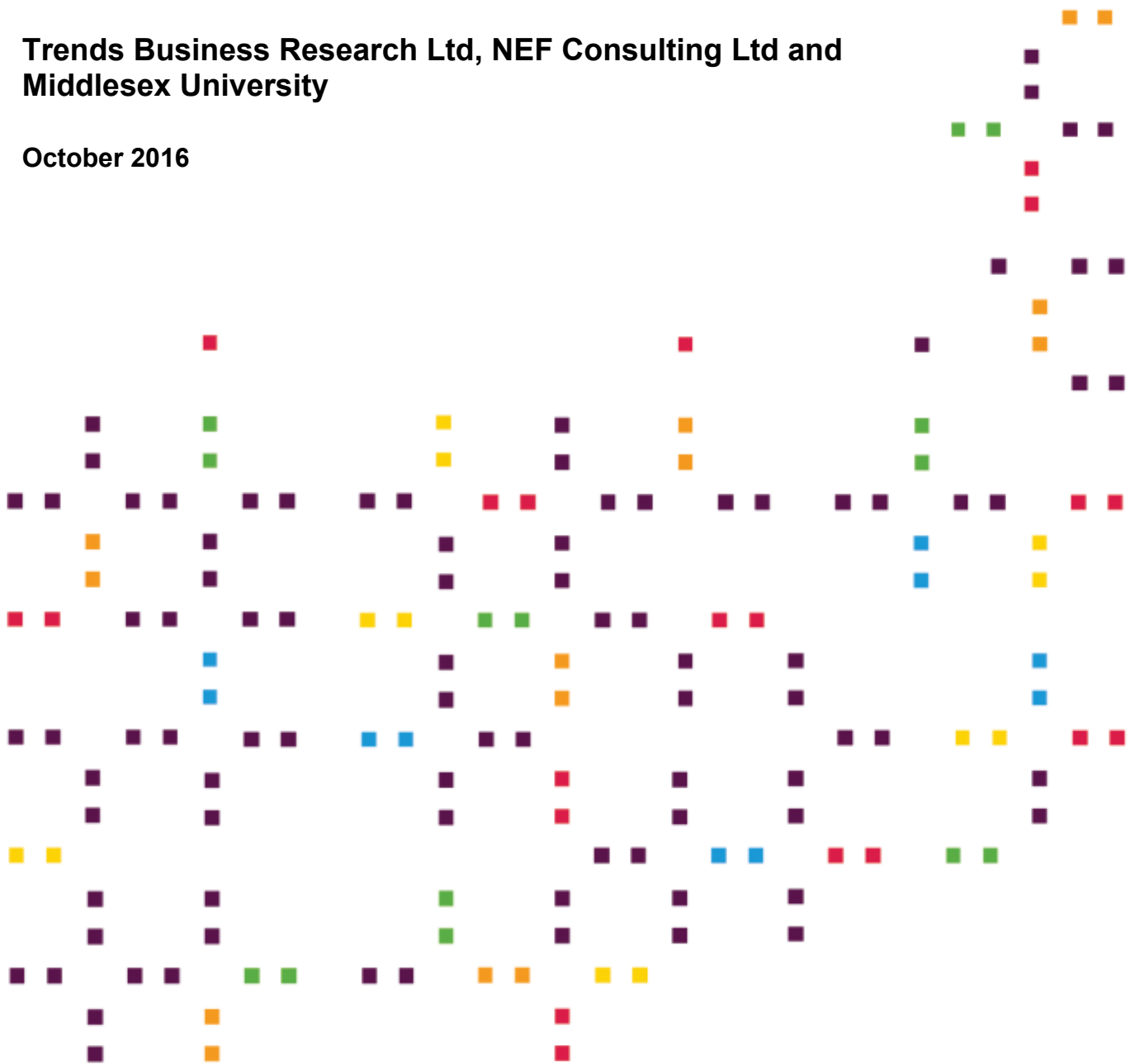


# The role of culture, sport and heritage in place shaping

Trends Business Research Ltd, NEF Consulting Ltd and Middlesex University

October 2016



**The Culture and Sport Evidence (CASE) programme is a joint programme of strategic research led by the Department for Culture, Media and Sport (DCMS) in collaboration with the Arts Council England (ACE), Historic England (HE) and Sport England (SE).**

**The CASE Programme commissioned TBR, an economic research consultancy with a specialism in the creative and cultural industries to deliver the study in partnership with NEF Consulting, a consultancy specialising in economic and social impact assessment and Professor Graeme Evans from Middlesex University, a leading researcher and expert adviser on cultural and creative cities, culture and regeneration and the creative economy.**



**The research team for this study was:**

Andrew Graves, TBR

Andrew Rowell, TBR

Olivier Vardakoulias, NEF Consulting

Sarah Arnold, NEF Consulting

Graeme Evans, Middlesex University

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# 1: Executive Summary

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## 1.1 Study aims and objectives

The CASE programme is a joint strategic research programme led by the Department for Culture, Media and Sport (DCMS) and its sector leading arms-length bodies: Arts Council England, Historic England and Sport England. CASE uses interdisciplinary research methods and analysis to inform the development of policy in culture and sport.

As part of its commitment to build an evidence base regarding the role that culture, sport and heritage (CS&H) play in driving positive economic and social outcomes in local places, in 2015 the CASE programme commissioned a partnership led by Trends Business Research Ltd (TBR) and including NEF Consulting Ltd and Middlesex University to undertake this study.

This study focuses on generating evidence to support the argument that culture, sport and heritage infrastructure and investment have the ability to promote and drive positive economic and social outcomes at the local level. It aims to examine the extent to which culture, sport and heritage infrastructure and investment within a place influence (through direct and indirect impacts, tangible and intangible) the economy and society of that place. Crucially, the study focuses on a range of potential economic indicators and linkages to the presence of CS&H infrastructure ('assets') and investment.

The study therefore represents a starting point for research which seeks to resolve the wider question of the role of CS&H assets and investment in place-shaping.

The study is by its very nature exploratory. It builds on a feasibility study published by the CASE programme in 2011 – *The Art of the Possible*<sup>1</sup> – which identified techniques and data sources that would support an empirical approach to measuring and evidencing economic and social impacts arising from culture, sport and heritage assets and investment.

## 1.2 Methodology

Previous studies in the UK and internationally have focused on quantifying the links between public and private investment in CS&H and the creation of productive creative industries clusters. This study builds on this approach and examines first, the links between CS&H assets and investment and local economic performance more generally and second, links between CS&H assets and investment and creative industry clusters.

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<sup>1</sup> TBR & Cities Institute (2011), *The Art of the Possible* - using secondary data to detect social and economic impacts from investment in culture and sport: a feasibility study

Decisions on methodological approach were driven by a number of factors: consideration of the existing literature, an assessment of available data for use in any econometric model, and discussions with the client steering group around the impact areas to focus on (taking feasibility, evidence gaps and client preferences into account).

The study has generated a large, longitudinal dataset containing multiple variables. These were employed in the econometric models as either independent variables (i.e. CS&H assets, CS&H investments), dependent variables (e.g. firm density per capita, turnover, net firm migration) or control variables (e.g. transport infrastructure, population). The dataset covers the time period 2003–2013 and the data are collected at the local authority level.

We exploited this rich dataset to conduct an econometric analysis, exploring these links both cross-sectionally and longitudinally over the last ten years. Our general strategy has been highly exploratory, controlling for as many determinants of outcomes as possible in order to identify push/pull factors of location and economic success. These factors are identified in multiple studies as cited in Arzauro-Carod et al (2009)<sup>2</sup>, and Lazzeretti et al (2009)<sup>3</sup>, combining multidisciplinary approaches based on cultural economics, evolutionary geography and urban economics.

### 1.3 Key findings – all firms

This section presents key findings from the econometric estimation and analysis of the links between CS&H assets and investment and local economic performance.

#### CS&H assets

- The number of firms per capita is strongly and positively associated with heritage assets density as well as other cultural assets. Net migration of all firms is also strongly and positively associated with cultural assets. These results are robust when considering local authorities in major urban centres as well as those that are not. This is an important result as it suggests a direct relationship, and not simply that agglomeration is driving a high level of both cultural events and a greater concentration of industry.
- Turnover of all firms per capita is associated positively with heritage assets density, and more weakly with population size. It is also very strongly associated with GVA per capita, although as with number of firms per capita, this result may be subject to simultaneity bias.

#### CS&H investment

- Investment in CS&H is in general negatively associated with indicators of all firms' economic performance, although it is only significant for local authority investment and number of firms per capita.
- Turnover of all firms per capita is negatively associated with per capita investment in CS&H.

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<sup>2</sup> Arzauro-Carod et al (2009), *Empirical studies in industrial location: an assessment of their methods and results*, Journal of Regional Science, April 2009

<sup>3</sup> Lazzeretti et al (2009), *Why do creative industries cluster? An analysis of the determinants of clustering of creative industries*, IERMB Working Paper in Economics, n° 09.02, April 2009



- Lagged investment in CS&H per capita on the other hand is positively associated with number of firms per capita and net migration of firms. Both migration of firms and number of firms variables are less immediately responsive to changes (e.g. firms must make decisions to relocate or start up) than turnover.

#### **Other variables**

- Number of firms per capita is also significantly associated with the employment rate, the availability of skilled labour, housing density, transport infrastructure, GVA per capita and population. The most significant variable is GVA per capita – however, this variable might be subject to simultaneity bias as it is reasonable to assume the number of firms per capita may contribute to GVA per capita.
- Net migration of firms is positively associated with employment rate, the availability of skilled labour, life satisfaction and population. These may effectively be thought of as factors that directly attract firms.

## **1.4 Key findings – creative industries**

This section presents key findings from the econometric estimation and analysis of the links between CS&H assets and investment and economic performance of the creative industries.

#### **CS&H assets**

- Both creative firms' location quotient and turnover is positively and significantly associated with the density of heritage assets and the number of cultural events listings per capita (i.e. cultural assets). It should be noted that, particularly with cultural events listings and turnover, there is a risk of reverse causality: if creative firms hold cultural events, this would likely increase turnover.
- Both relative concentration of creative firms and creative firms' turnover are negatively associated with density of sports assets.

#### **CS&H investment**

- Per capita investment in CS&H is strongly and positively associated with the relative concentration of creative firms, both within and outwith major urban centres. Two-year lagged investment per capita in CS&H is also strongly associated with the location quotient of creative firms.
- Lagged (two-year) per capita investment in CS&H is significantly and positively associated with turnover of creative firms in major urban centres, but not in local authorities outside major urban centres. Competitiveness, a composite measure including Gross Value Added (GVA), is positively associated with turnover in both cases.
- The potential significance of these results is that they may present evidence of drivers of creative industries clustering and growth.

#### **Other variables**

- Net migration of creative firms is not significantly associated with any CS&H assets or investment; the only significant variables for this model are network infrastructure and population. However, testing this relationship more conclusively would require a longer time series.

## 1.5 Conclusions

The study is by design highly exploratory and it is important that this is borne in mind when interpreting the results. Nevertheless, the study provides some important and interesting evidence of the positive role that CS&H assets and investment play in place-shaping, when examined through the lens of the economic performance of the creative industries and the wider local economy more generally.

Further work in this field is required in a number of areas. Case studies which examine the nature of the local impact ecosystem and the mechanisms by which local impact is stimulated could generate vital qualitative evidence to complement quantitative evidence of the direction and scale of impacts. They could also investigate the crucial local conditions (e.g. cumulative investment, wider investment/regeneration programmes, and so on) which might influence whether impacts are achieved and their scale. Data collection in response to a number of key data limitations could also underpin future analysis. For example, better longitudinal data on assets and investment would enhance results. Data that is robust at smaller spatial scale than local authority would also allow for wider influencers on economic performance (e.g. the loss of major employers in specific locations within a place) to be controlled out of the analysis.

This study represents an important first step on a journey to develop the evidence base around the role that CS&H assets and investment play in place-shaping. The hope is that it stimulates debate and further work amongst policy makers, practitioners and the research community.

## 2: Introduction

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The CASE programme is a joint strategic research programme led by the Department for Culture, Media and Sport (DCMS) and its sector leading arms-length bodies: Arts Council England, Historic England and Sport England. CASE uses interdisciplinary research methods and analysis to inform the development of policy in culture and sport.

Culture, sport and heritage have a long history of contributing to places and communities. In their many forms they are uniquely able to comment, reflect, influence, interpret and inspire and are increasingly recognised as a key part of the process that can help shape new places and engage communities. The CASE programme is committed to continuing to build the evidence base regarding the role of culture, sport and heritage in driving positive economic and social outcomes in local places.

As part of this commitment, in 2015 the CASE programme commissioned a partnership led by Trends Business Research Ltd (TBR) and including NEF Consulting Ltd and Middlesex University to undertake an important and ground-breaking study examining the role that cultural, sport and heritage (CS&H) assets and investment play in shaping local places.

This study focuses on generating evidence to support the argument that culture, sport and heritage infrastructure and investment have the ability to promote and drive positive economic and social outcomes at the local level and thereby play a role in place-shaping. The aim of the study is to examine the extent to which culture, sport and heritage infrastructure and investment within a place influence (through direct and indirect impacts, tangible and intangible) the economy and society of that place. Crucially, the study focuses on a range of potential economic indicators and linkages to the presence of CS&H infrastructure ('assets') and investment.

The study is by its very nature exploratory. It builds on a feasibility study published by the CASE programme in 2011 – *The Art of the Possible*<sup>4</sup> – which identified techniques and data sources that would support an empirical approach to measuring and evidencing economic and social impacts arising from culture, sport and heritage assets and investment.

### 2.1 Aims and objectives

This report is the output of a significant research exercise, undertaken iteratively in order to navigate the various complexities associated with the required analysis, the data upon which it might draw and the lack of 'tried and tested' approaches within the existing literature. The aims and objectives of the study

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<sup>4</sup> CASE Programme (2011), *The Art of the Possible – using secondary data to detect social and economic impacts from investments in culture and sport, a feasibility study*

have evolved and been refined as a result of discoveries made along the research pathway and consideration of their implications.

This study contributes to the wider ambition of the CASE programme to build a body of evidence in response to the following over-arching research question:

To what extent does culture, sport and heritage infrastructure and investment within a place (e.g. city-region, rural area) influence the:

- **Economy:** personal income, output (GVA), productivity, property prices, tourism, inward investment, business relocation, employment and skills, etc.
- **Society:** demographic characteristics (including ethnicity), education and learning, health, deprivation, social capital, crime and neighbourhood, wellbeing, identity, etc.

The specific research questions this study responds to were determined through a process of initial research, data collection and assessment, and discussion with the project steering group (comprising representatives of each of the four organisations involved in the CASE programme). Ultimately the nature of data available for both the independent variables (culture, sport and heritage assets and investment ) and the dependent variables (the range of outcomes that might arise from the factors represented by the independent variables) drove the final decisions on the contribution this study could and should make to the evidence base, which the steering group agreed should target specific gaps in the current evidence of economic (and social) impacts arising from CS&H assets and investment.

It is important to emphasise that a focus on the role of CS&H assets and investment play in place-shaping was maintained through an examination of the linkages between CS&H assets and investment and economic outcomes that are inherent to positive place-shaping (e.g. more and better firms/jobs that residents of a place can access and benefit from). A central idea running through this study is, therefore, that positive economic and social impacts are inherent goals associated with place-shaping.

This study specifically addresses the following research aim:

***To investigate, through econometric estimation, the link between CS&H assets and investment and a range of indicators of economic health, both for local economies as a whole and also the creative industries.***

It is important to note that this is not a study which seeks to understand whether CS&H assets agglomerate together (i.e. it is not a 'cluster' study). Rather, the study seeks to understand whether there is a relationship between CS&H critical mass (either in terms of assets density or investment density) and specific place-shaping outcomes.

## 2.2 Approach

The approach to the study was based on three key tasks:

1. Literature and data review: A synthesis of existing evidence and available relevant data, covering each area of impact and building them into a 'conceptual framework'.
2. Secondary data analysis: Compiling and conducting analysis on secondary datasets (including but not limited to those already identified by previous research) to explore the relationships between culture, sport and heritage infrastructure and investment and their impact.
3. Primary data analysis: exploring and evaluating gaps in the available data and identifying primary data options for future analysis.

The main body of this report includes further comments on the methodologies used including the analytical and statistical techniques employed. Specifically, chapter 3: (p.18) outlines the approach to empirical research and analysis.

## 2.3 A conceptual framework

The study focuses on the broad hypothesis that culture, sport and heritage serve as important drivers in achieving economic and social goals of economic prosperity, wellbeing, social inclusion and cohesion – and that this forms part of a wider place-shaping process. CS&H in their many forms are uniquely able to comment, reflect, influence, interpret and inspire and are increasingly recognised as a key part of the process that can help shape new places and engage communities. They therefore have a long history of contributing to places and communities.

This research focuses on evidence to support the argument that CS&H infrastructure and investment have the ability to promote economic and social outcomes and, thereby, to shape local places to achieve more desirable economic and social goals. It is worth noting that it is ultimately the intrinsic benefits of CS&H assets and investment which lead indirectly to economic and social impacts; for example, encouraging individuals and businesses to locate to a particular area in order to take advantage of the intrinsic value of CS&H assets in that area.

This section presents the conceptual framework which supports the research. The framework is designed to capture the key themes of the relevant economic literature and to identify the key research and evidence gaps in the literature. The conceptual framework is used as the basis for defining the precise scope of the study and comprises the following elements:

- Definition of terms
- Implications for the study arising from a review of conceptual/theoretical literature
- A description of the impact 'ecosystem'
- Implications for the study arising from a review of empirical literature
- A review of available secondary data in relation to the study aims and objectives

Each of these five elements is considered separately below.

### 2.3.1 Definition of terms

In order to achieve the required aims and objectives of a study such as this, it is important first to define a range of concepts and terms. In the context of this study, these are:

- Place-shaping
- Culture, Sport and Heritage Assets
- Culture, Sport and Heritage Investment
- Impact
- Geography of impact
- Culture, Sport and Heritage Ecosystem

These definitions also help to describe the focus and scope of the study. Within the context of the study, the definitions are to some extent dynamic, reflecting the specific application of these terms in various analytical scenarios and responding to the feasibility of delivering certain analyses using different datasets. For example, the definition of culture, sport and heritage itself is used selectively in the study to take account of the specific features of the datasets used in the analysis (which may be constrained by Standard Industrial Classification codes, or focused on specific culture, sport or heritage assets or investment, and so on).

#### Place-shaping

‘Place-shaping’ is not a term or concept used in the literature or policy on culture. The term placemaking is more widely used in relation to local and area-based improvement, often associated with environmental design of the public realm, and issues of accessibility and connectivity. This term also features in recent cultural policy: ‘We want to see more partnerships being formed between the national and local levels to put culture at the heart of placemaking’<sup>5</sup>. The related, observed concept of clustering (agglomeration of firms, amenities and occupation groups, e.g. the ‘creative class’) also operates at various scales, including in the ‘compact city’ where a mix of amenities, retail and public transport/accessibility are seen to provide a sustainable and liveable place.

The term place-shaping was used in local government reform, inspired by the Lyons Inquiry (2007), where the term was seen to cover a wide range of local activity which affects the well-being of the local community, informed by local character and history, community needs and demands, and local politics and leadership<sup>6</sup>. Here, well-being is approached not just from a local economic or services perspective, but contains an element of a ‘local sense of belonging and identity’: place-shaping is “about creating a vision for a locality that is distinctive, identifying and building on its unique selling points, and creating a sense of local identity, distinctiveness and place. It is about creating places that are attractive, vibrant, prosperous, safe and friendly. Places for people to be proud to call home”.

In some respects this study could be seen to introduce ‘culture’ to this local place-shaping aspiration, building as it does on preceding evidence-based policy around

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<sup>5</sup> DCMS (2016) The Culture White Paper. London

<sup>6</sup> Lyons, M (2007) Place-shaping: a shared ambition for the future of local government. Norwich, The Stationery Office.

culture and regeneration; living places; cultural asset mapping and investment appraisal (*The Art of the Possible*) and a range of impact reviews. This includes the recent AHRC Cultural Value Project<sup>7</sup> which emphasises the intrinsic value of cultural experience to the individual, wherever this is first gained – in the home, school, community or cultural venue. Cultural value that can be appreciated and acquired can both generate new demand and release latent demand. This is also likely to lead to behavioural changes which in turn can effect cultural consumption and participation and in some situations, location decisions – with direct economic effects arising. Cultural value is recognised in the AHRC review, for instance in terms of the ability of arts and cultural engagement to help shape reflective individuals, thereby facilitating greater understanding of themselves and empathy for others, as well as producing more engaged citizens, thus promoting civic behaviour and expression. However, access to cultural experiences and opportunities for cultural expression are, as the review confirms, uneven and both the generation of ‘demand’ and the cultural ecosystems that can flourish at varying levels require different modes and places of engagement in proximity to where people can actually access cultural experiences.

Without a clear definition in the literature, for our purposes the role and contribution that CS&H assets and investment make to shaping places therefore draw on both placemaking concepts including spatial and environmental amenity effects (e.g. clusters), and a range of social, economic, environmental and intrinsic values and benefits of a cultural ecosystem that arises from particular CS&H facilities, opportunities and activities. The place-shaping strategies identified through local governance and ‘creative city’ placemaking approaches (and associated investment) are also a measure of how effective places (boroughs, districts, clusters, etc.) are, in generating these positive impacts. Place-shaping in the context of this study therefore encompasses a broader range of activities, initiatives and concepts than placemaking alone would imply.

The Lyons Inquiry into local government defined place-shaping as “the creative use of powers and influence to promote the general well-being of a community and its citizens”<sup>8</sup>. Clearly this definition was developed in the context of the policy and investment decision-making power that local government has. We suggest that this definition is used in this research since it is in the area of policy and investment decision making where it is felt the results of the study could have most influence. However, within this study the term should be considered in the context of decisions around policy and investment with respect to culture, sport and heritage assets. We also want to capture specific economic impacts.

The definition of place-shaping that we use is:

*“The creative use of powers and influence to create, utilise and develop CS&H assets in order to promote the general well-being of a community and its residents and businesses, where well-being captures a range of positive attributes such as better health, high amenity value, good job opportunities, high business performance, low crime, good educational attainment and community cohesion.”*

We therefore draw a distinction between place-shaping and placemaking, where the latter is often seen as a narrower activity focused on an approach to planning, design and management of public spaces and the former is more about creating

<sup>7</sup> AHRC (2016) Understanding the value of arts & culture: The AHRC Cultural Value Project . Geoffrey Crossick & Patrycja Kaszynska.

<sup>8</sup> Lyons, M (2007) Place-shaping: a shared ambition for the future of local government. Norwich, The Stationery Office.



and delivering a vision of greater economic and social well-being. The focus on place-shaping means that the results of this study and their implications are, hopefully, relevant to a wider audience.

### **Culture, Sport and Heritage Assets**

We define CS&H assets<sup>9</sup> as:

*“The places (properties, spaces, monuments, buildings, etc.) that produce and provide culture, sport and heritage, and which can be participated in, enjoyed or ‘consumed’.”*

It should be noted that CS&H assets can have a positive economic or social impact without this being an intended outcome. There may also be ‘assets’ which do not fit within our definition – for example, storage or archive facilities which are not accessible by the public.

### **Culture, Sport and Heritage Investment**

We define CS&H investment as:

*“Financial support (operating, grant and capital expenditures) for culture, sport and heritage from diverse sources: national government departments and arm’s length bodies; lottery funding; local government; foundations, personal and business giving; private investment; consumer investment.”*

It should also be noted that investments differ in source and intended use of funds.

### **Impact**

We define impact as:

*“The positive outcomes on ‘well-being’ (i.e. liveability and economic performance) of a place that might be generated either directly or indirectly within a study location through CS&H assets or investments.”*

There are a wide range of possible impacts that this study is concerned with. The following were identified in the brief:

- **Economy:** Personal income, output (GVA), productivity, property prices, tourism, inward investment, business relocation, employment and skills, etc.
- **Society:** demographic characteristics (including ethnicity), education and learning, health, deprivation, social capital, crime and neighbourhood, personal wellbeing, identity.

These are underpinned and in many respects preceded by the intrinsic value that can be derived from cultural experience at the individual level, which in turn can generate economic and social effects and behavioural change, as noted above.

Despite the range of impacts of interest, however, the data collection exercise undertaken for this study, along with consideration of the existing evidence base

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<sup>9</sup> Note that we are aware of other definitions which have been derived for specific purposes, such as the definition of a Heritage Asset in the National Planning Policy Framework.



and – importantly – identification of evidence gaps has driven a narrowing of the focus on impacts.

### **Geography of impact**

We define the term ‘geography of impact’ as:

*“The spatial reach of the direct or indirect impacts arising from CS&H assets and investment.”*

### **Culture, Sport and Heritage ecosystem**

Lastly, we define the CS&H ecosystem as:

*“The set of processes and interactions whereby CS&H assets and investment not only deliver direct and indirect impacts but also generate numerous spillovers which further enhance the cumulative and total impact of those assets and investment (for example, through their role in potentially creating agglomeration effects).”*

## **2.3.2**

### **Study implications arising from the review of theoretical literature**

The literature review was undertaken as a ‘rapid review’ with the benefit of prior reviews, notably our *Art the Possible* feasibility study undertaken for CASE in 2010 which looked at literature on CS&H impacts and underlying quantitative methods and data availability<sup>10</sup>. More recent reviews include *Evidence Review: Sport and Culture*<sup>11</sup> and *Quantifying the Social Impacts of Culture and Sport*<sup>12</sup> as well as other reviews of social impacts<sup>13</sup> and culture and regeneration<sup>14</sup>. The literature review has drawn on these sources as well as published material in the form of journal articles, books/chapters and research reports, primarily (but not exclusively) from the UK and North America. The purpose of the review is to contribute to the design of a framework within which the study can operate, including the identification of specific evidence gaps which the study can address, and empirical models/approaches that can be adopted in order to address them.

This section presents the key points from the literature review of papers related to relevant theoretical concepts and policy, undertaken in order to inform the conceptual framework and therefore the focus of the study. The full review is available in section 6: (p, 40).

There is an extensive body of literature which relates to theoretical concepts that are relevant to this study. These range from how to define and value assets to the different types of impacts that might arise from their existence (directly and

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<sup>10</sup> CASE (2011) *The Art of the Possible: Using secondary data to detect social and economic impacts from investments in culture and sport: a feasibility study*. London, DCMS.

<sup>11</sup> What Works Centre for Local Economic Growth (2014) *Evidence Review: Sport and Culture*. London, DCMS.

<sup>12</sup> Fujiwara, D, Kudrna, L & Dolan, P (2014) *Quantifying the Social Impacts of Culture and Sport*. London, DCMS.

<sup>13</sup> For example, Reeves, M (2002) *Measuring the economic and social impact of the arts: a review*. London, Arts Council England.

<sup>14</sup> Evans, G & Shaw, P (2004) *The Contribution of Culture to Regeneration in the UK: A Review of Evidence: A report to the Department for Culture Media and Sport*. London, DCMS.

indirectly), from agglomeration effects to the creative and cultural industries and their role in placemaking and place-shaping.

The literature also identifies a number of conceptual and empirical considerations that should be borne in mind throughout a study of this type, including the notion of variation in the scale of assets and the scale of impact, temporal effects, asset mix, how externalities and spin-offs might occur around assets and how assets might themselves form part of a functioning economic cluster and so on.

