education, whilst a negative correlation is found with social cohesion, feminine and caring activities, adherence to social rules and collective actions. This would appear to indicate that competitiveness is greater in those areas that follow the typical masculine (Bruni et al. 2004), employment orientated (Weber, 1930), atomistic (Kirkman et al., 2006), unconstrained by rules (Noorderhaven et al., 2004), but networked (Huggins and Thompson, 2015b) culture. This holds for most of the component indices although there is some variation in the strength of these relationships. In particular, adherence to social rules has no negative relationship with the UKCI Input index.

Table 22: Correlation Matrix for Community Culture Measures

	1. UKCI Input Index	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2. UKCI Output Index	0.813 (0.000)															
3. UKCI Outcome Index	0.638 (0.000)	0.663 (0.000)														
4. UKCI	0.963 (0.000)	0.926 (0.000)	0.749 (0.000)													
5. Engagement with Work and Education	0.215 (0.000)	0.070 (0.175)	0.114 (0.027)	0.178 (0.001)												
6. Social Cohesion	-0.616 (0.000)	-0.574 (0.000)	-0.513 (0.000)	-0.638 (0.000)	0.078 (0.132)											
7. Feminine and Caring Activities	-0.369 (0.000)	-0.444 (0.000)	-0.376 (0.000)	-0.422 (0.000)	0.211 (0.000)	0.686 (0.000)										
8. Adherence to Social Rules	-0.033 (0.529)	-0.200 (0.000)	-0.174 (0.001)	-0.106 (0.040)	0.453 (0.000)	0.444 (0.000)	0.568 (0.000)									
9. Collective Actions	-0.384 (0.000)	-0.264 (0.000)	-0.213 (0.000)	-0.359 (0.000)	-0.544 (0.000)	0.205 (0.000)	-0.121 (0.020)	-0.449 (0.000)								
10. Institutions	0.293 (0.000)	0.255 (0.000)	0.274 (0.000)	0.303 (0.000)	0.246 (0.000)	-0.289 (0.000)	-0.207 (0.000)	-0.047 (0.361)	-0.453 (0.000)							
11. Diversity index	-0.371 (0.000)	-0.306 (0.000)	-0.318 (0.000)	-0.367 (0.000)	0.274 (0.000)	0.516 (0.000)	0.375 (0.000)	0.322 (0.000)	0.036 (0.485)	-0.188 (0.000)						
12. Specialisation index	-0.029 (0.573)	0.106 (0.041)	0.128 (0.013)	0.032 (0.540)	-0.074 (0.151)	-0.006 (0.908)	-0.037 (0.470)	0.002 (0.965)	0.120 (0.020)	-0.144 (0.005)	-0.072 (0.166)					
13. Proximity to a major airport	0.347 (0.000)	0.270 (0.000)	0.325 (0.000)	0.344 (0.000)	0.088 (0.088)	-0.353 (0.000)	-0.324 (0.000)	-0.267 (0.000)	0.069 (0.181)	0.075 (0.149)	-0.158 (0.002)	-0.089 (0.084)				
14. Rail usage	0.659 (0.000)	0.666 (0.000)	0.455 (0.000)	0.672 (0.000)	-0.067 (0.199)	-0.532 (0.000)	-0.419 (0.000)	-0.367 (0.000)	-0.111 (0.032)	0.285 (0.000)	-0.443 (0.000)	0.071 (0.169)	0.272 (0.000)			
15. Population Growth	0.372 (0.000)	0.364 (0.000)	0.444 (0.000)	0.420 (0.000)	0.063 (0.222)	-0.688 (0.000)	-0.451 (0.000)	-0.279 (0.000)	-0.246 (0.000)	0.265 (0.000)	-0.287 (0.000)	-0.033 (0.530)	0.248 (0.000)	0.304 (0.000)		
16. Population Density	0.497 (0.000)	0.543 (0.000)	0.447 (0.000)	0.541 (0.000)	-0.194 (0.000)	-0.799 (0.000)	-0.667 (0.000)	-0.605 (0.000)	0.005 (0.925)	0.268 (0.000)	-0.505 (0.000)	0.066 (0.204)	0.327 (0.000)	0.578 (0.000)	0.508 (0.000)	
17. Home Ownership	-0.269 (0.000)	-0.440 (0.000)	-0.431 (0.000)	-0.375 (0.000)	0.224 (0.000)	0.639 (0.000)	0.699 (0.000)	0.705 (0.000)	-0.179 (0.000)	-0.211 (0.000)	0.372 (0.000)	0.027 (0.609)	-0.362 (0.000)	-0.431 (0.000)	-0.603 (0.000)	-0.714 (0.000)

