The Cultural and Creative Cities Monitor

2017 Edition

The Cultural and Creative Cities Monitor. 2017 Edition

This first edition of the Cultural and Creative Cities Monitor shows how well 168 selected cities in 30 European countries perform on a range of measures describing the 'Cultural Vibrancy', the 'Creative Economy' and the 'Enabling Environment' of a city.

The Cultural and Creative Cities Monitor is designed to help national, regional and municipal policy makers identify local strengths and opportunities and benchmark their cities against similar urban centres using both quantitative and qualitative data. The Cultural and Creative Cities Monitor is thus an instrument to promote mutual exchange and learning between cities. For researchers, the pool of comparable data is expected to generate new questions and insights into the role of culture and creativity in cities' social and economic wellbeing.

The Cultural and Creative Cities Monitor supports the European Commission's efforts to put culture at the heart of its policy agenda. It provides a common evidence base at city level that illuminates the importance of culture and creativity and their contribution to improving socio-economic perspectives and resilience.

The Cultural and Creative Cities Monitor

2017 Edition

https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

Contents

Boxes, figures and tables

Disclaimer

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Foreword by Commissioner Navracsics

Culture nurtures our souls and binds our communities together, while creativity helps reveal new answers to the challenges we face. Industries built on creativity and culture are also a source of great economic value and contribute to societal well-being.

Culture must therefore be at the heart of European policy making. Sound policies are needed to promote cultural diversity, protect cultural heritage and support the contribution of cultural and creative industries to boosting jobs and growth. However, sound policy making requires a good evidence base. That culture and creativity are valuable to societies has long been assumed, but the specific evidence is often lacking or heavily contested.

Of course, it is difficult – indeed impossible – to fully capture the value of culture. It is something quintessentially human which cannot be reduced to numbers and statistics. Yet, in order to convince policy makers that culture and creativity are a strategic resource worthy of support, we must be able to demonstrate their positive impact on people's everyday lives – and with three quarters of Europeans living in cities, it is the city level that we should be looking at.

It is therefore very fortunate that President Juncker gave me responsibility, not just for the Directorate General for Education and Culture (DG EAC), but also for the Commission's Science and Knowledge Service, the Joint Research Centre (JRC). The JRC, over the years, has built up an exceptional knowledge base in territorial development and urban policies, as well as in the field of indicators and benchmarking. Combining this with DG EAC's policy knowledge has allowed us to construct a common evidence base at city level that illuminates the importance of culture and creativity.

The Cultural and Creative Cities Monitor is the result of this effort. It is designed to help cities identify their strengths and opportunities, benchmark their performance and push for policies to close gaps. Its vast pool of comparable data could lead to new insights into the impact of culture and creativity on cities' well-being and provide a toolbox for engaged citizens to develop new ideas and projects.

 Moreover, with a wealth of qualitative data on culture in cities and plans for a mobile app aimed at crowd-sourcing data, it provides a chance to discover the hidden cultural and creative resources of some of Europe's finest cities. And by offering a tool for citizens to share their local pride and discover the ties that bind them to their local cultural capital, it can contribute to a more liveable future based on local values and specificities.

Acknowledgements

Lexicon

The **Academic Ranking of World Universities (ARWU)**, also known as Shanghai Ranking, is an annual publication of university rankings by the Shanghai Ranking Consultancy. The publication currently includes overall world rankings and subject league tables, alongside the independent regional Greater China Ranking and Macedonian Higher Education Institutions (HEIs) Ranking.
http://www.shanghairanking.com/

The **Budget allocation method** is a method whereby experts are given a budget of N points, to be distributed over a number of indicators (or dimensions), allocating more to those indicators whose importance they wish to stress. The budget allocation method can be divided into four different phases: (a) selection of experts for the evaluation; (b) allocation of budget to the indicators; (c) calculation of the weights; (d) iteration of the budget allocation until convergence is reached (optional).
https://composite-indicators.jrc.ec.europa.eu/?q=10-step-guide/step-6-weighting

A **City** is a local administrative unit (LAU) where the majority of the population live in an urban centre of at least 50,000 inhabitants.
http://ec.europa.eu/eurostat/web/cities/spatial-units

The **Cultural and creative sectors (CCS)** include all sectors in which activities are based on cultural values and/or artistic and other forms of creative expression. They include architecture, archives, libraries and museums, artistic crafts, audiovisual (including film, television, video games and multimedia), tangible and intangible cultural heritage, design, festivals, music, literature, performing arts, publishing, radio and visual arts.
http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013R1295&from=EN

Cultural employment includes all individuals working in a culture-related economic activity (NACE Rev. 2 classification – see definition of 'NACE') regardless of their occupation, as well as all individuals with a culture-related occupation (ISCO-08 classification – see definition of 'ISCO') whatever the economic activity they are employed in. This means that cultural employment statistics include the culture-related occupations (such as writers, architects, musicians, journalists, actors, dancers, librarians, handicraft workers and graphic designers) whatever the sector they work in, and all individuals working in a culture-related economic activity (namely book publishing, publishing of newspapers, publishing of journals and periodicals, publishing of computer games, motion picture, video and television programme production, sound recording and music publishing activities, programming and broadcasting activities, news agency activities, architectural activities, specialised design activities, cultural education, creative, arts and entertainment activities, libraries, archives, museums and other cultural activities).
http://ec.europa.eu/eurostat/web/culture/cultural-employment

The **European Capital of Culture** (ECoC) programme, which was launched in 1985, is now regarded as the most prestigious and popular European cultural initiative. Winning cities invest a budget of around 60 million euros, on average, to build up the ECoC programme of events, not counting the budget for the infrastructural works that are carried out to prepare the city to host the event.

The current and future ECoCs are:

- 2017 – Aarhus (Denmark) and Pafos (Cyprus)
- 2018 – Leeuwarden (Netherlands) and Valetta (Malta)
- 2019 – Plovdiv (Bulgaria) and Matera (Italy)
- 2020 – Rijeka (Croatia) and Galway (Ireland)

Europe for Festivals, Festivals for Europe (EFFE) is an online platform for the 760 festivals across Europe that have received the EFFE Label since the launch of the initiative in 2014. This is a quality label awarded to European festivals meeting three criteria: artistic commitment, involvement in their local communities and a European and global outlook. The label has been awarded to many different types of festivals, some of which are already well known, such as the Edinburgh International Festival, which has been running for 70 years, the EFG London Jazz Festival, which has taken place since 1993, the Sibiu International Theatre Festival, the most important festival of performing arts in Romania, active since 1993, or MITO Settembre Musica, taking place in Milan and Turin since 2007. EFFE is a result of many years of intense collaboration between the European Festivals Association (EFA), the European Commission and the European Parliament. The EFFE Platform is the result of a response to a call for projects launched by the European Commission and the European Parliament. The European Commission has now given the EFA the mandate to set up a new, long-term implementing organisation for this project.

Gross Domestic Product in Purchasing Power Standards (GDP in PPS) is GDP converted into purchasing power standards, an artificial currency unit used for international comparisons. http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Gross_domestic_product_(GDP)_in_purchasing_power_standards

The **International Standard Classification of Occupations (ISCO)** is the classification structure set up by the International Labour Organization (ILO) for organising information on labour and jobs. It is part of the international family of economic and social classifications of the United Nations. The current version, known as ISCO-08, was published in 2008 and is the fourth iteration, following ISCO-58, ISCO-68 and ISCO-88. http://www.ilo.org/public/english/bureau/stat/isco/index.htm

The CWTS **Leiden Ranking** is an annual global university ranking based exclusively on bibliometric indicators. The rankings are compiled by the Centre for Science and Technology Studies at Leiden University in the Netherlands. Multiple rankings are released according to various bibliometric normalisation and impact indicators, including the number of publications, citations per publication, and field-normalised impact per publication. The Leiden Ranking also ranks universities by scientific collaboration, including collaboration with other institutions and collaboration with industry partners. http://www.leidenranking.com/

Metro regions are NUTS 3 regions (see below) or groupings of NUTS 3 regions representing all functional urban areas of more than 250,000 inhabitants. http://ec.europa.eu/eurostat/web/metropolitan-regions/overview

NACE is the statistical classification of economic activities in the European Union (EU). NACE is a four-digit classification providing the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics (e.g. production, employment and national accounts) and in other statistical domains developed within the European statistical system (ESS). NACE Rev. 2, a revised classification, was adopted at the end of 2006 and applied from 2007 onwards. http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Statistical_classification_of_economic_activities_in_the_European_Community_(NACE)

The **Nomenclature of territorial units for statistics**, abbreviated **NUTS** (from the French version Nomenclature des Unités territoriales statistiques), is a geographical nomenclature subdividing the economic territory of the European Union (EU) into regions at three levels (NUTS 1, 2 and 3, moving from larger to smaller territorial units). Above NUTS 1 is the national level of the Member States. http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Nomenclature_of_territorial_units_for_statistics_(NUTS)

The **Quacquarelli Symonds (QS) World University Rankings** is an annual publication of university rankings by Quacquarelli Symonds, a British company specialising in education. It was previously known as THE-QS World University Rankings. The QS system comprises global overall and subject-based rankings (naming the world's top universities in 46 subjects and five composite faculty areas), alongside five independent regional tables (for Asia, Latin America, Emerging Europe and Central Asia, the Arab Region, and BRICS: Brazil, Russia, India, China and South Africa).
https://www.topuniversities.com/university-rankings

The **Times Higher Education World University Rankings** is an annual publication of university rankings by Times Higher Education (THE) magazine. The publication comprises the world's overall, subject and reputation rankings, alongside three regional league tables for Asia, Latin America, and BRICS & Emerging Economies.
https://www.timeshighereducation.com/world-university-rankings

The **UNESCO Creative Cities Network (UCCN)** was set up in 2004 to promote cooperation with and among cities that have identified creativity as a strategic factor for sustainable urban development.

By joining the Network, which today counts 116 partner cities across the globe, cities commit to sharing best practice and developing public-private partnerships as well as partnerships with civil society in order to: strengthen the creation, production, distribution and dissemination of cultural activities, goods and services; develop hubs of creativity and innovation; broaden opportunities for creators and cultural professionals; improve access to and participation in cultural life; and fully integrate culture and creativity into sustainable development plans.

Cities compete for the title of UCC in one of the following seven creative fields: Crafts and Folk Arts, Media Arts, Film, Design, Gastronomy, Literature and Music.

44 European cities have been awarded the title to date (2017):

- Barcelona (ES) – Literature
- Bergen (NO) – Gastronomy
- Berlin (DE) – Design
- Bilbao (ES) – Design
- Bologna (IT) – Music
- Bradford (UK) – Film
- Budapest (HU) – Design
- Burgos (ES) – Gastronomy
- Dénia (ES) – Gastronomy
- Dublin (IE) – Literature
- Dundee (IE) – Design
- Edinburgh – (UK) – Literature
- Enghien-les-Bains (FR) – Media Arts
- Fabriano (IT) – Crafts and Folk Art
- Galway (IE) – Film
- Ghent (BE) – Music
- Glasgow (UK) – Music
- Granada (ES) – Literature
- Graz (AT) – Design
- Hanover (DE) Music
- Heidelberg (DE) – Literature
- Helsinki (FI) – Design
- Idanha-a-Nova (PT) – Music
- Katowice (PL) – Music
- Kaunas (LT) – Design
- Krakow (PL) – Literature
- Linz (AT) – Media Arts
- Liverpool (UK) – Music
- Ljubljana (SI) – Literature
- Lyon (FR) – Media Arts
- Mannheim (DE) – Music
- Norwich (UK) – Literature
- Nottingham (UK) – Literature
- Óbidos (PT) – Literature
- Östersund (SE) – Gastronomy
- Parma (IT) – Gastronomy
- Prague (CZ) – Gastronomy
- Rome (IT) – Film
- Saint-Étienne (FR) – Design
- Seville (ES) – Music
- Sofia (BG) – Film
- Tartu (EE) – Literature
- Turin (IT) – Design
- York (UK) – Media Arts

http://en.unesco.org/creative-cities/home

The **Urban Audit** data collection system provides information on different aspects of the quality of urban life in Europe's cities. The Urban Audit is the result of a joint effort by the participating cities, the statistical offices belonging to the European statistical system (ESS) and the European Commission's Directorate-General for Regional and Urban Policy. http://ec.europa.eu/eurostat/web/cities

Country names and geographic groupings

- **AT**: Austria
- **BE**: Belgium
- **BG**: Bulgaria
- **CY**: Cyprus
- **CZ**: Czech Republic
- **DK**: Denmark
- **DE**: Germany
- **EE**: Estonia
- **FI:** Finland
- **HU**: Hungary
- **IE**: Ireland
- **EL**: Greece
- **ES**: Spain
- **FR**: France
- **HR**: Croatia

- **IT**: Italy
- **LV**: Latvia
- **LT**: Lithuania
- **LU**: Luxembourg
- **MT**: Malta
- **NL**: Netherlands
- **PL**: Poland
- **PT**: Portugal
- **RO**: Romania
- **SI**: Slovenia
- **SK**: Slovakia
- **SE**: Sweden
- **UK**: United Kingdom
- **NO**: Norway
- **CH**: Switzerland

Central/Eastern Europe: Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia.
Northern Europe: Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Sweden, UK.
Southern Europe: Croatia, Cyprus, Greece, Italy, Malta, Portugal, Spain.
Western Europe: Austria, Belgium, France, Germany, Luxembourg, Netherlands.
(Source: UNO classification of geographical sub-regions –
http://unstats.un.org/unsd/methods/m49/m49regin.htm).
Europe: EU-28, Norway and Switzerland.

Executive Summary

Introducing the Cultural and Creative Cities Monitor

The Cultural and Creative Cities Monitor is a new tool to monitor and assess the performance of **'Cultural and Creative Cities' in Europe** vis-à-vis their peers using both quantitative and qualitative data. This first edition covers **168 cities in 30 European countries** (the EU-28 with Norway and Switzerland).

> **168 Cultural and Creative Cities**
>
> - 93 European Capitals of Culture (ECoCs) (including shortlisted cities);
> - 22 UNESCO Creative Cities (UCCs);
> - 53 cities hosting international cultural festivals.

The 168 cities covered in this edition of the Cultural and Creative Cities Monitor were selected on the basis of their demonstrable engagement in the promotion of culture and creativity – being included in the Cultural and Creative Cities Monitor is thus in itself an acknowledgement of these cities' efforts in this domain.

The Cultural and Creative Cities Monitor's quantitative information is captured in **29 indicators** relevant to **nine dimensions** reflecting **three major facets** of cities' cultural, social and economic vitality (see Figure 1)[1]:

- **Cultural Vibrancy** measures the cultural 'pulse' of a city in terms of cultural infrastructure and participation in culture;
- **Creative Economy** captures how the cultural and creative sectors contribute to a city's employment, job creation and innovative capacity;
- **Enabling Environment** identifies the tangible and intangible assets that help cities attract creative talent and stimulate cultural engagement.

Figure 1.

The Cultural and Creative Cities Monitor's conceptual framework

Note: the dimension Creative & Knowledge-based Jobs has been assigned to 'Creative Economy' because it is more statistically related to this facet of a Cultural and Creative City. However, from a conceptual point of view, it relates to 'Cultural Vibrancy' as well because it captures the presence of cultural professionals, amongst other creative jobs. This is why the section on Creative & Knowledge-based Jobs in the figure is between 'Cultural Vibrancy' and 'Creative Economy'.