We focus here, though, on one of the most relevant aspects of the literature: the concept of the creative and cultural industries as an ecosystem. This is important because it was identified in the project brief and exists as a cornerstone within the design of this study.

The literature identifies three key examples of use of the term 'ecosystem':

- Ecosystems in cultural and creative industries (derived from innovation/knowledge exchange, spillover effects and production chain links, etc.), such as that discussed in the Warwick Commission report<sup>15</sup> (i.e. creative and cultural industries feed and depend on each other).
- Ecosystems which are applied to arts and cultural activity and facilities which generate both an internal 'cultural' ecosystem (e.g. in Holden's *Ecology of Culture* report<sup>16</sup>) and also feed the creative industries and wider economy.
- Ecosystems of cultural engagement, for example ecosystem spillovers from local arts to economic growth – e.g. Brighton FUSE, as identified by AHRC<sup>17</sup> and NESTA<sup>18</sup>; Natural Cultural Districts studies (although Markusen doesn't actually use the term in her Creative Placemaking studies), and the recent *Cultural and Creative Spillovers in Europe* report<sup>19</sup> where cultural and creative ecosystems are identified as a network spillover effect.

Bringing these ideas together, the study brief stated that the role of CS&H infrastructure and investment in the local area should be thought of as an ecosystem, rather than in isolation. For example, a new arts centre will create direct employment (including freelance/SMEs) and cultural participation, but it will also create employment in local businesses because of increased trade due to visitors, and in time may also attract related and unrelated businesses and innovation/product development because the original investment has improved wellbeing, local aesthetics or skills leading to a better sense of place or increased human capital.

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<sup>15</sup> The Warwick Commission (2015), *Enriching Britain; Culture, Creativity and Growth*

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<sup>16</sup> Holden J. (2015), *The ecology of culture*, AHRC

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<sup>17</sup> Crossick G. & Kaszynska P. (2016), *Understanding the value of arts and culture*, ARHC

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<sup>18</sup> Bakhshi, H. et al (2014) *Capital of culture? An econometric analysis of the relationship between arts and cultural clusters, wages and the creative economy in English cities*, Nesta Working Paper No.14/06

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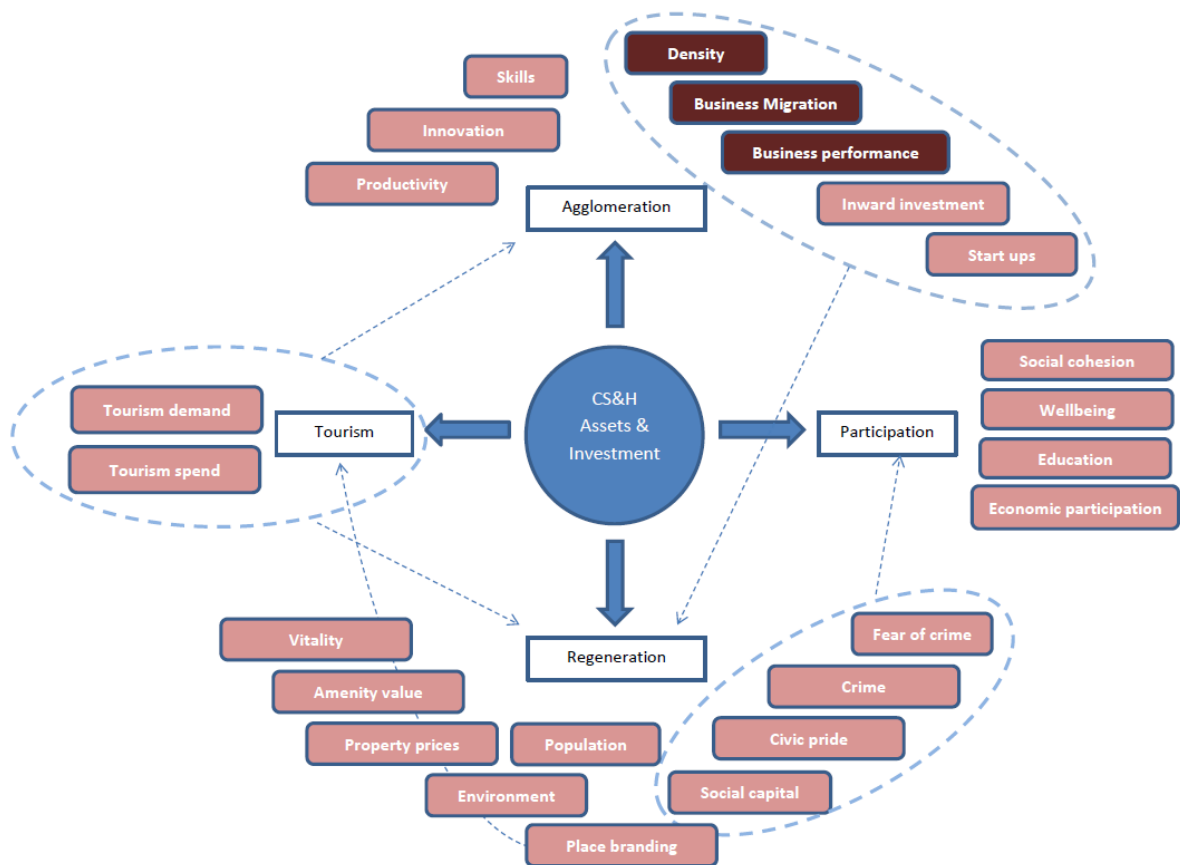
<sup>19</sup> Tom Fleming Creative Consultancy (2015), *Cultural and creative spillovers in Europe*

The concept of the impact ecosystem is considered further, alongside the practical implications of employing such a model for this study, in the following section.

### 2.3.3 Developing the concept of an impact ecosystem

The impact ecosystem is an important part of the conceptual framework for this study. Some important aspects of the impact ecosystem are articulated and presented in Figure 1 below. This diagram, based on the literature review summarised above (and set out in full in section 6: p.40), captures an inexhaustive number of important impact areas (agglomeration, tourism, participation and regeneration) and, for each of these, a number of specific outcomes. These range from those which are evidenced (e.g. participation in culture, sport or heritage has been shown to positively influence education choices, health and wellbeing, social cohesion and economic participation), to those that are postulated (e.g. CS&H assets may increase agglomeration which then produces positive outcomes in terms of innovation, skills development, productivity and so on). Note that the diagram does not attempt to be comprehensive, but instead focuses on impact areas and outcomes that are of interest to the study.

**Figure 1: Impact ecosystem**



Source: TBR, NEF Consulting, Middlesex University

The diagram also identifies a number of inter-relationships between different impact areas and outcomes, designed to demonstrate how cumulative impacts might be derived. An increase in business agglomeration, for example, might contribute to demand for commercial property within a specific location, which then might drive investment in the physical infrastructure of that area and therefore lead to physical regeneration.

Lastly, the diagram also identifies – in the dark red boxes – the specific economic measures that are the focus of the study. They are at once outcomes of, and measures of, impacts.

The intention in this study was originally to discover whether evidence of such an ecosystem, and the relationships within it, could be found using the available data. To explore the full ecosystem would require significant resource and, most likely, an iterative approach which breaks down the relationships and interactions within the ecosystem into manageable, discreet elements.

In effect, this is what has been achieved in this study. Section 7: (p.82) sets out three analytical options which were identified during the scoping stage. These identify examples of how the relationship between between CS&H assets and investment and direct and indirect economic and social outcomes might be examined. It was decided that the study would focus on testing the relationships between CS&H assets and investment and positive place-shaping outcomes (i.e. specific measures of economic and social 'success').

However, following consideration of the available data and suitable econometric models (see sections 2.3.4, p.14 and 2.3.5, p.15) it was agreed that the aims and objectives should be further narrowed. Thus the study has focused on more simple relationships than are captured and described by the ecosystem as a conceptual whole. Should suitable resources and data be available in the future, econometric analysis could be undertaken which explores other elements of the ecosystem (e.g. whether there is evidence of a relationship between CS&H assets and investment and indirect impacts associated with positive place-shaping).

#### 2.3.4 Study implications arising from the review of empirical literature

While there is an extensive body of literature relating to the theoretical and conceptual ideas relevant to this study, empirical evidence and literature is more sparse. A review of key studies is set out in section **Error! Reference source not found.** (p.**Error! Bookmark not defined.**). The most influential studies in relation to the design of this study include:

- Lazzeretti et al (2009), Why do creative industries cluster? An analysis of the determinants of clustering of creative industries, IERMB Working Paper in Economics, n° 09.02, April 2009
- Bakhshi et al (2014) Capital of culture? An econometric analysis of the relationship between arts and cultural clusters, wages and the creative economy in English cities, Nesta Working Paper No.14/06
- Noonan, D (2013) How US Cultural Districts Reshape Neighbourhoods, in Cultural Trends 22(3–4).
- Cruz, S. and Teixeira, A.A.C. (2014), The Determinants of Spatial Location of Creative Industries Start-Ups: Evidence from Portugal using a Discrete Choice Model Approach. FEP Working Papers no. 546 October 2014

In summary, the review of empirical literature found that:

- Existing evidence on the links between CS&H and economic outcomes is either:
  - Case study based and non-econometric
  - Based on effects of amenities on house prices (hedonic pricing models) or human capital
  - Cross-sectional (leading to weak causal interpretation)
  - Not based in the UK
- Traditional measures of firm location and economic performance do not tend to incorporate quality of life and amenity factors.
- The existing evidence suggests CS&H affects wellbeing, health and quality of life in the UK, for example:
  - health and wellbeing benefits of public libraries;
  - health and educational benefits of sport and culture;
  - creative occupations and subjective wellbeing
- The links to wellbeing have previously been explored and therefore it would appear appropriate to target this study at economic indicators rather than social indicators. However, how these variables and factors interact is less well explored.
- There is evidence that quality of life/amenity outcomes affect firm location decisions and human capital. This may suggest that CS&H asset/investment can influence the demand-side factors associated with the location decisions made by people and businesses.
- Whilst a tried and tested model to underpin the proposed analysis does not exist, there are models which focus on similar empirical questions within the creative industries. These existing studies align best to the aims and objectives of this study, and a key conclusion from the review was that it was sensible to build on the empirical approaches used, while developing an approach which could be extended to cover wider economic impacts at the local level (i.e. not restricted to the creative industries).
- Availability of suitable static and time-series data has a major influence on decisions relating to the empirical analysis. The data collection exercise is discussed in more detail in section 8: (p.85) and, in terms of its implications on the analysis, in the section below.

### 2.3.5 Study implications arising from the data review

A key factor in deciding the precise focus of this study was the availability of suitable data to represent independent variables (CS&H assets and investment) and dependent variables (desired outcomes related to place-shaping).

The data review (presented in full in section 8: p.85) found that:

- Identifying the CS&H assets in a place is relatively straightforward, though a comprehensive picture needs to be collated from a number of different data sources. Identifying changes in the number, type and quality of assets over time is more difficult.

- Similarly, developing a comprehensive picture of investment in CS&H assets is also difficult, and data availability should determine the specification for analysis.
- A range of indicators is available to examine the impacts of CS&H assets and investment. The available data will also allow impacts to be tested at a range of spatial levels, though generally not robustly below local authority level. The specific indicators to be used as dependent and control variables should be defined in line with the specification for analysis.

It was recognised that the process of reviewing data sources and developing a specification for the analysis is an iterative one, with each informing the other. A data specification describing the indicators to be used in the analysis and the sources from which they are drawn was developed as the study progressed. Details of the dataset used in the analysis can be found in section 11: (p.102).

### 2.3.6 Conceptual framework summary

The study began with the objective of generating evidence in relation to the following over-arching research question:

*To what extent does culture, sport and heritage infrastructure and investment within a place (e.g. city-region, rural area) influence the:*

- **Economy:** *Personal income, output (GVA), productivity, property prices, tourism, inward investment, business relocation, employment and skills etc.*
- **Society:** *demographic characteristics (including ethnicity), education and learning, health, deprivation, social capital, crime and neighbourhood, wellbeing, identity etc.*

A number of factors influenced the final design of the study with respect to this objective. These include:

- Existing theoretical literature,
- Consideration of the concept of an impact ecosystem, and the complexity of this concept,
- Existing empirical literature and models which might be used or adapted for use in this study. Importantly, consideration was given to the existence of evidence which directly relates to the over-arching research question, with a view to focusing this study on the creation of new evidence.
- Availability of data related to both assets and investment (independent variables) and key economic and social outcomes (dependent variables).

Clearly these factors are inter-related. For example, the design of empirical models must carefully consider and be informed by the availability of data. Having considered all these factors the study team and steering group drew the following conclusions:

- This study should not attempt to evidence the full ecosystem, as was originally intended. This decision was taken on the basis of the implied complexity of the task and a lack of data suitable to support it. Instead, it was agreed that the study should examine the relationship between CS&H assets and investment and economic and social indicators which are important to positive place-shaping.

- Evidence regarding some social and wellbeing indicators was already in the public domain and that therefore, this study should focus on economic indicators only.
- Existing empirical models have been employed in studies relate to the creative industries and these represent the best existing approach. These should therefore be modified in order to address the objectives of the study.
- The most relevant spatial area to be included in the empirical analysis is local authority since this allows for maximum exploitation of the available data. However, it is recognised that this has limitations for the study since some impacts may be felt at a spatial level other than this.
- As well as focusing on local economies as a whole, and following on from other existing studies, it was agreed that the empirical analysis would also examine the relationships between CS&H assets and investment and economic outcomes in the creative industries. This will extend the interest in and utility of the study.

The conclusions outlined above have driven an empirical approach which is described, along with the results of the estimation and modelling, in the following section.



## 3: Empirical approach

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This section sets out the empirical approach taken in the study. Our approach is highly exploratory, and we test a variety of relationships and models to clarify the effects of CS&H assets and investment in terms of a number of potential economic impacts.

### 3.1 Empirical strategy

Our empirical approach is informed by a review of the available literature, and the analytical methods used in existing studies. Although research on the location and productivity of firms and plants has been a major topic in economics since Marshall's influential work in 1890, the research literature varies substantially in terms of modelling specifications, sampling characteristics and determinants. There is no consensus on key location factors or the best way to estimate their importance (Arzauro-Carod et al, 2010<sup>20</sup>), and previous international studies have used a variety of approaches and indicators (variables) when trying to answer similar questions to this study. Some approaches take advantage of quasi-natural experiments, such as Falck et al's 2011 study<sup>21</sup> into the impact of baroque opera houses built before 1800 on the spatial equilibrium share of high-human-capital employees. Others take a case study approach to consider the impact of cultural, sports or heritage assets or investments, such as Ahlfeldt and Kavetsos' 2014 study<sup>22</sup> into the effect of new sports stadia on property prices in London.

This means that there are potentially hundreds of different combinations of variables and models which could be explored and tested in a regression analysis. The fact that there are always additional (or different) variables which could be used also means that it may not be possible to reach definitive conclusions. We acknowledge that this embedded complexity is one of the limits of this study, given the impossibility of testing absolutely all potential combinations, and the uncertainties entailed in obtaining different results when the combination of variables is altered.

Our general strategy has therefore been highly exploratory, controlling for as many determinants of outcomes as possible (given the data available to the study) to identify push/pull factors of location and economic success. These factors are drawn from multiple studies as identified in Arzauro-Carod et al<sup>23</sup>, and Lazzaretto et

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<sup>20</sup> Arzauro-Carod et al (2009), *Empirical studies in industrial location: an assessment of their methods and results*, Journal of Regional Science, April 2009

<sup>21</sup> Falck et al (2011) The phantom of the opera: Cultural amenities, human capital, and regional economic growth, Labour Economics, December 2011

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<sup>22</sup> Ahlfeldt, Gabriel M. and Kavetsos, Georgios (2014) Form or function?: the effect of new sports stadia on property prices in London. Journal of the Royal Statistical Society: Series A (Statistics in Society), 177 (1). pp. 169-190. ISSN 0964-1998

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<sup>23</sup> Op cit



al<sup>24</sup>, combining multidisciplinary approaches based on cultural economics, evolutionary geography and urban economics.

#### **Determinants of industrial location**

1. Agglomeration economies, advantages in costs or quality due to the spatial concentration of productive resources and actors. In particular, these can be of two types:
  - a. Urbanisation economies – concentration of industries in general in larger cities
  - b. Marshallian-sectoral economies – the concentration of firms of similar characteristics in particular localities, to benefit from local knowledge spillovers
2. Local amenities and quality of life factors, including:
  - a. **Culture, arts and heritage of the area**, including green spaces
  - b. Life satisfaction in an area
3. Transport and network infrastructures
4. Human capital characteristics

While there is some evidence that CS&H assets and investment stimulate the economy and contribute to place-shaping, in practice existing econometric analysis (as section 2.3.2 indicates) has tended to focus on the relationship between CS&H assets and investment and creative industries firms. Our approach has therefore been to expand the models used in previous research, in order to examine the relationship between CS&H assets and investment and *all* firms. First we tested whether the relationship between CSH assets and investment and the creative industries found in other studies holds for the UK. We then looked at the relationship between CS&H assets and investment and the wider economy, which was the main focus of this study.

This means that our empirical work is focused on understanding, through the application of specific econometric models, whether evidence can be detected of a relationship between CS&H assets and investment and creative industries at a local level, as reported in the research literature. We then expand this analysis to consider whether CS&H assets and investment contribute to more general sustained economic productivity; in doing so we look at all firms, as well as other specific industries including the knowledge economy, the tourism sector and professional and business services.

In summary, our research questions are as follows:

- Do CS&H assets and/or investment influence the location and economic success of creative industries?

<sup>24</sup> Lazzeretti et al (2009), *Why do creative industries cluster? An analysis of the determinants of clustering of creative industries*, IERMB Working Paper in Economics, n° 09.02, April 2009

- More generally, do CS&H assets and/or investment influence the location of other industries and the local economic performance of an area?

### 3.1.1 Model specifications

For our initial model (concentration of industries), we follow Lazzeretti et al (2011), in specifying an exponential distribution for the location of industries:

$$Y = aCSH_i^{\beta_1}Q_i^{\beta_2} \quad \text{(equation 1)}$$

Where:

- $Y_i$  is the measure of local economic performance in local authority  $i$
- $CSH_i$  is a vector containing measures of culture, sport and heritage assets and investment in local authority  $i$
- $Q$  is a vector of additional push/pull factors in the local authority as described above – note that these vary depending on availability of data in the cross-sectional and panel models
- $a$  is a constant
- $\beta_i$  are the parameters to be estimated

This functional form can be linearized using logarithms to give the following model, where estimated parameters can be interpreted as elasticities:

$$\ln(Y_i) = a + \beta_1 \ln(CSH_i) + \beta_2 \ln(Q_i) + \epsilon \quad \text{(equation 2)}$$

where  $\epsilon$  is an error term.

Note that this model was estimated for both cross-sectional and panel models.

We use different definitions and permutations of local economic performance, and run several different base models as follows:

#### Industry concentration cross-sectional model 1 (equation 2.1)

Equation 2 where  $Y$  = [location quotient of industry] and  $Q$  = [heritage assets density, sports assets density, libraries density, cultural events, cumulative local authority investment in culture per capita, cumulative local authority investment in heritage per capita, cumulative local authority investment in sports per capita, cumulative arts lottery investment per capita, cumulative sports lottery investment per capita, cumulative heritage lottery investment per capita, number of individuals in creative employment, employment rate, proportion of labour with level 4+ qualifications, housing density, network infrastructure, transport infrastructure, life satisfaction, proportion of population meeting physical activity guidelines, size of the market, GVA per capita]

#### Industry concentration cross-sectional model 2 (equation 2.2)

As equation 2.1 but  $Y$  = [net migration of industry] and  $Q$  = [heritage assets density, sports assets density, libraries density, cultural events listings per capita, annual local authority investment in culture per capita, annual local authority investment in heritage per capita, annual local authority investment in sports per capita, annual arts lottery investment per capita, annual sports lottery investment per capita, annual heritage lottery investment per capita, number of individuals in creative employment, employment rate, proportion of

labour with level 4+ qualifications, housing density, network infrastructure, transport infrastructure, life satisfaction, proportion of population meeting physical activity guidelines, size of the market, GVA per capita]

**Industry turnover cross-sectional model (equation 2.3)**

As equation 2.1 but  $Y =$  [turnover of industry]

Models were also tested to exploit the availability of panel data where possible, considering both turnover of firms and location/concentration of firms. Lagged investment was used as firm location decisions may not occur immediately, and firms' success may depend on prior investment that is not realised immediately.

Results were separated by location for local authorities within major urban centres and those outside, using government definitions of rural-urban classification<sup>25</sup>. This is important as if results are the same across both specifications we can be more confident that our results are not just showing urban agglomeration effects.

Both fixed effects and random effects models were considered:

- Random effects models control for unobserved heterogeneity when it is constant over time, by assuming that individual specific effects are uncorrelated with independent variable. Variables remaining constant over time can be included in the model.
- Fixed effects models control for time-independent effects in our unit of analysis (local authorities), but is less strict: it does not require individual specific effects be uncorrelated with independent variables. Our results are not biased only if we omit time-independent causal variables. However, we cannot include time-invariant variables (such as assets data).

The Hausman Test was used to determine the appropriate statistical model, which determined that fixed effects was likely to be more appropriate than the random effects model. However, this means that time invariant variables must be excluded – which applies to all the CS&H assets data we have available.

Errors are clustered at the Local Authority level – this means the observations may be correlated within local authorities but would be independent between them.

**Industry concentration panel model 1 (equation 2.4)**

As equation 2.1 but  $Q =$  [per capita investment in CS&H, lagged per capita investment in CS&H, two-year lagged per capita investment in CS&H, employment rate, skilled employment proportion, GVA, proportion of population meeting physical activity guidelines]

**Industry concentration panel model 2 (equation 2.5)**

As equation 2.2 but  $Q =$  [per capita investment in CS&H, lagged per capita investment in CS&H, two-year lagged per capita investment in CS&H, employment rate, skilled employment proportion, GVA]

**Industry turnover panel model****(equation 2.6)**

As equation 2.3 but  $Q =$  [per capita investment in CS&H, lagged per capita investment in CS&H, two-year lagged per capita investment in CS&H, employment rate, skilled employment proportion, GVA]

Equations 2.2, 2.3, 2.5, and 2.6 were re-estimated for all firms.

**3.2 Data and model specifications**

To enable our analysis, we developed an extensive and unique local authority level database consisting of multiple variables and observations over the time period 2003–2013. This database covers all English local authorities and encompasses a wide range of socio-economic indicators (variables), clustered into the following groups:

- CS&H investment variables, including a breakdown of investment by source (e.g. Big Lottery investment) and type (e.g. arts).
- CS&H assets variables, as with investment including variables representing the type of assets and their ownership.
- Creative industry-related variables, including for example net firm migration in and out of respective local authorities and measures of creative industry concentration.
- Wider industry performance variables, including net migration of all firms, turnover growth of firms, and variables as for the creative industries for a number of other sectors of interest – the knowledge economy, tourism and professional and business services.
- A set of control variables, accounting for different characteristics of local authorities including, for example, economic performance, infrastructure development, employment, human capital (education levels) and well-being indicators (e.g. life satisfaction scores and physical activity rates).

The variables used in our analysis are not exhaustive. The choice of variables is limited by data availability (including the availability of longitudinal data) at local authority level. Initial correlation analysis was also undertaken to examine whether relationships exist between infrastructure and investment indicators, and indicators of local economic performance; effectively, this tested whether subsequent regression analysis would be likely to yield results.

Correlation analysis found positive relationships between CS&H investment (and lagged investment) and many local economic indicators. These relationships persisted across years, but some weakened when outliers (in particular, the City of London and Isles of Scilly) were removed. In particular, the analysis suggested strong relationships between CS&H investment and firm numbers (total firms and creative industries firms), turnover growth rates and firm migration. These were identified as indicators on which further analysis should focus.

Weaker relationships were found between CS&H assets and local economic indicators, and the correlation analysis suggested that further exploration of the relationships between assets and local economic performance would be unlikely to yield meaningful results. Data quality, and the absence of longitudinal data on CS&H assets in particular, was identified as an issue. For example, there tends to be a lag in of one to two years in availability of economic variables (the most recent consistently available data was for 2013) while data on CS&H assets is

largely based on a more current snapshot. This means that the analysis does not test correlation in like-for-like time periods.

The results of the correlation analysis can be found in section

The following sections describe the variables used in our models. A detailed list of data sources used in the analysis can be found section 11: (p.102).

### 3.2.1 Dependent variables

We tested multiple indicators as dependent variables in order to obtain different information regarding the impacts of CS&H assets and investment at local authority level. For the wider economy, we considered:

- Net migration of all firms per local authority
- Total turnover of all firms per local authority
- Total turnover of knowledge industries per local authority
- Total turnover of tourism industries per local authority
- Total turnover of professional services industries per local authority

For the creative industries, the key indicators we tested were:

- Net migration of creative firms per local authority
- Total turnover of creative firms per local authority
- The location quotient for creative firms in a local authority

#### Location quotients

To determine the patterns of spatial clustering of creative industries, we created a territorial indicator of concentration-specialisation to indicate whether a place is specialised in creative industries, and if this is a relatively important part of industry in the area. Our unit of analysis is the local authority, and the location quotient is defined as:

$$LQ_{local\_authority} = \frac{Creative\ firms_{local\_authority} / Creative\ firms_{national}}{All\ firms_{local\_authority} / All\ firms_{national}}$$

Location quotients can be used to compare the relative concentration of creative firms in a local area compared with a wider comparator area (in this study, the country as a whole). A location quotient of more than one indicates the clustering of creative industry in a local authority is higher than the national average, and the local labour market is specialised in creative industries. Higher concentrations of creative firms are most likely to be found in London, the South East and the West Midlands.

### 3.2.2 Independent variables

In order to test the impact of CS&H assets and investment in local areas across England, we collected data on both stocks and flows.

- Stocks reflect the concentration of different CS&H assets in respective local authorities. This data is not available on a longitudinal basis, but only for 2013. Despite not being exhaustive, this data can be used as a proxy for CS&H assets. It includes:
  - Active places (i.e. sports venues – the variable is named ‘sports assets’ in the analysis)
  - Listed and designated heritage sites (‘heritage assets’)
  - Culture24 events listings (‘cultural events’)
  - Libraries
- Flows reflect the yearly investment in CS&H in respective local authorities. This data is available for the period 2003–2013, and accounts both for local authority investment and Big Lottery investment (sports, arts and heritage Lottery funding).

Overall, investment data is of considerably better quality and covers a wider range of CS&H components than assets data.

The raw data was also used to generate a number of composite indicators, such as:

- Total annual investment per capita
- Total annual investment per capita by investment source (local authority and Big Lottery respectively)
- Total annual investment per capita by source and type (e.g. open spaces, museums, galleries, theatres, libraries, sports facilities, etc.)
- Cumulative investment in CS&H for the period 2003–2013, in aggregate and by source and type
- Assets density per local authority

These composite indicators potentially allow identification of the components of CS&H assets and investment which may lead to particular impacts.

As with dependent variables, we interchangeably tested respective independent variables. The variables used in each model are specified in the respective model.

### 3.2.3 Control variables

In order to test the impact of CS&H assets and investment, it is necessary to account for other push and pull factors affecting firms’ location decisions as well as other socio-economic characteristics which may affect sector performance and size at the local authority level. We collected a range of control variables for this purpose.