Notes: *p*-values in parentheses

Table 23: Correlation Matrix for Personality Psychology Measures

	1. UKCI Input Index	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2. UKCI Output Index	0.813 (0.000)															
3. UKCI Outcome Index	0.638 (0.000)	0.663 (0.000)														
4. UKCI	0.963 (0.000)	0.926 (0.000)	0.749 (0.000)													
5. Extraversion	0.598 (0.000)	0.400 (0.000)	0.387 (0.000)	0.548 (0.000)												
6. Agreeableness	-0.405 (0.000)	-0.423 (0.000)	-0.353 (0.000)	-0.435 (0.000)	-0.214 (0.000)											
7. Conscientiousness	-0.093 (0.073)	-0.171 (0.001)	-0.180 (0.000)	-0.133 (0.010)	-0.087 (0.091)	0.551 (0.000)										
8. Neuroticism	-0.398 (0.000)	-0.221 (0.000)	-0.207 (0.000)	-0.346 (0.000)	-0.491 (0.000)	-0.269 (0.000)	-0.434 (0.000)									
9. Openness	0.535 (0.000)	0.425 (0.000)	0.308 (0.000)	0.505 (0.000)	0.462 (0.000)	-0.419 (0.000)	-0.440 (0.000)	-0.113 (0.029)								
10. Institutions	0.293 (0.000)	0.255 (0.000)	0.274 (0.000)	0.303 (0.000)	0.236 (0.000)	-0.235 (0.000)	0.008 (0.884)	-0.094 (0.071)	0.107 (0.039)							
11. Diversity index	-0.371 (0.000)	-0.306 (0.000)	-0.318 (0.000)	-0.367 (0.000)	-0.334 (0.000)	0.349 (0.000)	0.375 (0.000)	0.067 (0.194)	-0.477 (0.000)	-0.188 (0.000)						
12. Specialisation index	-0.029 (0.573)	0.106 (0.041)	0.128 (0.013)	0.032 (0.540)	-0.108 (0.037)	-0.028 (0.589)	-0.079 (0.128)	0.080 (0.122)	0.056 (0.278)	-0.144 (0.005)	-0.072 (0.166)					
13. Proximity to a major airport	0.347 (0.000)	0.270 (0.000)	0.325 (0.000)	0.344 (0.000)	0.276 (0.000)	-0.246 (0.000)	-0.166 (0.001)	-0.013 (0.806)	0.200 (0.000)	0.075 (0.149)	-0.158 (0.002)	-0.089 (0.084)				
14. Rail usage	0.659 (0.000)	0.666 (0.000)	0.455 (0.000)	0.672 (0.000)	0.363 (0.000)	-0.398 (0.000)	-0.270 (0.000)	-0.112 (0.030)	0.448 (0.000)	0.285 (0.000)	-0.443 (0.000)	0.071 (0.169)	0.272 (0.000)			
15. Population Growth	0.372 (0.000)	0.364 (0.000)	0.444 (0.000)	0.420 (0.000)	0.216 (0.000)	-0.362 (0.000)	-0.264 (0.000)	-0.008 (0.879)	0.301 (0.000)	0.265 (0.000)	-0.287 (0.000)	-0.033 (0.530)	0.248 (0.000)	0.304 (0.000)		
16. Population Density	0.497 (0.000)	0.543 (0.000)	0.447 (0.000)	0.541 (0.000)	0.395 (0.000)	-0.574 (0.000)	-0.549 (0.000)	0.097 (0.062)	0.616 (0.000)	0.268 (0.000)	-0.505 (0.000)	0.066 (0.204)	0.327 (0.000)	0.578 (0.000)	0.508 (0.000)	
17. Home Ownership	-0.269 (0.000)	-0.440 (0.000)	-0.431 (0.000)	-0.375 (0.000)	-0.200 (0.000)	0.465 (0.000)	0.558 (0.000)	-0.220 (0.000)	-0.309 (0.000)	-0.211 (0.000)	0.372 (0.000)	0.027 (0.609)	-0.362 (0.000)	-0.431 (0.000)	-0.603 (0.000)	-0.714 (0.000)