THE THREE DOMAINS AND NINE DIMENSIONS OF THE CULTURAL AND CREATIVE CITIES MONITOR

1. Cultural Vibrancy

D1.1 Cultural Venues & Facilities

Dimension 1.1 monitors the extent to which cities are 'culturally rich'. Cultural life is a key element in a place's quality of life and a 'soft location factor' to attract talent. Participation in cultural activities – see also Dimension 1.2 – increases people's connection to each other and to the place where they live, enhances their creative skills and improves their psychological well-being.

D1.2 Cultural Participation & Attractiveness

Dimension 1.2 is about cities' capacity to attract local, national and international audiences to participate in their cultural life. Participation is the 'raison d'être' of cultural amenities and facilities: they need a public to be meaningful. This is the most basic and yet crucial outcome that cities might expect as a result of their engagement in promoting arts and culture.

2. Creative Economy

D2.1 Creative & Knowledge-based Jobs

Dimension 2.1 measures the extent to which cities have access to a pool of highly qualified workers in three creative and knowledge-intensive fields which form the so-called 'cultural and creative sectors': arts, culture and entertainment; media and communication; and creative services such as advertising and fashion. Economists agree that creative and knowledge-based workers have an important role in both innovation and economic growth.

D2.2 Intellectual Property & Innovation

Dimension 2.2 assesses the extent to which a city is conducive to innovation. Cultural and creative sectors and professionals have stimulated and advanced the digital revolution. Cultural and artistic creativity have clearly contributed to the rapid evolution of new technologies and consumer electronic devices and facilitated their uptake with attractive content and user-friendly design.

D2.3 New Jobs in Creative Sectors

Dimension 2.3 is a proxy of how well a city is able to translate creative and innovative ideas into new jobs. This is measured in terms of jobs in newly created enterprises in the creative and knowledge-intensive sectors, as listed in Dimension 2.1.

3. Enabling Environment

D3.1 Human Capital & Education

Dimension 3.1 captures cities' access to talent in the form of human capital present in the city as well as the appeal of local universities, measured in terms of position in four international rankings. The presence of highly regarded universities is considered a crucial factor in attracting talent, while graduates in arts, humanities and ICT are important to a city's creative economy, its cultural dynamism and its capacity to support an innovative and sustainable society.

D3.2 Openness, Tolerance & Trust

Dimension 3.2 measures tolerance of diversity and mutual trust among inhabitants. Open-minded cities are better able to attract talent from different fields, welcome people from different cultures – including migrants and refugees – and facilitate the flow and translation of (new) ideas.

D3.3 Local & International Connections

Dimension 3.3 provides a measure of cities' connectedness via air, rail and road links. Connectedness is crucial for culture and creativity to develop as it enables the flow of visitors, talent, ideas and investments.

D3.4 Quality of Governance

Dimension 3.4 assesses the extent to which government delivers its policies in an effective and impartial way and without corruption. State support and fair regulatory systems, for example, are important conditions for culture and creativity to flourish.

The **qualitative component of the Cultural and Creative Cities Monitor** includes key facts and manifestations of cities' cultural and creative assets to illustrate and complement the quantitative evidence. These touch on features ranging from the main cultural sites, artistic institutions or live events to the development of policy strategies and infrastructure (e.g. funds, tax incentives, creative incubators, fab labs) that demonstrate a city's commitment to supporting culture and creativity. Some samples of qualitative information are offered in this report, with more comprehensive information available in the accompanying online version of the Monitor.

This **report** presents the policy context, methodology and main findings. In addition, an interactive **Cultural and Creative Cities Monitor Online**[2] allows users to browse the 168 selected cities and the quantitative and qualitative information about their performance. It also makes it possible to create a new city entry, by adding new data, and to compare it to selected cities in the Monitor; to adapt weights and produce customised rankings; and to simulate the impact of policy actions (e.g. increased city visitors) on the final scores, thus allowing users to build scenarios. **Infographics** with key results, **country fact sheets** providing easy benchmarking of cities within countries, **technical annexes** explaining in detail the methodology used to build the Cultural and Creative Cities Monitor, and **data tables** for additional analysis are also available for download from the Cultural and Creative Cities Monitor Online.

Why a Cultural and Creative Cities Monitor?

Since the adoption of the first 'European Agenda for Culture in a Globalising World' (2007), culture has taken an increasingly prominent place in **European Union policymaking**. However, mapping cultural and creative assets and measuring their value and impact in a systematic and comparable way across Europe remains a challenge, with no shared definitions or metrics, particularly at city level.

The Joint Research Centre (JRC) of the European Commission has developed the '**Cultural and Creative Cities Monitor**' in order to fill this information gap. The Cultural and Creative Cities Monitor provides a **common evidence base** on culture and creativity at city level to:

- **Support policy makers** in identifying strengths, assessing the impact of policy action and learning from peers;
- **Illuminate** and **communicate** the importance of **culture** and **creativity** for **improving socio-economic perspectives** and **resilience**;
- **Inspire new research questions** and approaches to studying the role of culture and creativity in cities.

The Cultural and Creative Cities Monitor is intended to contribute to the achievement of the **EU strategy 'Promoting cultural and creative sectors for growth and jobs'**, to the development of **Smart Specialisation Strategies** embracing culture-led innovation, and to the realisation of the '**Urban Agenda for the EU**', not least by stimulating cities to produce better data to support evidence-based policy making.

Creating the Cultural and Creative Cities Monitor on a European level has three main advantages:

- **Cost effectiveness**: The Cultural and Creative Cities Monitor addresses data gaps in the field of culture and creativity by making the most of comparable data sources available at European level, including official statistics. It provides a reliable and 'ready-to-use' database.

- **Benchmarking for decision making**: The Cultural and Creative Cities Monitor makes it possible to explore results based on groups of 'peer cities' according to population size, GDP per capita and employment rate, which provides a platform for EU level benchmarking that can spur relevant policy action.

- **Promotion of good practice:** Knowledge about how urban areas evolve is fragmented. By showing what peer cities are good at, the Cultural and Creative Cities Monitor promotes good practice and encourages exchanges between cities.

A unique and comprehensive tool

40 similar international indices inspired the development of the Cultural and Creative Cities Monitor. However, the Monitor combines eight key design and quality features that set it apart from other similar indices and make it valuable for a large number of cities, thus providing a powerful resource that can inform city-level policy debates both within and across countries.

Conceptual framework
1. Holistic and actionable
2. Relevant to all city types and for benchmarking purposes
3. Adaptable data and weights

Sample selection
4. 'Pragmatic' and clear selection criteria
5. Beyond 'usual suspects'

Statistical attributes
6. Representative and comparable
7. Sound and transparent on methods and data
8. Quantitative and qualitative monitoring perspective

A tool for everyone with an interest in their city

The Cultural and Creative Cities Monitor has been designed to be used by anyone with an interest in their city or in cities in Europe, including local authorities, policy makers, businesses, non-governmental organisations, academics and citizens.

The Cultural and Creative Cities Monitor, together with its accompanying Cultural and Creative Cities Monitor Online, allows users to:

- **Assess** how cultural and creative a city is in relation to others;
- **Benchmark** cities **within countries** and **across Europe**;
- **Learn** what **peers** are good at and look for opportunities for fruitful exchanges;
- **Use findings** on the relation between culture and creativity on one hand and growth and resilience on the other for **advocacy purposes;**
- **Create** a new ranking by creating new entries, adding or changing data for existing entries or adapting weights;
- **Simulate** the impact of policies (e.g. increased visitor numbers) on a city's performance in the rankings;
- **Explore** policy and research questions such as:
  - What is the relationship between a city's 'Enabling Environment' and the strength of its 'Creative Economy' or 'Cultural Vibrancy'?

o In which cities do 'Cultural Vibrancy' and the 'Creative Economy' seem to reinforce each other most?

o To what extent do culture and creativity contribute to job creation, wealth and resilience?

Ultimately, the Cultural and Creative Cities Monitor is expected to encourage cities to take further action to enhance culture-driven development in ways that go beyond models based solely on efficiency, in a more sustainable and inclusive approach to economic growth.

Challenges and way ahead

The Cultural and Creative Cities Monitor represents a first attempt towards better measurement and understanding of how Cultural and Creative Cities of diverse demographic and economic characteristics behave and perform across Europe, based on the most relevant and comparable data available at city level.

The Cultural and Creative Cities Monitor is not intended to be the definitive yardstick of city performance on culture and creativity. Many factors which contribute to culture and creativity in cities are hard to measure in a comparable way, such as policy and legal frameworks, funds aimed at supporting creativity and culture, ICT infrastructure and connectivity, the existence of local/international clusters and networks for the cultural and creative sectors, the formal and informal 'creative education' available, the creative 'atmosphere' in a city or the presence of informal types of cultural venues such as cultural clubs or dance schools.

Nevertheless, the dimensions and indicators used in this first edition constitute a sound starting point, as confirmed by the good-to-strong correlations between all indicators and their respective dimensions. Furthermore, all dimensions correlate strongly with the three sub-indices and the C3 Index itself. This means that the statistical structure of the C3 Index 2017 is coherent with its conceptual framework. In addition, the reasonably narrow confidence intervals for the majority of the cities' ranks (fewer than +-3 positions for 78% of the cities) imply that the C3 ranks are also, for most cities, robust to changes in modelling assumptions (e.g. the chosen weights)[3].

The Cultural and Creative Cities Monitor is expected to evolve as long as more and better data become available. In future versions, the domains of 'Cultural Vibrancy' and 'Enabling Environment' in particular are expected to be enhanced with data on informal cultural venues and on public funding allocated to culture. The cooperation of cities themselves will be crucial to identify the right sources for this type of data.

The Cultural and Creative Cities Monitor will be updated every two years, in line with the frequency of update of the data sources used. The second edition is thus expected in 2019.

In addition, an app will be released in the course of 2018 to complement the Cultural and Creative Cities' profiles with facts and opinions, offered by citizens, on cities' 'hidden treasures'.

Ultimately, the Cultural and Creative Cities Monitor aims to be a dynamic tool that will enable stakeholders not only to have a snapshot of their city or cities at a particular moment, but also to track progress over time, combining and valorising both quantitative and qualitative information.

Key findings

I The ideal Cultural and Creative City in Europe is a mix of eight cities mostly of small and medium size

The ideal Cultural and Creative City in Europe would have the **Cultural Venues & Facilities** of **Cork** (IE), the **Cultural Participation & Attractiveness** and the **Creative & Knowledge-based Jobs** of **Paris** (FR), the **Intellectual Property & Innovation** of **Eindhoven** (NL), the **New Jobs in Creative Sectors** of **Umeå** (SE), the **Human Capital & Education** of **Leuven** (BE), the **Openness, Tolerance & Trust** of **Glasgow** (UK), the **Local & International Connections** of **Utrecht** (NL) and the **Quality of Governance** of **Copenhagen** (DK). Of these eight cities, five have fewer than 500,000 inhabitants, namely Cork, Eindhoven, Umeå, Leuven and Utrecht[4].

The ideal Cultural and Creative City in Europe is a mix of eight cities of mostly small and medium size

UMEÅ (SE)
New Jobs in Creative Sectors

EINDHOVEN (NL)
Intellectual Property & Innovation

CORK (IE)
Cultural Venues & Facilities

PARIS (FR)
Cultural Participation & Attractiveness
Creative & Knowledge-based Jobs

IDEAL CULTURAL & CREATIVE CITY

LEUVEN (BE)
Human Capital & Education

GLASGOW (UK)
Openness, Tolerance & Trust

UTRECHT (NL)
Local & International Connections

COPENHAGEN (DK)
Quality of Governance

II Paris, Copenhagen, Edinburgh and Eindhoven are the top Cultural and Creative Cities in their respective population groups

While **Paris**, **Copenhagen**, **Edinburgh** and **Eindhoven** take the top spot on the Cultural and Creative Cities (C3) Index in their respective population groups, they do not necessarily excel on all the underlying dimensions.

Paris takes first place among **cities of more than one million inhabitants** (XXL cities), coming first on both the 'Cultural Vibrancy' and 'Creative Economy' sub-indices and second on 'Enabling Environment'. Within the 'Cultural Vibrancy' sub-index, Paris leads on Museum visitors and comes second on another four of nine indicators (namely Museums, Concerts & shows, Tourist overnight stays, and Cinema attendance). Within 'Creative Economy', Paris leads on five indicators related to jobs and job creation in the cultural and creative sectors, and on the two indicators related to innovation outputs. Within 'Enabling Environment', Paris leads on Graduates in arts & humanities, Graduates in ICT and Average appearances in university rankings and comes second on Passenger flights.

Copenhagen takes first place among **cities of 500,000 to 1,000,000 inhabitants** (XL cities), ranking second on both 'Cultural Vibrancy' and 'Creative Economy' and fifth on

'Enabling Environment'. Within the 'Cultural Vibrancy' sub-index, it leads on Theatres and comes third on Sights & landmarks and Museum visitors. Within 'Creative Economy', Copenhagen is first on Jobs in arts, culture & entertainment and Jobs in new media & communication enterprises and second on Jobs in media & communication. In 'Enabling Environment', Copenhagen ranks first on People trust and Quality of governance and second on Tolerance of foreigners.

Paris, Copenhagen, Edinburgh, and Eindhoven lead in Culture & Creativity

BEST

CULTURAL & CREATIVE CITIES

XXL group
1. Paris – FR   1 | 1 | 2
2. Munich – DE   9 | 2 | 3
3. Prague – CZ   2 | 6 | 16
4. Milan – IT   3 | 11 | 8
5. Brussels – BE   10 | 3 | 13

21 cities

1,000,000

XL group
1. Copenhagen-DK   2 | 2 | 5
2. Amsterdam-NL   4 | 3 | 7
3. Lisbon-PT   1 | 9 | 15
4. Stockholm-SE   5 | 6 | 4
5. Dublin-IE   3 | 10 | 1

34 cities

500,000

L group
1. Edinburgh-UK   5 | 8 | 3
2. Karlsruhe-DE   21 | 2 | 4
3. Utrecht-NL   11 | 4 | 1
4. Nuremberg-DE   13 | 3 | 8
5. Florence-IT   1 | 21 | 19

36 cities

250,000

S-M group
1. Eindhoven-NL   3 | 2 | 12
2. Linz-AT   4 | 5 | 15
3. 's-Hertogenbosch-NL   2 | 8 | 13
4. Cork-IE   1 | 20 | 11
5. Heidelberg-DE   16 | 6 | 3

64 cities

inhabitants

Sub-index ranks
- Cultural Vibrancy
- Creative Economy
- Enabling Environment

Figure 2.

Top 5 cities in the C3 Index per population group

Note: (a) Rankings are based on a total of 155 cities – see 'Chapter 3: The Cultural and Creative Cities Monitor Approach' for more details. (b) Due to its size, London is not among the 'top five' Cultural and Creative Cities because many indicators are expressed in per capita terms. This approach is primarily intended to enable cross-city comparability but also rewards more 'inclusive' cities which have more cultural and creative assets per inhabitant. As London eclipses other European cities with its population of eight million, it does not reach the 'top five' in the C3 index ranking, but does reach seventh place among the 21 cities in its population group.