The control variables are not exhaustive. Indeed, the choice has been subject to data availability at local authority level. We also attempted, inasmuch as possible, to collect information which is available for multiple years. Although numerous control indicators were explored (see section 8: p.85), those ultimately used for the quantitative analysis include:

**Wider economic performance**

The wider socio-economic performance of local authorities may obviously play a critical role in a) attracting businesses, b) the birth of new businesses and c) business performance (e.g. aggregate turnover).

**Availability of human capital**

The availability of human capital is important both in terms of attracting existing businesses and the creation of new businesses.

**Transport infrastructure**

Transport infrastructure may be a factor in economic development, providing better access to jobs and markets, as well as reducing costs of production.

**Network infrastructure**

Network infrastructure may be a crucial pull factor for digital or media businesses. Digital and technology companies are an important driver of current economic performance in the UK.

**Housing density**

Housing density was used as a proxy for the degree of “urbanity” of respective local authorities. This may indeed influence business location, either as a push or a pull factor. The push component may be linked to higher premises prices in densely populated areas. The pull component may consist in wanting to locate in densely populated urban centres rather than in semi-urban or rural local authorities.

**Population**

The ‘size of the market’ can be represented by the population.

**Wellbeing**

Beyond strictly “hard” economic push and pull factors, other aspects may also attract firms or constitute enabling conditions for businesses. For example, areas of high wellbeing may constitute a pull factor for entrepreneurs – and by extension for firms.

**3.2.4 Spatial considerations**

In addition to control indicators, we also derived proxy indicators to make the geographical distinction between different groups of local authorities. Indeed, it may be challenging to understand the impact of CS&H assets and investment by simply aggregating all local authorities, regardless of whether they are predominantly urban or rural, or indeed located in major urban centres or not.

Areas more central to cities may tend to have more listed buildings, and a higher concentration of firms. Therefore, effects of the impact of cultural and heritage assets on economic development in an area may relate to the fact that both are more likely to occur in centrally located local authorities in urban areas. In larger urban population centres with multiple local authorities, the distribution of listed buildings is important, and thus results are sensitive to geography.

To account for these differences, we grouped local authorities into two categories, to test if results varied in different areas:

- Those which form part of a major urban centre (even if partially), including Greater London



- Those which contain no urban centre at all, i.e. those which are predominantly rural

This clustering allowed us to provide aggregate estimations for each of the regressions run, and to test relationships for different groups of local authorities.

The results were run separately in the panel data for local authorities in rural and urban locations, to account for these differences. These are reported for the creative firms analysis, where it can be seen that results do not vary significantly whether the Local Authority contains a major urban centre or not.

### 3.2.5 Temporal considerations

Some of the data was only available at a single point in time, and was not available longitudinally. Therefore we estimate two sets of models:

- Cross-sectional models
- Panel data models

Cross-sectional models are estimated using point in time data for 2013 only. This allows more variables to be included.

Panel data models allow us to test data over multiple points in time, although fewer variables can be tested. This has a stronger causal interpretation, as we can control for unobserved area-specific agglomeration effects (i.e. any time-invariant characteristics of an area for which we do not currently have data but may be skewing results).

Table 1 shows the variables for which we have single or multiple points.

**Table 1: Data types**

Cross-sectional data	Panel data
Heritage assets density (natural assets and listed buildings/monuments)	Per capita investment in CS&H
Sports assets density	Employment rate
Libraries	Proportion of skilled employment
Life satisfaction	GVA
Transport infrastructure	Size of the market (population)
Network infrastructure	Housing density



## 4: Econometric analysis and findings

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This chapter sets out the results of our econometric analysis. Although some results are promising and there are clear links between some variables and CS&H assets and investment, results are not always consistent across models or specifications. Therefore the chapter concludes by discussing some important caveats of the results.

### 4.1 All firms

We first present the results of our analysis of the relationships between CS&H assets and investment and local economies as a whole (including all firms). As this is an analysis that – to the authors' knowledge – has not been considered econometrically before, these results are highly exploratory and should be considered a starting point for future research.

All models are estimated using data for the year 2013.

#### 4.1.1 Cross-sectional models – all firms

The results for the relationships between all firms' turnover, concentration and migration and CS&H assets and investment are presented below in

Table 2.

The number of firms per capita is strongly and positively associated with heritage assets density, and cultural events per capita. Net migration of all firms is also strongly and positively associated with cultural events per capita. These results are robust when considering local authorities in major urban centres, as well as those that aren't – this is an important result as it suggests a direct relationship, and not simply that agglomeration is driving a high level of both cultural events and a greater concentration of industry.

Investment in CS&H is in general negatively associated with indicators of all firms' economic performance, although it is only significant for local authority investment and number of firms per capita.

Number of firms per capita is also significantly associated with the employment rate, the availability of skilled labour, housing density, transport infrastructure, GVA per capita and population size. The most significant variable is GVA per capita – however, this variable may be subject to simultaneity bias as it is reasonable to assume the number of firms per capita may contribute to GVA per capita.

**Table 2: All firms and CS&H assets and investment**

Variable	Coefficients		
	Number of firms per capita	Turnover (all firms) per capita	Net migration of firms per capita
<b><u>Assets</u></b>			
Heritage assets density	0.031***	0.050**	0.015
Sports assets density	0.092	-0.040	0.057
Cultural events per capita	0.211***	0.104	0.210***
Libraries density	-0.068**	-0.007	-0.086***
<b><u>Investment</u></b>			
Local authority investment in culture, sports and heritage	-0.051**	-0.081	-0.013
Lottery investment in arts, sports and heritage	-0.013	-0.027	0.002
<b><u>Additional push/pull factors</u></b>			
Employment rate	0.029**	0.030	0.027*
Skilled labour proportion	0.141***	0.087	0.107***
Housing density	0.409*	-0.637	0.340
Network infrastructure	0.018	0.098	0.001
Transport infrastructure	-0.141***	-0.104	0.012
Life satisfaction	-0.087	-0.287	0.435***
Size of the market (population)	0.571**	0.846*	0.587**
GVA per capita	0.133***	0.891***	0.234
Adjusted R <sup>2</sup>	0.9042	0.7903	0.8999

Source: NEF Consulting

Net migration of firms is positively associated with the employment rate, skilled labour, life satisfaction and population size. These may effectively be thought of as factors that directly attract firms.

Turnover of all firms per capita is associated positively with heritage assets density, and more weakly with population size. It is also very strongly associated with GVA per capita, although as with number of firms per capita, this result may be subject to simultaneity bias.

#### 4.1.2 Panel data models – all firms

Results for the models of the relationships between per capita investment in CS&H and all firms are presented in Table 3. We use a fixed effects model and cluster errors at the local authority level.

Turnover of all firms per capita is negatively associated with per capita investment in CS&H. Lagged investment in CS&H per capita on the other hand is positively associated with number of firms per capita and net migration of firms. Both migration of firms and number of firms variables are less immediately responsive to changes (e.g. firms must make decisions to relocate or start up) than turnover.

The number of firms per capita model has a very low R-squared value, suggesting that the model does not explain much of the variation, although the other two are

higher. Other significant variables are skilled labour (for turnover and net migration), and competitiveness and physical activity (for number of firms).

**Table 3: CS&H investment and all firms**

	Number of firms per capita	Turnover of firms per capita	Net migration of firms
Per capita investment in CS&H	-0.007	-0.024***	-0.001
Lagged per capita investment in CS&H	0.012***	0.001	0.027***
2-year lagged per capita investment in CS&H	0.000	-0.000	-0.000
Skilled labour	0.002*	0.021***	0.004*
Competitiveness	0.345***	0.654*	0.120**
Physical activity (proxy for wellbeing)	0.034*	0.023	0.022
Adjusted R <sup>2</sup>	0.0008	0.6345	0.4339

Source: NEF Consulting

## 4.2 Creative industries

### 4.2.1 Cross-sectional models – creative firms

Table 4 shows the location quotient of creative industries in a local authority as a function of the stock of CS&H assets, cumulative investment in CS&H by source of investment and type of investment, and an additional set of push/pull factors.

Both creative firms' location quotient and turnover is positively and significantly associated with the density of heritage assets, and the number of cultural events listings per capita. It should be noted that, particularly with cultural events listings and turnover, there is a risk of reverse causality: if creative firms hold cultural events, this would be likely to increase turnover.

Both relative concentration of creative firms and creative firms' turnover are negatively associated with density of sports assets.

Availability of skilled labour, network infrastructure and transport infrastructure are also significantly associated with relative concentration of creative firms. GVA is particularly strongly associated with turnover of creative firms, as is to be expected.

Net migration of creative firms is not significantly associated with any CS&H assets or investment; the only significant variables for this model are network infrastructure and population size.

**Table 4: Relationships between creative firms and CS&H assets and investment**

Variable	Coefficients		
	Creative firms location quotient model (2.1)	Creative firms turnover per capita model (2.3)	Creative firms net migration model (2.2)
<b>Assets</b>			
Heritage assets density	0.040***	0.067**	-0.119
Sports assets density	-0.200***	-0.568***	0.082
Cultural events per capita	0.098***	0.354***	0.159
Libraries density	-0.011	-0.047	-0.270
<b>Investment</b>			
Local authority investment in CS&H	-0.000	-0.061	0.006
Lottery investment in CS&H	-0.015	-0.093**	0.025
<b>Additional push/pull factors</b>			
Employment rate	0.028*	0.065	-0.201
Skilled labour proportion	0.085**	0.463	0.331
Housing density	-0.241	-1.131	-3.94
Network infrastructure	0.132**	0.369	-1.060**
Transport infrastructure	0.041***	0.055	0.069
Life satisfaction	-0.211	-0.017	4.341
Size of the market (population)	-0.046	1.188	4.438*
GVA per capita	-0.021	0.589***	0.003
Adjusted R <sup>2</sup>	0.2936	0.6758	0.1383

Source: NEF Consulting

#### 4.2.2 Panel data models – creative firms

The relationships between CS&H investment and the location quotient of creative firms is presented in Table 5. Results are encouraging: when controlling for time invariant effects across local authorities. Per capita investment in CS&H is strongly and positively associated with the relative concentration of creative firms, both within and outwith major urban centres. Lagged investment per capita is not significant, but two year lagged investment per capita in CS&H is also strongly associated with the location quotient of creative firms. The employment rate is negatively and significantly associated with the location quotient of creative firms in urban centres and outwith, which indicates that the relationships observed are not simply a reflection of urban agglomeration effects.

**Table 5: CS&H investment and the location quotient of creative firms**

	Major urban centres	Non major urban centres
Investment per capita in CS&H	0.025***	0.022***
Lagged per capita investment in CS&H	-0.000	0.000
2-year lagged investment per capita in CS&H	0.367***	0.412***
Competitiveness	0.299	0.543
Life satisfaction	-0.012	-0.001
Adjusted R <sup>2</sup>	0.0343	0.0234

Source: NEF Consulting

As can be seen in Table 6, there were no significant results for CS&H investment and net migration of creative firms.

**Table 6: CS&H investment and net migration of creative firms**

	Major urban centres	Non major urban centres
Investment per capita in CS&H	-0.002	-0.012*
Lagged per capita investment in CS&H	0.012	0.028
2-year lagged investment per capita in CS&H	-0.055	-0.059
Competitiveness	-0.123	0.265
Life satisfaction	0.998	0.682
Adjusted R <sup>2</sup>	0.0435	0.1199

Source: NEF Consulting

Interestingly, results do not vary significantly between local authorities in major urban centres and outwith major urban centres. This may be due to the multidirectional effect of major urban centres: for a major urban centre (comprising multiple local authorities) with a high concentration of culture, sport or heritage assets or investments in one particular area, this means some local authorities will contain this concentration, and others will not, so the effect could work in both ways.

Finally we consider turnover of creative firms and investment in CS&H in Table 7. Two-year lagged per capita investment in CS&H is significantly and positively associated with turnover of creative firms in major urban centres, but not in local authorities outside major urban centres. Competitiveness, a measure including GVA, is positively associated with turnover in both cases.

**Table 7: CS&H investment and creative firms' turnover**

	Major urban centres	Non major urban centres
Investment per capita in CS&H	-0.023	-0.022
Lagged per capita investment in CS&H	0.002	-0.001
2-year lagged investment per capita in CS&H	0.078*	0.054
Competitiveness	0.763**	0.350**
Life satisfaction	0.008	0.222
Adjusted R <sup>2</sup>	0.4590	0.5834

Source: NEF Consulting

### 4.3 Other industries

In this section we consider the links between CS&H assets and investment and three other sectors of the economy: the knowledge economy, tourism industries and professional and business services.

There is evidence that CS&H assets are associated with other sectors beyond the creative industries. Both knowledge economy and tourism turnover are significantly and positively associated with higher heritage assets density and cultural events per capita. There will naturally be more economic activity around the tourism industry in areas with high heritage assets and cultural events, as these are tourist destinations. Professional and business services turnover is not significantly linked to culture, sports and heritage assets. There are no significant impacts of cumulative CS&H investment on any of the industries in these results. All are very strongly and significantly associated with higher GVA per capita.

Results are not presented for the panel analysis as investment was not significant in the cross-sectional analysis.

**Table 8: Relationships between other industries and CS&H assets and investment**

Variable	Coefficients		
	Knowledge industries turnover per capita	Tourism industries turnover per capita	Professional industries turnover per capita
<b>Assets</b>			
Heritage assets density	0.082***	0.099***	0.022
Sports assets density	-0.157	-0.163	0.055
Cultural events per capita	0.175***	0.311***	0.144
Libraries density	-0.039	-0.097	-0.048
<b>Investment</b>			
Local authority investment in CS&H	0.005	0.060	-0.095*
Lottery investment in CS&H	-0.041	0.057	-0.027
<b>Additional push/pull factors</b>			
Employment rate	0.036	0.041	-0.001
Skilled labour proportion	0.406***	-0.036	0.481
Housing density	-0.485	0.131	-0.886
Network infrastructure	0.179	0.336**	0.169
Transport infrastructure	-0.179*	-0.116	-0.111
Life satisfaction	0.235	0.394	-0.471
Size of the market (population)	0.538	0.336	0.810
GVA per capita	0.891***	0.640***	0.903***
Adjusted R <sup>2</sup>	0.8091	0.7147	0.7780

Source: NEF Consulting

#### 4.4 Technical discussion of econometric approach

The results show some significant associations between the performance of local economies and CS&H assets and investment. In particular, the number of cultural events per capita is strongly associated with measures of all firms' economic activity, and there is some evidence that CS&H investment is linked to number of firms per capita and net migration of firms. The relative concentration and turnover of creative industries is also strongly associated with the number of cultural events per capita, as well as lagged investment in CS&H in the panel data.

The results should be considered exploratory, and are presented as a starting point for further research. The relationships between variables influencing local economic development are complex, with dynamic interactions and uncertain causality. One future avenue of research could be to use a structural equations approach, making the links between variables explicit. However, this would not be possible without clarifying the theoretical relationships between all variables, which as yet are not wholly clear.

We must be cautious about the findings of these results for a number of reasons. A key concern is reverse causality, i.e. the cause and effect assumptions of our model may be backwards. Our model assumes that higher local authority investment causes improved economic activity. However, it may be the case that economic activity causes local authority investment, perhaps due to increased local authority funds in more affluent areas. This would bias our results to appear significant when they are not. Alternatively, the two variables may appear to be linked but are actually due to some third unidentified factor.

A solution would be to use an instrumental variables approach: i.e. to find a variable that only affects firms through its relationship with CS&H investment. This

would allow an unbiased estimation of results, but we have been unable to identify such a variable. This may be an area for further research in the future.

Another area for attention is our unit of analysis, the local authority. Effects of arts, culture and heritage have been found in previous studies to be hyperlocal. As such, the local authority is a comparatively large unit of analysis – however, we have had to balance the need for a local or hyperlocal focus with availability of data. Some CS&H assets and investment data is available at postcode level, or even by grid reference, but such local detail is not available consistently. While economic performance can also be analysed at hyperlocal scales, however, few of our control variables are available below local authority level. An econometric analysis at hyperlocal level has therefore not been possible. The availability of localised datasets which might allow further testing of our models at hyperlocal levels is worth exploring.

A third area where better data is needed is changes in culture, sports and heritage assets over time. Many (though not all) datasets are available only as a current snapshot, which presents a challenge for longitudinal analysis. Therefore, our panel data analysis does not contain many push/pull factors explicitly (our main control, the Competitiveness Index<sup>26</sup>, contains many of these factors but aggregated and so specific effects cannot be determined – it was felt it was better to include a more reliable composite indicator, even though the individual effects are masked. However, with better data this would not be necessary.

In the future, further data could be gathered to improve analysis over time: data such as cultural events listings could perhaps be expanded to be longitudinal, for example if data was scraped from the web annually.

Nevertheless, the dataset we have compiled for this study is incredibly rich and detailed, in particular containing detailed breakdowns of types of local authority investment and lottery investment. Culture, sport and heritage are diverse areas and although treated in aggregate in this analysis (effects could not be separated due to collinearity of CS&H variables), it is worth exploring the potentially differing mechanisms of their effects.

An important question that naturally follows on from our analysis is whether CS&H assets and investment generate sustained economic impacts or rather a temporary ‘multiplier’ effect that diminishes over time. It is unsurprising that any investment, including culture, sport and heritage, will boost the local economy in the short term, through the activity it directly creates. However, economies are dynamic and may respond in unexpected ways: in the long term such investment could crowd out other investment<sup>27</sup>. We could not answer this question with only ten years’ of data – a longer term dataset would be needed – but this is an important area for further research in the future as more data becomes available; we suggest that data should be collected regularly over another ten years to allow sufficient data for proper analysis.

Note that the broader implications of these results are discussed in more detail in the conclusion (section 5:, p.36).

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<sup>26</sup> Centre for International Competitiveness

<sup>27</sup> Pedroni, P., Sheppard, S. and Wilson, N. (2012) “Culture shocks and consequences: the connection between the arts and urban economic growth”, Department of Economics Working Papers 2012-04, Department of Economics, Williams College.



## 5: Conclusions: discussion of findings and implications

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It has long been recognised that culture, sport and heritage have the capacity to add a great deal to local places and to stimulate community engagement. The existing evidence base regarding these interactions is relatively well developed though studies have tended to be focused on specific institutions or assets (e.g. in order to understand the economic or social impact of a theatre or event), focused on one specific outcome (e.g. house prices), cross-sectional or not UK-based.

This study focuses on a key gap in the evidence base associated with the question of whether, when all local places are examined, an empirical link can be detected between the presence of or investment in CS&H assets and positive economic outcomes.

There are some important contextual points to consider before drawing conclusions from the analysis presented in this report. First, there is no tried and tested methodology for a study of this nature, and our approach has therefore been highly exploratory. The results should be interpreted with this in mind. The study might be considered the first step on a research journey for which the ultimate destination is the gaining of deeper insight into the extent to which, and how, CS&H assets and investment generate positive economic and social outcomes at the local (place) level, and how they contribute to generating the intrinsic benefits of cultural value.

Further, the study places an emphasis on place-shaping. This is a term which is not well represented in the literature. It reflects a more holistic approach to building better places than, for example, placemaking (which tends to be used more specifically to capture local-area based improvement, often associated with environmental design or public realm and/or place marketing and branding).

Addressing the research question has required three significant exercises. Firstly, a review of theoretical/conceptual and empirical literature has helped in identifying analytical techniques and in identifying key gaps in the evidence base. Overall the review found that the most significant gaps in the evidence base were around econometric estimation, in the UK, of the links between CS&H assets and investment and economic outcomes. It also found that other research studies had investigated the link between the creative industries and the density of local culture and other amenities, in attempts to explain location decisions of firms. This was an important finding in that it suggested that a focus on the link between CS&H assets and investment and the creative industries (and other knowledge-based sectors) should be pursued.

The second element was an extensive data collection and assessment exercise. The goal was to gather relevant data that could be used in an econometric model (either as dependent, independent or control variables). This exercise drove a number of decisions relating to the scope of the study, including the spatial scale at which the data should be collected (and therefore the level at which the investigation would take place – i.e. local authority) and the time-series that could be adopted for the panel models.

The third element was the design and implementation of econometric models to investigate the key relationships and interactions (where their design was

informed to some extent by the existing literature). Importantly, and recognising that the role that CS&H play in local places should be thought of as an 'ecosystem' rather than as isolated investments, the analysis tests push and pull factors that might influence firm location and performance.

The results of this study represent an important milestone in the development of the evidence base around the place-shaping impacts of CS&H assets and investment. Accepting some of the key caveats of the analysis (which we return to below), we have identified a number of statistically significant relationships which highlight the importance of CS&H assets to economic performance in local places.

The analysis examines the relationship between CS&H assets and investment and the performance of local economies as a whole. This study represents the first of its kind in that it seeks to test these relationships on a national scale but at the local level.

We find that the density of cultural and heritage assets was highly and positively related to the density of firms in a local economy, indicating that where there are high densities of theatres, museums, monuments and so on, we tend to find concentrations of economic activity. Further, the density of cultural assets is found to be positively and strongly related to in the net in-migration of businesses, which suggests that such assets are important 'pull' factors which influence location decisions. These findings hold regardless of the urban scale at which they are examined: cultural assets are equally important as attractors in non-major urban areas as in major urban areas and this suggests that the observed results are not simply a reflection of general urban agglomeration effects.

We also find that net migration of firms is positively associated with the employment rate, the availability of skilled labour, life satisfaction and population size and these can therefore also be identified as key 'pull' factors.

When examining the impact of investment, we find that lagged investment is positively and significantly associated with firm density and net migration of firms.

Examining the relationship between CS&H assets and investment and the creative industries, the analysis finds that there is a significant and positive relationship between the density of creative firms and their performance as measured by levels of turnover, and density of heritage assets and cultural events. We also find that the density of creative firms and firms' turnover are negatively associated with sporting assets. In other words, the higher the density of sporting assets, the lower the density and turnover of the creative industries. This makes intuitive sense. Firstly, the existence of cultural and heritage assets creates direct commercial opportunity for creative firms, but also adds to the wider amenity value of a place. On the other hand, sporting infrastructure can often be of large scale and located away from commercial/urban centres, which would reduce the likelihood of attracting the creative (or other) industries. The physical infrastructure required to provide accommodation to creative firms may be some distance from sporting and recreation assets.

The analysis also finds that the level of turnover generated by creative firms is positively associated with availability of skilled labour, network infrastructure and transport infrastructure. This implies that places with these attributes are likely to be more successful in nurturing a successful creative sector than those without.

There is also evidence that investment in CS&H assets is strongly related to concentrations of creative firms, both within and outwith major urban centres. Similarly, lagged per capita investment in CS&H is also positively and significantly

related to creative firms' turnover. In other words, places where higher CS&H investment has occurred are also places more likely to see a growth in the density of creative industries.

There are two key messages to take from this research. Firstly, the data and analysis undertaken has delivered evidence which demonstrates positive and strong relationships between CS&H assets and investment and positive economic impacts for local places, especially when it comes to impacts associated with the creative industries. We therefore conclude that whilst there is more research to be done, the emerging evidence is that the existence of and investment in CS&H assets can be seen to be important influencers of place-shaping. The precise mechanisms through which this influence is exerted (i.e. the nature of the impact ecosystem at an asset/investment and local level) require further investigation. However, we can clearly see that places that contain a greater density of CS&H assets and receive higher per capita CS&H investment are more likely to build a strong creative sector. They also are able to attract businesses to locate in local places more effectively than others and/or slow the rate at which businesses out-migrate to other locations. This is consonant with Markusen's findings on creative placemaking in the USA where cultural consumption was also higher in these areas as a result of this clustering and ecosystem.

Secondly, the absence of stronger evidence of relationships and associations should not necessarily be interpreted as an absence of impact. The data and methodology limitations of the study mean that the relationships are yet to be fully explored. Further research is needed to fully examine the relationships suggested by this study.

Caution should be applied because of the limitations of the research. For example, the analysis is limited by data availability. Reverse causality may be an issue in some of the results (for example, our model assumes that local authority investment is a driver of local economic performance, but high local investment may occur where there is a higher concentration of firms). This could be addressed through further study focused on an instrumental variables approach.

There is much further scope for future research in this field. Future econometric modelling approaches would be enhanced if a number of data limitations were resolved. Firstly, availability of a wider range of variables at local authority level – or, better, availability of key variables at spatial areas smaller than local authority – would be very advantageous. In particular, a wider range of control variables would benefit further research. However, given the source of much of the data is the public sector, this would require a significant investment in creating survey sample sizes which are robust at, for example, the middle super output area level. It is unrealistic to believe that such an investment is viable or likely at present, but development of such a range of data would open up a range of new analytical options for this and other studies which examine local impact.

Meanwhile, it is perhaps worth investigating the availability of localised data – for example, detailed local authority investment data and/or venue data (ticket sales, participation data, etc.) may be available on a consistent basis for a number of areas sufficient to allow econometric analysis of the kind undertaken in this study. Control variables are a key concern, however, given issues relating to the reliability of sample surveys at localised levels; any investigation of localised data will need to take this into account.

A third area where better data is needed is on culture, sports and heritage assets over time. Data capture using digital techniques could be employed to enhance the longitudinal data on assets over time, for example using regular web-scraping

to collate time-series data on cultural events each year, to enhance one of the indicators used in our analysis.

Finally, the question of whether impacts are temporary or sustained is impossible to resolve with only ten years of data – and the time-series was limited by the availability of data. There is therefore a future opportunity to examine the question of impact permanence as more and more data points are added to these time-series in order .

## 6: Appendix I – Literature review

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### 6.1 Introduction

This review was undertaken during the early stages of the research. It is not a comprehensive ‘annotated’ literature review or meta-analysis of the role of culture in place-shaping, although it is observed that a systematic meta-analysis is now required given the number of partial literature and evidence reviews that have been undertaken over the past 15 years. These have been limited by their sectoral and methodological focus, their coverage<sup>28</sup> and geographic scope – making it difficult to compare art, sport, heritage and other sectors and the scales of impact.

The literature review was undertaken as a ‘rapid review’ with the benefit of prior reviews, notably our *Art the Possible* feasibility study undertaken for the CASE programme in 2011<sup>29</sup> which looked at literature on CS&H impacts and underlying quantitative methods and data availability. More recent reviews include *Evidence Review: Sport and Culture* (WWCLEC, 2013); *Local economic impacts from cultural sector investment* (ECORYS, 2014); *Understanding the value of arts & culture* (AHRC, 2016); *The Warwick Commission on the Future of Cultural Value* (Warwick University, 2015); *Quantifying the Social Impacts of Culture and Sport* (DCMS, 2014) as well as earlier reviews of Social Impacts (CCS, 2005; Reeves, 2001) and *Culture and Regeneration* (DCMS, 2004). The review has drawn on these sources as well as published material in the form of journal articles, books/chapters and research reports, primarily (but not exclusively) from the UK and North America. As well as evidence in the specific field of public culture, sport and heritage, research in economic and related fields such as regional innovation/competitiveness (e.g. clusters), health and wellbeing, and placemaking were also considered to the extent that they may contribute to a conceptual framework and potential modelling of CS&H impacts on place-shaping.

To complement the initial literature review, a further review of a number of specific studies which contribute empirical evidence to the debate around the impacts of CS&H assets and/or investment was also undertaken. The findings of both reviews are presented together here.