Notes: *p*-values in parentheses

Table 24: Correlation Matrix for Psychocultural Behaviour Measures

	1. UKCI Input Index	2	3	4	5	6	7	8	9	10	11	12	13	14
2. UKCI Output Index	0.813 (0.000)													
3. UKCI Outcome Index	0.638 (0.000)	0.663 (0.000)												
4. UKCI	0.963 (0.000)	0.926 (0.000)	0.749 (0.000)											
5. Inclusive Amenability	-0.499 (0.000)	-0.527 (0.000)	-0.456 (0.000)	-0.542 (0.000)										
6. Individual Commitment	0.309 (0.000)	0.173 (0.001)	0.165 (0.001)	0.278 (0.000)	0.011 (0.833)									
7. Diverse Extraversion	0.551 (0.000)	0.347 (0.000)	0.303 (0.000)	0.490 (0.000)	-0.009 (0.867)	0.006 (0.915)								
8. Institutions	0.293 (0.000)	0.255 (0.000)	0.274 (0.000)	0.303 (0.000)	-0.319 (0.000)	0.370 (0.000)	0.108 (0.036)							
9. Diversity index	-0.371 (0.000)	-0.306 (0.000)	-0.318 (0.000)	-0.367 (0.000)	0.472 (0.000)	0.157 (0.002)	-0.301 (0.000)	-0.188 (0.000)						
10. Specialisation index	-0.029 (0.573)	0.106 (0.041)	0.128 (0.013)	0.032 (0.540)	-0.022 (0.678)	-0.092 (0.074)	-0.067 (0.199)	-0.144 (0.005)	-0.072 (0.166)					
11. Proximity to a major airport	0.347 (0.000)	0.270 (0.000)	0.325 (0.000)	0.344 (0.000)	-0.342 (0.000)	-0.009 (0.861)	0.144 (0.005)	0.075 (0.149)	-0.158 (0.002)	-0.089 (0.084)				
12. Rail usage	0.659 (0.000)	0.666 (0.000)	0.455 (0.000)	0.672 (0.000)	-0.518 (0.000)	-0.013 (0.809)	0.295 (0.000)	0.285 (0.000)	-0.443 (0.000)	0.071 (0.169)	0.272 (0.000)			
13. Population Growth	0.372 (0.000)	0.364 (0.000)	0.444 (0.000)	0.420 (0.000)	-0.587 (0.000)	0.168 (0.001)	0.130 (0.012)	0.265 (0.000)	-0.287 (0.000)	-0.033 (0.530)	0.248 (0.000)	0.304 (0.000)		
14. Population Density	0.497 (0.000)	0.543 (0.000)	0.447 (0.000)	0.541 (0.000)	-0.810 (0.000)	-0.150 (0.004)	0.237 (0.000)	0.268 (0.000)	-0.505 (0.000)	0.066 (0.204)	0.327 (0.000)	0.578 (0.000)	0.508 (0.000)	
15. Home Ownership	-0.269 (0.000)	-0.440 (0.000)	-0.431 (0.000)	-0.375 (0.000)	0.706 (0.000)	0.258 (0.000)	-0.012 (0.813)	-0.211 (0.000)	0.372 (0.000)	0.027 (0.609)	-0.362 (0.000)	-0.431 (0.000)	-0.603 (0.000)	-0.714 (0.000)

Notes: *p*-values in parentheses

Table 23 finds overall competitiveness to be associated with greater extraversion, openness, emotional stability (low neuroticism) and lower agreeableness and conscientiousness. This is consistent with those studies that have found a positive relationship between economic performance and more open and extravert places (Rentfrow et al., 2015). However, some studies, particularly at the individual level, have also suggested that the combination, rather than specific, personality traits may be important for outcomes such as success in education (Asendorpf and van Aken, 1999; Hart et al., 2003) and the development of social networks (Caspi, 2000). For example, although the US states classed by Rentfrow et al. (2013) as friendly and conventional are high in extraversion and emotional stability, they also tend to be low in openness, high in agreeableness and exhibit poorer economic performance.

When the combined psychocultural behaviour measures are used (Table 24) a positive relationship is found with individual commitment and diverse extraversion, and a negative relationship with inclusive amenability. This suggests that inclusive amenable psychocultural behaviour - which is high with regard to more tightly bonded, friendly, caring, hardworking and rule abiding characteristics - is less likely to promote competitiveness (although this is not to say that broader measures of well-being might not be promoted). Diverse extraversion, on the other hand, is the form of behaviour which appears to have the strongest positive relationship with competitiveness due to its extravert, emotionally stable and more open profile. Based on previous studies this might be expected, whereby an environment with higher levels of these characteristics generates individuals suited to artistic and investigative occupations that may promote innovative activities.

It is interesting to find that conscientiousness on its own - Table 23 - is negatively related to competitiveness, given the findings of Lee (2016), which suggested it is the personality trait most strongly related to innovation. However, whilst the inclusive amenable behaviour is negatively related to competitiveness, the individual commitment profile, which also has high conscientiousness, displays a positive relationship. As with inclusive amenability, there is higher adherence to social rules, but where they differ is that for localities displaying high levels of individual commitment, feminine and caring attitudes and collective activities are less pronounced, whilst engagement with work and education is higher, implying a much more self-sufficient perspective (Weber, 1930).