Edinburgh ranks first among cities of **250,000 to 500,000 inhabitants** (L cities), taking fifth position on 'Cultural Vibrancy', eighth on 'Creative Economy' and third on 'Enabling Environment'. Within the 'Cultural Vibrancy' sub-index, Edinburgh ranks fourth on three indicators (Sights & landmarks, Museums, and Concerts & shows). On 'Creative Economy', its best performance is in Jobs in new enterprises in other creative sectors (with second place). Within the 'Enabling Environment' sub-index, Edinburgh ranks first on Average appearances in university rankings and third on Graduates in ICT.

Eindhoven leads among small and medium-sized cities of **50,000 to 250,000 inhabitants** (S-M cities), ranking third on 'Cultural Vibrancy', second on 'Creative Economy' and twelfth on 'Enabling Environment'. Within the 'Cultural Vibrancy' sub-index, Eindhoven is first on Cinema seats and second on Theatres. Within 'Creative Economy', Eindhoven leads on three indicators (Jobs in other creative sectors, ICT patent applications and Community design applications). Within 'Enabling Environment', Eindhoven ranks first on Passenger flights and Potential road accessibility and third on Graduates in ICT.

III   Size isn't everything

Contrary to what one might expect, **the population size of a city does not determine its performance in culture and creativity**. On average, small and medium-sized cities score relatively well compared to larger ones, particularly on 'Cultural Vibrancy' and 'Enabling Environment'. The top-scoring cities on the three sub-indices (all population groups inclusive) include cities as diverse in size as Cork (S-M), Florence (L), Stuttgart (XL), Paris and London (XXL).

Top 5 cities on 'Cultural Vibrancy', 'Creative Economy' and 'Enabling Environment'

CULTURAL & CREATIVE CITIES

1. Cultural Vibrancy
1. Cork-IE (S-M)
2. Paris-FR (XXL)
3. Florence-IT (L)
4. Lisbon-PT (XL)
5. Copenhagen-DK (XL)

2. Creative Economy
1. Paris-FR (XXL)
2. Stuttgart-DE (XL)
3. Munich-DE (XL)
4. Copenhagen-DK (XL)
5. Eindhoven-NL (S-M)

3. Enabling Environment
1. Leuven-BE (S-M)
2. London-UK (XXL)
3. Utrecht-NL (L)
4. Nottingham-UK (L)
5. Galway-IE (S-M)

XXL: > 1 million inhabitants
XL: between 500,000 and 1 million
L: between 250,000 and 500,000
S-M: between 50,000 and 250,000

Figure 3.
Top 5 cities on 'Cultural Vibrancy', 'Creative Economy' and 'Enabling Environment'

IV Capitals fly high but not always the highest

Capitals tend to be the top performing cities on the C3 Index in their country. However, there are some exceptions. In eight countries out of the 24 with ranked cities[5] – namely Austria, Belgium, Germany, Italy, Poland, Spain, the Netherlands and the UK – non-capitals outperform capitals. In most cases, the cities outperforming the capitals have fewer than 500,000 inhabitants (Linz, Leuven, Bologna, Florence, Eindhoven, Poznan and Edinburgh).
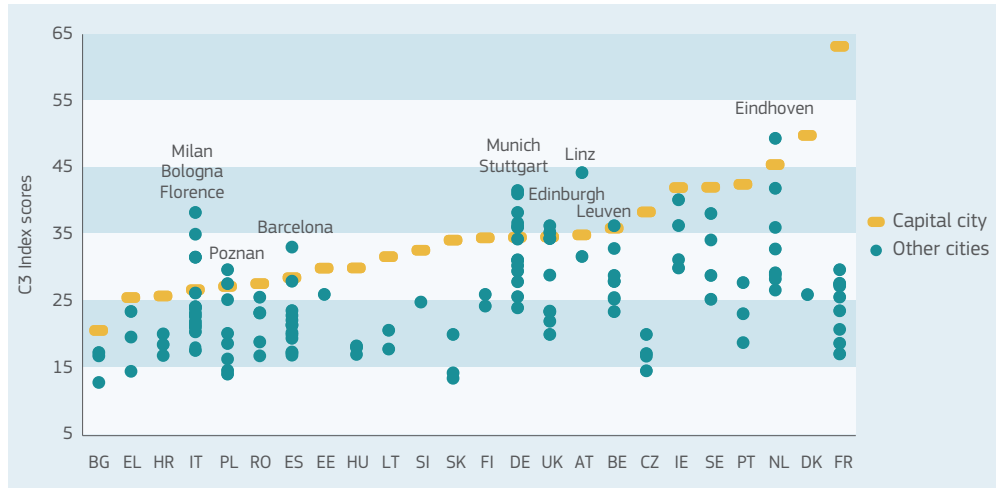
Figure 4.
C3 Index scores within EU countries

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.

This departure is even more prominent in the 'Cultural Vibrancy' sub-index: in fifteen countries, non-capital cities – mostly of medium size – outperform capitals. The polycentric pattern of 'Cultural Vibrancy' may indicate that cities of diverse size can be successful in attracting and retaining educated and creative individuals, thus favouring the development of smaller cities or more peripheral areas. According to recent literature, in a post-industrial economy, for the same job and same monetary returns, given a choice, workers would seem to prefer amenity-rich locations with plentiful cultural and entertainment opportunities[6].
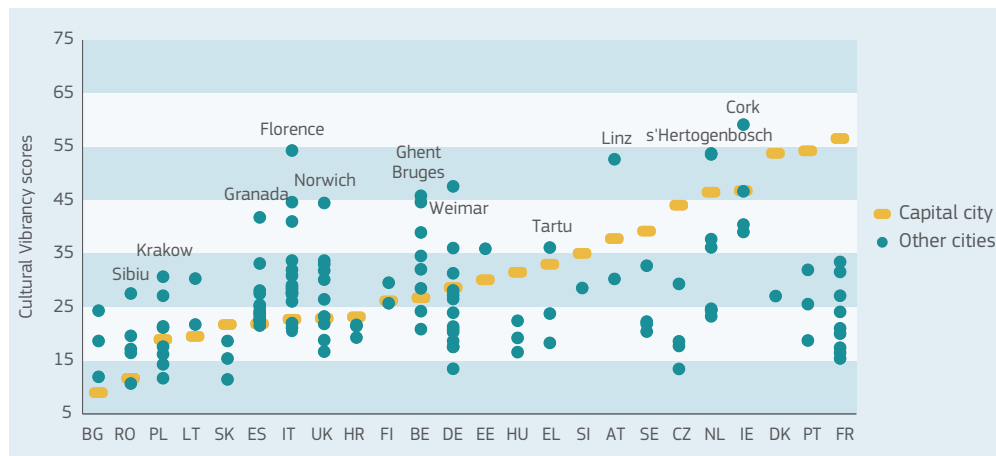
Figure 5.
'Cultural Vibrancy' scores within EU countries

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.

On 'Creative Economy', capital cities perform considerably better than non-capital cities. The only exceptions are in Austria, Italy, Germany, Sweden and the Netherlands.
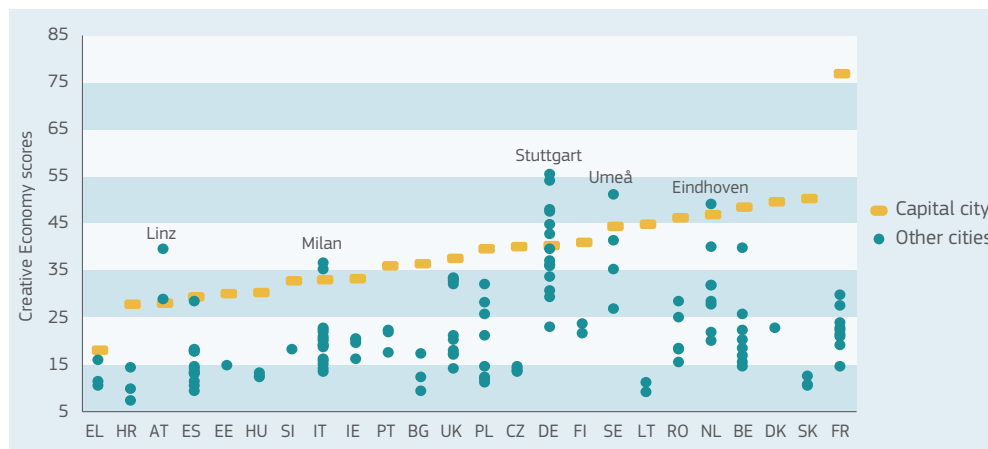
Figure 6.
'Creative Economy' scores within EU countries.

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.

Furthermore, the gap between the capital and the second-best city is more significant for 'Creative Economy' than for 'Cultural Vibrancy'. This might be due to the fact that cultural and creative sectors benefit from agglomeration advantages which are concentrated in capitals. Spreading agglomeration advantages beyond capitals could bring equity gains at national level. National policies targeting culture, creativity, innovation, research and development, education and skills, and transport and connectivity can have a major impact upon the attractiveness and relative performance of both capitals and non-capital cities.

V   All cities can learn from each other's strengths

Top cities are generally strong across the board but are not necessarily the best on each dimension or indicator. The XXL group (more than one million inhabitants), for instance, shows how widely European cultural assets are distributed. As shown in Table 1, Prague (Eastern Europe) leads on D1.1, Cultural Venues & Facilities, thanks to its strong performance on Museums and Concerts & shows, but other cities, such as Rome (Southern Europe) and Brussels (Western Europe), lead on some of the other underlying indicators. In the L group (500,000–1,000,000 inhabitants), Venice (Southern Europe) takes the lead on most of the indicators under D1.1, Cultural Venues & Facilities, but Katowice (Eastern Europe) leads on Cinema seats and Ghent (Western Europe) on Theatres. European diversity thus provides a learning platform for cities wishing to further develop a culturally vibrant and attractive ecosystem.

Table 1.

Leaders per dimension and indicator (excerpt)

Sub-Index	1. Cultural Vibrancy	
Dimensions	D1.1 Cultural Venues & Facilities	D1.2 Cultural Participation & Attractiveness
Pop groups		
XXL	Prague	Paris
	Sights & landmarks	**Tourist overnight stays**
XXL	Rome	Budapest
	Museums	**Cinema attendance**
XXL	Prague	Vienna
	Concerts & shows	**Museum visitors**
XXL	Prague	Milan, Paris
	Cinema seats	**Satisfaction with cultural facilities**
XXL	Barcelona	Lyon, Vienna
	Theatres	
XXL	Brussels	

Sub-Index	1. Cultural Vibrancy	
Dimensions	D1.1 Cultural Venues & Facilities	D1.2 Cultural Participation & Attractiveness
Pop groups		
L	Venice	Florence
	Sights & landmarks	**Tourist overnight stays**
L	Venice	Florence
	Museums	**Cinema attendance**
L	Venice	Ghent
	Concerts & shows	**Museum visitors**
L	Venice	Florence
	Cinema seats	**Satisfaction with cultural facilities**
L	Katowice	Florence, Graz
	Theatres	
L	Ghent	

VI   Cultural and Creative Cities have more jobs and more human capital

Compared to other European cities with a minimum of 50,000 inhabitants[7], the Cultural and Creative Cities included in the 2017 Cultural and Creative Cities Monitor have[8]:

- 19% more jobs per capita (or 7.55 percentage points (p.p.));
- 8% more young people (20-34 years old) per capita (1.76 p.p.);
- 73% more students in higher education per capita (a difference of 4.85 p.p.) and 15% more highly educated people per capita (2.65 p.p.);
- 22% more EU foreigners (0.13 p.p.) and 26% more non-EU foreigners (0.56 p.p.[9]) per capita.

Cultural and Creative Cities have more jobs and a diverse work force

Compared to European cities with 50,000 inhabitants or more, the Cultural and Creative Cities included in 2017 Cultural and Creative Cities Monitor have:

+8% young people (20-34 years old)

+73% students in higher education

+22% EU foreigners

+19% jobs

+15% highly educated people

+26% non-EU foreigners

CULTURAL & CREATIVE CITIES

The finding that Cultural and Creative Cities have more foreigners than other cities is particularly interesting in light of the results of a recent study[10] using novel data from the World Bank on migrant stocks – the number of people born in a country other than that in which they live, over the period 1960–2010 – which finds that cultural diversity has a positive impact on real GDP per capita.

In fact, Cultural and Creative Cities such as Berlin, London or Barcelona have been successful in capturing the positive contributions that migrants are ready to make, by recruiting them as guides in museums or in designing new and successful TV programmes[11].

VII   Leading Cultural and Creative Cities are more prosperous

There is a clear, positive and strong association between the C3 Index scores and (a) annual GDP per capita in comparable euros, and (b) the number of jobs per capita. This result shows that higher GDP per capita and more jobs are found in the top-scoring Cultural and Creative Cities, suggesting that culture and creativity on one hand, and economic and social prosperity on the other, may mutually reinforce each other. The association remains strong even when excluding capital cities.
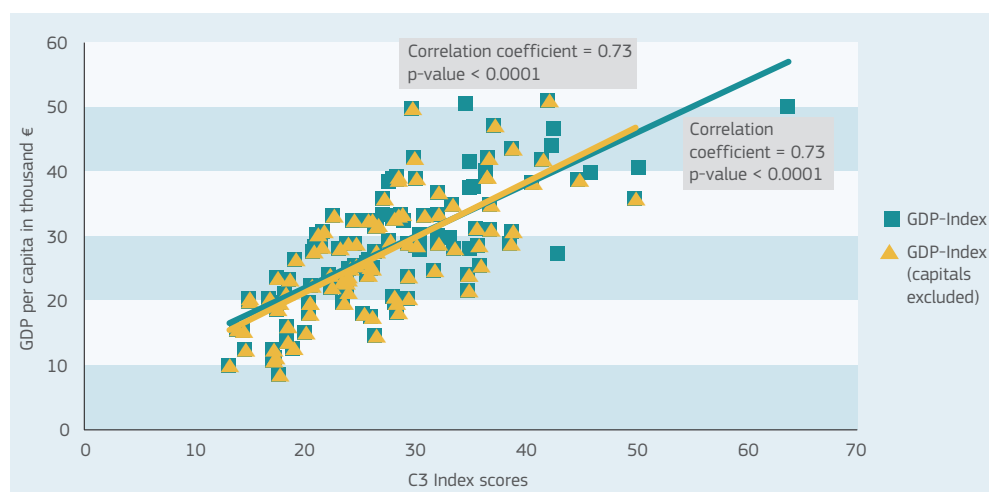
Figure 7.
The C3 Index and GDP per capita
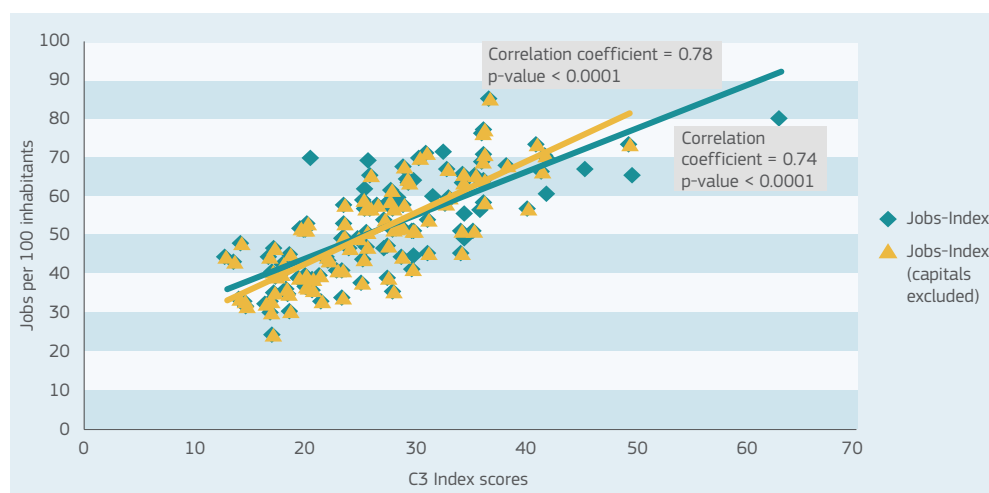
Figure 8.
The C3 Index and jobs per capita

Additionally, culture and creativity contribute to higher growth rates. On average, in 2013, the GDP per capita of the Cultural and Creative Cities included in the Cultural and Creative Cities Monitor was almost **750 euros higher for each additional point in the C3 Index** compared to 2009[12].