### 6.2 Cultural Assets

Culture, Sport & Heritage assets can be conceived and valued in four ways, as:

- Amenities

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<sup>28</sup> For example, the *Evidence Review: Sport and Culture* (2013) analysed only 37 publications of which over 90% were Sports based and predominantly from the USA; *Local economic impacts from cultural investments* (ECORYS, 2014) analysed 40 studies only four of which were non-UK/Ireland based.

<sup>29</sup> CASE Programme (2011), *The Art of the Possible – using secondary data to detect social and economic impacts from investments in culture and sport, a feasibility study*

- Economic generators and attractors
- Social and Cultural capital-builders
- Cultural value-givers

Generally speaking these assets are primarily *amenities* in that their main 'cultural' aim and objective is to provide arts, sporting and heritage activities, experiences, 'intrinsic cultural value' and resources, whilst their economic and social impacts can be considered in most cases to be external spin-offs to their core purpose. This is important in any consideration of the economic and social values attributable to CS&H assets since these are not anticipated or normally required outputs. As amenities with or without significant quantifiable economic and social impacts, their role in place-shaping and contributing to the value of everyday life is however fundamental, if often under-valued, and this review seeks to assess these values in tangible terms. The term 'assets' is appropriate here, as both inclusive and positive, but also consonant with the Physical Cultural Asset Mapping approach developed for CASE (2010)<sup>30</sup> and in *Living Places* and cultural planning generally (Evans, 2008). This concept informs the classification and identification of CS&H assets in the study in terms of available and consistent data.

### 6.2.1 Public, Merit and Private Goods

These three value systems are not of course exclusive (although treated as such in the literature and in planning), with CS&H provision ranging from **public goods** ('free' to users e.g. public parks, libraries, museums); **merit goods** (low/subsidised price to users, e.g. most arts, cultural, heritage, sports) to **private goods** (full cost, commercial entertainment, e.g. cinemas). Providers of these CS&H goods encompass public (local, national), voluntary/third sector (charities, trusts, associations) and private enterprises (large and small). Organisational structures range from national networks and chains (e.g. National Trust, Odeon cinemas, David Lloyd Sports Centres, Virgin Gyms), to municipal and voluntary provision serving a local catchment. Some local provision may be the subject or product of standards (population or space-based) such as libraries, parks, sports facilities which have influenced their location, scale and catchment, but others effectively were not planned in this sense (most arts and heritage provision). One type of asset may serve a local user group whilst another may be focused on the visitor economy. For example, an elite national sport facility and a local community sports venue will have very different footprints and impact profiles. Many CS&H facilities nevertheless will serve a mix of local (however defined) and non-local users and potentially, wider beneficiaries.

### 6.2.2 Valorisation

Economic values are often ascribed to CS&H assets, but rarely their amenity value (see 1.4 below for social impacts). Amenity valuations are very occasionally undertaken and the subject of cost-benefit analysis exercises using contingent valuation/willingness to pay (WTP) estimates ('stated preferences'), for example the value placed by the public/users of parks and open spaces, sports and recreation facilities, museums, and access to nature (e.g. woodlands, water).

<sup>30</sup> [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/71127/DCMS\\_Mapping\\_Toolkit.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/71127/DCMS_Mapping_Toolkit.pdf)



Specific impact studies into the effect on property prices from sports facilities and environmental amenities have applied 'hedonic pricing' analysis of properties in close proximity to these assets. Several studies were investigated in our *Art of the Possible* study (TBR, 2010) based on research into amenity valuation, e.g. parks and green space commissioned by CABE (2007) and GLA (2003 and Varma, 2003). More recently the National Ecosystems Assessment (NEA, 2011) has developed measurements of Cultural Ecosystems Services (Plieninger et al, 2013), i.e. the value of "nature/natural heritage" (NEA, 2010) which will be analysed below. A number of studies have been published into the effect on property prices attributable to new/upgraded sports facilities in the USA and Germany. A qualitative study of the new Manchester City and Cardiff Millennium stadia was also carried out using a small sample by Davies (2005). Since 2010, one study using property prices has been published on the impact of the new Wembley and Arsenal stadia (Ahlfeldt, Gabriel & Kavetsos, 2014). These studies need further analysis for our purposes, but an observation is that the hedonic pricing model has not been verified with householders to attribute the location decision or value added to the new facility. For example, in the case of the Arsenal and new Wembley study, important factors have not been taken into account in relation to the local and sub-regional property market, regeneration effects, morphological variations, density or displacement effects.

The contingent valuation approach has been in particular informed by environmental economics and in cultural economics, mainly applied to museums (Noonan, 2003). Willingness to pay studies are used to assess the value of 'free' cultural and natural heritage facilities, for example English Heritage has carried out WTP studies of two heritage sites (Castle Priory and Walmer Castle/Gardens) on users/members and non-users (ECORYS, 2014) which can be used to estimate the financial value of annual visitors. This approach can also distinguish between residence (local, visitor) and socio-economic characteristics, estimating values from local and non-local beneficiaries. For example, Bolton Museum, Library & Archives undertook a WTP survey of users/non-users. Museum users estimated the value of their visit at £2.77 per month and non-users at £1.14 per month. The total value of the city's MLA services was put at £10.4 million (£7m users, £3.4m non-users), 1.6 times higher than the amount of public funding received (Jura, 2005).

Stated preferences are seldom actually tested through revealed preferences, i.e. what beneficiaries subsequently paid for a 'public' (or subsidised 'merit') good that was previously free or at a lower price. However, in an earlier willingness to pay study conducted for the Arts Council, a majority of existing arts attenders said that they would pay more for Dance, Opera, Drama with 21% willing to pay more for Ballet, 34% for Opera, 37% for Drama, and 44% for Drama in Rep. During this decade (1987–1998) increased ticket yields at major performing arts venues saw average prices paid increase by 27% (Ballet), 44% (Opera), 27% (Drama) and 22% (Reps). There appears to be a correlation therefore in this case between willingness to pay and actual payment of a higher price, although how this effects the distribution and behaviour of audiences is an issue, e.g. a possible narrowing of audience profiles – in this case, 35% of respondents said that they would go less frequently (ACE, 2001; Evans, 1999). Capturing latent 'willingness to pay' for C&HS facility usage will nonetheless be one measure of value placed on these assets. These impacts need to be extended to a wider range and type of CS&H assets and reflect other environmental factors.

### 6.2.3 Economic impact

CS&H assets also have a direct and indirect economic value irrespective of their status and the services provided, since – except in very few cases (i.e. entirely voluntary, free provision) – they employ staff, contractors, purchase goods and services, and many will charge for services. Even public goods also generate income, e.g. via hire fees (e.g. pitches, room/facility hire, training), special exhibitions (museums and galleries) and events, and through trading activity, notably hospitality, shops, bookshops, sponsorship, etc.

Most impact studies using Economic Impact Assessment (EIA) focus on these economic outputs arising firstly from investment in the capital phase (e.g. construction/supplies), and then from subsequent and ongoing operational income and expenditure flows. These studies are generally carried out by applying multipliers to direct income and jobs generated and money circulating in the economy through spending by users/visitors, and to direct expenditure generated by the organisation through salaries and purchase of supplies – and the subsequent (indirect and induced) spending in successive rounds as employees and suppliers re-spend part of these receipts in the economy. Practical challenges to these exercises start with basic data collection of direct income and expenditure, then how this is distributed in the (local) economy with significant leakage of these benefits out of the ‘area’ likely. This of course depends on the size of the area and the extent of goods & services imported from outside of the area, including from abroad. In more sustainable place-shaping cases, the strength and diversity of the local/regional economy will minimise leakage and may also better support endogenous growth and innovation through these and genuine cluster effects (e.g. knowledge spillovers, valued added, scale benefits).

An EIA study was carried out for the Anvil Arts organisation (concert and theatre venues) in Basingstoke, Hants in 2010. This assessment used financial and management data and accounts to measure spending and its distribution, followed by an online survey of users (n=2,000) to estimate their spending in the local area in addition to ticket purchases. Estimates were made of spending by visiting performers based on their records and standard allowances. Together the value placed on the organisation produced a gross economic output of £6.2m. After factoring in additionality and multiplier effects using benchmarks (BIS) taken from the sub-regional level (not available for single LA level), the net economic impact was £5m (ACE, 2012).

Sectoral or macro-economic ‘footprint’ studies have also been carried out on behalf of government and funding agencies, calculating the importance of a particular domain or ‘industry’ to the national economy (e.g. UK/GB, Scotland), such as the arts (Myerscough, 1988), sport (e.g. LIRC, 1997), heritage (English Heritage, 2010; 2014), libraries (ACE, 2014) and sub-sectoral studies including theatre, cultural tourism, sports events, festivals, the BBC (ACE, 2012), and investment in funding programmes, e.g. Lottery (arts, heritage – e.g. Evans, 2007; GHK, 2009). These are replicated at regional level, whilst cities and local authorities periodically undertake ‘audits’ of specific sectors as part of policy and planning strategies. Attention here has shifted towards the creative economy/industries and this incorporates some arts, heritage and events activity.



The extent to which CS&H assets contribute to the wider creative economy and production chain through cluster effects and labour/skills markets therefore needs to be considered (below). It should be noted that CS&H activity and provision provide much of the “cultural content” on which the creative and digital media industries rely – from live arts, heritage to sports. In this sense football and other stadia serve as the “theatre” which is fundamental to the live sporting experience and its transmission via the media, with spectators the crowd “extras” – and therefore a key component in the monetisation seen in Premier League broadcast rights. A similar association can be made between historic houses and heritage sites which serve as backdrops to TV and film drama productions. This also materialises through film locating at these historic and other cultural sites, which generates income not only for the heritage and other venue organisations, but local authorities and local businesses and in future visitor activity associated with the film, e.g. Harry Potter and Alnwick Castle.

Macro-level sectoral studies tend to rely on these same multipliers of income and employment, except where sector/industry specific multipliers are available, e.g. trade/employment, GVA (e.g. ACE Lottery Employment study – Evans, 1997), or where survey data is generated as in the economic impact studies noted above. However, they are not generally place-based or attributable to specific supply. National studies also use Input-Output (I-O) tables, but at regional and local level these are not available or appropriate. National Income Accounting (NIA) is however used since it can derive sectoral data to produce localised GDP. This measures the flow of goods and services produced in an economy taking into account income and expenditure from the production of goods and services; total expenditures on consumption; and added value (net output).

In a study of the economic significance of the sport sector in Sheffield, NIA data was divided into Consumer, Voluntary, Commercial and Non-Commercial Sport, Local and Central Government sectors. Income and Expenditure profiles were derived for each of these sectors, with value added estimated from wages/salaries plus factor costs and profit. A survey of consumers in the first three sectors was undertaken by postal survey of Sheffield residents randomly selected from the electoral register. The focus of this survey was sports behaviour with a follow-up questionnaire on participation in sport over the last 12 months and consumer spending on sport. The analysis found that sports-related activities accounted for 4.11% of the city’s total GDP (three times larger than the proportion of value added from this sector to the UK as a whole) with the value added of sport-related activity estimated at £165m (Davies, 2002).

In all cases, taking into account displacement effects and counterfactual scenarios requires a comparative and ideally a ‘control’ to be used. Methodologically, finding suitable comparators and controls (‘with’ and ‘without’ CS&H investment/infrastructure examples) can be limiting. In practice economic impact studies are undertaken at single facility level (including ‘events’) where income and expenditure originates and can be attributed. Scaling this up over larger areas and a number of separate CS&H assets may therefore require econometric modelling.

#### 6.2.4 Social Impacts

A third value set can be considered for CS&H assets – these can be expressed as intangible and external effects arising from the presence or activities of a facility (or group of facilities), over and above their direct economic impacts (actual and imputed). These externalities might include a range of social benefits in education/skills, health/well-being, social capital and cohesion, reduction in crime/anti-social behaviour, environmental benefits etc. (see Evans, 2005 and Evans & Shaw, 2004 for a range of social, economic and physical impacts arising from culture in regeneration). These too, over time, might influence location/retention and investment decisions. Capturing and attributing these effects and their distribution is problematic – most evidence in this field draws on qualitative, process-based evaluation studies of particular programmes and interventions. Evidence on culture and sports projects targeting specific social issues, e.g. crime prevention/recidivism, suggest that behavioural change/impacts beyond the life of a time limited intervention are hard to sustain (Evans & Shaw, 2001). In CS&H investment and infrastructure terms, place-shaping effects are therefore more likely to be evident where a sustained programme (rather than short term activity e.g. one-off events) is available, with positive effects embedded over time – social and economic. This may include reputational advantages associated with particular CS&H assets and places.

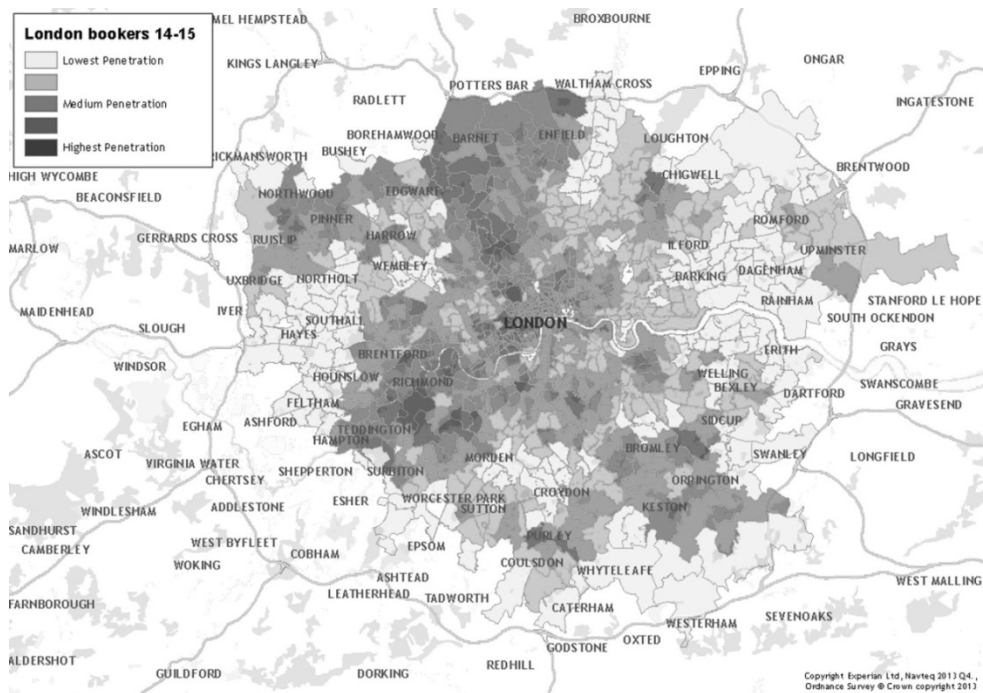
The literature and case studies on social impacts has expanded since the 1990s with several reviews (Reeves, 2002; Jermyn, 2000, 2001; Evans & Shaw, 2000; Comedia, 1999; Matarasso, 1997, 1999; DCMS, 1999; 2014; Daly, 2005) and indicators developed for organisations to capture these effects. This focus has also been reinforced through national administrative datasets and indicators around quality of life and satisfaction/best value studies carried out periodically by local authorities. These surveys assess resident satisfaction towards bundles of cultural assets, i.e. all the theatres/concerts halls/arts venues; museums and galleries; parks; sports centres; and libraries, etc. in the local authority area. Whilst resident satisfaction and general impacts are based on supply-led factors attributed to CS&H facilities, culture and sport participation and user data is captured via various survey samples – for example Taking Part, Active People and social surveys (ONS, e.g. UK Time Use Survey). However, these surveys are non-place specific, i.e. there is no link made to where or what audiences/participants actually inter-acted with (in Taking Part this could well have been abroad on holiday, as in the UK); this means that there is no direct way of linking supply and demand relationships from these data sources (Evans, 2015).

Individual funded venues and organisations do provide user information and performance indicators as part of funding reporting, although this is not likely to include the spatial reach, impacts or externalities generated by each project. Access to this data may be required in order link these to place-shaping effects, and in order to aggregate or scale up (e.g. Arts Council, Local Authority 'clients'). Such data is not likely to be made available in any event for unfunded and commercial organisations. This point is relevant to this study in terms of measuring usage and 'flows' to specific places and the intensity of access and usage across different areas (districts, towns, cities, regions).

*Mapping place-participation and provision*

There have been some novel advances in investigating the spatial relationships between the supply, location and usage of cultural venues as part the *CultureMap London* initiative and AudienceDevelopment agencies (Boyle, Flowerdew and Brook, 2008). In a negative sense, the barriers to access and participation are well established if perennial – social/demographic, ‘class’, education and access divides (Warwick Commission Study, 2015). The *CultureMap* web-based resource produced online maps of cultural facilities, population profiles and audience penetration from participating arts venues in London. This specialist planning tool responded to the need to map both cultural provision and link this to actual usage and population typologies and catchments. *CultureMap* created a series of web-accessible maps of arts and community cultural provision and audiences for a range of participating cultural facilities city-wide down to ward levels, alongside demographic and other population data. Valuable primary data was also generated by collaborating arts venues capturing audience profiles in a common format. This online tool could also reveal gaps in provision and participation, drawing on secondary and primary surveys revealing interesting correlation between audience and venues types and locations. This spatial variation within a region is illustrated visually (Fig.1) in The Audience Agency’s analysis of the concentration of audience penetration in Greater London based on ticket ‘bookers’ to events and user address information from 35 participating venues (Audience Agency, 2015). Central/inner west London dominates both in the supply of cultural venues, but also in generating demand, with outer east and west areas showing lower attendance – a combination of poorer access including public transport and much lower levels of provision. However some ‘outlying’ cultural venues also demonstrate high audience participation from their local area, particularly where offering a range of accessible cultural programming/art forms.

**Figure 2: London wide map showing performing arts venue distribution and audience penetration**

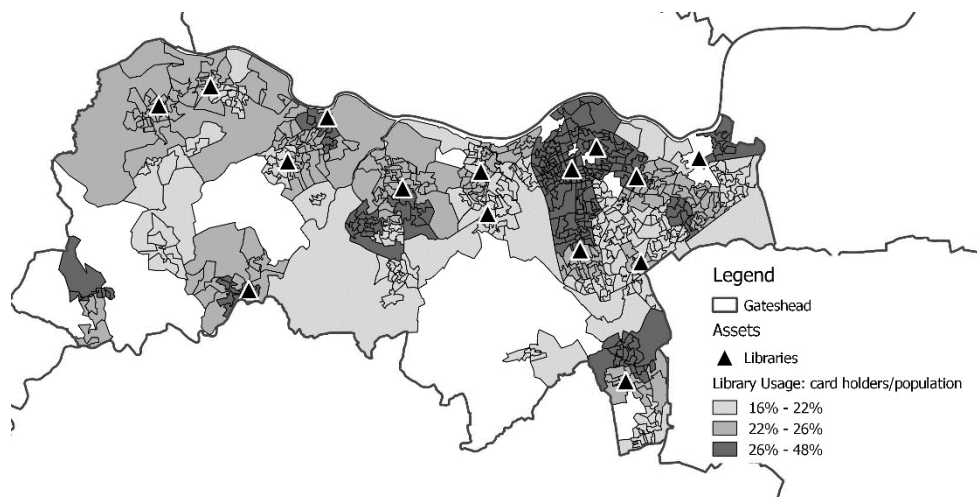


Source: Audience Agency, 2015

To date, the *CultureMap* project has developed the most valuable evidence and information on the relationship between certain arts provision and attendance in a demographic and spatial context. This includes facilities such as libraries revealing their important role in attracting a local and socially cross-sectional user group, whilst key local venues serve a high frequency local catchment, and other venues draw users from a wider area, particularly areas with few cultural facilities and venues offering specialist programmes (e.g. Asian arts).

Libraries also offer a good litmus test of participation of a local population through the library/swipe card with user address details. Whilst the full range of services actually used is not distinguishable (and is therefore understated) without further survey data, this does provide a clear indication of the geographic catchment in terms of households, and therefore socio-demographic analysis. An example of utilizing local data to profile library catchments is Hampshire County Council's Public Library User System (PLUS). This creates user profiles for each library, combining data on users/ visitor activity, behaviour and attitudes – profiled by postcode – with census, deprivation and lifestyle data (e.g. ACORN, MOSAIC). This creates user profiles, defining the demographic for each library catchment and highlighting the difference between users and the actual community through a 'community variance index' (Dorward, 2006). An example of catchment and population usage is illustrated through an analysis of library provision in Gateshead (Fig.2). This reveals which areas of the borough attracts comparatively higher and lower library usage in proximity to library facilities. Local provision is clearly important to actual usage, but variations are apparent between areas where library facilities are similar. This information in turn can be analysed by household and demographic profiles, and can suggest where there may be gaps in provision and where accessibility and quality issues may be constraining or encouraging usage, and where place making (all else being equal) may be more successful.

**Figure 3: Gateshead Library Usage**



Source: analysis by Orian Brook for the 'Understanding Everyday Participation' project using data supplied by Gateshead District Council. Acknowledgement: map supplied by *Understanding Everyday Participation – Articulating Cultural Values*. Funder: AHRC. Project ref: AH/J005401/1. PI: Dr. Andrew Miles.

Places that are better at overcoming some of the barriers to participation – social, spatial, economic, cultural, physical – may therefore be worth identifying and analysing in detail (e.g. ‘good cultural places’) since they are more likely to contribute to place-shaping. This will include cultural assets that are highly valued locally and maintain a high frequency of usage from a local catchment notably sports facilities and arts centres (see below). A key question is the extent to which cultural activity through attendance, participation and consumption is supply-led, and therefore, where there is quantifiably more or less provision, activity levels can be attributed and distinguished between places over time.

### 6.2.5 Cultural Value

The intrinsic values that can be observed through our experience of the arts in various forms has received renewed attention, in some respects in response to the sustained trend since the 1980s towards a more instrumental approach to measuring and valuing the impact of the arts and culture through the ‘externalities’ noted above (Holden, 2004). As also noted, cultural assets are primarily amenities with amenity value which is not necessarily quantified or quantifiable, although social and economic impacts and benefits obviously derive from their provision, including opportunities to experience culture and derive personal cultural value as a result. In the words of the Arts Council: ‘When we talk about the value of arts and culture to society, we always start with its intrinsic value: how arts and culture can illuminate our inner lives and enrich our emotional world. The concept and importance of cultural value has featured in important studies of arts in education (Robinson/NACCCE, 1999; DEMOS, 2003; the Warwick Commission Report (2015); AHRC, 2016) and in some respects it is hard to separate social impacts from cultural impacts at the level of the individual. These are also likely to lead to behavioural changes and decisions which in turn can effect cultural consumption and participation and in some situations, location decisions – with direct economic effects arising. Cultural value is recognised in the AHRC review for instance in terms of the ability of arts and cultural engagement to help shape reflective individuals thereby facilitating greater understanding of themselves and empathy for others and diversity, as well as producing more engaged citizens, thus promoting civic behaviour and expression. Culture in this respect can be viewed as the fourth ‘impact’ domain (economic, environmental/physical, social, *culture*) and one that has been taken for granted or at best is ‘implicit’ in evaluation and impact studies, including in the field of placemaking/shaping. This is consonant with the sustainable development agenda where culture is now accepted as the ‘fourth pillar’ (Hawkes, 2001). Initiatives such as Agenda 21 for Culture (UCLG, 2008) have thus promoted the centrality of culture to sustainable development:

... “Culture in sustainable development” is not only about “using artists to raise concern on climate change” or about “building cultural venues that are efficient in the use of energy and natural resources”. It is not only about the income that cultural industries can bring to the economy. It is not about “asking more” to the cultural circles. These are very important questions that need to be addressed, but they do not articulate the core question. The role of culture in sustainable development is mainly about including a cultural perspective in all public policies. It is about guaranteeing that any sustainable development process has a soul (UNESCO 2009, 6).



The AHRC *Understanding Cultural Value Project* report is based on the findings from research studies funded under this programme, which included 46 primary research projects and over 25 critical reviews and workshops, supported by selected literature. Although neither a systematic review nor an in depth programme evaluation (and not itself 'peer reviewed' but undertaken by the funding body itself), the review has raised key issues about the nature of evaluation and measurement undertaken of the role and effects that arts and culture has through engagement, and where questions still remain largely unanswered. The issue of 'place' is not central to the review, although the 'home' is highlighted as an important and under-researched area. The intrinsic value to be gained from engagement with arts and culture is a common theme however, and this can both generate new 'demand' and release latent demand, in contrast to the more supply-led focus of culture-led regeneration. The report also concludes that the divide between the type of 'supply' (public/funded, private/commercial, voluntary/amateur, etc.) is less useful in determining how and what values are derived from cultural engagement and this is important in considering the difference that cultural assets can make to place-shaping, i.e. all assets in a place can potentially shape and contribute to a 'creative place'. Access to cultural experiences and opportunities for cultural expression are, as this review confirms, uneven (including in the home) and both the generation of 'demand' and the cultural ecosystems that can flourish at varying levels require different modes and places of engagement in proximity to where people actually can access cultural activity.

## 6.3 Scale

This all begs the question of scale. Amenity, economic, social and cultural value and impacts may be attributed to individual CS&H assets based on bottom-up data and evidence, and to clusters of CS&H assets. These may be within the same sphere, e.g. clusters of arts and entertainment venues; heritage venues/sites; sports & recreation facilities, or combine one or more of these. Some facilities of course provide dual or mixed use activities, e.g. arts/entertainment and sports, arts and heritage, heritage and sports, or all three of these. Within these cultural fields there may be a case for distinguishing between types of activity and assets, e.g. art form, sport, heritage type, etc. as well as size and scale (area, catchment).

### 6.3.1 Local area

Clusters of CS&H facilities can firstly be considered at a local area scale identified with particular districts such as cultural quarters (e.g. museum quarters, heritage quarters) which may also congruent with planning designation such as conservation areas, heritage sites (e.g. World Heritage Site delineation). Large sports venues may form part of a complex of facilities (e.g. Wembley) and support a range of other services and outlets in close proximity and CS&H facilities can also be co-located in or adjoining parks. A concentration of facilities representing a 'critical mass' is familiar in retail (e.g. high streets/markets/malls), university districts, business & science parks and in other land zoning (industrial, housing, recreation, town centres, etc.). In planning and infrastructure provision these zoning and land uses influence (or try to influence) location decisions and investment, e.g. transport and to a lesser extent, recreation and some larger cultural facilities. These clusters of co-location can be both consumption and production based and there are increasing examples of a convergence between the two, for example in the Digital Shoreditch area (and putative Tech City

swathe) of east London which hosts a large number of established arts and digital media enterprises, alongside a vibrant independent retail, club and event scene, and co-located financial and advertising services district. There are similar examples in cities such as Brighton and Manchester, as well as in cities such as Amsterdam, Barcelona and Berlin, all with strong place-shaping effect, and extending existing city place brands (Evans, 2015; Foord, 2012; Kloosterman, 2013).

### 6.3.2 Local authority

At the next spatial scale: local authority or district administrative unit, a council area will contain a number of CS&H assets, with larger venues normally concentrated in town or equivalent centres, and which might be seen as a feature of the 'place' and related place marketing and resident satisfaction (i.e. "town/borough x has a good quality and range of CS&H amenities/facilities"). However, this does not represent a cluster in the economic 'market' sense (where the economic 'sum of the parts is greater than the whole'), but with data available and generated at borough, ward and lower super output area (LSOA) level, this might serve as a viable unit for comparison, given the use of benchmarking applied at this scale (e.g. by CIPFA), including data from Census, lifestyle (e.g. MOSAIC, ACORN) and participation surveys, e.g. Active People. The Active People Survey provides a range of participation data at local authority level with a simple arts participation question added between 2010 and 2012<sup>31</sup> providing an opportunity to combine/compare arts and sports participation data by local authority during this period.