The other relationships indicates that cities and regions with stronger formal institutions, more concentrated industrial structures, good transport links, population

growth and urban natures, and lower home ownership, are more competitive. It is clear that some control variables have strong relationships with the community culture, personality trait and psychocultural behaviour variables. For example, population growth and population density are negatively associated with social cohesion, whilst home ownership is positively associated.

Moving to the multivariate analysis, to reduce potential problems of collinearity three specifications are run for each regression model. The first contains the cultural or personality variables and controls for location in a core region and formal institutions. The second introduces those variables associated with industrial structure and transport infrastructure. The third introduces the variables relating to population and home ownership. The variance inflation factors are below the conventional cut off of 10 for all specifications, but social cohesion has a variance inflation factor of 5.998 when all community culture and personality trait variables are included in the third specification with the full set of controls (Model C3). Even with both the community culture and personality trait variables included, when the second specification is used – which excludes the population and home ownership measures (Model C2) - the variance inflation factor drops to 4.15.

Table 25 presents the regression analysis for overall competitiveness as captured by the UKCI. All of the regressions reject the null of collective insignificance according to the *F*-test results. The variance explained by the regressions varies depending on the competitiveness measure used, but those incorporating personality traits appear to perform most strongly. In terms of overall competitiveness, the variance explained ranges from 50 percent when using the community culture variables and minimal controls (Table 25 Model A1) to 74 percent when community culture, personality traits and a full set of controls are included (Table 25 Model C3).

Table 25: Regressions for the Competitiveness of Local Authority Areas

	Model A1	Model A2	Model A3	Model B1	Model B2	Model B3	Model C1	Model C2	Model C3	Model D1	Model D2	Model D3
Core Region	<b>7.421</b> (0.000)	3.194 (0.067)	3.186 (0.082)	<b>10.921</b> (0.000)	<b>8.542</b> (0.000)	<b>7.169</b> (0.000)	<b>7.659</b> (0.000)	<b>4.483</b> (0.005)	<b>3.509</b> (0.034)	<b>5.076</b> (0.002)	<b>3.325</b> (0.021)	<b>3.101</b> (0.040)
Institutions	-3.395 (0.283)	-4.278 (0.102)	-4.932 (0.061)	-3.857 (0.169)	-4.584 (0.059)	-4.560 (0.061)	<b>-5.552</b> (0.044)	<b>-5.477</b> (0.022)	<b>-5.354</b> (0.025)	<b>-6.060</b> (0.023)	<b>-6.666</b> (0.004)	<b>-6.994</b> (0.003)
Diversity index		-0.753 (0.953)	2.163 (0.866)		<b>28.380</b> (0.021)	<b>29.952</b> (0.015)		20.559 (0.084)	21.495 (0.069)		20.473 (0.082)	19.172 (0.104)
Specialisation index		2.356 (0.664)	1.919 (0.725)		7.793 (0.136)	8.096 (0.122)		5.825 (0.239)	7.108 (0.152)		8.481 (0.084)	9.639 (0.052)
Proximity to a major airport		<b>3.556</b> (0.002)	<b>3.405</b> (0.003)		<b>3.742</b> (0.000)	<b>3.075</b> (0.004)		<b>2.542</b> (0.017)	<b>2.294</b> (0.030)		<b>2.693</b> (0.007)	<b>2.337</b> (0.021)
Rail usage		<b>0.151</b> (0.000)	<b>0.145</b> (0.000)		<b>0.121</b> (0.000)	<b>0.115</b> (0.000)		<b>0.123</b> (0.000)	<b>0.121</b> (0.000)		<b>0.121</b> (0.000)	<b>0.120</b> (0.000)
Population Growth			-0.341 (0.154)			0.291 (0.147)			-0.316 (0.142)			-0.247 (0.218)
Population Density			0.001 (0.144)			0.000 (0.394)			0.000 (0.620)			0.000 (0.391)
Home Ownership			-23.816 (0.171)			-11.123 (0.442)			<b>-48.943</b> (0.002)			<b>-28.797</b> (0.043)
<u>Community Culture</u>												
Engagement with Work and Education	<b>2.606</b> (0.001)	<b>1.851</b> (0.007)	<b>1.850</b> (0.008)				<b>3.099</b> (0.000)	<b>2.143</b> (0.001)	<b>2.030</b> (0.002)			
Social Cohesion	<b>-8.488</b> (0.000)	<b>-5.589</b> (0.000)	<b>-5.223</b> (0.000)				<b>-3.865</b> (0.000)	<b>-3.088</b> (0.001)	<b>-3.295</b> (0.003)			
Feminine and Caring Activities	<b>-1.863</b> (0.049)	<b>-1.602</b> (0.039)	-1.143 (0.157)				-1.474 (0.074)	-1.238 (0.082)	-0.610 (0.406)			
Adherence to Social Rules	1.370 (0.141)	<b>3.502</b> (0.000)	<b>4.326</b> (0.000)				0.080 (0.923)	<b>2.045</b> (0.006)	<b>2.950</b> (0.000)			
Collective Actions	-0.512 (0.633)	-1.194 (0.186)	-1.497 (0.104)				0.346 (0.730)	-0.601 (0.500)	-1.143 (0.205)			