VIII   Culture and creativity are critical for the development of low-income cities

Before the recent economic crisis, low-income cities were growing much faster than high-income cities, suggesting that a catching-up process was underway, as predicted by classical economic theory[13]. However, after the crisis GDP growth slowed down, most notably in low- and very-low-income cities (Figure 9).

Low-income cities also register lower-than-average C3 Index scores compared to higher-income cities. This raises the concern that some cities may be facing a 'low-income trap': while they can compete as lower-cost locations, they may lack the means to move into creative and high-value-added activities. Recognising and promoting culture and creativity in low-income cities will be critical to attracting and inspiring the next generation of artists, entrepreneurs and innovators that will help these cities move into the next phase of their development.
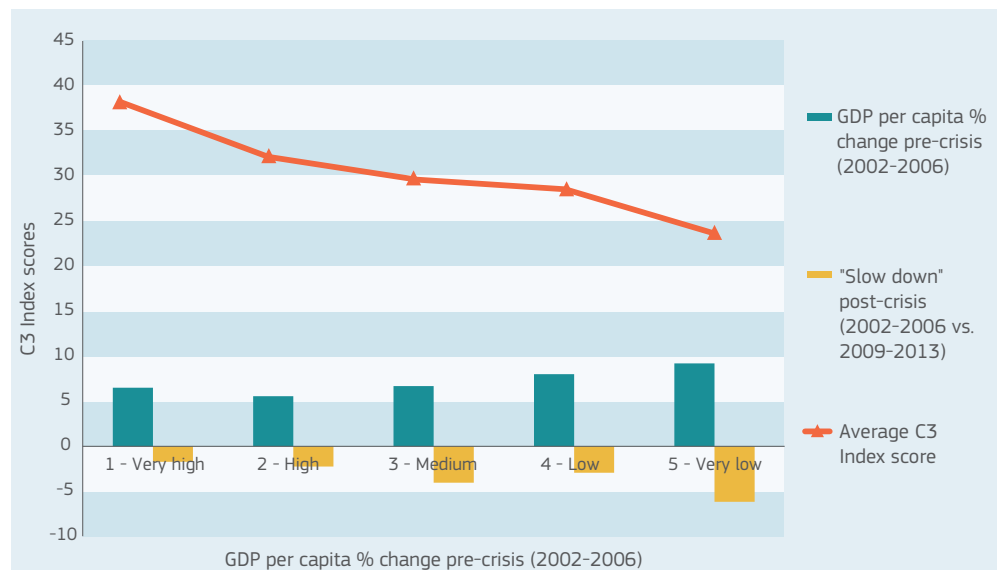
Figure 9.

The C3 Index and GDP per capita growth

Note: The five city groups based on GDP per capita (in comparable euros) are as follows: 'Very high': more than €35,000 (40 cities); 'High': €30,000–35,000 (26 cities); 'Medium': €25,000–30,000 (38 cities); 'Low': €20,000– 25,000 (27 cities); 'Very low': less than €20,000 (37 cities).

1

The context: Placing culture and creativity at the heart of EU policy

Culture and creativity in EU policy

Economic growth has improved the living standards of many people over the last half-century. Yet a model of development based solely on economic growth would clearly be inadequate – prosperity and sustainability have important economic, social, cultural and environmental dimensions.

Culture and creativity are increasingly seen by policy makers as major assets in achieving policy objectives beyond economic growth. Since the adoption of the first 'European Agenda for Culture in a Globalising World' (2007) culture has been at the heart of European Union policymaking (see Figure 10 for an overview of key EU policy documents in this area). Culture is understood to be a key driver of growth and job creation, enhancing creativity and innovation through processes of cross-fertilisation. Culture furthermore fosters a sense of belonging and cohesion among citizens; improves quality of life and the attractiveness of cities and regions for citizens, tourists, businesses and investors; and ultimately promotes peace, inter-cultural dialogue and socio-economic development within and beyond national borders.

However, investment in culture remains extremely difficult to track, and its impact difficult to assess, due to the lack of shared definitions, data and metrics, particularly at city level. The new Urban Agenda[14] for the EU stresses the importance of reliable data in supporting evidence-based urban policy making.

The Joint Research Centre (JRC) of the European Commission has therefore developed the 'Cultural and Creative Cities Monitor', a tool to help assess and analyse the cultural and creative condition of cities across Europe. The tool is based on a pool of comparable data for 168 'Cultural and Creative Cities' of varying population sizes (from 50,000 to eight million inhabitants), employment profiles (with employment rates ranging from 40% to more than 74%) and wealth levels (from €10,000 to more than €35,000 GDP per capita).

> *'The European Capitals of Culture and the World Cities Culture Report 2015 demonstrate the significant return – in terms of growth and social cohesion – for cities and other local authorities that invest in culture. The Commission's Joint Research Centre is developing a tool for monitoring cultural and creative initiatives at city level, which will support more targeted investments and learning from best practices'.*
>
> European Commission [Joint Communication to the European Parliament and the Council]. JOIN(2016) 29 final (2016). *Towards an EU strategy for international cultural relations*, p.9.

The tool responds to the need to develop a common evidence base at city level that can serve three main functions:

- **Supporting policy makers** in identifying strengths, assessing the impact of policy action and learning from peers;
- **Illuminating** and **communicating** the importance of **culture** and **creativity** for **improving socio-economic perspectives** and **resilience**;
- **Inspiring new research questions** and approaches to studying the role of culture and creativity in cities.

> *'The Cultural and Creative Cities Monitor can represent the starting point of a virtuous circle of policy experimentation at the urban level, and possibly even the basis for a community of practice of European cities willing to seriously build on culture and creativity as a key policy level, beyond the simple formulas and the affirmational rhetoric that have affected some previous discussion and experiences on the theme, and pursuing developmental goals through a more solid data-driven approach that does not aim to put cities in competition, but rather to create a public space for learning and 'cross-contamination'. There are good reasons to look forward to this perspective with interest and anticipation'.*
>
> Pier Luigi Sacco
> Professor of Cultural Economics
> IULM/Harvard University

The remainder of this report is structured as follows. This first chapter explains why culture and creativity are important factors in cities' development and how the Cultural and Creative Cities Monitor addresses the need for better data to support evidence-based policies and mutual learning in this area. Chapter 2 defines what is meant by a Cultural and Creative City. The third chapter illustrates the development process of the Monitor, its main design and quality features and its potential uses by a wide range of stakeholders. Chapter 4 presents and comments on the quantitative results, including the leading cities on the Cultural and Creative Cities (C3) Index, the nine dimensions and the 29 indicators based on population size groups. The fifth chapter examines how the C3 Index scores relate to city size, capitals and wealth. Finally, Chapter 6 offers concluding remarks and sketches plans for the future development of the tool.

The importance of culture and creativity in cities

Our understanding of culture is no longer limited to appreciating 'art for art's sake' or for its entertainment value – rather, culture is now recognised as being a competitive and resilient economic sector in its own right as well as having broader impacts: for example, as an attractor of creative talent and a catalyst of economic, technological and social innovation and change (see Box 1).

> '*Cities, which want to be innovative, to flourish and to offer wealth and employment to its inhabitants, feel that they have to adapt to arenas in which knowledge and creativity can develop. Culture is often added to this arena, not just as a condition to attract the creative knowledge workers, but also as a major economic sector, intricately interwoven with other sectors of the economy*'.
>
> Musterd, S. & Ostendorf, W.J.M. (2004). Creative Cultural Knowledge Cities: Perspectives and Planning Strategies, *Built Environment* (3), 189–193.

The potential of the so-called 'cultural and creative sectors' (CCS) is best realised and demonstrated at city level, for three main reasons. First, while cities have historically been at the centre of innovation and change, in recent decades they have acquired an even greater role in socio-economic development due to the high concentration of people and economic activity they favour[15]. Second, local autonomy has increased over time to enable cities better to address specific opportunities and challenges[16]. Last, but not least, geographical clustering, a prominent feature of the cultural and creative sectors[16], often generates positive externalities in the areas where they are located, ranging from improved image and reputation and increased numbers of tourists to greater social pride and revitalised local economies.

Recognising and promoting culture and creativity is seen as particularly critical in **low- and middle-income** cities, as the key to inspiring the artists, entrepreneurs and innovators who will help take these cities to the next stage of their development. In **smaller cities**, networks of arts and culture can help maximise economic returns on the production of place-specific and high-value-added products (e.g. arts and crafts), while promoting citizen engagement and community building. **Rural areas** are also becoming significant sites of culture and creativity, often through the bottom-up initiative of civil society[18].

Several city-level authorities, including in former industrial cities such as Glasgow, Nantes and Essen (counting fewer than 600,000 inhabitants) or even in smaller cities such as Mons (with around 100,000 inhabitants), are therefore putting **investment in culture and creativity at the centre of their local development strategies** to support policy objectives ranging from urban regeneration and economic diversification and rejuvenation to job creation and social innovation and cohesion. The role of public policies is crucial in maximising the positive effects of culture and creativity and avoiding potential traps – such as

With 'Café Europa', a network of digitally connected places, Mons explored with ten other cities how new collaborative spaces and technological tools can foster social links.

Nantes' former industrial area today hosts the 'Quartier de la Création' which aims to support the emergence of a pole of excellence in the cultural and creative sectors. The quarter is home to 'La Machine', a creative company that builds 'live machines' attracting thousands of visitors every year.

Figure 10.
Overview of major EU policy documents promoting the role of culture as a key asset for European economic and social prosperity

Council Conclusions
● *Culture as a catalyst for creativity and innovation*

EC Communication
● *European Agenda for culture in a globalising world*

EP Resolution
● *Role of culture in the development of European regions*

EP Resolution
● *Unlocking the potential of cultural and creative industries*

● *Cultural dimensions of the EU's external actions*

2008

2010

2007

2009

2011

EP Resolution
● *Cultural Industries in Europe*

EC Green Paper
● *Unlocking the potential of cultural and creative industries*

EC Communication
● *Europe, the world's №1 tourist destination - a new political framework for tourism in Europe*

EP Resolution
- *Promoting the European cultural and creative sectors as sources of economic growth and jobs*

Council Conclusions
- *Cultural and creative crossovers to stimulate innovation, economic sustainability and social inclusion*

2012

2013

2014

2015

2016

EC Communication
- *Promoting cultural and creative sectors for growth and jobs in the EU*

- *Regional policy contributing to smart growth in Europe*

- *Europe 2020 Flagship Initiative Innovation Union*

- *Industrial Policy Communication update: a Stronger European Industry for Growth and Economic Recovery*

EC Communication
- *For a European Industrial Renaissance*

- *Towards an integrated approach to cultural heritage for Europe*

EC Communication
- *Towards an EU Strategy for International Cultural Relations*

EP Resolution
- *Coherent EU policy for cultural and creative industries*

EC Staff Working Document
- *Competitiveness of the European high-end industries*

EC – European Commission
EP – European Parliament

cultural elitism or gentrification[19] – that might ultimately push creative talent away to more affordable and inclusive places.

Box 1.

The cultural and creative sectors as an economic and social engine

High growth and resilient sectors, led by qualified human capital

In the EU, the cultural and creative sectors (CCS) contribute 4.4% of GDP and employ 8.5 million people, representing almost 3.8% of total employment[20]. Between 2008 and 2011 employment in the CCS was resilient to the economic crisis, growing by 0.7% in comparison with a drop of 1.4% in employment in the overall economy[21].

The level of education of those employed in cultural fields stands out. Slightly more than 60% of people working in culture in the EU had a tertiary education, almost double the figure for the total working population (33%).

Catalysts of creativity and innovation

Combining artistic, business and technological creativity, CCS naturally trigger spillover effects in other industries.

CCS foster growth in sectors such as ICT (by fuelling content and boosting the demand for cutting-edge consumer electronics and telecommunication devices) and tourism (by enhancing the attractiveness of places). More generally, culture and creativity contribute to innovation, which is increasingly driven by non-technological factors such as creativity, design and new organisational processes or business models. The use of design in manufacturing industries, for instance, increasingly enhances the value of products, services and processes. It is estimated that firms spending twice the average amount on creative inputs such as design or media content are 25% more likely to introduce product innovations[22].

CCS are also an engine of social innovation, helping to address major societal challenges, such as inclusive development, demographic change and cultural diversity. For example, in partnership with urban developers, CCS can contribute to the design of more inclusive urban spaces to counteract segregation. In cooperation with schools, they can contribute to developing creative skills and critical thinking as well as a risk-taking attitude – valued skills and qualities in a knowledge-based society[23].

Forging identities and social cohesion

At the heart of our social fabric, culture shapes our identities, aspirations and relations to others and the world. Culture in its manifest forms – built and immaterial heritage, but also cinema, music or books – has great capacity to promote social cohesion and integration, through regeneration of neglected areas, creation of locally rooted jobs and promotion of a sense of community across cultures and generations.

The soft power of culture

Culture has long been employed by states as a tool to assert their presence internationally and to boost their 'soft power' to attract talent. European excellence in sectors such as fashion, design, cinema and music is a strategic asset in the effort to shape an attractive image of Europe, to promote European core values, including peace and inter-cultural dialogue, and to strengthen Europe's capacity to attract talent from around the world.

The European Commission encourages EU Member States to 'fully assess the potential of [the cultural and creative sectors] for smart, inclusive and sustainable growth and further integrate them in their development strategies at all levels, in particular in the context of smart specialisation strategies' (see Box 2)[24].

Box 2.
Research and innovation strategies for smart specialisation

Research and innovation strategies for smart specialisation

(RIS3) are integrated and place-based policy plans that focus support and investment on key priorities, challenges and needs for knowledge-based development and which build on local strengths. They are evidence based and assessed through sound monitoring and evaluation systems[25].

The European Commission promotes the concept of smart specialisation as part of the EU Cohesion Policy to support smart, sustainable and inclusive growth across Europe: smart, because it encourages the development of an economy based on knowledge and innovation; sustainable, as it promotes the shift towards a resource-efficient and low carbon economy; inclusive, as it aims to create new economic opportunities by investing in skill development, better jobs and social innovation.