### 6.3.3 Sub-regions

Sub-regions have also been identified particularly in economic development and regeneration programmes to better represent clusters of activity, employment and communities which cross borough boundaries (i.e. are made up of selected wards across two or more boroughs). An example is the City Fringe in east London (three boroughs), one of the government's City Growth Strategy (CGS) areas, which prioritised cultural and creative sectors and hubs. Another sub-regional example includes housing growth areas such as Milton Keynes South Midlands (MKSM) and Partners for Urban South Hampshire (PUSH) both of which developed extensive culture and sport strategies on a spatial basis linked to new housing investment, e.g. North Northants/Corby. Again data at this level may be available linking investment with place shaping outcomes and change. Another spatial concept is that of 'polycentric regions', more familiar in countries such as the Netherlands (Meijers, 2008) and Germany (and to a lesser extent France – Puissant & Lacour, 2011). This model has a more even distribution of services and facilities rather than concentrating these in monocentric towns/cities. In CS&H asset terms this would mean that some towns would have some types of facilities and others would have complementary ones (rather than duplicating). One could perhaps look at some English regions with several cities and large towns as partially polycentric where there is some CS&H specialisation within these, e.g. Leeds-Sheffield-Bradford; Manchester-Liverpool and Glasgow-Edinburgh-Dundee. The Scottish national policy in fact focuses on six "Vibrant Cultural Cities

<sup>31</sup> [www.artscouncil.org.uk/what-we-do/research-and-data/arts-audiences/active-people-survey/](http://www.artscouncil.org.uk/what-we-do/research-and-data/arts-audiences/active-people-survey/)

characterised as: *first and foremost a liveable city – a place where highly skilled and highly mobile people choose to live. A vibrant cultural city also attracts new investment and is a place that people choose to visit because of its cultural, social and retail diversity and the diversity of its people. It is a place where a nation's heritage is displayed and will evolve. The world's most successful cities have an identity that reaches out across different markets and customers and that tells a unifying story about the value the city can add to the activity that is looking for a home*" (Scotland's Cities, 2011).

#### 6.3.4 Region

This leaves us with the regional scale (not ignoring sub-units such as counties which may have associated 'character', tourism brands and CS&H features) at which macro-economic indicators are available, e.g. GVA, industry clusters, tourism, and where spatial data analysis may be feasible, e.g. Travel to Work Areas (TTWAs – although these can also be applied at lower scales, e.g. borough). The region is the common 'unit' for general studies of growth, innovation and cluster analysis which is extensive (Regional Studies, Economic Geography, Urban Studies etc.). Culture, sport and heritage tend to feature in this literature only in as far as they represent 'amenities' (as a location and attractor, as noted above) unless the industry sector concerns specific cultural and creative industry sectors and creative clusters (see section 6.5 below). Regional-level data is also a feature in Taking Part surveys and investment data (including ERDF) and also via regional agencies (and the former RDAs). There is the risk however that CS&H assets will get 'lost' at this scale and be too large for meaningful comparison and controls.

The city region or metropolitan region may therefore be a more focused scale for our purposes, particularly where this can be associated with CS&H investment and infrastructure and place-shaping strategies. These include culture and sport-led regeneration, including associated events and festivals, tourism development and wider economic and cluster development. This might also better incorporate the local area cluster, zone, district and sub-regional clusters, as noted above. For example, Florida's 'Creative Class' analysis and index in the USA took Metropolitan Statistical Areas (MSA) as the unit of comparison – and as Lorenzen & Andersen (2007) confirm, the highest shares of creative class workers are located in the highest ranked (size) cities. Different regional configurations are used, e.g. Nomenclature of Territorial Units for Statistics (NUTS), however these do not necessarily correspond with regions identified for cultural planning in the UK.

### 6.4 Location advantages

One of the measures of place-shaping through investment in CS&H assets and a critical mass of facilities is the locational advantages to which they might contribute, i.e. to what extent do CS&H assets serve as attractors to and retainers of people and firms. One of the first studies to measure the economic impact of the arts in Great Britain was Myerscough's study published in 1988. As well as calculating impacts through spending and employment in three city-regional cases (Ipswich, Glasgow, Merseyside) using multipliers, the study surveyed middle managers in these areas, asking firstly which factors they saw as important in a location decision, and then how far these factors were enjoyed once living in an area.



**Table 9: Location decision factors and post-relocation value**

Factor	Location decision	Enjoyed when resident
Pleasant environment and architecture; access to pleasant countryside	98%	93% (Access to countryside)
Good road, rail and air links	84%	–
Outdoor recreation and sporting facilities	81%	54% (Participation in sports) 62% (Parks and public gardens)
Wide choice of housing	80%	–
Good choice of schools	76%	–
Museums, theatres, concerts and other cultural facilities	74%	69%
Fine old buildings	–	69%
Pubs, clubs and nightlife	–	50%

Source: Myerscough (1988)

Whilst natural and built environmental quality were valued fairly equally in each of these three regions, middle managers in Glasgow (79%) and Merseyside (68%) rated cultural facilities higher than those in Ipswich (60%), both as a location-decision and resident-user factor, with spectator sports rated low as a valued amenity (only 10% in Ipswich, but 39% in Merseyside). Prior reputation and supply-led factors would be expected to play an important part in these assessments and in explaining these variations, including the prominence given to investment in CS&H assets: for example, Glasgow's 'Renaissance' post-Glasgow SMiles Better campaign (1983), 1988 Garden Festival and European City of Culture 1990. More recently, Liverpool's 'European Capital of Culture' (ECOC) award in 2008 is credited with reputational advantage through improvements in its cultural and urban amenities (including the Liverpool One shopping centre). Both of these cities have been recipients of sustained capital investment through national and European regional development funding (e.g. £12m to North West and £5m to Glasgow, 1990–6 – Evans & Foord, 2000).

As an indication of the influence of a change in supply of cultural facilities, between 2005 and 2009 attendance at museums and galleries in the North West region increased from 40% to 47%. This was attributed to the build-up and effect of Liverpool's European Capital of Culture in 2008, although attendance slipped back to 45% in 2009 (Taking Part, DCMS 2010). In an extensive impact study of Liverpool'08, secondary analysis of visitor data was supplemented by profiling visitors, and data was then modelled to determine additionality. The study found that 9.7m additional visits (35% of all visits to the city in 2008) were attributed to the ECOC award, generating an additional economic impact of c£754m across the region, and supporting 14,888 FTE equivalent jobs. Placemaking effects were also assessed through media analysis and surveys of local community perceptions (Impact 08, 2010). Here, most people did not feel that the ECoC award would benefit either them as individuals or their neighbourhoods (Impacts08, 2009: 12). Businesses in the city centre (less so outside of the area) saw a growth in sales due to the ECoC award, although less so in Merseyside than in the region as a whole. However the majority of firms did not anticipate winning future business from the event, which was not seen as the critical factor in the city's economic recovery (although a source of 'great pride and

enthusiasm') which was, rather, the major infrastructure investments such as the new Arena and Convention Centre (Impacts08, 2008). These impact findings highlight the importance of defining the impact area and of identifying key 'agents of change' which may include CS&H investment (particularly permanent/ongoing vs. time-limited event based) but will also include other investments e.g. retail, transport, public realm.

The impact of the regeneration of historic assets on business location decisions was also evaluated in a study of five UK case study areas. The study found that 25% of businesses surveyed agreed that the heritage setting was an important factor in the decision to locate there (particularly smaller, independent firms), ranking this equally with road access, but below environmental quality, availability of premises, labour and proximity to customers and suppliers (Amion/Locum, 2010 and see GHK, 2010). It was estimated in 2011 there were 138,000 UK businesses located in listed buildings, accounting for £4.7bn in economic output and 1.4m jobs – 3.5% of UK economic output and 5% of all UK employment (Oxford Economics, 2013).

A novel study on the link between cultural amenities, high-skilled workers and regional economic growth has looked at baroque (pre-1800s) opera houses in Germany (Falck et al 2011). This modelled spatial/distance relationships, factoring a range of counterfactual (without opera houses), amenity and skills/growth data, including education level, GDP/employee and accessibility indices. The results show a correlation between regions with high human-capital employees and those with a high level of cultural amenities, compared with those with lower cultural amenities. Translating this in terms of economic growth, an increase in higher education employees by one standard deviation increases average growth of regional GDP/employee by 1% to 2%. The federal German system supports a more even distribution of cultural facilities than in the UK, with higher levels of participation as a result (Brook, 2011). As Glaeser also concluded from his econometric study of skills and regional growth, city growth responds to faster improvement in amenities, which skilled residents induce through their demand as consumers and as voters

**The extent to which clusters of cultural amenities attract and support employees and entrepreneurs who are key to economic growth and innovation warrants further investigation, given the above evidence of the importance of place quality and particular cultural facilities** (see Bakhshi et al, 2013 – discussed below).

#### 6.4.1 Creative Cities and Spaces

The importance of urban amenities, access to nature and historic building character was also stressed in a Dutch national study of Creative Class concentration and economic growth. Marlet and Woerkens (2005) found that Florida's Creative Class Index empirically failed to materialize for the Netherlands, whilst the aesthetic assets of cities were found to provide a strong explanation for both share and growth of the creative class in Dutch cities, concluding that job opportunities and urban amenities (including cultural venues) are still the most important factors influencing the choice for a place of residence. Whilst the Creative Class thesis is focused on economic growth and innovation in the knowledge economy (rather than arts and culture and the cultural economy), Florida's Creative Class Index ranks certain factors and conditions which attract/retain and influence firm growth (his three T's of Tolerance, Technology and Talent). It therefore combines human capital theory with a new take on place-based/location/cluster theory, generally applied at MSA/city scale. In reviews of

the Creative Class model (Evans, 2009), as applied in Europe, Scandinavia and in the USA, correlations and exogeneity were found to be high (Glaeser, 2004), i.e. they have weak explanatory power and proof of causality, with education/skills and job opportunities the over-riding factors attributed to growth and innovation in most cases. In European regions (NUTS3) the Creative Class groups were unevenly distributed across the EU, with Florida's Bohemian, Openness and Public Provision indices the most significant factors correlating with economic growth. In UK NUTS3 regions (n=97), distribution was also uneven, but appeared to support Creative Class growth effects (per USA) but not in hi-tech employment growth. In the UK (DTI, 2004) there was found to be no correlation of the Creative Class with productivity or innovation growth, whilst in several countries (Denmark, Netherlands), urban amenities and quality of place were important growth factors.

In an international comparative study of creative spaces/industry policies and strategies (n=130) carried out for Creative London (LDA) and Metro Toronto/Ontario Province (Evans, 2009c) the prime rationales for public investment and policy formation were, not surprisingly, economic development/job creation, followed by infrastructure and regeneration, tourism/branding and less so social and heritage impacts (although heritage was more important in smaller cities). However, art form/cultural sectors prioritised were the more traditional arts and cultural industries of visual /performing arts, film (including location, studios), architecture, music (especially smaller cities) and design, i.e. culture that is a feature of CS&H facilities, with tourism and placemaking key agendas for these established and prospective creative cities – large and small. This is consonant with what leading economic geographer Allen Scott has identified as the 'cognitive-cultural' city economy (2014) with a combination of comparative and competitive advantages; production/job opportunities; networks and clusters driving the post-industrial growth machines of creative cities.

**Cultural content for the new digital media industries is seen to be very important and therefore the importance of place and creative spaces is consistent with developing city growth from the knowledge and digital economies. This includes key 'client' sectors such a bio-tech and health sciences.**

## 6.5 Clusters

The concept of clusters in economics originates from agglomeration theory (Marshall, late-1890s) which associates the co-location of (competing) firms, skilled labour and infrastructure support with innovation and firm growth. Physical proximities are both efficient and facilitate tacit and codified knowledge spillovers through formal and, importantly, informal networks. This has manifested in manufacturing as observed by Marshall in the steel towns of Sheffield and Songinen (Potter & Watts, 2012); in craft-based production in Italy's Emilia Romagna region linked to the showcase provided by Milan (providing what Porter suggests is essential in economic clusters – international pipelines and market access); to Hollywood's interdependent film/digital/jewellery/fashion clusters (Scott, 2000) and today's hi-tech and digital clusters of Silicon Valley and Silicon Roundabout in London. In an in depth study of New York's fashion cluster (Rantisi, 2002), a cultural-creative production chain was established between art museums, specialist colleges, retail, advertising, publishing and specific design and production clusters – from haute couture to start-ups and sweatshops, and from boutique, fashion shows to high street and street culture.

CEBR's study of the contribution of arts and culture to the UK economy (2013) reported some evidence of wider impacts felt by industries co-located with creative clusters, however this evidence is not yet robust, limited to a few small scale studies of the links between talent and supply chain benefits between arts/culture and creative industries. As the AHRC *Cultural Values* report noted, "more attention needs to be given to the ways in which arts and culture feeds into the creative industries and supports the innovation system" (AHRC, 2016) or 'ecosystem'.

**Some CS&H assets form part of economic clusters in generating innovation and growth within their own organisation as part of a cultural ecosystem or creative production chain involving other enterprises and entrepreneurs. Evidence of this is however lacking, largely because this role has not been researched or considered, outside specific creative industry clusters. Our data modelling may however reveal where cultural assets correlate with places where economic and creative industries growth is evident. This could go towards filling this knowledge gap.**

At the same time, physical clustering is a feature of urban planning at regional, city and local area levels which are seen to support a visitor economy (local, domestic, international), and 'carrying capacity' to absorb and retain visitors, consumers and a range of cultural amenities. This range and diversity can in itself enhance a place and produce 'cultural spillovers' including firm innovation and growth in the locality. This is seen in the area around the Guggenheim Bilbao where numerous galleries, dealers and showrooms have located or relocated, in order to further shape this regeneration place and its association with modern art (Plaza, 2009 in *Art of the Possible*, 2010: 16-20). This phenomenon is also seen in the case of art gallery location in Manhattan (Schuetz, 2013a&b). This study used spatial data analysis and changes in land-use and building characteristics over time, together with the presence of historic, museums, park and transport amenities in each area. Regression analysis found that art galleries were attracted to neighbourhoods with amenities and physical characteristics such as historic buildings, museums and parks and commercial zoning, as well the presence of other galleries. In a separate study of Manhattan's gallery scene, Molotch & Treskon (2009) found that new hubs such as Chelsea and declining gallery clusters in SoHo were influenced not by the oft-cited gentrification and property price rise cycle, but by the external art market and specific placemaking associated with these spaces that did not depend on proximity to either artists or buyers (the study used location, rent and sales data over a 17 year period). This gallery district has been designated by the city as an arts district 'to encourage and support the growth of arts-related uses'.

Clusters or 'assemblages' within cities can also be perceived as 'scenes' creating a particular buzz which can attract a particular kind of visitor/tourist, creative worker or entrepreneur. What creates and makes up these scenes has been analysed by sociologists and cultural geographers (Silver, nd). These formations are said to bring a tangible cultural "value added" to deprived communities, as well as feed the knowledge economy with innovation and "buzz" (Bathelt, Malmberg & Maskell, 2004), and its hunger for content. This is evident in sectors such as advertising, financial services, fashion and music which draw inspiration from street culture and street life, a direct benefit of co-location. It is no accident that there is a high correlation and co-location between these cultural and non-cultural sectors in creative clusters (Freeman, 2010).

Clusters are also identified with heritage – whether historic architectural, monuments or collections such as museums. Examples include museum

quarters, historic quarters including parks and gardens. These undoubtedly contribute to a sense of place and place brand, measured in terms of usage/visitors and associated economic impacts, and in amenity value terms (estimated through contingent valuation and relative property values). Local amenities not necessarily associated with formal heritage or historic designation would also generate positive valuation as a community asset. These include post-industrial areas that have served as the basis for contemporary cultural and creative production. Case study examples are numerous but largely descriptive – estimating outputs and visitor data (see *Cultural Quarters*, Roodhouse, 2010) but seldom sustained impacts beyond snapshot EIA studies. There is longitudinal evidence however that historic quarters serve as the site for heritage, cultural and now creative-digital clusters, suggesting that there are local conditions that are both symbolic, physical (building types, character, connectivity) and economic (Evans, 2004, 2009cd).

In a study of Nottingham's Lace Quarter, Shorthouse (2004) conducted a survey of local business and visitors. The importance of their location in this heritage cultural quarter was found to be high:

- 67% rated as important to crucial for their business
- 61% rated as important to crucial for their business the capacity for meeting and networking with suppliers, collaborators, competitors
- 70% as a location for business and social interaction
- 74% rated as important to crucial for their business the attractiveness of the built environment
- 50% rated as important to crucial for their business the proximity of arts and cultural institutions.
- Over 90% of users/visitors agreed that it adds vitality to the city centre area; 94% that its heritage quality makes it an attractive place; and 90% rated it good for socialising

A study of the impact of Heritage Lottery funded projects (n=10) on the local economy considered project expenditure and impacts as well as from visitor activity (GHK, 2010). Across the ten projects which had received over £250,000 HLF funding and completed by 2008, expenditure supported 159 job years in local economies and 750 in regional economies, enhancing GVA by £33.9m in total. Ongoing outputs were found to support 120 FTE jobs locally, 170 regionally, with ongoing GVA estimated at £3.2m locally and £4.7m regionally, after adjusting for additionality, leakage, deadweight and substitution effects.

### 6.5.1 District Clusters

Clusters of cultural amenities with economic and social impacts have been identified at the district/borough level, for example in the case of the City of London Arts & Cultural cluster. In a study commissioned by the City of London Economic Development unit (BOP, 2013), an extensive assessment of this borough's cultural heritage, performing arts/events and visual arts facilities and programmes was undertaken.



This study of the City of London Art & Cultural cluster looked at economic, social and cultural impacts from the combined range of cultural facilities in the City of London. This cluster was found to produce £225m (net of 'additionality') of GVA (total 'additional' revenues less operating costs) and supported over 6,700 FTE jobs. Indirect impacts were calculated based on organisational spend across 11 industry sectors. This analysis was based on financial data from cultural organisations, and an audience spending survey. Social impacts were based on aggregate data on volunteering, educational and outreach activities from organisations and in-depth case studies. Cultural impacts drew on audience surveys, data on the international dimension and new work produced, as well as media coverage, with the effect of cultural experiences on audiences' views about the City of London assessed through audience surveys and case studies (Barbican, City of London Festival). This included assessment of how audiences felt that their attendance improved their well-being – 82% said they agreed/strongly agreed. The placemaking capacity of the City's arts and culture provision was thus assessed through audience research surveys at two venues; case studies (e.g. Festival effort to create a place-based identity and impact); organisational survey information on media coverage and general visibility of the cluster (BOP, 2013).

In an impact study of the arts in Birmingham, the benefits of the city's provision was assessed by a large-scale telephone survey of those both attending and not attending arts facilities in the city (Morris, Hargreaves, McIntyre, 2009). The study found that the arts organisations were having a positive impact on the image of the city and region, as well on individuals, including social outcomes such as social cohesion, learning, cultural understanding. 73%–76% said that the cultural provision made the city vibrant and exciting and provided opportunities for people to come together and share experiences; 44% said that it improved the quality of their life.

### 6.5.2 Cultural Districts (USA)

A third, more localised cluster has been identified in the USA, categorised as *Cultural Districts* (Stern & Seifert, 2007, 2010). The work was first reviewed in *Art of the Possible* (TBR, 2010: 44) and has been supplemented by national research on Cultural Districts in the USA by Noonan (below). Cultural Districts are defined as 'a well-recognised labeled, mixed-use area of a city in which a high concentration of cultural facilities serves as the anchor or attraction', and are often centred around large arts institutions. The concept of 'Natural Cultural Districts' was developed in Philadelphia, in areas suffering multiple deprivation, population and economic decline, building on the idea that urban neighbourhoods often germinate clusters of community, commercial and informal cultural assets linked by artists and creatives as producers, and participants as consumers or practitioners.

The study uses four indicators of the intensity of the cultural scene in a neighbourhood: cultural participation, non-profit cultural providers/community associations, commercial cultural firms and independent artists/creative workers, together making up an area's cultural assets. Four data sources were used: a regional inventory of non-profit cultural resources, a database of

commercial cultural firms in the metropolitan area, a listing of artists, and small-area estimates of regional cultural participation based on data provided by over 75 cultural organizations. All four of these indicators were calculated for every census block group (approximately 6–8 city blocks) in metropolitan Philadelphia. The identification of natural cultural districts used factor analysis to create a single scale, capturing variation of all four of these indicators across the metropolitan area. The analysis determined that the four indicators had very similar patterns of variation (a single scale accounted for 81% of the variation – a *cultural assets index*). The second stage identified neighbourhoods with a cultural assets index score higher than expected when corrected for these variables such as socio-economic profile, diversity, distance from centre, etc. Essentially, these are districts that were “exceeding expectations” in their concentration of cultural assets. The cultural assets index is correlated with the chances that a neighbourhood would improve over time. In order to test the role of cultural assets in neighbourhood revitalization, the model combined the cultural assets index with data on neighbourhood change. The results were striking: 83% of all block groups that improved by two or more market value analysis (MVA) categories between 2001–3 were cultural districts and this association between these clusters and improvement in housing market conditions has continued (Stern & Seifert, 2010).

In a US-wide study of 99 designated (post-1990s) Cultural Districts (Noonan, 2013) their impact on economic and demographic change was assessed based on data on income, employment and unemployment, population/resident change, census, property values and educational levels. Using regression models the aggregate results found that these cultural clusters (average area 1km<sup>2</sup>) revealed positive effects on property values, employment and income, but little evidence of significant effects on population/diversity, education or distance to employment.

Noonan and Breznitz (2013) also study the effects of arts and cultural districts combined with the presence of research-intensive universities, arts colleges and growth in the media arts sector. Using a range of descriptive statistics based on a sample of 89 cities with cultural districts, including employment change and patent data (shares and trends) over two decades, OLS regression analysis found that the presence of cultural districts and research intensive universities had little explanatory power across arts and media-arts employment. However, art colleges were positively associated with higher levels of employment growth in these sectors. The growth in media-arts employment is even higher in cities with arts schools and research universities. Cities with cultural districts did see much faster rates in media arts patenting but surprisingly not the presence of universities or art colleges, concluding that the more innovative cities in media arts appear to be those with an arts or cultural district. This of course depends on the nature of cultural districts and other factors (as the authors admit), but it is interesting to note that in London, the biggest media-arts cluster ‘Digital Shoreditch’ has evolved largely independently of either local university or arts school influence, with growth factors such as connectivity, personal networks (non-place-based) and proximity to production/supply chains in financial, advertising and other creative industries, in a pre-existing cultural district (Foord, 2012). This cultural hub had been designated in both sub-regional city growth and city-wide creative industry strategies (LDA, 2003), recognising that cultural assets directly influenced the location and growth of creative and digital industries.

### 6.5.3 Consumption (Endogenous) vs. Export-based Impacts

As we have seen from the literature and commissioned studies, economic impact assessments of the contribution of a particular cultural facility or sector to a (local/regional) economy have dominated in this field. In the USA, Markusen and others have argued for a consumption based alternative to this 'export-based' model. This argues that increasing a sector's ability to capture local discretionary income provides a route to sustainable job and income generation, for example by:

- providing a local outlet for user/audience attendance and spending that would otherwise leak out of the area
- offering residents opportunities to spend more of their discretionary income on new locally produced goods and services
- seeding innovations that later expand into export markets
- nurturing organisations and occupations that re-spend more of their earnings locally than others

This also recognises that much arts economic activity is 'lost' in EIA studies due to a high level of self-employment and entrepreneurial activity that is distinct from the largely not-for-profit organisations that are typically the subject of impact assessments (Gadwa & Markusen, 2009; Markusen & Gadwa, 2010). In the UK, the labour structure of cultural production relies on a substantial freelance workforce many of who may be closely associated with specific CS&H venues (arts, sports) including performers, artists, technicians, trainers, etc. They are critical to the operation and provision of cultural experiences and cultural places, but they may be 'dispersed' in employment terms, understating their importance in the economic and social life of these places. Particular cultural clusters that are not considered in mainstream impact studies include artist centres and housing (e.g. studios/live-work). These US-based authors have designed a mixed methods research model in response to the conclusion that the evidence from local economic development studies into place-based impacts lacks any robust, well-developed tools. This model combines quantitative and qualitative research techniques to capture tourism/business expansion, employment/industry mix, property values, gentrification/population displacement, fiscal impacts, artist in-migration and a range of physical and social impacts (connectivity, civic engagement, tenure/diversity, safety, neighbourhood confidence).

A large-scale study of California's Arts and Cultural Ecology found marked differentials in the number of arts organisations per capita and arts participation rates across cities which were not based on population size, profile or other industry factors, but were seen to be due to decade-long cultivation of local-serving arts capacity that sustains jobs and income. The methodology used several datasets including estimates of the budgets of regional arts and cultural organisations, census and community survey data and arts participation data (regional only, as in the UK). Local characteristics were determined in terms of income, education, race/ethnicity and age as well as population size/density, city status, jobs per capita and both city and private funding of arts activity. Regression (OLS) analysis was done at city level (n=237 with population >20,000). Features positively associated with a higher number of arts and cultural organisations per capita were job density, private arts funding, residents' education level and personal wealth. Regional location did not prove to be a statistically significant predictor. Job density was



seen to facilitate host businesses, owners/managers and employees who contribute to local arts and culture, and firms who feel that a strong arts offering enhances employee motivations, helps attract/retain employees and encourages customers/sales. Evidence on the comparative density of artists also supported a capacity-building interpretation of their role. The study concludes that place-based analysis confirms that certain communities especially job centres that also attract well-educated, wealthier residents are more apt to provide a home for arts and cultural organisations regardless of region, reinforcing a virtual cycle of arts activity and attendance (Markusen, et al, 2012).

In a separate study in the USA of culture-based development and the effects on economic and social well-being (Tubadji et al, 2015) a cross-sectional study also found the existence of a positive cultural effect on local development – economic and social well-being – as well as the fact that endogenous cultural industries had a positive effect on the mobility of human capital. A concentration of cultural activity seems to be a predictor for those areas which have the characteristics of regional economic growth.

In *Art of the Possible* (2010: 21-28), one of the studies analysed in depth was on the *Spillover Effects of Investments in Cultural Facilities* carried out in Toronto and Vancouver, Canada (Jones et al, 2003). This study used spatial data analysis/GIS techniques to measure small area effects arising from cultural investments. This included impacts on property values, employment, income, retail sales, vacancy rates, new business creation and building development, alongside demographic, community engagement, crime and usage indicators (based on resident and business surveys). The cultural districts included cultural, community and production facilities. The study found that in both cases artistic and cultural components were strongly associated with growth, retail sales increase, development, image improvement and investment. Residents and firms strongly believed that artists and facilities were important drivers of growth and change including wellbeing, with new firm growth as well as churn (20–30% of these were ‘culturally-related’ businesses.). Social impacts included higher employment/income, lower unemployment and higher levels of education within the resident community, as well as property value increases and building development. Proving causality for some of these associations is of course difficult, but comparable data is available in the UK for some of the indicators used in this study, although some primary research would be needed to gauge change effects and perceptions (as in all cases to directly attribute CS&H asset change effects). These studies were the subject of a subsequent review at national level (Sharpe et al, 2004) and issues of methodology was helpfully discussed. This included the issue of control/counterfactual, like for like comparisons (i.e. between similar cultural investment types in different locations) and also between different types of cultural activity, visitor vs. producer-led, for example between more contemporary cultural production (e.g. artists studios, live arts) and static provision (e.g. historic museum).