Notes:  $p$ -values in parentheses; emboldened values significant at 5% level

Table 25 - continued

	Model A1	Model A2	Model A3	Model B1	Model B2	Model B3	Model C1	Model C2	Model C3	Model D1	Model D2	Model D3
<u>Personality Psychology</u>												
Extraversion				<b>57.396</b> (0.000)	<b>40.607</b> (0.004)	<b>39.347</b> (0.006)	<b>43.466</b> (0.004)	<b>34.720</b> (0.009)	<b>33.258</b> (0.012)			
Agreeableness				<b>-168.731</b> (0.000)	<b>-125.576</b> (0.000)	<b>-118.363</b> (0.000)	<b>-125.647</b> (0.000)	<b>-89.151</b> (0.000)	<b>-87.995</b> (0.000)			
Conscientiousness				11.392 (0.435)	18.861 (0.144)	<b>30.721</b> (0.028)	19.880 (0.242)	3.188 (0.830)	5.257 (0.721)			
Neuroticism				<b>-86.498</b> (0.000)	<b>-79.751</b> (0.000)	<b>-82.456</b> (0.000)	<b>-72.942</b> (0.000)	<b>-60.849</b> (0.000)	<b>-63.976</b> (0.000)			
Openness				<b>56.245</b> (0.000)	<b>38.574</b> (0.000)	<b>35.010</b> (0.001)	<b>48.464</b> (0.000)	<b>31.199</b> (0.002)	<b>36.618</b> (0.000)			
<u>Psycho-Cultural Behaviour</u>												
Inclusive Amenability										<b>-8.559</b> (0.000)	<b>-5.624</b> (0.000)	<b>-5.693</b> (0.000)
Individual Commitment										<b>4.083</b> (0.000)	<b>4.528</b> (0.000)	<b>5.087</b> (0.000)
Diverse Extraversion										<b>7.568</b> (0.000)	<b>6.105</b> (0.000)	<b>6.455</b> (0.000)
Constant	<b>93.705</b> (0.000)	<b>89.798</b> (0.000)	<b>95.499</b> (0.000)	<b>548.062</b> (0.001)	<b>431.992</b> (0.002)	<b>387.879</b> (0.006)	<b>391.648</b> (0.011)	<b>351.721</b> (0.008)	<b>348.347</b> (0.009)	<b>96.728</b> (0.000)	<b>76.079</b> (0.000)	<b>86.567</b> (0.000)
N	374	374	374	374	374	374	374	374	374	374	374	374
R <sup>2</sup>	0.502	0.670	0.676	0.575	0.694	0.700	0.638	0.736	0.743	0.620	0.725	0.729
F-test	52.735 (0.000)	66.832 (0.000)	53.491 (0.000)	70.835 (0.000)	74.472 (0.000)	59.938 (0.000)	53.057 (0.000)	62.203 (0.000)	53.847 (0.000)	119.875 (0.000)	106.775 (0.000)	80.753 (0.000)

Notes: *p*-values in parentheses; emboldened values significant at 5% level

Models A1 to A3 and C1 to C3 include the community culture variables. The coefficients for engagement with work and education are positive and significant in all specifications run regardless of whether the personality traits are included in the estimations (Models C1 to C3) or not (Models A1 to A3). This implies that cultures with a strong work ethic remain important even in advanced cities and localities where knowledge and networking have gone some way to superseding more basic and routine tasks (Weber, 1930; Tabellini, 2010). The other community culture variable that remains significant in all specifications is social cohesion, where a negative relationship is found. This supports those studies that have found access to new ideas and people to be key factors for competitiveness generating activities such as entrepreneurship and innovation (Levie, 2007; Huggins and Thompson, 2016a).