The Urban Development Network (UDN)[26] – made up of more than 500 cities or urban areas across the EU responsible for implementing 'Sustainable Urban Development' strategies financed by European Regional Development Fund (ERDF) in the period 2014-2020 – helps cities develop their own smart specialisation strategies.

Culture-led specialisation has relevance for cities and regions in all stages of development – not only in 'less advanced' cities, where investment in infrastructure and institutions may still be sorely needed, but also in 'advanced' cities and regions where local resources could be better exploited to enhance the comparative advantages of the local economy and stimulate innovation. European cooperation and exchange, combined with tailored investment from the Cohesion Policy, support cities and regions in their various growth paths and help them acquire new infrastructure and develop new strategies and skills.

For example, the European Capital of Culture (ECoC) programme (see Lexicon) has in many cases boosted culture-led revitalisation strategies thanks to its capacity to mobilise local stakeholders and resources around a shared programme of cultural events and policy objectives. The experience of particularly successful ECoCs, such as Glasgow 1990, Linz 2009 or Mons 2015, has shown that the event is an excellent opportunity to regenerate cities, strengthen social ties, inject new life into the local cultural scene and boost tourism.

Two decades after his first report into the impact of European City of Culture 1990 on Glasgow, analyst John Myerscough found that the number of live performances – of music, theatre or dance – had risen by 82% since 1992.

A contribution to EU policy action

The Cultural and Creative Cities Monitor is a new tool to monitor and assess the performance of **'Cultural and Creative Cities'** in **Europe** vis-à-vis their peers using both quantitative and qualitative data. This first edition covers **168 cities in 30 European countries** (the EU-28 with Norway and Switzerland).

The Cultural and Creative Cities Monitor is based on **29 indicators** relevant to **nine dimensions** reflecting **three major facets** of cities' cultural, social and economic vitality:

- **Cultural Vibrancy**, which measures the cultural 'pulse' of a city in terms of cultural infrastructure and participation in culture;
- **Creative Economy**, which captures the extent to which the cultural and creative sectors contribute to a city's economy in terms of employment, job creation and innovation;
- **Enabling Environment**, which identifies the tangible and intangible assets that help cities attract creative talent and stimulate cultural engagement.

Figure 11.
The Cultural and Creative Cities Monitor's conceptual framework

Note: the dimension Creative & Knowledge-based Jobs has been assigned to 'Creative Economy' because it is more statistically related to this facet of a Cultural and Creative City. However, from a conceptual point of view, it relates to 'Cultural Vibrancy' as well because it captures the presence of cultural professionals, amongst other creative jobs. This is why the section on Creative & Knowledge-based Jobs in the figure is between 'Cultural Vibrancy' and 'Creative Economy'.

The Cultural and Creative Cities Monitor is intended to contribute to the achievement of the EU strategy 'Promoting cultural and creative sectors for growth and jobs', to smart Specialisation Strategies embracing culture-led innovation and to the realisation of the 'Urban Agenda for the EU'. The Cultural and Creative Cities Monitor also has the potential to support the development of innovative policies and funding schemes, both at the EU and local levels, aimed at helping cities to become more resilient. As the global workforce becomes more mobile, cities that offer the best amenities - including arts, culture, and other entertainment opportunities - and quality of life will attract most people and workers who will in turn drive economic growth and motivate cities to maintain high life standards.

> '*As a general rule successful strategies for the cultural and creative sectors build on a full **mapping and mobilisation of the cultural and creative resources of a given territory**. [...] **Strategies** must also be underpinned by **research** to ensure effectiveness, efficiency and sustainability*.' (European Commission Communication (2012). Promoting cultural and creative sectors for growth and jobs in the EU.)
>
> The approach to smart Specialisation Strategies '*embraces a **broader concept of innovation**, not only investment in research or the manufacturing sector, but also building competitiveness **through design and creative industries**.*' (European Commission (2012). Guide to Research and Innovation Strategies for Smart Specialisations - RIS 3.)
>
> '***Reliable data** is important for portraying the diversity of structures and tasks of Urban Authorities, for evidence-based urban policy making, as well as for providing tailor-made solutions to major challenges. Knowledge on how Urban Areas evolve is fragmented and successful experiences can be better exploited.*' (European Commission (2016). Urban Agenda for the EU)

The **European added value** of the Cultural and Creative Cities Monitor inheres in the following features:

- **Cost effectiveness**: it addresses data gaps in the field of culture and creativity by exploiting comparable data sources already available at European level, including both official statistics and the web. It provides – for 168 cities of all sizes, income and employment levels – a reliable and ready-to-use database that can support policy making or research, helping to avoid duplication of data collection efforts.

- **Benchmarking for decision making**: The possibility of exploring results based on groups of peers, according to population size, GDP per capita and employment rates, provides a new basis for realistic international benchmarking and policy action.

- **Promotion of good practice:** knowledge on how urban areas evolve is fragmented. By showing what similar cities are good at, the Cultural and Creative Cities Monitor can contribute to the promotion of good practice and exchange between cities. European diversity provides a learning platform for cities interested in identifying new ideas, approaches and partners to better promote their competitive features or further enrich their cultural and creative ecosystems.

Complementary to this main **report** – which presents the policy context, methodology and main quantitative findings of the work – other practical features put the Cultural and Creative Cities Monitor at the service of policy and research publics: an interactive **Cultural and Creative Cities Monitor Online** offers both quantitative and qualitative evidence on the 168 selected cities as well as the possibility to 'play' with the scores by adding new data, adjusting weights to better reflect local priorities or simulating the desired impact of policy actions (e.g. an increased number of visitors) on city performance; an **infographic** concisely summarises the main purpose and findings of the Cultural and Creative Cities Monitor using a visual and user-friendly approach; **country fact sheets** allow for easy benchmarking of cities within countries; and **data tables** permit further investigation. All these features and material are available on the Cultural and Creative Cities Monitor Online[27].

2

Defining a Cultural and Creative City

First conceptualised in the mid-1990s by Bianchini and Landry[28], the notion of a 'creative city' has gained currency over the past two decades. Researchers have theorised culture as a tool for urban regeneration and the cultural and creative industries as a motor of economic development[29]. In particular, Florida's theory of the 'creative class'[30] has won the attention of policy makers, who appreciate his 'user-friendly' approach, which promises growth to cities investing in high-tech industries, a tolerant environment and creative talent (the so called '3Ts').

Despite, or because of, the popularity of the topic in both the scientific and political spheres, the term has not only lost its precision but has moreover gained many overlapping and sometimes contradictory associations and connotations[31]. The definitional challenge is all the more complex in Europe, which is home to 'cultural and creative cities' as diverse as London, Paris, Milan and Berlin ('global' cultural cities), Florence and Athens ('historical' cultural cities – see also Box 3) and Nantes, Essen, Mons and, since more recently, Poznań or Pilsen ('newcomers' which are investing heavily in culture and creativity as a way out of the post-industrial economic crisis).

Every year, the film festival Berlinale attracts thousands of film enthusiasts. The city's support to creativity and culture is part of the 'Project Zukunft', an initiative of the Berlin´s Senate Department for Economics, Technology and Research to support the creative economy.

Given the absence of a harmonised theoretical framework and the extreme diversity of the demographic, socio-economic and political features of cities that can be labelled 'creative', the Cultural and Creative Cities Monitor takes a pragmatic approach, focusing on cities actively engaging with culture and creativity, as evidenced by concrete and 'tangible' initiatives of international relevance.

The Cultural and Creative Cities Monitor considers as **Cultural and Creative Cities** those which host or support international initiatives aimed at promoting arts, culture and creativity coming from artists, creative professionals and the related 'cultural and creative sectors' (CCS). The goal of these initiatives is to deliver cultural, social and economic benefits to the local community – such as greater engagement in culture, strengthened civic identity and pride, the attraction of talent, job creation or enhanced innovation and competitiveness. Three types of internationally comparable initiatives have been identified in this respect: the European Capital of Culture programme, the UNESCO Creative Cities Network and inter-

national cultural festivals (see Chapter 3 and the Lexicon for more detail about these initiatives).

Unlike a Smart City[32], which puts digital and communication technologies at the core of its development strategy, the Cultural and Creative Cities approach sees technology as a complementary tool that can help enhance the innovation potential, business opportunities and range of action of cultural and creative professionals and activity.

While investment in culture and creativity may come at the risk of homogenisation, gentrification and, paradoxically, more polarised cities, our vision of Cultural and Creative Cities is inspired by the Urban Agenda for the EU and by the UN Sustainable Development Goals (SDG)[33], which call for an urban development model that is economically, socially, ecologically and culturally sustainable and inclusive.

If accompanied by appropriate policy actions, the Cultural and Creative Cities of tomorrow will have the capacity to launch new waves of local development that:

- Aligns the cities' economies with their historical and cultural identities (*authentic development*);
- Empowers culturally diverse people to be the key agents of innovation, entrepreneurship and job creation (*people-centred development*); and,
- Promotes social interaction and inclusion by fostering the collaborative culture typical of the cultural and creative sectors and by developing accessible cultural infrastructure and public spaces that help connect diverse people, including migrants (*inclusive development*).

In this way, Cultural and Creative Cities are expected to promote a model of **harmonious urban development and wellbeing** which is **sustainable** for both present and future generations.

Box 3.
Cultural & Creative Cities through history

Athens 500 BC

Art and culture contributed to making ancient Athens a global city, not only trading products but also exporting its philosophy, art and new, liberal ideas. This put Athens on the map of the ancient world and strengthened the cultural foundation of Mediterranean cities.

Both democracy and trade relations contributed to the circulation of new ideas and the spread of new cultural impulses. Furthermore, creative people contributed to **innovation in the city's urban planning and governance system**. Innovative architects designed numerous secular buildings such as theatres and stadia. The design of the *Agora* was particularly important as it contributed to both commercial and intellectual interaction.

Florence 1400

Florence is perhaps the best example of an historical creative city. It was one of the great creative cities of both the 13th century, with Cimabue, Giotto and Dante Alighieri all active in the city during that period, and the 15th century, when Lorenzo di Medici was a major patron of creativity in the arts and science. Renaissance **Florence saw an explosion of innovation in many different domains:** in **architecture**, Brunelleschi's dome of Florence cathedral was a masterpiece of engineering centuries ahead of its time; in **science**, artist and engineer Leonardo da Vinci's discoveries in human anatomy advanced both the arts and science; in **finance** and **society**, a new class of bankers and merchants replaced the old noble families as the locus of power, instituting a new social structure.

Towards the end of the 15th century Florence nevertheless declined as a creative city. The great masters of the Renaissance – Michelangelo, Leonardo and Raphael – were eventually forced to leave the city as it became less tolerant.

Amsterdam 1600

In the 17th century Amsterdam (and the rest of the country) experienced an astonishing rise of artistic creativity mainly due to the success of Amsterdam as a trading port. This was Holland's Golden Age.

In comparison with other countries at that time, Holland was considered a tolerant society. A new class of wealthy merchants, bankers, manufacturers and shippers were drawn to the city, stimulating the demand for furniture, objects and art.

Simultaneously, **innovative practices** were tested in the trade sector and the **city transport system**, through the combination of **engineering** and **architectural skills**. In 1602 the Dutch East India Company (VOC) was founded. The city was then expanded with the famous ring of canals for the rich merchants. The 'Seventeenth-Century Canal Ring Area of Amsterdam inside the Singelgracht' has been in the UNESCO World Heritage List since 2010 as 'a masterpiece of hydraulic engineering, town planning, and a rational programme of construction and bourgeois architecture. It is a unique and innovative, large-scale but homogeneous urban ensemble. (…). The Amsterdam Canal District represents an outstanding example of a built urban ensemble that required and illustrates expertise in hydraulics, civil engineering, town planning, construction and architectural knowhow'.

San Francisco 1960

With the so-called 'San Francisco Renaissance' – a proliferation of artistic activity that began with poetry but later encompassed visual and performing arts, philosophy and new social sensibilities – the American city of San Francisco not only marked the history of the 1960s but also became an international reference as a progressive and diverse city creating and incubating new and exciting forms of expression, technology and urbanism.

By promoting risk taking, innovation and creativity, San Francisco has become a **vibrant artistic and cultural centre as well as a major technological innovation hub**. According to the cultural historian Theodore Roszak[34], the avant-garde subcultures of the 1960s produced some of the world's computing and networking pioneers, including, for example, Apple.

3

The Cultural and Creative Cities Monitor Approach

The development of the Cultural and Creative Cities Monitor

The Cultural and Creative Cities Monitor project was initiated by the Director General of the Joint Research Centre, Vladimir Šucha, in February 2015, with a view to developing a tool that would help firmly establish the importance of culture and creativity among the public and engage policy makers and other stakeholders in targeted policy design and investment plans.

The Cultural and Creative Cities Monitor is thus part of an effort not only to create an environment in which the value of culture and creativity is fully recognised, but furthermore to provide the tools and information to support the design of appropriate policies and action.

However, measuring the level of culture and creativity of cities is not an easy task, not least due to the multidimensional nature of the concepts involved. There are neither established definitions, nor generally accepted methodologies, to guide the attempt.

To overcome this challenge a **twofold approach** was adopted:

- Literature review: The relevant literature on culture, creativity and cities was reviewed, along with 40 existing, relevant indices and monitoring tools[35];
- Expert consultation: Around 20 stakeholders (including policy makers, practitioners and academics[36]) were consulted over the course of two participatory workshops that took place in September 2015 and November 2016 as part of the Cultural and Creative Cities Monitor development process, to ensure that a wide range of inputs, expectations and needs were taken into account in the definition of a 'Cultural and Creative City' and the development of a measurement framework.

Based on the **literature review** and **expert consultation**, the theoretical framework was elaborated. Approximately **200 indicators** were proposed and screened. These came from official and publicly available sources – mainly Eurostat, but also ETER (the European Tertiary Education Register[37]), four university rankings (QS, ARWU, Times and Leiden), the Directorate-General for Regional and Urban Policy (DG Regio) and TripAdvisor. Where data at city level were not available, data at NUTS 3 and, in one case, NUTS 2 level were accepted.

29 indicators were ultimately retained based on their theoretical relevance and statistical soundness. Data checking included a number of steps, amongst which the expression of the indicators in per capita terms to allow for cross-city comparability. Missing data were estimated and imputed indicators normalised, meaning that the scores on each component of the Index are on a 0 to 100 scale to ease comparison. As an aggregated measure, the total score on the Cultural and Creative Cities (C3) Index for each city was calculated based on a fixed structure of weights defined by fourteen experts during the second workshop, using the budget allocation method[38]. The structure gives more prominence to culture- and creativity-related variables and less to more 'general' enabling factors such as transport links or quality of governance. In this way, the framework will help inform and guide policy action that can actually lead to the promotion of culture and creativity rather than of 'collateral' factors, and will reward such action in the final scores and rankings. Finally, a number of tests were run to check the statistical coherence of the results and the impact of the modelling assumptions. **Tables, figures, infographics**, **country fact sheets** and an interactive **Cultural and Creative Cities Monitor Online** were prepared in order to help interpret and communicate the results.

The development process thus respected the methodological recommendations of the 'Handbook on Constructing Composite Indicators' developed by the JRC and the OECD (2008), summarised in Figure 12[39].