In a study by Pedroni & Sheppard (2013) the issue of cultural spending and the lack of hard evidence of the causal relationship between local cultural production and prosperity is investigated. Using a model of culture and growth drawing on an established econometric framework (Canning & Pedroni, 2008) this is applied across 384 Metropolitan Statistical Areas (MSAs) using panel data (preferred over cross-sectional data) based on non-profits at two time points, 1990 and 2006. The

results reveal divergence between regions, with the urban Northeast showing the strongest positive relationship between culture and prosperity and the equivalent region in the Southeast the lowest – indeed a negative relationship between locally financed cultural production and GDP. This analysis reveals a causal connection between increases in local cultural production and permanent increases in local GDP, both in short-run multiplier effects but also steady-state income levels. As with other studies, it would be illuminating to focus on the distinctions between arts/cultural forms and sectors, since they perform economically quite differently.

#### 6.5.4 UK Cultural Clusters and Creative Economy

Recognising that the literature in this field is predominantly North American, a team from NESTA undertook a study of English cities to determine through econometric analysis the relationships between arts and cultural agglomeration and different parts of the creative economy (Bakhshi et al, 2013). There are two main competing theories as to the effects of cultural clustering on local wages. The first suggests that workers will be willing to sacrifice low wages in order to live in an area with a rich cultural sector, therefore – all other things being equal – wages will negatively correlate with cultural clustering. The second theory posits that cultural clusters boost the local economy due to an influx of human/organisational capital, causing spillover to other industries. According to this theory, cultural clustering is expected to be positively associated with wages, leading to a wage premium in cities with high cultural clustering.

In England, there appears to be a positive relationship between the level of employment in cultural industries in an area and hourly wages. However, this relationship may not hold when other factors are controlled for. Through the use of an econometric model, this study tests the robustness of the relationship between arts and cultural clustering and worker wages. The model estimates individual wages by estimating wages as a function of both individual characteristics (e.g. education, ethnicity, migration status), characteristics of the city (including factors such as clustering, education levels, size of the population) and regional characteristics which control for wider characteristics of where the city is located. The model is estimated using Ordinary Least Squares (OLS). The model is designed to test whether there is a positive (wage premium) or negative (compensating effect) relationship between cultural clustering and wages.

The data is at the level of Travel to Work Area (TTW) and draws from the Annual Population Survey (APS), Business Register Employment Survey (BRES) and a dataset of business registered on the Culture24 platform. The model uses average hourly wage calculated from APS data while simultaneously controlling for individual characteristics using data drawn from the APS including: experience, education, gender, ethnicity, broad occupational level (one digit SOC) and whether the individual is in the private or public sector. Three measures of cultural cluster were used, *employment*, *occupational* and *institutional*. Employment clustering was calculated for each area using data from BRES while occupation clustering was calculated using data from the APS; these measure creative clustering at the industrial sector levels and occupation level respectively. The model also included a measure of institutional clustering (e.g. galleries, libraries, heritage sites) using data drawn from Culture24.

After controlling for individual characteristics cultural occupational clustering was positively correlated with wages, however, cultural employment clustering and cultural institution clustering were negatively associated with wages. However, the positive relationship between cultural occupational clustering is not significant

when controlling for city level factors (such as education). By contrast the negative relationship between cultural employment cluster and cultural institution and wages were unaffected by city level factors. However, when focussing on workers in creative occupations industries, there appears to be a wage premium for these workers from higher institutional cultural clustering, but not the other measures of cultural clustering. For the workforce as a whole, therefore, the evidence seems to suggest that cultural clustering leads to lower wages while worker in creative industries may enjoy a wage premium in areas with high institutional creative clustering. This provides evidence for the idea that workers sacrifice higher wages to live in areas with high culture but also provides some evidence for the idea of spillover effects. However, these spillover effects appear to be limited to the creative industries only. The authors conclude that this study provides evidence of the positive effect of arts and cultural clustering on the productivity of cultural and creative workers, with evidence of spillovers from arts clustering to the wider creative economy.

Chapain et al (2010)<sup>32</sup> investigated the link between creative industries and innovation. The paper presents several lines of research, first a mapping of creative clusters in the UK using economic geographic techniques, secondly, exploring the level of innovation in the creative sector and thirdly, exploring the potential spillover effects from creative clusters to the wider local economy.

### **Cluster Mapping**

The study uses the DCMS definition of the creative industries and focuses on three geographical levels: regional, Travel to Work Area and Middle Super Output Area (MSOA), drawing data from the Annual Business Inquiry (ABI) and BRES. At the regional level, London and (to a lesser extent) the South East stood out as creative hubs. At the TTWA level, several creative agglomerations stood out including Bath, Bristol, Edinburgh, Manchester and Brighton. The cluster mapping also found evidence of co-location within sections of the creative industries. Finally, the cluster mapping showed how the level of specialisation varies across the country, the North of England tended to show more specialisation while the South showed more diversification.

### **Innovation in the creative industries**

The study drew evidence from the UK Innovation Survey. The results show that the creative industries are more innovative than other industries (except Engineering-Based Manufacturing and Other Manufacturing), particularly in respect to how they approach R&D and their propensity to launch new products into the market. Within the creative industries, Software, Computer Games and Electronic Publishing showed the highest levels of innovation while Film, Video & Photography and Arts & Antiques firms show low levels of innovation. Creative industries were also shown to be more innovative than most industries when controlling for the level of innovation in the region as a whole. The exception to this is London where the creative industries show lower innovation than the region as a whole.

### **Creative Spillovers**

To explore the idea that the creative industries boost the wider economy through spillover effects to other industries, the paper explores the level of co-location between the creative industries and two highly innovative sectors: High-Tech

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<sup>32</sup> Chapain et al (2010), Creative clusters and innovation – putting creativity on the map, Nesta

Manufacturing and Knowledge Intensive Business Services (KIBS). This analysis used the DCMS definition of the creative industries and definitions of High-Tech Manufacturing and KIBS produced by AeA and EFILW. Co-location analysis was performed at the level of TTWA using data from ONS. The results showed that Advertising, Designer Fashion and Software, Computer Games & Electronic Publishing co-locate significantly and strongly with KIBS and less strongly with High-Tech Manufacturing. Most other creative sectors co-locate with KIBS, but not with High-Tech Manufacturing industries. This provides indirect evidence for economic spillover effects between highly innovative sectors.

### 6.5.5 Creative Placemaking London

The integration of cultural infrastructure, enterprise and placemaking is part of an initiative by the London Assembly, which seeks to use placemaking to shape regeneration with a cultural dimension. This responds both to the loss of and threat to cultural workspace and cultural facilities in London (e.g. small theatres, music venues, artists studios) and represents a shift in the approach to the potential social and cultural benefits of supporting artistic activity, as well as physical and economic benefits, with placemaking described as a 'process where partners from public, private, non-profit and community sectors strategically shape the physical and social character of a neighbourhood, town, city, or region around arts and cultural activities' (Markusen & Gadwa, 2010). Cultural provision (through a Cultural Infrastructure Plan) and local economic development (through Creative Enterprise Zones) will be better integrated through Creative Placemaking efforts and projects (examples below), as a more sustainable approach to culture and regeneration than has been experienced in the past.

Creative Barking and Dagenham (CBD) is an example of creative placemaking in practice in London. Funded by Arts Council England and the London Borough of Barking & Dagenham the project is running from 2014 to 2016 with an aim to "put the area firmly on the map as a place to make and enjoy exciting art in all its many forms". It forms part of ACE's *Creative People and Places* Programme which aims to encourage more people to choose, develop and take part in local cultural activities. To achieve these aims, CBD has focused on working in partnership to develop the community's interest in the arts and creativity. Its partners include business, such as the Barking Enterprise Centre, artists such as Studio3 Arts, volunteers, local government and the community. In particular, CBD has focused on involving the community through its 'Cultural Connectors', a network of 120 volunteer local adult residents with a remit to build enthusiasm for arts and creativity at a local level, as well as helping with events and marketing. CBD has also run a wide variety of other projects to boost the area's creative profile. These include Landmark Commissions, site-specific events inspired by local landmarks with an aim to "showcase the borough as a place where great art happens" and Neighbourhood Commissions, six-month artist residencies in selected parts of the borough aimed at encouraging creativity and ambition in local communities. CBD also runs summer festivals and a small number of funds supporting local artistic enterprises, voluntary arts groups and events in the borough. Collectively, this work has helped run 300 creative events with 8,000 participants at 25 venues across the borough. The work has also supported local arts projects with £350,000 in funding and acted as a catalyst for £280,000 of funding for additional creative projects in the borough. CBD forms part of a wider effort to regenerate the borough as a centre for creativity

in London. This includes the development of new artists' studios, such as at the Ice House Quarter, supporting local theatres, new public art and the renovation of the former Abbey Leisure Centre into a cinema. The borough has also received £250,000 in funding from the London Regeneration Fund to develop a new Artist Enterprise Zone in Barking, including new artists' studios and apartments at Linton Road. The borough has ambitions that the zone will include a future creative arts hub, performance spaces and the redevelopment of the Broadway Theatre.

The London Borough of Croydon differs in its approach to culture and regeneration, focusing on a diverse range of projects in specific geographic locations in the borough. This includes large-scale projects, such as the plans for a new Cultural and Education Quarter at Fairfield Halls in the centre of Croydon, as well as smaller creative placemaking projects in New Addington and at Ashburton Park. Croydon is investing £30m in the large-scale regeneration of the 1960s Fairfield Halls music venue and Croydon College to make the area into a Cultural and Education Quarter, a 'destination for Londoners'. Croydon's Director for Culture, Paula Murray, has argued that the space will meet community needs as residents 'want to see our young people performing on those stages, they want to see it open more of the time with activity happening throughout the day, they absolutely want a quality classical music offer'. Croydon has also invested in small-scale creative placemaking projects working with local communities. For example, in New Addington, a geographically isolated, socially excluded part of the borough, Croydon used £516,000 funding from the GLA's Outer London Fund to regenerate the Central Parade as part of its Connected Croydon Programme. As part of this project, the borough worked with local community group Pathfinders and identified a need for an 'animating public space' with a programme of events. The GLA claims that this work resulted in a local cultural events programme for the public space, greater trust in the regeneration project and the development of a Business Improvement District (BID). Croydon is also undertaking a similar community partnership approach in the restoration of a former library in Ashburton Park. It has identified a need to 'celebrate local culture and heritage' on the site, potentially including multi-use performing arts space, local history exhibits and arts and crafts events.

### 6.5.6 International literature on creative clustering and determinants of location decisions

A central question in this research study is the extent to which CS&H assets and associated investment represent pull factors which encourage economic activity (e.g. through the relocation or start-up of firms in certain locations). The literature includes a number of studies which consider the potential influence of CS&H assets and investments (amongst other things, but in the form of amenities, asset density, etc.) on the location decisions of firms. There is a significant focus on the location decisions of firms in the creative industries in this literature, especially those which use econometric estimation techniques to examine these relationships.

Creative industries in these studies refer to a range of economic activities concerned with the output of creativity, ideas and knowledge – including digital. We follow the creative industries definition from DCMS: "Those industries which have their origin in individual creativity, skill and talent and which have a potential



for wealth and job creation through the generation and exploitation of intellectual property”.

The creative industries and the creative class (a class of individuals in professions relating to the generation of creativity and knowledge) have been a focus for researchers as it has been posited that these are an ascendant source of growth in modern economies, capable of driving regional economic growth through innovation<sup>33</sup>.

Recognising that the creative industries tend to concentrate mainly around large- and medium-sized cities, forming creative local production systems, Lazzeretti et al (2009)<sup>34</sup> examined the forces behind clustering of creative industries. The objective was to provide the first empirical explanation of the determinants of creative employment clustering, following a multidisciplinary approach based on cultural and creative economics, evolutionary geography and urban economics. This was achieved through a comparative analysis of Italy and Spain.

The study first assesses the level of clustering of the creative industries using location quotient analysis in Italy and Spain. It goes on to design and employ an empirical (exponential) model to understand the process of creative industries' clustering.

The model tested the relationship between levels of creative clustering and a number of determinants, namely historical and cultural heritage, localisation economies, urbanisation economies, related variety, human capital and Florida's three T's (technology, talent, tolerance).

The results identify that the determinants of clustering in the two countries are different. The small role of historical and cultural endowments, the size of the place, the average size of creative industries, the productive diversity and the concentration of human capital and creative class have been found as common factors of clustering in both countries. However, in Italy, creativity is more related to cultural and artistic heritage and localisation economies and it is dispersed all over the country. In Spain, creative activities are not only correlated with localisation economies, but also they are particularly related to urbanisation economies and talent and are concentrated in the main metropolitan areas.

Cruz and Teixeira (2014)<sup>35</sup> investigated the determinants of spatial location of creative industries start-ups in Portugal within the framework of Discrete Choice Models. The study first examines the location behaviour of creative industries at a micro-level using highly detailed data on firms. It then assesses the role played by location determinants for the creative industries as a whole and for each creative sector in isolation, accounting for the potential heterogeneity of location behaviour across creative industries, using some of the most recent modelling approaches to location. The econometric estimation was based on the application of a Contingent Logit Model which examined the relationship between creative industries start-ups concentration and a range of potential determinants, namely; population density, creative firms' density, service firms' density, knowledge firms'

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<sup>33</sup> Florida, Richard (2002). *Bohemia and Economic Geography*, Journal of Economic Geography issue 2, pp 55 - 71

<sup>34</sup> Lazzeretti et al (2009), *Why do creative industries cluster? An analysis of the determinants of clustering of creative industries*, IERMB Working Paper in Economics, n° 09.02, April 2009

<sup>35</sup> Cruz, S. and Teixeira, A.A.C. (2014), *The Determinants of Spatial Location of Creative Industries Start-Ups: Evidence from Portugal using a Discrete Choice Model Approach*. FEP Working Papers no. 546 October 2014

density, industrial diversity, creative diversity, higher education, secondary education, culture, social inequality and R&D firms' density.

The findings show that as a whole, creative firms share similarities in their location behaviour with other industries (e.g. the manufacturing sector). However, there are determinants that are specific to these firms and affect their location choices, most notably urbanization economies, human capital and tolerance/institutional factors.

## 6.6 Valuing Environmental Assets

As noted above, the contingent valuation method is used in order to place financial values on intangible and 'free' resources such as parks/open spaces, some heritage and environmental amenities. A key quantitative technique is the use of hedonic pricing models of property prices in neighbourhoods where new or upgraded facilities are located. This approach has been used in assessing the impact on domestic property prices from sports facilities in the USA and Germany, and more recently in the UK (Ahlfeldt, Gabriel & Kavetsos, 2014). Recognising the difficulties in obtaining property transaction data over a long enough period, particularly for newer stadia development, Davies (2005) undertook a qualitative survey of the Cardiff and Manchester stadia impacts.

This study of the impacts of the Cardiff Millennium Stadium and City of Manchester (COM) Stadium used the expert opinion of property professionals together with the opinions of local interest groups/key stakeholders. The research revealed that the stadia in each city have generally impacted positively on the residential property market. The findings suggest that in the case of Manchester, the early signs indicated that the impacts have been positive with an average net positive change of 12.5% to property values over and above general house price increases in the area. Over half of respondents thought the impacts occurred within the construction phase of the stadium and the first three months of it opening and 67% of respondents thought that the impacts of the stadium were within 2km of the stadium site. In the case of Cardiff (in a more established real estate market area), there was evidence that the Millennium Stadium had been a key factor in the increased price of property in the surrounding vicinity. Property professionals and surveyors reported that the Millennium Stadium has resulted in an average net positive change of 2.9% to residential property values in the surrounding area over and above general house price increases. 53% of survey respondents thought that the impacts were within 1km of the stadium site, over 30% felt that the Millennium Stadium impacted on property over 5km away. Again this was felt to be a result of the enhanced profile and image of Cardiff generated by the Millennium Stadium (Davies, 2005).

Distinguishing major facility developments from the effects from other improvements is however problematic, as some of these studies confirm. Displacement (negative) effects can also be evident, where changes to other areas produce disbenefits, for example in the case of the Arsenal FC stadium, the relocation of a major waste recycling plant. Amenity value is more commonly measured in terms of environmental assets such as open/green space and urban design, and several studies were reviewed in *Art of the Possible* (including CABE,

2007; Varma, 2003 and GLA, 2003). This method attempts to control for a range of variables that affect property values to try to isolate the effect of the specific amenity. These studies generally conclude that there is a direct effect on the price paid for properties in close proximity to the asset, with this benefit subject to a 'distance decay' (i.e. prices go down rapidly as the distance from the amenity increases). This is due to the values associated with direct 'views', access and associated locational benefits such as lower densities, noise, traffic, etc. This evaluation method of course relies on access to property sale data over time, and data on a range of urban change factors that also influence property values. There has been no study that considers the effect of different CS&H asset types on property, to determine exactly what features benefit land/property values, e.g. scale, design, morphology, environmental benefits/disbenefits, etc. Built projects often occur as part of larger area regeneration schemes (e.g. Arsenal FC, East Manchester, Salford Quays) and a wider assessment of regeneration process and impacts is required, not limited to property prices. As WWCLEC note (2014), policymakers should also consider the distributional effects of these property market changes (i.e. who are the likely winners and losers) in investment evaluation.

### 6.6.1 Cultural Ecosystems Services

The hedonic pricing technique has also been applied more recently as part the National Ecosystems Assessment (2011). This ongoing initiative is part of an international effort (Millennium Ecosystems Assessment) led in the UK by DEFRA. As part of this extensive process, Cultural Ecosystems Services have been identified and indicators and measurement developed (NEA, 2010). Ecosystems in this case include broad habitats, designated areas, private gardens and other environmental and heritage resources. These correspond with CS&H assets, particularly natural heritage and facilities located in areas of natural habitats, whether countryside or urban. Amenity values assessed include associated wellbeing and recreational access. As well as the impact on property prices from propinquity to these resources, the economic value of educational and ecosystems knowledge, non-use values and physical and mental health effects are analysed. The analysis firstly concluded that the house market reveals substantial amenity value attached to a number of ecosystems, heritage sites and local environmental amenities. This was based on one million housing transactions between 1996–2008 against data on a large number of environmental characteristics.

Overall, a 1% increase in land use characteristics (domestic gardens, green space, areas of water within census ward) increased house prices by a similar 1%; whilst within 1km there was a price premium of between 0.06% to 0.4% depending on the land cover characteristic. Conversely, each 1km increase to (i.e. further away from) the nearest National Trust-owned site lowers prices by 0.7%. Educational values associated with school ecological knowledge subjects and school visits to sites used a model based on observed higher performance in exams (human capital) and subsequent higher lifetime earning levels with a total value based on GCSE and A-level candidates of £2,128m (2010). Non-use values looked at the proxy value of legacies to environmental charities, whilst health benefits from cultural ecosystems services focused on health improvements (physical and mental) arising from additional exercise created by the provision of natural habitats and green spaces and from more passive forms of contact with nature (e.g. viewing, being within natural spaces). This analysis estimated the value of health benefits from a change in these natural environments that would create a 1% reduction in the sedentary population (using willingness-to-pay based



values) producing a total benefit of £2bn, or £750m if people aged 75 and over (less able or likely to be physically active) were excluded. Benefits from proximity of home to green space/views increased emotional wellbeing by 5% and generally health utility score by 2%; accessing non-countryside ecosystems monthly increased physical functioning and emotional wellbeing by 3.4% and 2.6% respectively. This analysis used a geo-located survey (n=1,851) and OLS regression model. In a separate study of attitudes to beauty (IPSOS, 2010) 87% of respondents agreed that better quality buildings and public spaces can improve quality of life, and 69% of adults believe that heritage sites are important to the local community (Ecclesiastical Insurance, 2013).

In a separate study of Conservation areas, a price premium was also found for residential properties located within a conservation area of, on average, 9% (LSE, 2012), after controlling for a range of other factors. This premium doubles with properties in the centre of a conservation area, compared with those on the edge. There was also a smaller but significant premium for properties just outside the conservation area. Overall the intensity of the heritage character increases the value of residential properties. This is logical, since the characteristics that led to conservation area status being granted affirms an intrinsic value which is reinforced through conservation area protection from certain types of development change. Conversely, areas outside of the conservation area may experience negative impacts from developments which would not be allowed in the more (aesthetically) controlled area. The attractiveness of businesses locating within historic buildings is also confirmed by a study of the returns to investing in historic commercial buildings. Colliers (2011) found that over 5, 10 and 30 years, the annualised return on listed offices has been higher than for offices overall. These studies indicate the place value of the contribution of historic buildings to the local environment and quality of life, 'which in turn may have an indirect impact on business location decisions by encouraging supply of suitable qualified labour' (English Heritage, 2014).

### 6.6.2 Quality of Life and 'Place'

Many of the claims and evidence of the effects arising from CS&H assets relate to social impacts. These are associated with terms such as social capital, social cohesion and social inclusion, manifested through a range of indicators which measure participant's perceptions and experience, including public attitudes, as noted above, for example in relation to heritage assets and amenity values, etc. These draw on programme and project evaluations and post-completion surveys assessing for instance, the extent and effect on volunteering and engagement. These affects can be situated broadly in the sphere of quality of life and wellbeing. For example, a survey found that people who had engaged with heritage activities over the previous year reported significantly higher happiness scores compared with those not engaging (English Heritage, 2013); heritage volunteers reported levels of mental health and wellbeing that are higher than for the general population, or amongst all those who undertook some form of volunteering activity (BOP, 2011). In a survey of the AV Festival (BOP, 2010) the large majority of volunteers responding reported improvements in their communication skills, self-confidence and willingness to try new things, and felt that this made them more employable. In a study for the Scottish Government on the impact of cultural engagement and sports participation on health (2013), those attending a cultural place or event were found to be 60% more likely to report good health compared to those who had not; participants in dance were 62% more likely to report good health. These associations between participation in a range of cultural activities

and engagement are mirrored in similar studies both in the UK and abroad (see ACE, 2014; Daly, 2005).

A systematic analysis of the *Understanding Society* dataset (DCMS, 2014) sought to highlight the social benefits extracted from the results of this survey. The study, which ran a number of regression models, looked at the impacts of engagement in culture and sport and participation on four domains: health, education, economy and civic participation. The headline results found that arts audiences were 5.4% more likely to report good health, whilst sports participants were 14.1% more likely to do so. Arts participants were 14.1% more likely to report and intention to go on to further education (we do not however know if they subsequently did). Unemployed people who engage with the arts as an audience member were 12% more likely (than those not attending) to have looked for a job in the last 4 weeks; unemployed sports participants were 11% more likely to have done so. Those engaging with the arts as an audience member were 6% more likely to have volunteered frequently; sports participants were 3% more likely (they also gave £50 and £25 per person more to charitable donations than the non-engaged over the last year, respectively).

An example of how a sport-based initiative with the West Yorkshire probation service is provided by an evaluation of its impacts.

The West Yorkshire Sports Counselling scheme accepted voluntary referrals from the Probation Service and Youth Justice teams in West Yorkshire to participate in a 12-week programme of sports activities. The programme involved one-to-one, participant-centred work by sports leaders, typically meeting participants in sports centres and clubs for three hours a week. Of the 52 participants who completed the self-evaluation of fitness at the start and at the end of the programme, 75% recorded an increase in fitness and 22% no change. The programme had a beneficial impact on participants' perception of their own fitness. Probation officers who had supervised the case study participants all felt that their clients had gained in self-confidence through participation and the achievement of completing the 12-week programme. For the comparative reconviction rate study the difference in actual reconviction was statistically significant. The actual reconviction rate was 40% versus a Home Office-based prediction of 64% over two years. These results indicate that the length of counselling makes a difference to its impact on reconvictions, which is consistent with the logic of a scheme which relies on building up an offender's trust and confidence over 12 weeks. Not only did fewer participants re-offend, but those that did re-offend did so with less frequency than non-participants (in Evans & Shaw, 2001).

Visiting museums is found to have a positive impact on happiness and self-reported health. Participation in the arts and being audience to the arts also have positive effects on happiness<sup>36</sup>. Similarly, library use is positively associated with subjective wellbeing; library use is associated with higher life satisfaction, higher

<sup>36</sup> Fujiwara, D (2013) Museums and Happiness: The value of participating in museums and the arts. Stowmarket, The Happy Museum Project.

happiness and a higher sense of purpose in life. Library use also has a positive association with general health; being a regular library user is associated with a 1.4% increase in the likelihood of reporting general good health. This is estimated to represent an average cost saving to the NHS of £27.5m per year<sup>37</sup>.

A further paper by the same authors (Fujiwara et al, 2015) sets out to quantify the value of health and wellbeing benefits of library engagement through a contingent valuation method. This involves surveying people about their willingness to pay for library services. This method measures primary benefits of library services (i.e. those that accrue directly to the individual). The paper also looks at secondary benefits; these are benefits that impact society more widely, such as those that lead to reduced public spending on health.

The primary benefit of libraries was measured using an online survey of 2,000 library users and non-library users. They were asked how much additional council tax they would be willing to pay in order to maintain facilities at their current level.

As expected, library users were willing to pay more than non-library users but both groups were willing to pay a premium (around £20 and £10 per year on average, respectively). Extrapolated to the English population as a whole this equates to over £723m per year.

The secondary benefits of libraries were measured using data from the Taking Part Survey and the British Household Panel Survey (BHPS). Using this data, the authors estimate the association between library service usage, subjective wellbeing and general health. They then value these differences in health using GP-related NHS savings. This part of the study used a regression model approach that controlled for factors known to be associated with health such as age, ethnicity, smoking, family status, employment status, income, housing, religion, education, region and time of year. It used a measure of self-reported health on a scale from one to seven. The study also looked at the effects of poor health on GP visits in order to quantify the costs associated with poor health.

The study found a correlation between subjective wellbeing and library usage after controlling for a number of different factors. Library usage was associated with higher life satisfaction, higher happiness, a higher sense of purpose but was also associated with higher levels of anxiety.

Library usage was also found to be positively associated with self-reported general health after controlling for a number of confounding factors. Linking this increase in general health with the increased costs associated with poor health (due to increased GP visits) the authors estimate a saving of £27.5 to the NHS. The primary and secondary benefits estimated in this study suggest that libraries have a total value of around £750m per year.

In an earlier paper, Fujiwara et al (2013)<sup>38</sup> looked at the impact of engagement with museums on self-reported health and subjective wellbeing using regression analysis and then attempted to ascribe a monetary value to this impact. Like Fujiwara et al, 2015<sup>39</sup> (see above) the researchers employ a Wellbeing Valuation

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<sup>37</sup> Fujiwara, D, Lawton, R & Mourato, S (2015) The health and wellbeing benefits of public libraries. London, Arts Council England.

<sup>38</sup> Fujiwara et al (2013, *op cit*)

<sup>39</sup> Fujiwara et al (2015), *op cit*

approach to estimate the equivalent monetary value associated with an increase in wellbeing.

The models use data derived from the Taking Part Survey which provides several metrics on cultural and sport participation as well as questions on subjective wellbeing and self-reported health. The study also uses data from the BHPS to produce estimates of the monetary values associated with a given increase in subjective wellbeing. In addition, both surveys provide data on a wide range of personal characteristics (such as marital status, education, age, etc.) so that these can be controlled for in the models. The models are estimated using Ordinary Least Squares (OLS).