Other elements of community culture do not display a consistently significant relationship. For example, feminine and caring activities are found to have a negative relationship with competitiveness in models A1 and A2, but this disappears when controlling for population characteristics and home ownership. In a similar fashion, whilst adherence to social rules is not initially significant in model A1, a positive relationship is found when controlling for industry structure and transport infrastructure. Table 22 indicates that adherence to social rules tends to be weaker in places with stronger transport connections, which are likely to be cities and larger urban areas. However, after taking account of the benefit these receive from their transport links, adherence to social rules does have a positive effect, potentially associated with the support this provides in terms of aiding coordination (Rodríguez-Pose and Storper, 2006; Lorenzen, 2007).

With regard to the personality traits included in models B1 to B3 and models C1 to C3, four traits consistently show a significant relationship with competitiveness. Extraversion and openness are positively linked to competitiveness, whilst neuroticism and agreeableness display a negative relationship. These results largely support the findings from the descriptive analysis and previous studies whereby greater levels of openness and extraversion aid creative and networking activities (Caspi, 2000; Barrick et al., 2003). These activities are also supported by lower levels of neuroticism (emotional stability). However, contrary to the results produced by Lee's (2016) investigation of innovation, conscientiousness is only significantly related to competitiveness in model B3 after controlling for population growth, population density and home ownership. Agreeableness is negatively associated with competitiveness, indicating that in Britain, at least, it appears

that a city's or locality's ability to continue to compete and provide a high standard of living is often associated with psychologies where personal conflict is more readily accepted. However, this does not preclude a positive relationship with broader measures of well-being, with other studies finding that competitiveness is positively associated with these broader measures (Huggins and Thompson, 2012).

Given the results relating to community culture and personality trait variables, it is of little surprise to find that the most competitive localities are those that display higher levels of diverse extravert and individually committed psychocultural behaviours. The inclusive amenability psychocultural behaviour profile is negatively associated with competitiveness, implying that cities, localities and regions with behaviour that might be regarded as socially 'nicer' are likely to enjoy this benefit at the cost of economic rewards if competitiveness is eroded.

Surprisingly, formal institutions do not display a positive relationship, but rather a negative relationship with competitiveness, albeit mainly at the 10 per cent significance level. This may reflect Rodriguez-Pose and Storper's (2006) argument that culture and institutions are substitutes, with the former strengthening to account for weaknesses in the latter.

In terms of the component factor indices of the UKCI, due to space constraints the full results are not presented here, but it is instructive to note that there are some subtle differences from overall competitiveness analysis. The regressions for input competitiveness perform similarly to those for overall competitiveness in terms of the percentage of variance explained, with the community culture and personality traits variables showing the same significant relationships as are found for overall competitiveness. Positive links are found with: engagement with work and education; extraversion; and openness. Negative links are found with: social cohesion; agreeableness and neuroticism. However, when the community culture variables are not included in the regressions, across the personality trait variables conscientiousness also has a positive link with input competitiveness. This makes sense given that many high growth and innovative businesses may be attracted to cities and localities with a labour supply displaying a strong work ethic and prepared to work methodically to complete investigative tasks (Barrick et al., 2003). This is likely to be self-supporting, with the jobs created encouraging likeminded highly-skilled individuals to move to such places. As such, the positive relationship with the individually committed psychocultural behaviour remains.

Compared with the regressions for overall competitiveness, the regressions for output competitiveness perform less strongly, with community culture and personality traits in combination, explaining only 63 percent of the variance. Engagement with work and education - and to a degree social cohesion - are the community cultural aspects that are found to play less of a role, and for personality traits, extraversion and conscientiousness are not significant. As with social cohesion, openness is more weakly related to output competitiveness. Instead, it seems that a more individualistic competitive, but emotionally stable personality, is required to turn inputs into high value production.

The regressions relating to outcome competitiveness are the weakest performing, with only 48 percent of variance explained when all variables are included. With regard to how outputs are converted into incomes for the residents of the localities – the UKCI Outcome Index - again a slightly different pattern is present to that found for overall competitiveness. Although agreeableness retains a negative relationship with outcome competitiveness, as does neuroticism, at the community level there is less evidence that collective actions have a negative effect, and when other controls are excluded a positive relationship is found. Key factors, however, are a culture of engagement with work and education. Also, what appears to be consistent throughout is that more friendly localities do not succeed in terms of input, output or outcome competitiveness, suggesting that any benefits in terms of welfare are likely to have to overcome a large potential deficit from that obtained through economic outputs. Only the diverse extraversion psychocultural behaviour is positively associated with outcome competitiveness, which given the results for the individual personality traits and community culture variables suggests that emotional stability is a key rooted determinant of competitiveness.