The end result is a theoretically and statistically consistent and easily understood indicator framework that covers a wide range of factors relevant to culture and creativity that can be addressed through policy action, namely: cultural facilities, numbers of visitors, jobs in culture and creativity, innovation, governance, transport, education, human capital and openness, and tolerance and trust. Cities such as Rome are already planning to use the Cultural and Creative Cities Monitor to understand how culture and creativity in the city relate to citizens' wellbeing.

The principal value added of the Cultural and Creative Cities Monitor is not in establishing rankings of the cultural and creative potential and capacity of cities, but rather in helping cities understand the complex relationships among the many factors that contribute to a city's capacity to produce and disseminate culture and creative content. This implies that there is no one single 'formula' to copy, but rather a spectrum of possibilities along which each city has to position itself on the basis of a deep and refined understanding of its own characteristics and of the local community's priorities and goals.
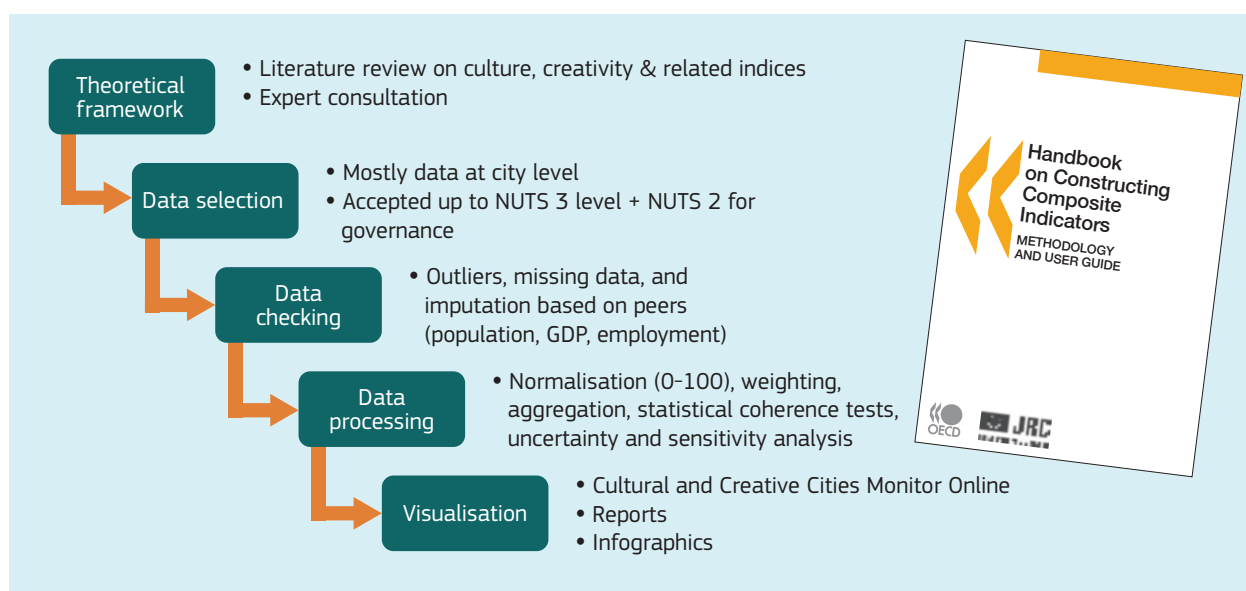
Figure 12.
The Cultural and Creative Cities Monitor's development process

The Cultural and Creative Cities Monitor is not intended to be the definitive yardstick of cities' performance with respect to culture and creativity. Many factors which contribute to culture and creativity in cities are hard to measure in a comparable way, such as policy and legal frameworks, funds aimed at supporting creativity and culture, ICT infrastructure and connectivity, the existence of local/international clusters and networks for the cultural and creative sectors, the formal and informal 'creative education' available, the creative 'atmosphere' in a city or the presence of informal types of cultural venues such as cultural clubs or dance schools, besides more conventional cultural infrastructure such as museums, theatres, concert halls, sights and landmarks.

In this first edition of the Cultural and Creative Cities Monitor, emphasis is thus placed on those concepts and indicators on which consensus could be found and for which accessible and comparable data exist. Other relevant facts are highlighted in the 'Did you know that…?' section of each city page in the Cultural and Creative Cities Monitor Online as a complement to the quantitative analysis. The information contained in the 'Did you know that…?' section has been validated by the cities themselves.

The Cultural and Creative Cities Monitor will be continually updated in line with evolutions in the availability of data and our understanding of culture and creativity. More data are indeed expected to become available as a result of cities' active engagement in data collection as well as with novel uses of crowdsourced tools such as OpenStreetMap (a collaborative project to create a free, editable map of the world including cultural points of interest) or the Cultural and Creative Cities Monitor App which is currently under development and which will collect citizens' inputs on urban culture and creativity (see also 'Chapter 6: Conclusions and Future Work').

While acknowledging that there is potential to improve the indicators used, the statistical assessment of the C3 Index 2017 confirms that this first edition represents a sound starting point. All indicators show good-to-strong correlations with their respective dimensions. Furthermore, all dimensions correlate strongly with the three sub-indices ('Cultural Vibrancy', 'Creative Economy' and 'Enabling Environment') and the C3 Index itself meaning that the statistical structure of the C3 Index 2017 is coherent with its conceptual framework. In addition, the reasonably narrow confidence intervals for the majority of the cities' ranks (fewer than +-3 positions for 78% of the cities) imply that the C3 ranks are also, for most cities, robust to changes in the modelling assumptions (e.g. the chosen weights)[40].

Eight key design features

With culture and creativity now seen as major assets for cities in re-shaping their economies and identities, especially after the economic crisis that began in 2008, it may be no surprise that in recent years a plethora of indices monitoring various aspects of culture and creativity have emerged.

The Cultural and Creative Cities Monitor is not intended to replicate or even enhance what already exists. Rather, it aims to provide a comprehensive measurement framework for the European context that meets eight key design features that together set it apart from other indices.
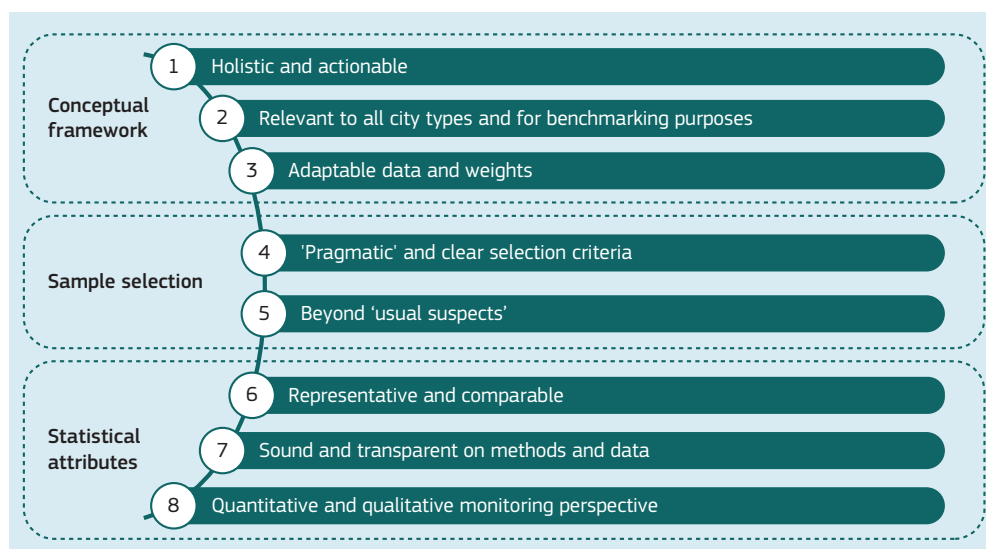
Figure 13.
The Cultural and Creative Cities Monitor's eight key features

Conceptual framework

1. Holistic and actionable

The Cultural and Creative Cities Monitor is intended both to make it possible to assess the level of culture and creativity in cities and thereby to provide an evidence base to inform the development of culture- and creativity-related policies.

To achieve this goal, the Cultural and Creative Cities Monitor not only provides an aggregate C3 Index score, but also allows for benchmarking on three sub-indices, 29 policy dimensions and 29 individual indicators[41].

The **C3 Index** score is the weighted average of the 'Cultural Vibrancy' (40%), 'Creative Economy' (40%) and 'Enabling Environment' (20%) sub-index scores.

The **'Cultural Vibrancy'** sub-index is the weighted average of two dimensions that capture elements of the 'cultural pulse' of cities: D1.1 Cultural Venues & Facilities (50%) and D1.2 Cultural Participation & Attractiveness (50%).

Dimension 1.1, Cultural Venues & Facilities, monitors the extent to which Cultural and Creative Cities are culturally rich and vibrant. Cultural amenities are a key element in a place's quality of life and a 'soft location factor' to attract talent and generate innovation and growth. Participation in cultural activities – see also Dimension 1.2 – increases people's connection to each other and to the place where they live. It enhances their creative skills and psychological well-being[42]. Cultural vibrancy is here approximated by indicators relating to the number of sights and landmarks, museums, theatres, cinema seats and concerts and shows in the city.

Dimension 1.2, Cultural Participation & Attractiveness, is about Cultural and Creative Cities' capacity to attract both local and international audiences to cultural sites or performances. Cultural participation is the 'raison d'être' of cultural amenities and facilities: they need a public to be meaningful. This is the most basic and yet crucial outcome that cities might expect as a result of their active engagement in promoting arts and culture. Cultural Participation & Attractiveness is measured through indicators on overnight tourists, museum visitors, cinema attendance and perceived satisfaction with cultural facilities.

The '**Creative Economy'** sub-index is the weighted average of three dimensions that show how well cities are doing in terms of: D2.1 Creative and Knowledge-based Jobs (40%), D2.2 Intellectual Property & Innovation (20%), and D2.3 New Jobs in Creative Sectors (40%).

Dimension 2.1, Creative & Knowledge-based Jobs, measures the extent to which Cultural and Creative Cities have access to a pool of highly qualified workers in three creative and knowledge-intensive fields which form the so-called 'cultural and creative sectors' (CCS): arts, culture and entertainment; media and communication; and creative services such as advertising and fashion. Economists agree that creative and knowledge-based workers have an important role as regards both innovation and economic growth[43]. The indicators in this dimension refer to the number of jobs in the three above-mentioned economic sub-sectors.

Dimension 2.2, Intellectual Property & Innovation, assesses whether Cultural and Creative Cities are conducive to innovation. Creativity flowing from artists, creative professionals and the CCS fosters innovation in diverse ways, for instance by fuelling content and boosting demand for consumer electronics; by adding value to new products and services through design; or by helping people develop creative skills[44]. Here the focus is on design and technological innovation. Indicators on ICT patent applications and design applications[45] are used as innovation proxies.

Dimension 2.3, New Jobs in Creative Sectors, is a proxy of how well a Cultural and Creative City is able to translate creative and innovative ideas into new jobs. This is measured in terms of jobs created in newly created enterprises in creative and knowledge-intensive sectors, as listed in Dimension 2.1.

The '**Enabling Environment**' sub-index is the weighted average of four dimensions that capture tangible and intangible assets of a city that stimulate cultural engagement and help attract creative minds, namely: D3.1 Human Capital & Education (40%), D3.2 Openness, Tolerance & Trust (40%), D3.3 Local & International Connections (15%) and D3.4 Quality of Governance (5%).

Dimension 3.1, Human Capital & Education, measures Cultural and Creative Cities' access to talent in the form of human capital in the city as well as the appeal of local universities, measured in terms of position in four international rankings – QS, ARWU, Times and Leiden (see Lexicon). The existence of high quality universities is considered a crucial factor in attracting talent, and graduates in arts, humanities and ICT are important to a creative economy[46], its cultural dynamism and its capacity to support an innovative yet sustainable society. Indicators in this dimension thus include the number of tertiary education graduates (bachelor, master and doctoral or equivalent-level graduates) in arts and humanities and in ICT disciplines, per capita.

Dimension 3.2, Openness, Tolerance & Trust, measures tolerance of diversity and mutual trust among inhabitants[47]. Acceptance of diversity and trust are crucial to facilitating the flow and translation of novel ideas. A Cultural and Creative City is open-minded and able to attract talent from different fields, welcome people with different cultures – including migrants and refugees – and enable the exchange and undertaking of creative endeavours. Indicators used to estimate a city's degree of openness, tolerance and trust include numbers of foreign graduates in tertiary education and foreign-born people, people's perception of foreigners' integration and people's trust in each other.

Dimension 3.3, Local & International Connections, provides a measure of cities' connectedness via air, rail and road links. Transport links are vital for a Cultural and Creative City as they enable the flow of visitors, talent, ideas and investments. This dimension includes indicators relating to the population-weighted average number of passenger flights per day, potential road accessibility, and trains to other cities, per capita.

Dimension 3.4, Quality of Governance, assesses the extent to which '*government delivers its policies [...] in an effective and impartial way and without corruption*'[48]. A Cultural and Creative City should provide favourable conditions for creative individuals and businesses to flourish, by, for example, providing public support and ensuring a fair regulatory system. The Cultural and Creative Cities Monitor uses the EU Quality of Government Index (QoG) as it is the only source of comparable data on quality of government at the sub-national (mainly NUTS 2) level. It measures the extent to which citizens think their public sector services (such as education, healthcare and law enforcement) are free from corruption, of good quality and allocated impartially[49]. In the absence of culture- and creativity-specific institutional indicators (to measure, for instance, the appropriateness of public policies to support culture and creativity), the QoG Index was selected as a relatively good proxy of well-functioning government institutions that can contribute to the 'liveability' of a place and its attractiveness for creative talent.

All indicators are attributed equal weight of 1, apart from Sights & landmarks and Museums – which each have a weight of 0.5, to make their contribution to the related dimension D1.1 Cultural Venues & Facilities more balanced compared to the other underlying indicators – and Tourist overnight stays, which also has a weight of 0.5 to account for the fact that this variable captures all kinds of tourists (i.e. rather than only cultural tourists).

Weight	Sub-indices	Weight	Dimensions		Indicators	
40%	1. Cultural Vibrancy	50%	🏛	1.1 Cultural Venues & Facilities	1	Sights & landmarks
					2	Museums
					3	Cinema seats
					4	Concerts & shows
					5	Theatres
		50%	👥	1.2 Cultural Participation & Attractiveness	6	Tourist overnight stays
					7	Museum visitors
					8	Cinema attendance
					9	Satisfaction with cultural facilities
40%	2. Creative Economy	40%	👤	2.1 Creative & Knowledge-based Jobs	10	Jobs in arts, culture & entertainment
					11	Jobs in media & communication
					12	Jobs in other creative sectors
		20%	©	2.2 Intellectual Property & Innovation	13	ICT patent applications
					14	Community design applications
		40%	🚀	2.3 New Jobs in Creative Sectors	15	Jobs in new arts, culture & entertainment enterprises
					16	Jobs in new media & communication enterprises
					17	Jobs in new enterprises in other creative sectors
20%	3. Enabling Environment	40%	🎓	3.1 Human Capital & Education	18	Graduates in arts & humanities
					19	Graduates in ICT
					20	Average appearances in university rankings
		40%	☮	3.2 Openness, Tolerance & Trust	21	Foreign graduates
					22	Foreign-born population
					23	Tolerance of foreigners
					24	Integration of foreigners
					25	People trust
		15%	🚆	3.3 Local & International Connections	26	Passenger flights
					27	Potential road accessibility
					28	Direct trains to other cities
		5%	⚖	3.4 Quality of Governance	29	Quality of governance

(Index 40% applies to Creative Economy; weights 40%, 40%, 20% for the three sub-indices)

Figure 14.
The Cultural and Creative Cities Monitor's conceptual framework, weighting scheme and indicators

2. Relevant to all city types and for benchmarking purposes

'*An important value of the Cultural and Creative Cities Monitor for European cities is that it emphasizes their uniqueness, regardless of their size and overall economic welfare. A simple ranking could prove useless, whereas more and more middle-size cities could be motivated to unlock their cultural and creative potential by the results of the Cultural and Creative Cities Monitor (and not necessarily by being an ECoC or UNESCO Creative city).*'

Isabelle Schwarz – Director
Tsveta Andreeva – Policy Officer
European Cultural Foundation (ECF), Amsterdam

Grouping cities into different income, employment and population size groups can generate insights into their development trajectories and help local authorities interpret results in the light of peer cities' performances.