Four different models were used for four different measures of museum participation: whether participants go to museums in their spare time, whether they volunteer at museums, the frequency with which they visit museums and the amount of time spent at museums. All these factors were positively associated with wellbeing, but the results were only statistically significant for whether people visit museums in their spare time. For health, whether a person visits museums in their spare time has a positive effect while the frequency of museums visits and time spent at museums have no impact on health. Surprisingly, volunteering at a museum was negatively associated with health.

The study also looked at participation in the arts on health and wellbeing. Participation in the arts, participation in sports and being an audience in the arts all had significant positive relationships with wellbeing. Participation in sports and being an audience to the arts were significantly positively associated with better health, however there was no effect of participation in the arts on health.

Using a Wellbeing Valuation approach (using data from the BHPS) the authors estimate values associated with visiting museums of over £3,000 per person per year. Participation in the arts and sports showed a value of around £1,500 each while being an audience to the arts was valued at over £2,000 per year.

The role of the arts in education is another interesting area, although largely beyond the scope of this study. These engagements and experiences are, however, often place-based – in formal, informal education and cultural settings. Education facilities can therefore form part of CS&H assets within a place, whilst education is a key role of many CS&H organisations and venues for educational and training activity. In a novel study in the USA, a survey tested the proposition that entrepreneurial innovators in STEM fields who actively participated in arts and crafts activity in their youth and adulthood were more successful than their less active engineering and science peers. This found a positive correlation. The relationship between childhood experience and subsequent adult participation in a range of arts activities was identified some time ago (see Dobson & West 1989), with a higher importance suggested for informal/participative engagement than formal/passive. CS&H resources have a particularly important role, distinct from school/college and formal engagement (e.g. school visits), notably combined arts centres, heritage interpretation and multi-use facilities (including community sport). In the last national study of arts centres in the UK (Shaw et al, 2006), participation rates across multi-form activities were much higher than general arts participation, with a more even age distribution and higher frequency of use in both urban and rural centres. These centres also fulfilled a social role over and above their arts activity programmes – 14% often used and 38% occasionally used these centres for social activities, independent of any arts attendance/participation. **Such venues are likely to have a stronger place-shaping contribution, particularly in communities where they serve**

**either a local or singular catchment where there may be few or no other cultural facilities (this is more prevalent in rural and more deprived areas).**

An earlier attitude survey conducted by English Heritage (MORI, 2000 in Evans & Shaw, 2001) found that 96% to 98% of people think that heritage is important to educate adults and children about the past and that all schoolchildren should be given the opportunity to find out more about England's heritage; 88% thought that it was right that there should be public funding to preserve the heritage and 76% agreed that their lives are enriched by the heritage.

Assessing place qualities is also the subject of design and planning, often associated with accessibility indicators and community safety ('fear of crime'). Design Quality Indicators have been developed for instance by CABE (2002, <http://cic.org.uk/services/the-design-quality-indicator-dqi.php>) to measure the impact of new buildings and spaces, from the perspective of users/visitors, operational staff and in the environmental/spatial context. This uses a survey-based weighted algorithm. There are also a number of street design/audit tools developed to measure accessibility levels, linkages and street quality (Evans, 2009b). This has included the value to retail and other premises owners, as well as place attractiveness (CABE, 2007) and impacts on (fear of) crime. The vitality that well-used CS&H facilities can generate contributes to natural surveillance and perceptions of safety, which can make such places important spaces for a wider user group, including women, families and children and the elderly – who experience higher concerns over street and transport safety.

**Given that the concept of place-shaping draws on the practice of placemaking which has a prime (urban) design focus, the extent to which investment in CS&H contributes to good design needs consideration. This has a range of effects as noted, from community safety and conviviality, property values (domestic and commercial), to a sense of place and belonging, community pride and positive place branding.**

### 6.6.3 Night-time Economy

CS&H facilities can be an important element in the evening economy of towns and cities. The so-called night-time economy (NTE) has a substantial economic value in larger cities. It is estimated that NTE activity contributed £66 billion to the UK economy in 2009, employing 1.3 million people – 10% of all employment, 8% of all firms (Bevan & Turnham, 2010). CS&H facilities contribute to this particular sector, notably theatres and evening productions. A particular challenge since the liberalisation of opening hours and licencing has been the development of a 'monoculture' in town centres and entertainment areas dominated by late night drinking establishments, cubs/bars and anti-social behaviour associated with excessive alcohol consumption ('binge drinking'). This has had the effect of making it far less attractive to wider user groups to go into town and access other amenities including cultural venues. A particular response has been the adoption of late night (or 'nuit blanche') festivals and museums nights, as have been practiced in Europe and North America (Evans, 2010). These events have succeeded in bringing visitors back into town/city centres and to experience these places in a different temporal environment. This has seen younger visitors to venues traditionally attracting older age groups, such as museums and galleries. The temporal and geographic spread of visitor activity offered by extended late night cultural activity directly contributes to this increase in capacity and therefore their sustainability. However, the benefits according to the survey of local authorities are also wider than just the commercial returns and income to



incumbent local authorities and businesses, who also link a vibrant night life with attraction to residents and investors (Roberts & Gornostaeva, 2007). Perceived benefits from NTE growth included:

- improvement in vitality of the area (and reduced crime/fear of crime)
- attraction/expansion of leisure venues (cinemas, theatres, gyms, cyber-cafés, events)
- new residents moving into the area
- increased number of jobs
- greater number of tourists
- inward investment in other businesses

The Greater London Authority study of the *Leisure Economy* (GLA, 2003), for example, found that on average each ward had gained 20 bar jobs between 1995 and 2000 (an increase of 12%) and restaurant jobs increased by 28%, presenting one of London's 'best sources of employment growth'. Attendance at non-alcohol-based venues also recorded an increase of 25%. For our purposes, isolating evening economic activity attributed to CS&H assets may be possible although this may require some judgements over the timing of programmes/facility opening, etc.

Total attendances at these late night events and festivals events range from the smaller 40,000 to 100,000, and mega-events from 1 million (Lisbon, Lyon, Toronto) to 2 million (Paris, Rome). Their scale has developed rapidly on an annual basis. Paris first attracted 500,000 in 2002 and now attracts 2 million; 40,000 visited Dublin's first all-night culture festival in 2006 and over 100,000 in 2008; Rome saw 1 million in 2005 and receives 2 million today; Toronto attracted 425,000 in 2006 and over 1 million in 2008. This expansion reflects the growing number of events, venues and geographic area covered, but also the success in marketing and generation of excitement around what has become a 'must see' event. Some visitor surveys have been undertaken (in Evans, 2011). Satisfaction with the quality of these events was high – Rome 90% (42% 'Excellent', 48% 'Good') and Dublin 94% (65% 'Very' and 29% 'Somewhat Satisfied'). Nearly half of the visitors to this event participated in two or more activities and nearly 80% travelled by foot or public transport. Visitors to these late night events are primarily local residents and 'domestic' visitors (whether staying overnight or not) with a growing international tourist or visitor; while Dublin's Culture Festival attracts 100,000 visitors, 75% of these are from Ireland (62% from Dublin), but the remainder are from the UK/Europe and the USA. **It seems clear that the night time cultural economy benefits from the place-shaping effects that CS&H evening activities provide, with tangible economic, cultural and social benefits. Late night festivals have spread in the UK as a result, particularly building on local cultural assets (e.g. Stoke, Leeds).**

#### 6.6.4 City Branding and Creative City indices

The field of branding has also developed models of city and place branding linked to destination marketing, which uses a range of indices to rank places. These rely on surveys of visitors, property and business owners and marketing organisations, as well as the application of network analysis and visual audits (see Zenker & Braun, 2014). Place indices are popular ways of ranking cities and places internationally and follow the trend for ranking cities (e.g. World/Global, Business Location, Quality of Life, Sustainable) including cultural and creative

cities. In London's *Cultural Audit* (GLA, 2008), the city was compared with several world cities in terms of a quantified range of cultural facilities, public and commercial, and this exercise is being updated to include more international cities. Creative City ranking was also a product of Florida's (2002) Creative Class analysis which used his combined indices based on MSA level data analysis. Creative City indices and ranking have been developed first largely qualitatively through Landry's set of elements and qualities (based on 10 'domains') that distinguish a successful creative city (see Evans, 2015b). A group in Australia have developed a more systematic Creative City Index (CCI, 2012) drawing on world city and cultural indices, i.e.

- *Creative Stocks: creativity and culture-based* – This index, exemplified by the work of Richard Florida et al, is based on the premise that a 'creative class' of migrants is drawn to cities by cultural attractors and by societies that value diversity, openness and tolerance. These indices also strive to measure the vibrancy of the creative sectors in terms of output, employment, participation and talent. This is a *stocks* approach, even though the point is to attract mobile *inflowing stocks* of talent and intellectual capital.
- *Creative Flows: indices that focus more broadly on world status, global integration, and ICTs* – Indices in this class, exemplified by the Global Power Cities Index, tend to include comparable (though less detailed) 'creative' indicators as a subset, while expanding to cover a wider pool of city attractors, including business activity, liveability, the environment, transportation and accessibility, and technology. This wider scope tends to shift the focal point from culture and creativity towards city infrastructure and basic services, innovation and technology performance, and international exchange and network formation. This is a *flows* approach since it measures a city by the magnitude of connections that flow between cities.

The CCI index synthesises these and groups city data into eight categories of sub-indexes, producing city indicators and ranking, applied in this case to six cities (including Cardiff and London):

- 1. Creative industries scale, scope and employment
- 2. Micro-productivity
- 3. Attractions and economy of attention
- 4. Participation and expenditure
- 5. Public support
- 6. Human capital and research
- 7. Global integration
- 8. Openness, tolerance and diversity

The extent to which the Creative City Index approach may be adapted to place-shaping effects needs consideration. This would be closer to the first type of index, above, but expanded to include key amenity factors provided by CS&H assets.



## 6.7 Towards a Conceptual Framework

As already noted, one of the fundamental challenges in establishing relationships between CS&H assets and place-shaping – and between CS&H activity and impacts generally – is the weak link between population-based data and provision/CS&H assets. The former is the basis for most participation, attendance, attitudinal surveys, but it is not generally place-based. On the other hand, CS&H organisations and clusters have been measured locally (transactions, multipliers, surveys) in terms of economic and some social impacts, but not in most cases in relation to a discrete or measurable population group or wider geographic area.

As we have summarised above, evidence and literature ranges from the more linear hedonic price studies (amenity, property, place/regeneration) and economic impact/footprint studies, to the multi-dimensional effects in terms of social and economic impacts. **The latter includes the relationship – under-researched but potentially fruitful (see NESTA, Markusen, etc.) – and the effects generated by CS&H assets/clusters and activity on the creative economy and the wider economy at expanding scales.** This includes processes of co-location/proximity, innovation spillovers and consequent growth (of firms, investment, participation levels/demand, spending). Another set of change effects are the social and environmental benefits which CS&H assets can make to local quality of life/wellbeing, a sense of place and place-shaping, including public realm/safety and design.

Two basic requirements need to be met in order to assess and distinguish the contribution that culture makes to place-shaping. Firstly the identification of CS&H assets at varying scales both as a comparative and independent variable against which to measure various place-shaping effects; and secondly, the effects that can be associated with place-shaping. Once identified and in some cases more specifically defined, data sources for each set will be needed, including investment and infrastructure resources. It needs to be accepted at the outset that much evidence in the literature of place-shaping effects associated with CS&H assets has drawn on primary and customised research data collection. Primary research data may be used, however, in subsequent ('synthetic') modelling provided an acceptable statistical base is available (e.g. output averages for CS&H asset types).

In terms of robust data, this suggests the following routes:

- Define and specify data sources on CS&H assets including investment flows and infrastructure value(ations), *cf.* Physical Asset Mapping (CASE, 2010) and also see Points of Interest (POI, OS), land-use types and classifications (including as used by funders).
- Model clusters of CS&H assets (1) aggregated at various scales (see section 6.3 above).

**Data on CS&H assets will provide the *independent variable* in any regression analysis modelling.**

- Scope change effects – correlated and potentially causally linked to CS&H assets, new and established.

**Data on change effects will provide a range of *dependent variables* that might be attributed to CS&H assets and therefore a predictor of CS&H investment impacts.**

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## 7: Appendix II – Quantitative Analysis options

This section presents key options for the quantitative analysis which were identified in the early stages of the study. It was suggested that these options were not mutually exclusive and all were feasible from a modelling point of view.

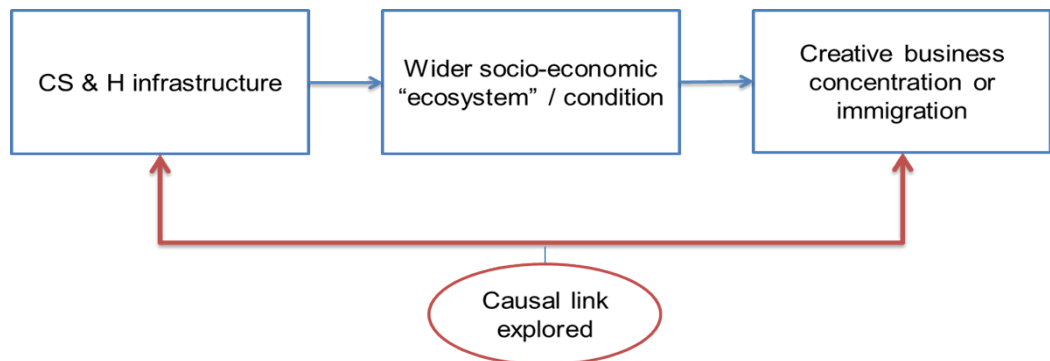
However, once available data had been collated and reviewed, it was decided with the project steering group that Option 1 presented the most feasible and deliverable option.

Options 2 and 3 might be considered for future work and may contribute further to the evidence base regarding the existence and nature of the impact ecosystem (discussed in section □, p.8).

### 7.1 Option 1: exploring direct causal links between CS&H infrastructure and competitiveness

Option 1 would test the hypothesis that **there are direct causal links between concentrations of culture, sport and heritage (CS&H) infrastructure and/or investment in CS&H infrastructure and indicators of competitiveness**. We use here as an example, business concentration or immigration of creative industries. However, other indicators may be used depending on data availability and/or meaningfulness (e.g. immigration of highly qualified individuals).

An econometric testing of that type would use as a dependent variable a business indicator to be determined (e.g. density of creative businesses, migration of creative businesses etc.) and a set of independent variables traditionally used to determine business location decisions. One of the independent variables would be concentration of CS&H infrastructure and/or investment in CS&H infrastructure and business concentration. This would allow us to test whether concentration of CS&H infrastructure and/or investment in CS&H infrastructure and business concentration has a *direct* statistically significant impact on business location (and therefore on local/regional competitiveness).



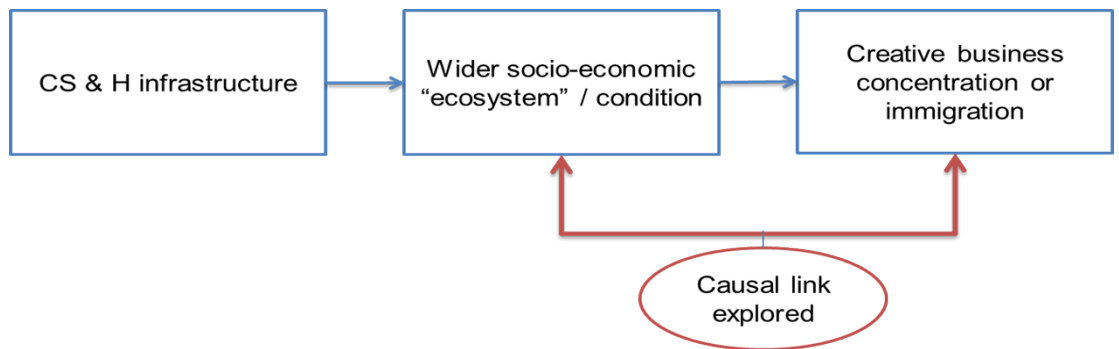
In a nutshell, this approach would use previous (established in the economics literature) regression models to explain business location by adding to these models one variable on concentration of / investment in CS&H infrastructure.

## 7.2 Option 2: exploring indirect causal links between CS & H infrastructure and competitiveness

Concentration of, and investment in, CS&H infrastructure has multiple short and long term impacts on urban spaces (and local and regional social economies). Some of these impacts are likely to affect pull (and push) factors of businesses. Some of these links have already been explored in previous quantitative analyses, to an extent.

In a situation whereby no *direct* causal link can be established (either due to lack of appropriate data or due to non-statistically significant results) option 2 would test the hypothesis that **there are indirect causal links between the impacts of CS&H infrastructure on social economies (e.g. well-being, criminality, health etc.) and business location decisions.**

As with option 1, the dependent variable will be a business indicator to be determined, but the independent variables added (to established regression models) would be key selected impacts of CS&H infrastructure.



For example, since it is established that concentration of CS&H infrastructure affects well-being indicators, then determining a causal link between business location (or concentration, migration, etc.) and well-being would bring to the light the indirect link between sports and cultural infrastructure and local/regional competitiveness.

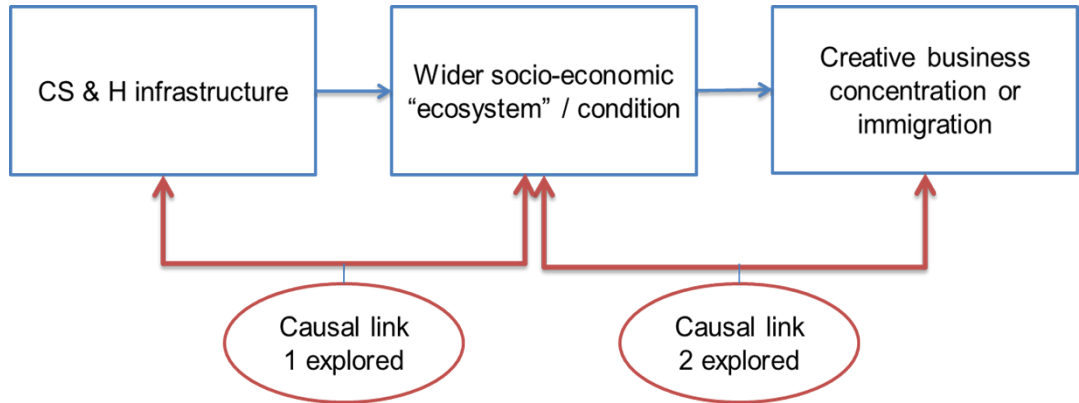
The challenge for this approach will be that (unless creating a composite indicator reflecting numerous socio-economic indicators) numerous models may need to be run to elicit the links between business location and respective socio-economic conditions.

## 7.3 Option 3: exploring indirect causal links between CS & H infrastructure and competitiveness through a two-stage approach

Option 3 would be an enhanced version of option 2. If deemed that the quantitative evidence on the links between CS&H infrastructure (concentration and/or investment) and key socio-economic impacts affecting business location

(concentration) are not sufficiently determined at a national scale, then this option would aim to test the following hypotheses:

- Firstly, that there are causal links between CS&H infrastructure and key socio-economic impacts, and
- Secondly (as per Option 2) that there are causal links between these impacts and concentration (migration etc.) of businesses



For example, if there is a causal link between concentration of sports and cultural infrastructure and criminality levels, and there is also a causal link between criminality levels and business location decisions, then there is a strong case for suggesting that CS&H infrastructure may affect business location decisions and thus local and regional competitiveness. This approach is thus an indirect way of eliciting possible routes through which sports and cultural infrastructure affect economic outcomes for local areas or regions.

## 8: Appendix III – Correlation analysis

This section presents findings from an initial exploration of the relationships between CS&H assets and investment and local economic performance. This analysis was undertaken in order to determine whether any correlation is at play between CS&H infrastructure indicators and economic indicators, effectively testing whether the first of our quantitative analysis options (see section 7:, p.82) would be likely to yield meaningful results.

Correlations were run between key variables to examine whether relationships exist. Note that correlations were run on static data (i.e. in one year). To test relationships over time, regression analysis is needed.

Initial correlations were run for 2013 using local authorities as the unit of analysis, in order to test whether simple relationships exist. Correlations were re-tested for 2006 where initial findings suggested a strong relationship.

### 8.1 Key findings

Table 10 shows the results for correlations between indicators of competitiveness and CS&H investment in 2013.

**Table 10: Selected correlations between CS&H investment and economic indicators, 2013**

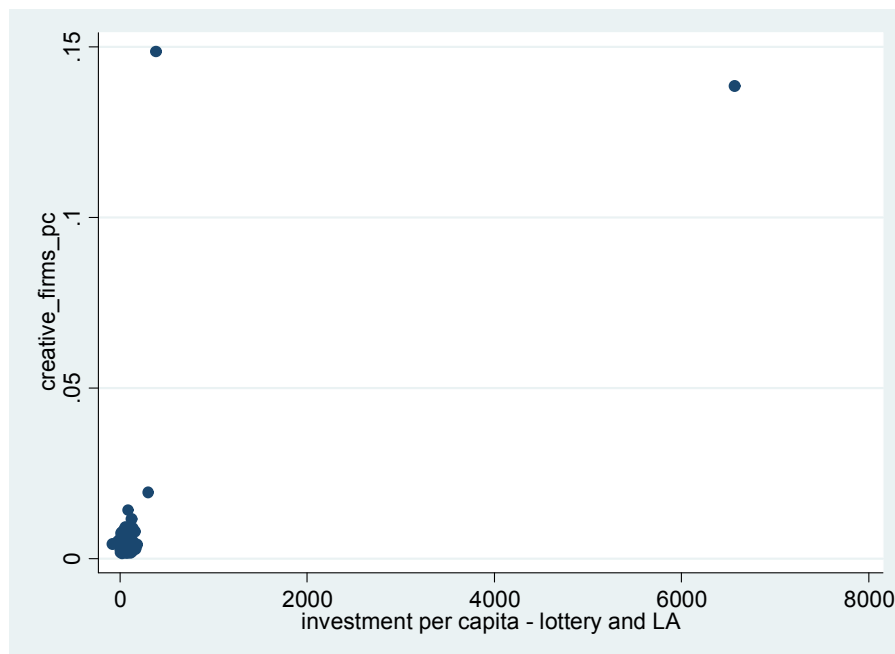
	Total number of firms	Total turnover of all firms	Turnover growth rate of all firms	Number of creative industries firms	Creative industries firms per capita	Creative industries firms LQ	Net migration of creative industries firms	Turnover of creative industries firms	Turnover growth rate of creative industries firms
Total CS&H investment	0.78	0.43	0.04	0.64	0.09	-0.07	-0.38	0.42	0.3
CS&H investment, lagged one year	0.78	0.41	0.03	0.65	0.08	-0.08	-0.33	0.43	0.3
CS&H investment, lagged two years	0.65	0.31	0.03	0.52	0.08	-0.08	-0.31	0.32	0.19
CS&H investment, lagged three years	0.69	0.34	0.04	0.53	0.09	-0.09	-0.28	0.28	0.23
CS&H investment per capita	0.16	0.4	-0.04	0.11	0.71	0.03	-0.2	0.09	0.07
Lottery investment per capita	0.41	0.47	0.01	0.41	0.52	0.06	-0.37	0.4	0.18
Local authority investment per capita	0.13	0.38	-0.05	0.08	0.7	0.03	-0.18	0.06	0.05
CS&H investment per capita, lagged one year	0.16	0.41	-0.05	0.11	0.69	0	-0.19	0.09	0.07
CS&H investment per capita, lagged two years	0.14	0.38	-0.04	0.09	0.74	0.08	-0.19	0.07	0.05
CS&H investment per capita, lagged three years	0.14	0.39	-0.04	0.08	0.68	-0.01	-0.18	0.06	0.05

Source: NEF Consulting

There are several ostensibly strong relationships between local economic performance and CS&H investment, including the number of creative firms, turnover of creative firms, turnover growth of creative firms and level of CS&H investment.

The strongest relationship appears to be between CS&H investment per capita and number of creative firms per capita (correlation coefficient = 0.71). However, examination of the data reveals two extreme outliers: the Isles of Scilly and City of London (see Figure 4).

**Figure 4: Correlation between number of creative industries firms per capita and Lottery investment, by local authority**

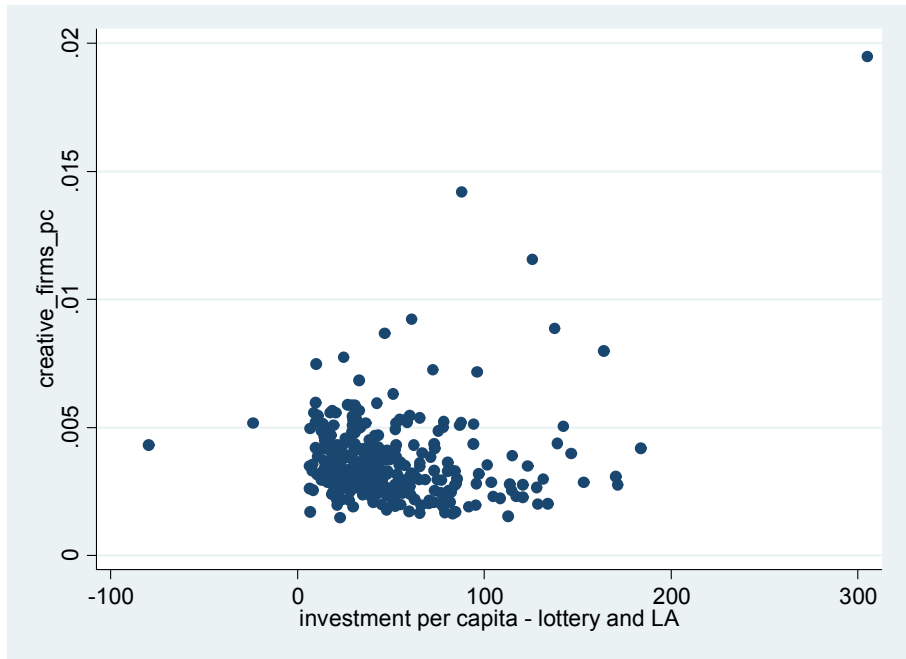


Source: NEF Consulting

The relationship remains once these two outliers are removed (see Figure 5), but is less strong at 0.18, although lottery CS&H investment per capita is still reasonably well correlated at 0.44 – compared to minus 0.16 for local authority CS&H investment (the latter suggesting a negative relationship).