# 9. Conclusions



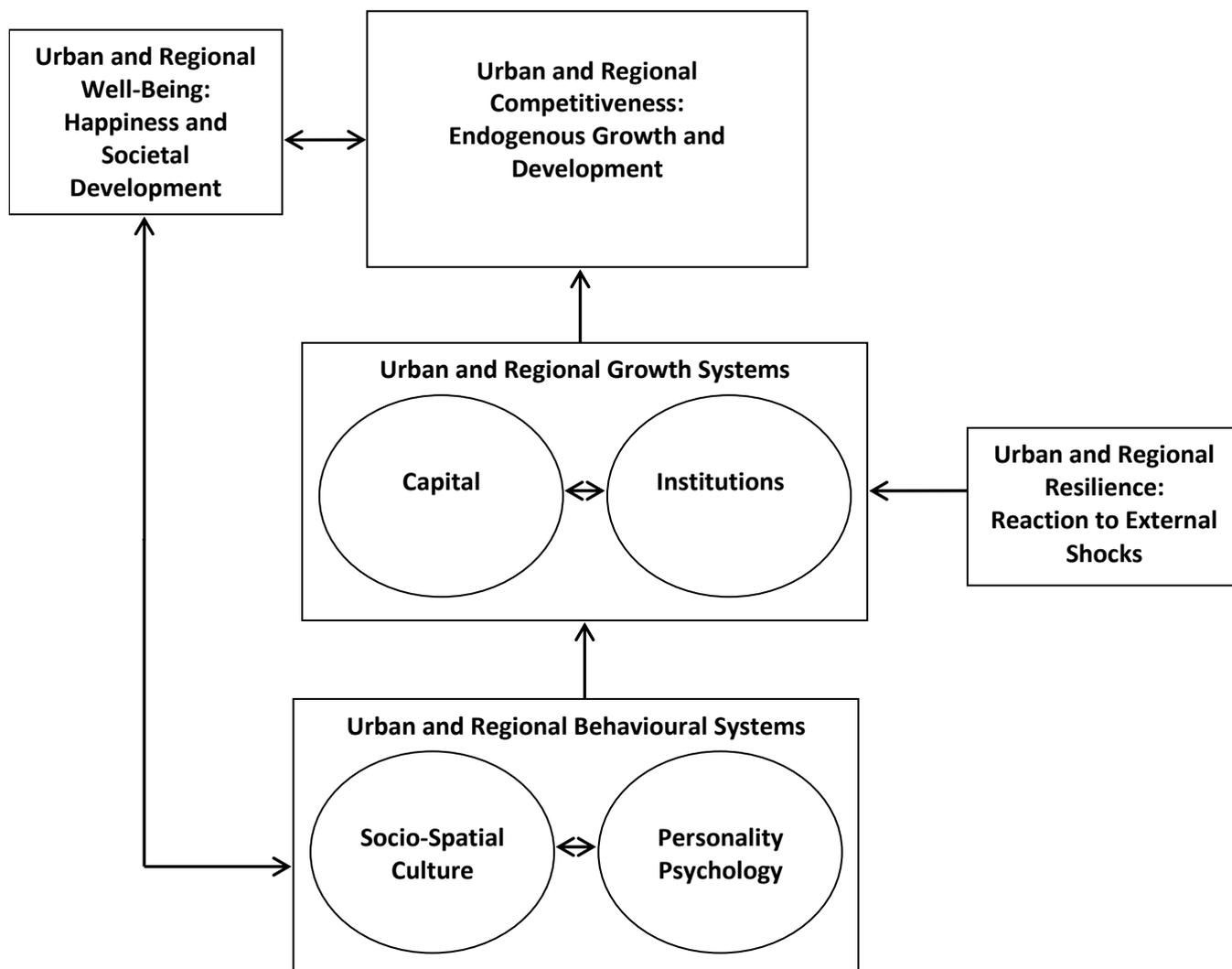
This report has argued that the underlying community culture and aggregate personality psychology found in particular localities and regions are determining factors of the level of economic competitiveness found in these places. Furthermore, the report has empirically found a range of strong and significant relationships between a number of dominant cultural and psychology traits within localities and regions of Great Britain and the competitiveness of these territorial areas. In particular, it appears to be the case that the interplay between culture and psychology in form of the psychocultural behaviour of cities, localities and regions helps to shape their long-term competitiveness trajectories. Localities and regions that have relatively atomised behavioural environments with high levels of individual commitment tend to enjoy competitiveness benefits. Similarly, places with high rates of cultural diversity and extravert individuals have relatively high levels of competitiveness.