Cities have thus been classified into five income[50], employment rate and population groups, making benchmarking between peer cities possible.

In this report, rankings are always provided according to four population size groups (the two smallest groups having been merged) to ease the reading and interpretation of results. Users can find out more about the relative performance of cities by group with the Cultural and Creative Cities Monitor Online.

Table 2.

City peer groups

GDP per capita groups (in PPS)	Number of cities	Employment rate groups	Number of cities	Population groups	Number of cities
> 35,000	40	> 74%	47	> 1 million	21
30,000-35,000	26	71–74%	22	500,000–1,000,000	36
25,000-30,000	38	68–71%	24	250,000–500,000	38
20,000-25,000	27	65–68%	31	100,000–250,000	54
< 20,000	37	< 65%	44	50,000–100,000	19

3. Adaptable data and weights

The development of the Cultural and Creative Cities Monitor has been guided by the principle that a 'gold standard' of culture and creativity does not exist and that many different approaches to capturing culture and creativity in cities should be tested. For this reason, the Cultural and Creative Cities Monitor provides two different and complementary versions – 'standardised' and 'flexible' – in the accompanying Cultural and Creative Cities Monitor Online. This tool enables users to input their own data for an existing city, create a new city entry or change the weights of indicators, dimensions or sub-indices to create tailored versions of the Monitor.

Sample selection

4. Pragmatic and clear selection criteria

168 cities have been selected following **three criteria**:

1. Cities which have been or will be **European Capitals of Culture** (ECoC) up to 2019, or which have been shortlisted to become an ECoC up to 2021 – **93 cities**;

2. **UNESCO Creative Cities** (including the most recent winners in 2015[51]) – excluding overlap with the ECoC, a further **22 cities**;

3. Cities **hosting at least two regular international cultural festivals**[52] running until at least 2015 – a further **53 cities**.
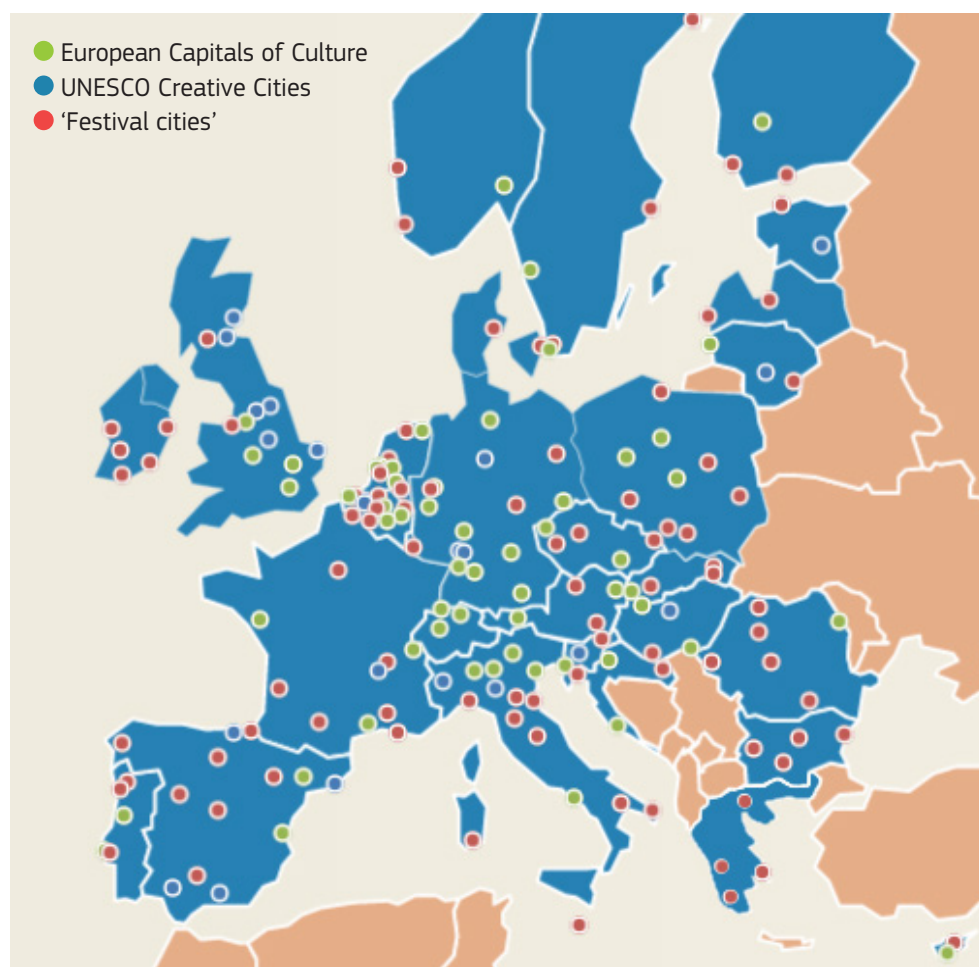
Figure 15.
168 selected cities in 30 European countries

These criteria were used to refine the list from about 1000 cities in Eurostat's Urban Audit database down to 168 cities that are actively investing in arts and culture and that have good data coverage. As a result, it is estimated that the 2017 edition of the Cultural and Creative Cities Monitor includes roughly 90% of the European cities referred to in the literature as Cultural and Creative Cities with more than 50,000 inhabitants (the minimum threshold available in the Urban Audit).

While several other European cities from the Urban Audit meet the above criteria, they have not been included in this version due to poor data coverage[53].

5. Beyond 'usual suspects'

The 168 selected cities include 30 capital cities, but the majority are small and medium-sized cities (with a minimum of 50,000 inhabitants). 43% percent have fewer than 250,000 inhabitants and 66% fewer than 500,000.

Statistical attributes

6. Representative and comparable

The Cultural and Creative Cities Monitor's scoring methodology has been developed to ensure representativeness of the results, comparability (both within and across city peer groups), and ease of use by city authorities, business people, policymakers, academics, and laypersons alike. With a total of 168 cities in the Cultural and Creative Cities Monitor (of which 155 are based in EU countries and have sufficient data coverage to be ranked), the sample size is comprehensive enough in terms of geographic breadth, population size and income to be representative of European realities.

7. Sound and transparent on methods and data

The design and development of the Cultural and Creative Cities Monitor, the statistical assessment and the dissemination of its results follow the methodology detailed in the JRC–OECD 'Handbook on Constructing Composite Indicators' (2008). Both the data and the complete methodology can be accessed on the Cultural and Creative Cities Monitor Online[54].

8. Quantitative and qualitative monitoring perspective

The 2017 edition of the Cultural and Creative Cities Monitor is based on both official statistics – mainly coming from Eurostat's Urban Audit (see Figure 16) – and publicly available web-scraped data.

The Cultural and Creative Cities Monitor also includes key qualitative information in each city page of the online version, with some samples of qualitative facts offered in this report. These show the diverse forms that cities' cultural and creative vibrancy can take, from the hosting of internationally renowned festivals to state-of-the-art policy measures supporting culture and creativity.
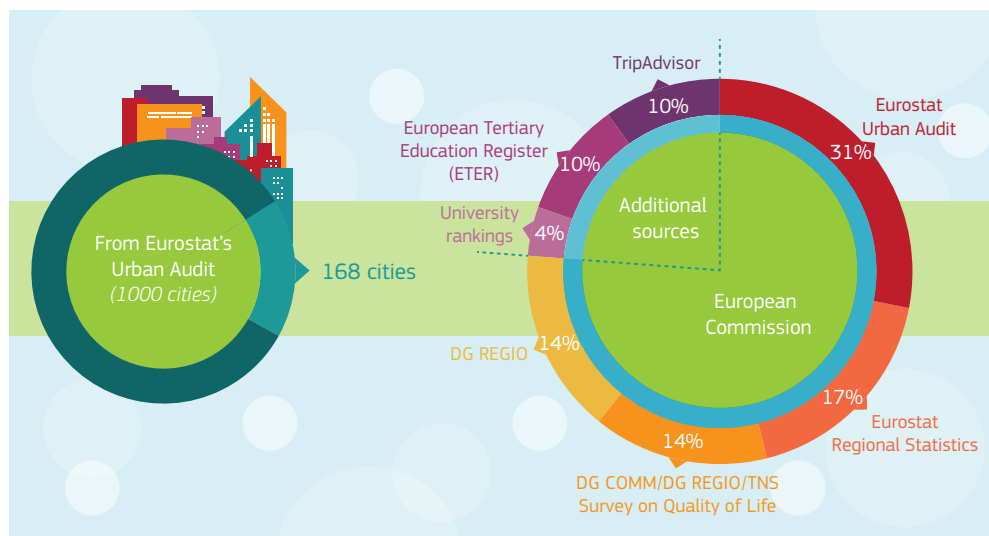
Figure 16.
Data sources for the Cultural and Creative Cities Monitor's Conceptual Framework (quantitative component)

Using the Cultural and Creative Cities Monitor

The Cultural and Creative Cities Monitor has been designed to make it possible to assess a city's performance on key culture- and creativity-related dimensions, to identify strengths and weaknesses in comparison to peer cities and eventually, with future editions, to track changes over time.

> 'The Cultural and Creative Cities Monitor can be a useful tool to inspire, raise aware-ness and provide guidelines to cities, cultural and creative decision- and policy-makers, managers, professionals, amateurs, audiences, citizens, scholars, tourists and migrants for better governance of and investment and participation in culture and creativity. It can facilitate exchange between cities in terms of similarities and complementarities. Also, at national and cross-country levels, it can provide useful insights and practical indications on more specific aspects and dimensions for leverage purposes among cit-ies aiming at increasing their cultural and creative 'density'.
>
> Elisabetta Lazzaro
> Professor of Creative Economy
> HKU – University of the Arts Utrecht

The indicator framework can be used by anyone with an interest in their city or in cities in Europe at different levels: on the level of the main Index, the three sub-indices, the nine dimensions or the actual raw data of the 29 indicators to assess and benchmark the perfor-mance of the included cities against peers of the same population size, income and employ-ment rate, or against geographical neighbours (in the same country or region), thanks to interactive features available on the Cultural and Creative Cities Monitor Online.

> *'Positive use would be if mayors would invest more in this sector and take specific actions to improve on one or the other indicator [taking into account that culture- and creativity-related indicators will have major impact on the cities' performance due to greater weight attributed to these indicators in the Cultural and Creative Cities Monitor]'.*
>
> European Commission – DG EAC

In practical terms, the Cultural and Creative Cities Monitor, together with its accompanying Cultural and Creative Cities Monitor Online, allows users to:

- **Assess** how cultural and creative a city is in relation to others;
- **Benchmark** cities against peers across **Europe** and **within countries**;
- **Learn** what **peers** are good at and where fruitful exchange could be established;
- **Use findings** on the relation between culture and creativity and growth and resilience for **advocacy purposes;**
- **Create** a new ranking by creating new city entries, adding data for existing entries or adapting weights;
- **Simulate** the desired impact of policies (e.g. an increased number of visitors) on a city's overall performance;
- **Explore** policy and research questions such as:
  - What is the relationship between a city's 'Enabling Environment' and the strength of its 'Creative Economy' or 'Cultural Vibrancy'?
  - In which cities do 'Cultural Vibrancy' and the 'Creative Economy' seem to reinforce each other most?
  - To what extent do culture and creativity contribute to job creation, wealth and resilience?

The Cultural and Creative Cities Monitor's findings must, however, be interpreted in light of certain inherent boundaries:

- The Cultural and Creative Cities Monitor is **not intended to establish causation** or to determine the complex relationships among different dimensions of culture and creativity in cities. Nevertheless, some additional analysis has been carried out (see 'Chapter 5: How Culture and Creativity relate to City Size, Capitals and Wealth') to explore in greater detail correlations between the Cultural and Creative Cities Monitor's components as well as between the C3 Index and socio-economic variables such as the number of jobs per capita and GDP growth.
- The Cultural and Creative Cities Monitor's **scores and rankings are the product of a rigorous data collection and aggregation methodology**. Nonetheless, as with all measures, they are subject to measurement error.
- Given the uncertainties associated with choosing a particular weighting scheme or aggregation rule, **confidence intervals have been calculated** to test whether the overall city ranks are statistically significant[55].
- Despite being broad, the set of 29 quantitative indicators that feed the Cultural and Creative Cities Monitor is not exhaustive and **can only capture some of the multifarious aspects of culture and creativity in cities**. Furthermore, in some cases the indicators do not isolate the 'cultural component': for example, the innovation indicators mainly capture ICT-based innovation and not process, management or artistic innovation; the tourism indicator counts all tourists rather than 'cultural tourists'; and the jobs indicators, which are based on aggregates, might include jobs that are not strictly related to culture and creativity[56]. Policy makers aiming to promote and foster cultural assets and creativity are encouraged to consider carefully all locally relevant factors and to combine different sources, instruments and methods to inform their policy actions.

It must also be borne in mind that all **indices and indicators are vulnerable to potential abuse and misinterpretation**. Once published, they can take on a life of their own and be used for purposes unanticipated by their developers. Taking data out of context can lead to unintended or erroneous policy decisions.

4

Cultural and Creative Cities Monitor 2017 Scores and Rankings

Top 5 cities per population group

Table 3.