**Figure 5: Correlation between number of creative industries firms per capita and Lottery CS&H investment, by local authority (excluding Isles of Scilly and City of London)**



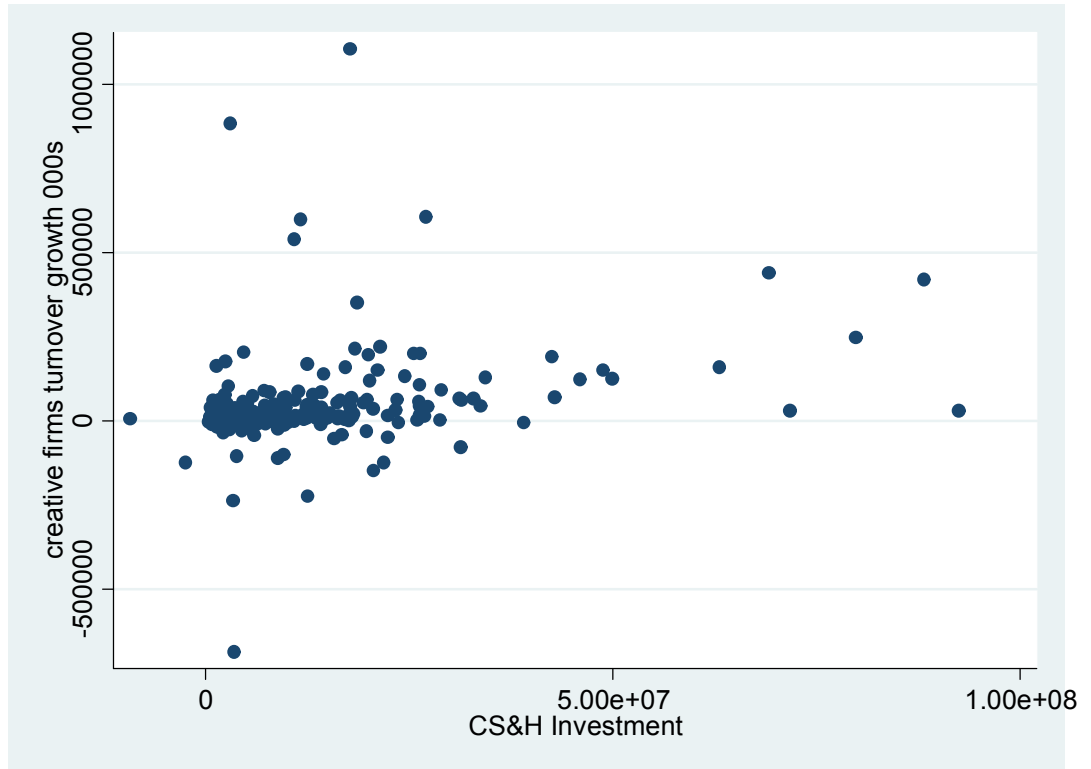


Source: NEF Consulting

The relationship between the total number of firms and CS&H investment, is stronger than the relationship between CS&H investment and creative industries firms. This is reflected in the location quotient variable, which measures the relative concentration of creative firms in a local authority compared to the national context – higher CS&H current and lagged investment is associated with a lower concentration of creative firms, although this relationship is weak.

As investment is a flow variable, it makes sense to consider the relationship between it and other flow variables. Turnover growth rate was found to also have a weak positive relationship with investment (see Figure 6). Creative industries firms’ turnover growth is more strongly correlated with CS&H investment than turnover growth among all firms: creative industries firms’ turnover growth and investment have a correlation coefficient of 0.3, whereas all firms’ turnover growth and investment have a correlation coefficient of 0.04.

**Figure 6: Correlation between turnover growth in creative industries firms and CS&H investment, by local authority**



Source: NEF Consulting

Lagged investment was also tested, and yielded very similar correlations as investment – nearly identical for the one year lag, with slightly weaker relationships for the later year lags.

Results for correlations between the same variables in 2006 were broadly similar to results from 2013 (2006 was chosen as a comparator year so that considerations around the financial crisis did not have to be taken into account). The only large difference between the two years was the relationship between net migration of creative firms and CS&H investment, which was weakly negative in 2013 (-0.38) and weakly positive in 2006 (0.27).

All investment data is public investment. It would be useful to be able to test data including private investment, though data limitations prevent this.

**Table 11: Selected correlations between CS&H assets and economic indicators, 2013**

	Total number of firms	Total turnover of all firms	Number of creative industries firms	Creative industries firms per capita	Creative industries firms LQ	Net migration of creative industries firms	Turnover of creative industries firms
Total number of CS&H assets	0.1	-0.03	0.03	-0.04	-0.05	0.19	-0.11
CS&H assets density	0.02	0.06	0.12	0.08	0.13	-0.09	0.12
Number of Heritage assets	0.31	0.06	0.22	-0.02	-0.07	0.12	0.05
Number of sports assets	0.61	0.1	0.39	-0.14	-0.16	-0.02	0.07

Sports assets density	-0.19	0.11	-0.24	0.57	0.16	0.14	-0.22
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Source: NEF Consulting

There were few correlations between CS&H assets and local economic indicators. However, this may be due to quality of available data. Data on CS&H assets were only available for the current year, but economic indicators were from previous years – so essentially these correlations are testing, for example, whether the number of creative firms, etc. from two years ago is related to cultural assets now.

Note that the regressions to be used for the econometric analysis are panel data regressions, whereas the correlation analysis is ‘static’ (looking at correlation for one year at a time). It may thus be that panel data regressions will yield somewhat different results and are consequently worth undertaking.

## 8.2 Conclusions

Not all relationships are worth testing econometrically. Most notably, given the quality of existing data and the absence of longitudinal information, testing the relationship between CS&H assets and any variables linked to local economic performance is unlikely to yield meaningful results..

Investment in CS&H (and associated variables, such as growth rate of CS&H investment, etc.) is positively correlated with numerous indicators, such as turnover of creative (and other) firms, turnover growth rates and, for some years, net firm migration. The econometric analysis should thus focus primarily on these variables.

More granular analysis may need to be undertaken. For example, we have run preliminary estimations both at a regional scale and by distinguishing between local authorities which are predominantly urban and those which are predominantly rural. A more granular analysis may show different correlations. In London’s local authorities, for example, the correlation between CS&H investment and various creative industries indicators appear extremely strong. The question is whether this holds when considering all major English urban centres. Preliminary analysis shows this may be the case. On the other hand, in predominantly rural areas, investment in CS&H may not provide sufficient incentives for firms to stay, expand, or migrate in those areas (due to other factors at play). A more granular analysis would provide answers to these hypotheses.

## 9: Appendix IV – Data review

A detailed review of data sources which identify CS&H assets and investments, and/or which might provide dependent variables for the analysis was undertaken to inform the study. This focused initially on assets and investments, but also considered other indicators. The data sources reviewed include freely available data, mainly provided by public bodies, as well as commercial datasets.

Data sources reviewed in relation to assets and investment are set out in Table 12 below.

**Table 12: Assets and investment datasets reviewed**

<b>Assets/infrastructure:</b>	<b>Investment:</b>
<ul style="list-style-type: none"> <li>• Inter-Departmental Business Database (IDBR) / Business Structures Database (BSD)</li> <li>• TCR (longitudinal database of UK businesses, owned by TBR)</li> <li>• Experian National Business Data</li> <li>• Yellow Pages</li> <li>• FAME</li> <li>• Market Location</li> <li>• Active Places Power</li> <li>• Culture24</li> <li>• ArchSearch</li> <li>• National Record of the Historic Environment</li> <li>• National Heritage List for England</li> <li>• Natural England GIS Digital Boundary Datasets</li> <li>• UK Public Library Dataset</li> <li>• Culture Grid</li> <li>• PointX</li> <li>• Points of Interest</li> </ul>	<ul style="list-style-type: none"> <li>• Local authority revenue expenditure</li> <li>• Local authority capital expenditure</li> <li>• National English Heritage Grants</li> <li>• Heritage Lottery Fund – 20 years in 12 places</li> <li>• Heritage Lottery Fund – Grants research</li> <li>• Churches Conservation Trust</li> <li>• Listed Places of Worship Grant Scheme</li> <li>• National Heritage Memorial Fund</li> <li>• DCMS Arms Length Bodies funding</li> <li>• Rural Development programme budget</li> <li>• Rural Development programme budget</li> <li>• CAP Payments</li> <li>• Science and Heritage Programme</li> <li>• Gateway to Research (GtR)</li> <li>• CIPFA data</li> </ul>

<ul style="list-style-type: none"> <li>• OSMasterMap</li> <li>• OpenStreetMap</li> <li>• POIplaza</li> <li>• Points of Interest Northern Ireland, Isle of Man, Channel Islands</li> <li>• OpenPOIS</li> <li>• GPS POI data</li> </ul>	
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## 9.1 Assets

The data review did not identify a single source which provides comprehensive coverage of all CS&H assets. A number of datasets are available which appear to ‘definitively’ identify assets in a particular category – culture, sport or heritage – but not all three. While this means the analysis might potentially examine the impacts of each type of asset separately, in order to test the impact of the CS&H offer as a whole it is necessary to collate data from a number of different sources.

In the absence of detailed local knowledge of all the places to be examined in the analysis it is, of course, difficult to judge the comprehensiveness of many of the data sources reviewed. At the national level, this is impossible. Where they relate to assets which receive public funding, or which are managed by public bodies, we can generally expect coverage of data sources to be comprehensive (within the definitions of the dataset). Other data sources may vary in their coverage, especially where data is supplied by individual organisations which own or manage the assets themselves (as in the case of the Culture24 website/dataset). There may also be spatial variation in comprehensiveness – that is, a single source may provide comprehensive coverage of the assets in one place, while coverage may be patchy in another.

Commercial datasets (e.g. point of interest data) are likely to provide the broadest coverage (that is, include a broad range of CS&H assets) but are hardest to judge in terms of comprehensiveness without arranging access to the data and comparing with the available public data. There is also a cost implication to the use of commercial datasets which needs to be considered, of course.

Identifying the places in which CS&H assets are located is generally straightforward – the data sources reviewed include postcodes, grid references or both. This means that assets can be georeferenced at detailed spatial levels, and other indicators used in the analysis are more likely to determine the spatial level at which CS&H impacts can be tested. However, it should be noted that our experience of some sources available from public bodies shows that georeferencing variables are not always fully populated or accurate. This points to a wider need to validate the sources used.

Time-series data on CS&H assets is not readily available. Many data sources provide a recent snapshot of assets, without historical comparisons. In some cases, time series might be constructed by comparing historical versions of the datasets. In many cases, however, historical datasets are not available – this is particularly the case where data is sourced from a continuously updated database or from a commercial supplier.

Data on the value of CS&H assets is not readily available. Value indicators may be available on a case-study basis, though collating this data would require extensive desk research and is unlikely to provide a consistent picture across either the range of CS&H assets or the places examined. It may be possible to match data sources in order to identify the economic value of commercial assets (e.g. turnover, GVA or output). However, the definition of 'value' needs to be considered and agreed – it may be that value is better defined in terms of usage or public perception/satisfaction, rather than in purely economic terms. One or more proxy indicators of value may need to be defined and suitable sources identified.

It must also be recognised that examining stocks *and* flows, in terms of assets and investments (discussed below) will add value to the analysis. The key implication is that longitudinal data would be required to examine flows.

Also, the measurement of the existence of an asset (at one or more points in time) is 'easier' than measuring quality, given the nature of available data.

## 9.2 Investment

Data on investment in CS&H assets – and in particular, data on private investment – is less readily available than data relating to the type or location of assets themselves. As with data on value, investment data (including private investment) may be available on a case-study basis, though again collating this would require extensive desk research and is unlikely to provide a consistent picture across the range of CS&H assets or the places examined.

Where it is available, investment data is often not specific to individual assets but is only available at aggregate levels. The availability of investment data was a key factor in determining the spatial level at which CS&H impacts could be tested in this study. The most consistent source of investment data is on local authority expenditure, which would not allow analysis at spatial levels below local authority boundaries.

It may be possible to use proxy indicators for investment. At the broadest level, for example, an increase in the number of CS&H assets in a place would imply investment in the CS&H infrastructure. However, the extent of investment is likely to be difficult to measure by proxy, and the suitability of proxy indicators needs further consideration.

## 9.3 Dependent variables

A wide range of data sources is available which can provide dependent variables (and control variables) for the analysis. These include data on business infrastructure and performance (including the Inter-Departmental Business Register as well as commercial datasets), demography, labour market indicators, indicators relating to quality of life and well-being, and indicators relating to the local infrastructure. In most cases, data is freely available. In a few cases (e.g. availability and cost of business premises) the use of commercial datasets is needed.

Data is available at various spatial levels, depending on the specific indicator and the source used. Data on business infrastructure and performance and data on demography is generally available at detailed spatial levels (though in the case of demography, time-series data at fine resolution is only available from the



Census and therefore covers change over ten-year periods). Other data may only be available at local authority level and not for smaller geographies.

## 9.4 Conclusions

Identifying the CS&H assets in a place is relatively straightforward, though a comprehensive picture needs to be collated from a number of different data sources. Identifying changes in the number, type and quality of assets is more difficult. Similarly, developing a comprehensive picture of investment in CS&H assets is also difficult. Data availability was taken to determine the specification for analysis.

A range of indicators is available to examine the impacts of CS&H assets and investment. The available data will also allow impacts to be tested at a range of spatial levels, though generally not robustly below local authority level. The specific indicators to be used as dependent and control variables were defined in line with the specification for analysis.

The ecosystem presented in section 2.3.3 (p.13) highlights some of the theoretical impacts of CS&H assets/investments. This study presented an opportunity to test a variety of these potential impacts to understand where relationships do and do not exist and then to focus in on strong relationships in order to understand how they are generated. In some cases, however, specific indicators were not available. This is the case, for example, in relation to independent and dependent variables relating to quality or value (e.g. the quality of the CS&H offer). Where the data review identified a gap in the available data, a suitable proxy was sought. However, the analysis was driven by available data.

It was recognised that the process of reviewing data sources and developing a specification for the analysis should be an iterative one, with each informing the other. A data specification which describes the indicators to be used in the analysis and the sources from which they are drawn was developed as the study progressed. Details of the dataset used in the analysis can be found in section 11: (p.102).

# 10: Appendix V – Sector definitions

This section provides Standard Industrial Classification definitions for the four sectors tested in the analysis: creative industries, knowledge industries, tourism and professional services.

## 10.1 Creative Industries

Analysis is based on the DCMS definition of the Creative Industries<sup>40</sup>. Tier 1 is the standard definition used unless specified otherwise. Tier 2 and 3 industries were successively added to test the robustness of the analysis.

SIC07	Description	Tier
32120	Manufacture of jewellery and related articles	1
32300	Manufacture of sports goods	1
58110	Book publishing	1
58120	Publishing of directories and mailing lists	1
58130	Publishing of newspapers	1
58141	Publishing of learned journals	1
58142	Publishing of consumer and business journals and periodicals	1
58190	Other publishing activities	1
58210	Publishing of computer games	1
58290	Other software publishing	1
59111	Motion picture production activities	1
59112	Video production activities	1
59113	Television programme production activities	1
59120	Motion picture, video and television programme post-production activities	1
59131	Motion picture distribution activities	1
59132	Video distribution activities	1
59133	Television programme distribution activities	1
59140	Motion picture projection activities	1
59200	Sound recording and music publishing activities	1
60100	Radio broadcasting	1
60200	Television programming and broadcasting activities	1
62011	Ready-made interactive leisure and entertainment software development	1
62012	Business and domestic software development	1
62020	Computer consultancy activities	1
70210	Public relations and communications activities	1
71111	Architectural activities	1
71112	Urban planning and landscape architectural activities	1

<sup>40</sup> <https://www.gov.uk/government/statistics/creative-industries-economic-estimates-january-2015>

<b>SIC07</b>	<b>Description</b>	<b>Tier</b>
73110	Advertising agencies	1
73120	Media representation services	1
74100	specialised design activities	1
74201	Portrait photographic activities	1
74202	Other specialist photography (not including portrait photography)	1
74203	Film processing	1
74209	Photographic activities not elsewhere classified	1
74300	Translation and interpretation activities	1
85510	Sports and recreation education	1
85520	Cultural education	1
90010	Performing arts	1
90020	Support activities to performing arts	1
90030	Artistic creation	1
90040	Operation of arts facilities	1
91011	Library activities	1
91012	Archives activities	1
91020	Museums activities	1
93110	Operation of sports facilities	1
93120	Activities of sport clubs	1
93130	Fitness facilities	1
93191	Activities of racehorse owners	1
93199	Other sports activities	1
18110	Printing of newspapers	2
18201	Reproduction of sound recording	2
18202	Reproduction of video recording	2
18203	Reproduction of computer media	2
23410	Manufacture of ceramic household and ornamental articles	2
31090	Manufacture of other furniture	3
32200	Manufacture of musical instruments	2
46491	Wholesale of musical instruments	2
47781	Retail sale in commercial art galleries	3
47791	Retail sale of antiques including antique books in stores	3
78101	Motion picture, television and other theatrical casting activities	2
91030	Operation of historical sites and buildings and similar visitor attractions	2
91040	Botanical and zoological gardens and nature reserves activities	2
95240	Repair of furniture and home furnishings	2

## 10.2 Knowledge Industries

Analysis is based on the OECD definition of the Knowledge Industries<sup>41</sup>, updated from SIC 2003<sup>42</sup> to SIC 2007 using conversion tables from ONS<sup>43</sup>.

SIC03	Description
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
221	Publishing
724	Data base activities
722	Software consultancy and supply
724	Data base activities
921	Motion picture and video activities
922	Radio and television activities
221	Publishing
724	Data base activities
748	Miscellaneous business activities not elsewhere classified
921	Motion picture and video activities
922	Radio and television activities
642	Telecommunications
922	Radio and television activities
642	Telecommunications
922	Radio and television activities
642	Telecommunications
642	Telecommunications
642	Telecommunications
642	Telecommunications
721	Hardware consultancy
722	Software consultancy and supply
723	Data processing
724	Data base activities
726	Other computer related activities
723	Data processing
724	Data base activities
748	Miscellaneous business activities not elsewhere classified
924	News agency activities
651	Monetary intermediation
652	Other financial intermediation

<sup>41</sup> <http://www.oecd.org/science/sci-tech/2087188.pdf>

<sup>42</sup> <http://www.futureoflondon.org.uk/futureoflondon/wp-content/uploads/downloads/2011/10/Future-of-London-Knowledge-Economy.pdf>

<sup>43</sup> <https://www.ons.gov.uk/methodology/classificationsandstandards/ukstandardindustrialclassificationofeconomicactivities/uksic2007>

SIC03	Description
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
652	Other financial intermediation
652	Other financial intermediation
660	Insurance and pension funding, except compulsory social security
660	Insurance and pension funding, except compulsory social security
660	Insurance and pension funding, except compulsory social security
671	Activities auxiliary to financial intermediation, except insurance and pension funding
672	Activities auxiliary to insurance and pension funding
671	Activities auxiliary to financial intermediation, except insurance and pension funding
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
742	Architectural and engineering activities and related technical consultancy
743	Technical testing and analysis
731	Research and experimental development on natural sciences and engineering
731	Research and experimental development on natural sciences and engineering
732	Research and experimental development on social sciences and humanities
744	Advertising
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
748	Miscellaneous business activities not elsewhere classified
748	Miscellaneous business activities not elsewhere classified
924	News agency activities
748	Miscellaneous business activities not elsewhere classified
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
742	Architectural and engineering activities and related technical consultancy
748	Miscellaneous business activities not elsewhere classified
852	Veterinary activities
748	Miscellaneous business activities not elsewhere classified
745	Labour recruitment and provision of personnel
745	Labour recruitment and provision of personnel
745	Labour recruitment and provision of personnel
923	Other entertainment activities
748	Miscellaneous business activities not elsewhere classified
751	Administration of the State and the economic and social policy of the community
748	Miscellaneous business activities not elsewhere classified
748	Miscellaneous business activities not elsewhere classified
748	Miscellaneous business activities not elsewhere classified
748	Miscellaneous business activities not elsewhere classified
751	Administration of the State and the economic and social policy of the community

<b>SIC03</b>	<b>Description</b>
752	Provision of services to the community as a whole
801	Primary education
801	Primary education
802	Secondary Education
804	Adult and other education
803	Higher education
804	Adult and other education
923	Other entertainment activities
741	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
851	Human health activities
851	Human health activities
851	Human health activities
851	Human health activities
851	Human health activities
851	Human health activities
851	Human health activities
923	Other entertainment activities
924	News agency activities
751	Administration of the State and the economic and social policy of the community
925	Library, archives, museums and other cultural activities
923	Other entertainment activities



## 10.3 Tourism

Analysis uses the UN World Tourism Organisation definition, as set out by the ONS Tourism Intelligence Unit<sup>44</sup>.

SIC07	Description
55100	Hotels and similar accommodation
55202	Youth hostels
55300	Recreational vehicle parks, trailer parks and camping grounds
55201	Holiday centres and villages
55209	Other holiday and other collective accommodation
55900	Other accommodation
56101	Licensed restaurants
56102	Unlicensed restaurants and cafes
56103	Take-away food shops and mobile food stands
56290	Other food services
56210	Event catering activities
56301	Licensed clubs
56302	Public houses and bars
49100	Passenger rail transport, interurban
49320	Taxi operation
49390	Other passenger land transport
50100	Sea and coastal passenger water transport
50300	Inland passenger water transport
51101	Scheduled passenger air transport
51102	Non-scheduled passenger air transport
77110	Renting and leasing of cars and light motor vehicles
77341	Renting and leasing of passenger water transport equipment
77351	Renting and leasing of passenger air transport equipment
79110	Travel agency activities
79120	Tour operator activities
79901	Activities of tourist guides
79909	Other reservation service activities n.e.c.
90010	Performing arts
90020	Support activities to performing arts
90030	Artistic creation
90040	Operation of arts facilities
91020	Museums activities
91030	Operation of historical sites and buildings and similar visitor attractions
91040	Botanical and zoological gardens and nature reserves activities

<sup>44</sup> <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/economic-value-of-tourism/measuring-tourism-locally/2012/note-1/measuring-tourism-locally-v2-2012-guidance-note-1--definitions-of-tourism-.pdf>

<b>SIC07</b>	<b>Description</b>
92000	Gambling and betting activities
93110	Operation of sports facilities
93199	Other sports activities
93210	Activities of amusement parks and theme parks
93290	Other amusement and recreation activities n.e.c.
77210	Renting and leasing of recreational and sports goods
82301	Activities of exhibition and fair organisers
82302	Activities of conference organisers
68202	Letting and operating of conference and exhibition centres

### 10.3.2 Professional Services

Analysis uses the Department for Business, Innovation & Skills definition<sup>45</sup>.

<b>SIC</b>	<b>Description</b>
69	Legal and accounting activities
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities; technical testing and analysis
72	Scientific research and development
73	Advertising and market research
74	Other professional, scientific and technical activities
77	Rental and leasing activities
78	Employment activities
82	Office administrative, office support and other business support activities

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<sup>45</sup> <https://www.gov.uk/government/publications/growth-is-our-business-professional-and-business-services-strategy>

# 11: Appendix VI – Data sources and details of variables

Variable	Definition and source
<b><u>Dependent variables</u></b>	
Firm density	Number of live firms per capita in each local authority. Data from TBR's Trends Central Resource.
Turnover per capita	Turnover in all live firms per capita in each local authority. Data from TBR's Trends Central Resource.
Net firm gain per capita	Total number of firm births and firms migrating inward less the number of firm deaths and firms migrating outward per capita per year in each local authority. Data from TBR's Trends Central Resource.
Location quotient of creative firms	The location quotient is an indicator of the specialised clustering of an industry. The location quotient of creative firms in a local authority is the ratio of the number creative firms in the local authority to nationally, divided by the ratio of total firms in the local authority compared to nationally. Data from TBR's Trends Central Resource.
<b><u>Assets</u></b>	
Heritage assets	Heritage assets is a compound measure of the number of scheduled monuments and listed buildings of grades I and II, protected wrecks and registered parks, gardens and battlefields in a local authority. Data from Natural Heritage List for England. This data was not available as time series.
Sports assets	Sports assets measures the availability of community sport in an area. It is the number of active places listed on the Active Places Power website ( <a href="https://www.activeplacespower.com/">https://www.activeplacespower.com/</a> ) in each local authority. Data was available from 2009 to 2015.
Cultural events	Cultural events are measured by cultural listings on the Culture24 website, a government funded website ( <a href="http://www.culture24.org.uk/home">http://www.culture24.org.uk/home</a> ) which provides event listings from UK museums, art galleries and heritage sites. Data was not available as a time

series.

Libraries

The number of libraries per local authority, taken from the UK Public Libraries Contacts database.

<b>Investment</b>	
Local authority investment in culture, sports and heritage	The sum of various types of local authority expenditure in a local authority in a year. Spending categories included: archives, heritage, museums and galleries, arts development and support, theatres and public entertainment, community centres, foreshore, sports development and community recreation, sports and recreation facilities including golf course, open spaces, tourism, and library services. Data from DCLG local authority revenue expenditure and financing, and all figures take the net total expenditure, i.e. the sum of net current and capital (net of fees and income), including expenditure on fixed assets.
Lottery investment in arts, sports and heritage	The sum of lottery investment in arts, sports and heritage in the local authority. Data is from the Heritage Lottery Fund, Arts Council England and Sport England.
<b>Additional push/pull factors or control variables</b>	
Employment rate	The estimated proportion of employed individuals, taken from the Annual Population Survey.
Skilled labour proportion	The proportion of employed workers at high skill level – skill level 4 (SOC 11, 21, 22, 23, 24) – in the Annual Population Survey.
Housing density	Housing density was calculated by determining the number of households per hectare in a local authority. Data is based on Census estimates (available for 2001 and 2011).
Network infrastructure	Network infrastructure is the percentage availability of Super Fast Broadband (SFBB) in premises in each local authority. Data from OFCOM networks data, and is not available in time series.
Transport infrastructure	Transport infrastructure is measured by the number of rail station stops in each local authority. Data from the National Public Transport Access Nodes dataset.
Life satisfaction	Two well-being proxy indicators were selected, on the basis of availability and quality. The first was the Life Satisfaction Index, collected by ONS, which is however not available for the entire period 2003-2013. It was thus possible to use it for cross-sectional regressions, but not for the panel analysis (longitudinal analysis). The best proxy indicator we found for the panel data analysis was the average

	hours of physical activity undertaken weekly, and the percentage of the population being active on at least a weekly basis, taken from the Active People Survey.
Size of the market (population)	Population size in the local authority each year is used as a control variable. Data from the Annual Population Survey.
GVA	Data on GVA is not easily available at a local level. Therefore as a proxy for GVA, we used total compensation of employees from the Annual Survey of Hours and Earnings.
Competitiveness	<p>Competitiveness is a measure of the ability of a local authority to create value. It is a concept that encompasses multiple indicators. The analysis uses the Centre for International Competitiveness's <i>UK Competitiveness Index</i><sup>46</sup>, an integrated measure of competitiveness that includes:</p> <ul style="list-style-type: none"> <li>- Business start-up rates per 1000 inhabitants</li> <li>- Number of businesses per 1000 inhabitants</li> <li>- Proportion of knowledge-based businesses</li> <li>- Proportion of population with NVQ level 4+</li> <li>- GVA per head</li> <li>- Productivity (output per hour worked)</li> <li>- Employment rate</li> </ul> <p>As such, it overlaps with other variables used in the analysis. Therefore where it is used in the analysis, we do not variables represented in the index as separate controls. This was considered preferable as some of the variables within the Index (such as productivity) are not easily available at a local authority level. The Index is published every two years; where data was not available we interpolated results to estimate index values for the intervening years.</p>
Major urban centre	<p>An area is considered a major urban centre if it contains a population in a major conurbation according to the ONS (e.g. London, Birmingham, Greater Manchester).</p> <p>This variable is binary, and equal to 1 if the Local Authority contains a major urban centre; 0 otherwise.</p>

The gathered dataset also includes further variables not used in the final analysis (for example the Index of Multiple Deprivation) as well as detailed breakdowns of variables (such as local authority investment disaggregated), which will aid in future analysis.

<sup>46</sup> <http://www.cforic.org/pages/ukci2016.php>