On the other hand, localities and regions that tend to be more socially inclusive, with a significant number of people with amenable and agreeable personality traits, experience relatively low rates of competitiveness. To a large extent, the findings make intuitive sense with, for example, the individual commitment found in competitive localities and regions being a manifestation of a 'personal competitiveness' that subsequently becomes visible at an aggregated spatial level. Clearly, however, the relationship between psychocultural human behaviour and urban and regional competitiveness is unlikely to be a direct one. It is more likely that behaviour initially impacts upon other sources of competitiveness such as the form and efficiency of local institutions as well as the capability and capacity to generate and mobilise the types of capital required for high rates of economic competitiveness.

As previously noted, at the highest level it can be argued that the key tenets of urban and regional competitiveness theories – in the form of knowledge, innovation and entrepreneurship – are strongly associated with endogenous growth frameworks, and represent the more downstream explanations of urban and regional development. However, it is increasingly suggested that positive urban and regional growth and development also requires high-quality institutions, in the form of growth-enabling rules and incentives, alongside the types of capital suggested by regional competitiveness theory. Therefore, as shown by Figure 15, a more midstream means of explaining urban and regional competitiveness and development is to conceptualise cities and regions as growth

systems within which the interaction between available capital assets and the institutional infrastructure is a major determinant (Huggins, 2016).

Figure 15: Connecting contemporary theories of urban and regional competitiveness and development



Such a systems-based approach to connecting endogenous capital accumulation and institutional theories of urban and regional competitiveness and development potentially offers a means of delineating a framework to better understand how investment in capital assets, especially intangible assets, is related to the institutions underlying the economic functioning of cities and regions. In the past, both capital accumulation and institutional theories of growth and development have been criticised by some commentators for their lack of explanatory power (Glaeser et al., 2004; Chang, 2011), which is perhaps a result of each theory being viewed somewhat in isolation. A meshing of these theoretical

approaches, however, indicates that regional growth is a highly endogenous, recursive and evolutionary process whereby the interaction between capital and institutions at a number of different, yet interdependent, levels of organisational arrangement may offer more explanatory power (Huggins, 2016).

Within this framework, it is proposed here that the economic growth systems of cities and regions are shaped and influenced by deeper-rooted upstream determinants stemming from the human behavioural traits of these places. Whilst institutions can be considered to be the rules of the game governing growth processes, cultural and psychological traits encompass the extent to which such rules are adhered to, as well as the way in which they foster future institutional change.

It is concluded that in the field of urban and regional competitiveness and development research there is a need for further theoretical integration, particularly through the deployment of a behavioural conceptual lens. Behavioural economic geography, encompassing culture, psychology and the agency of individuals, potentially provides new insights into the persistence of the long-term unevenness of competitiveness across regions. In particular, psychocultural behavioural patterns, and their evolution, provide a basis for understanding the type and nature of human agency that exists within cities and regions, and the institutions such agency generates. Furthermore, behavioural-based frameworks incorporating cultural and psychological aspects help us understand why particular agents within a city or region, especially entrepreneurial agents, may possess a proclivity towards fostering the forms of innovation that propel competitiveness, as well as how the interaction between cultural and psychology factors result in city and regional behavioural systems with a higher or lower tendency to sustain long-term economic growth. Finally, although the focus of urban and regional competitiveness narratives concerns explanations of economic outcomes, there is scope to consider further theoretical connections with wider development goals beyond economic growth, such as those related to social development, well-being and the sustainable development of cities and regions.

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# Appendix



Appendix Table 1: Principal Components Analysis: Rotated Component Matrix of Socio-Spatial Community Culture and Personality Psychology Variables

	Psycho-Cultural Behaviour: Inclusive Amenability	Psycho-Cultural Behaviour: Individual Commitment	Psycho-Cultural Behaviour: Diverse Extraversion	Extracted Variance
Extraversion	-0.299	0.068	0.807	0.745
Agreeableness	0.833	-0.059	0.129	0.713
Conscientiousness	0.679	0.548	0.145	0.781
Neuroticism	-0.269	-0.276	-0.824	0.827
Openness	-0.570	-0.222	0.509	0.633
Engagement with Education	0.112	0.832	-0.014	0.705
Social Cohesion	0.838	-0.066	-0.322	0.810
Femininity and Caring	0.757	0.194	-0.153	0.634
Adherence to Social Rules	0.584	0.577	0.085	0.682
Collective Activities	0.080	-0.877	-0.194	0.813
Unrotated				
Eigenvalues	3.865	2.352	1.125	
Percentage of Variance	38.7	23.5	11.3	
Rotated				
Eigenvalues	3.275	2.270	1.798	
Percentage of Variance	32.8	22.7	18.0	
Average Scores				
Cluster 1 Open Atomistic	-2.100	-0.279	0.619	
Cluster 2 Closed Collectively Reliant	0.218	-1.173	-0.237	
Cluster 3 Closed Individually Responsible	0.268	0.626	0.006	