Top 5 cities in the C3 Index per population group

Index Rank		Sub-index Ranks		
#	**City-country [confidence intervals]**	**1. Cultural Vibrancy**	**2. Creative Economy**	**3. Enabling Environment**
[XXL group] >1,000,000 inhabitants (21 cities)				
1	Paris-FR [1, 1]	**1**	**1**	**2**
2	Munich-DE [2, 2]	9	**2**	**3**
3	Prague-CZ [3, 6]	**2**	6	16
4	Milan-IT [3, 4]	**3**	11	8
5	Brussels-BE [5, 9]	10	**3**	13
6	Vienna-AT [4, 8]	**4**	17	**5**
[XL group] 500,000–1,000,000 inhabitants (34 cities)				
1	Copenhagen-DK [1, 1]	**2**	**2**	**5**
2	Amsterdam-NL [2, 2]	**4**	**3**	7
3	Lisbon-PT [3, 8]	**1**	9	15
4	Stockholm-SE [3, 9]	**5**	6	**4**
5	Dublin-IE [3, 6]	**3**	10	**1**
6	Stuttgart-DE [3, 6]	12	**1**	9
7	Frankfurt-DE [5, 8]	17	**5**	6
8	Glasgow-UK [5, 9]	6	14	**2**
[L group] 250,000–500,000 inhabitants (36 cities)				
1	Edinburgh-UK [1, 4]	**5**	8	**3**
2	Karlsruhe-DE [1, 6]	21	**2**	**4**
3	Utrecht-NL [1, 5]	11	**4**	**1**
4	Nuremberg-DE [2, 5]	13	**3**	8
5	Florence-IT [1, 11]	**1**	21	19
6	Bratislava-SK [5, 14]	19	**1**	24
[S-M group] <250,000 inhabitants (64 cities)				
1	Eindhoven-NL [1, 1]	**3**	**2**	12
2	Linz-AT [2, 3]	**4**	**5**	15
3	's-Hertogenbosch-NL [2, 3]	**2**	8	13
4	Cork-IE [4, 7]	**1**	20	11
5	Heidelberg-DE [4, 6]	16	6	**3**
6	Lund-SE [4, 7]	21	**3**	8

Note: (a) Rankings are based on a total of 155 cities – see 'Chapter 3: The Cultural and Creative Cities Monitor Approach' for more details. (b) Top five positions on each sub-index are highlighted in bold. (c) [Confidence intervals] are based on the results of the statistical assessment. They indicate by how many positions the cities could move in the rankings depending on the modelling assumptions – for more details see 'Annex B: Statistical Assessment of the Cultural and Creative Cities (C3) Index 2017', available for download on the Cultural and Creative Cities Monitor Online. (d) Cities that could have taken up to the fifth position based on the results of the statistical assessment are included in the table.

XXL Group (more than 1 million inhabitants): Paris claims first place by a clear margin, followed by Munich, Prague, Milan and Brussels. Paris leads in both the 'Cultural Vibrancy' and 'Creative Economy' sub-indices and comes second in 'Enabling Environment', with Munich coming second on 'Creative Economy'. However, there is no one recipe for success: while Munich and Brussels score particularly well on 'Creative Economy', Prague and Milan are stronger on 'Cultural Vibrancy'.

Results are particularly robust for Paris and Munich. The narrow confidence intervals reported in Table 5 indicate that the two cities maintain their first and second position respectively under different modelling scenarios[57]. Milan appears to be a strong competitor to Prague, as the Italian city could also come third instead of fourth, depending on the modelling assumptions. Vienna is a potential competitor to both Milan and Brussels as it could have taken either fourth or fifth position under different modelling assumptions.

The reason why London is not among the top Cultural and Creative Cities in its category is explained by the fact that nearly all the Cultural and Creative Cities (C3) indicators are expressed in per capita terms. This approach is primarily intended to enable cross-city comparability but finally rewards more 'inclusive' cities which have more cultural and creative assets per inhabitant. As London dominates all other cities with its population of eight million, it does not lead on any dimension in the ranking, but does reach seventh place among the 21 XXL cities.

Did you know that...?

Paris was one of the first cities to acquire the title of European Capital of Culture, in 1989, for its uncontested cultural richness and the creative atmosphere that has attracted countless artists, creative professionals and intellectuals through history. The French capital is a hive of creativity, particularly in fashion design, architecture, performing arts, publishing and advertising. It is estimated that the cultural and creative sectors (CCS) contribute 13% of total employment in the Paris region (Île de France). In 2015, despite terrorist attacks in the city, the Louvre remained the most visited art museum in the world, attracting 8.6 million visitors.

Munich is a major centre of art, culture, publishing, advanced technologies, innovation, education and tourism in Germany and Europe. The city is historically associated with music: it has hosted prominent composers such as Mozart, Richard Wagner and Richard Strauss. With the Munich Biennale and the A*DEvantgarde festival, Munich continues to boast a lively music scene. A recent study found that CCS account for 3.8% of the city's total economic output – much more than the national average of 2.4%. Four local segments dominate their respective markets nationwide, notably the film industry (18% of nationwide turnover), the book market and the art market (10% each) and the Munich advertising market (9%). Likewise, the Bavarian capital's design industry (8%) and music industry (7%) outstrip the national average and hold strong market positions.

Prague is a major cultural destination in Europe, featuring a beautiful historical centre which has been in the UNESCO World Heritage List since 1992. Prague ranked sixth in the TripAdvisor world list of best destinations in 2016. The city's authorities are committed to promoting Prague as a cultural centre, but also as a creative location. In 2014, the city became UNESCO Creative City of Literature due to its long and rich tradition in literature, its rich offering of (around 200) bookshops and important festivals celebrating literature (e.g. the Prague Writers' Festival and the International Literature and Theatre Festival). The 'Prague Creative Cluster' project has recently been launched to convert abandoned buildings into centres for education, culture and creativity.

Milan is an important cultural and educational centre, a major (and growing) tourist destination and a global creative economy hub. The city is world-renowned for fashion and design and the high-level international events taking place every year (e.g. Milan Fashion Week, the Milan Furniture Fair and the connected outdoor initiative 'Fuori Salone'). Milan is experiencing a moment of great cultural and urban vitality: major regeneration projects are currently underway, such as CityLife, involving famous architects such as Renzo Piano, Zaha Hadid, Massimiliano Fuksas and Daniel Libeskind. Various industrial buildings are progressively being transformed into 'creative spaces' (incubators, co-working areas, production spaces, etc.), amongst which BASE – a 6,000sqm building intended to foster new encounters between arts, creativity, business and technology.

Brussels is a multicultural and multilingual capital hosting three different communities (Dutch-, French- and German-speaking), and attracting each year numerous migrants and expatriates. In recent years Brussels has experienced a cultural renaissance. After being European Capital of Culture in 2000, culture has increasingly been promoted both as a means of developing the attractiveness and international image of the city and as a vehicle of social cohesion. The Zinneke Parade – a biennial parade aimed at connecting the many different cultures, communities and districts of the city – is a legacy of the ECoC title. Cultural life in the city today is very rich thanks to the excellent cultural institutions such as BOZAR (a multidisciplinary cultural centre), the numerous theatres (amongst which the Opera theatre 'La Monnaie') and a lively contemporary dance scene. The city is also increasingly home to creators active in various fields – from visual arts to music and fashion design – which is certainly helped by the moderate housing costs compared to other European capitals. Employment in CCS represents 6.5% of total employment in the city, more than at national level (5.4%).

XL Group (500,000–1,000,000 inhabitants): Copenhagen takes the top spot but there are other strong contenders. Copenhagen takes first position in the group, ranking second on both 'Cultural Vibrancy' and 'Creative Economy', closely followed by Amsterdam which ranks fourth and third in these two categories respectively. But Lisbon and Dublin (third and fifth respectively) also do well: Lisbon ranks first on 'Cultural Vibrancy' and Dublin first on 'Enabling Environment'. Dublin furthermore takes third position on 'Cultural Vibrancy'. According to the statistical robustness checks, Copenhagen and Amsterdam have very stable positions, as shown by the narrow confidence intervals reported in Table 5. Various cities seem to contend for third place, namely: Stockholm, Dublin (both currently in the Top 5) and Stuttgart. Frankfurt and Glasgow could come fifth, either together with or instead of Dublin.

Did you know that...?

Copenhagen was the first Danish city to be awarded the title of European Capital of Culture, in 1996. Apart from hosting a wide selection of museums, art galleries and music venues of international standing (e.g. the National Museum, the Danish National Gallery and the new Copenhagen Concert Hall designed by Jean Nouvel), Copenhagen is also home to a lively jazz and punk music scene as well as numerous bars and restaurants (e.g. 'Noma', one of the world's best restaurants). Major architectural works adorn the city, such as the 2011 world's best residential house designed by the Danish architect Bjarke Ingels. Twice a year Copenhagen hosts the Nordic region's largest fashion event, the Copenhagen Fashion Week, which has put the city and the entire country on the fashion map of Europe.

Amsterdam – the third city to be awarded the title of European Capital of Culture, in 1987 – is a blooming city with an increasingly large and ethnically diverse population. Culture is considered a key asset in fostering economic development and enhancing the city's international reputation. The Dutch capital's cultural infrastructure has been considerably enriched in the last decade with new or renovated venues such as the Rijksmuseum, the Stedelijk Museum Amsterdam and the Eye Film Institute. New creative workspaces are being established and festivals are flourishing (such as the world-famous ADE Festival of electronic music), all of which contribute to the city's attractiveness for diverse types of creators and cross-overs between sectors and disciplines. Amsterdam-Noord has been particularly successful in this sense: abandoned warehouses in that part of the city have been turned into restaurants and headquarters for creative start-ups. Others serve as festival and event spaces. One of Amsterdam-Noord's major attractions is the monthly IJ-Hallen – the biggest flea market in Europe – which takes place in the largest of these warehouses. Amsterdam is particularly strong in advertising, marketing and fashion, but also in music, TV, app development and gaming.

Lisbon is well known as a diverse and multicultural capital. Since 1994, when it was European Capital of Culture, various international events (such as Expo '98 and Euro 2004) have taken place in the city, boosting the local cultural infrastructure and activities. Culture is seen as a tool for social cohesion thanks to the positive experience of the Urban Art Gallery (GAU), which promotes the use of public space as a medium for graffiti and street art. It was established in 2008 as part of a rehabilitation plan by the Lisbon City Council in Bairro Alto, a much degraded district. Due to its success the project was extended to the whole city. In recent years, the local authorities have taken new action to strengthen the economic potential of arts, culture and creativity. Co-working spaces, fab labs and start-up incubators are now available in the rehabilitated urban areas. In addition to long-lived international events such as the Lisbon Architecture Triennale, the Lisbon Fashion Week and the Lisbon & Estoril Film Festival, the city has started to host new creativity-related events, such as the European Creative Hubs Forum in 2015, connecting over 200 creative hubs across Europe.

Stockholm is an innovative, multicultural and globally connected city which was awarded the title of European Capital of Culture in 1998. Its rich cultural landscape counts three UNESCO World heritage sites and various world-class museums and attractions, such as the maritime Vasa Museum – the most visited non-art museum in Scandinavia. Stockholm has a vibrant art scene with a number of internationally recognised art centres and commercial galleries. The Stockholm metro, opened in 1950, is well known for the interior design of the stations. It has been called the longest art gallery in the world. The Stockholm Business Region works to develop and promote Stockholm as a business and tourist destination. Creative industries represent one of its major axes of work.

Dublin is known as a thriving cultural and artistic centre. Culture Night – when more than 80 museums, galleries, theatres, cathedrals and cultural institutions of all branches provide a night of free entertainment and discovery – is one of the most popular events. Temple Bar – an historic district of the medieval centre of Dublin – has become the centre of the vibrant cultural life of the city. The quarter underwent an important regeneration process in the '90s, becoming a major creative quarter attracting artists and creative businesses as well as tourists. Dublin was European Capital of Culture in 1991. Later it was shortlisted by the International Council for the Society of Industrial Designers (ICSID) to become World Design Capital 2014. In 2010 Dublin acquired the status of UNESCO Creative City of Literature. Dublin has a redoubtable literary history which featured many prominent literary figures, including the Nobel laureates William Butler Yeats, George Bernard Shaw and Samuel Beckett.

L Group (250,000–500,000 inhabitants): Edinburgh has the best overall performance… but does not lead on all sub-indices. Edinburgh ranks first among cities accommodating between 250,000 and 500,000 inhabitants, thanks to good performance on all the sub-indices. However, other cities score well or even better on individual sub-indices, notably Karlsruhe, Utrecht and Nuremberg, which do better on 'Creative Economy'. First place on 'Cultural Vibrancy' goes to Florence, which ranks fifth overall. In this population group the confidence intervals for the top five cities on the C3 Index are slightly bigger than in the previous groups. Edinburgh, for instance could slip down to forth position, Utrecht to fifth and Florence to eleventh. Bratislava could take fifth place, currently occupied by Florence.

Did you know that…?

Edinburgh is internationally famous for its unique topography and historic architecture, with the medieval Old Town and neo-classical New Town featuring on the UNESCO World Heritage Site list. Edinburgh hosts 12 major festivals each year. Overall, the Edinburgh festivals are among the biggest ticketed events in the world, and the Fringe Festival is now the largest annual international arts festival. Edinburgh also has a rich literary tradition dating back to the Enlightenment, which won the city the first title of UNESCO City of Literature in 2004. On the policy side, Edinburgh actively supports the growth of the cultural and creative sectors. The city has put forward 'A Strategy for Jobs, 2012-17' to foster job creation through investment in innovative start-up workspaces. Also, the City of Edinburgh Strategic Plan 2012-17 aims to invest in sporting and cultural infrastructure to further improve quality of life and care for its citizens.

Karlsruhe is a technological and scientific centre with an open and tolerant atmosphere which has attracted artists throughout history and contributed to the prosperity of cultural and creative businesses. The city hosts a cutting-edge cultural centre, opened in 1999: the ZKM (Zentrum für Kunst und Medientechnologie – Centre for Art and Media). Located in a former weapons factory, the ZKM hosts various local cultural institutions linking new media theory and practice. The cultural and creative sectors as a whole have progressively become a major local factor for urban development and jobs: more than 13.3% of local companies and 7.3% of employees are active in CCS. The creative cluster Kreativpark Alter Schlachthof Karlsruhe has been launched as part of the city's 'Integrated Urban Development Plan' (ISEK) to further support the economic potential of the cultural and creative sectors.

Utrecht is a student city with a young population, thanks to the presence of the largest university in the Netherlands. The city's cultural life is animated by several well-known festivals, such as the annual International Chamber Music Festival, the Utrecht Early Music Festival, or the Spring Performing Arts Festival. But the city's major potential lies in the games sector. The Dutch Game Garden, an organisation supported by both the city and the province of Utrecht, has the mission to create economic growth and employment by accelerating the growth of the Dutch video game industry. In addition, Utrecht's cultural strategy for 2012-22 ('Open space') aims to promote Utrecht as a diverse, hospitable and creative city where culture is connected to the wider urban agenda for economic growth and social progress.

Nuremberg was an early centre of humanism, science and printing. It hosts the oldest fine arts academy in central Europe, with a 350-year tradition of artistic education. The 2010 Report on the Cultural and Creative Industries in the Nuremberg Metropolitan Region identified for the first time the region's creative potential and made recommendations for action. The recently opened Bavarian Centre for Cultural and Creative Industries is based in Nuremberg.

Florence – the second city in Europe to have been awarded the European Capital of Culture title, in 1986 – is universally recognised as the birthplace of the Renaissance as well as one of the cradles of Italian art and architecture. Florence is perhaps the best example of an 'historical' creative city, with reference to both the 13th century (the era of Cimabue, Giotto and Dante Alighieri) and the 15th (when Lorenzo di Medici was a major patron of creativity in the arts and science). Florence's artistic creativity remains reflected in its world-renowned museums and architectural heritage as well as in the Historic Centre of Florence which was inscribed in the UNESCO World Heritage list in 1992. Florence also features a well-established fashion sector, especially as regards leather and high-fashion products. It is home to prestigious fashion houses such as Gucci, Enrico Coveri, Roberto Cavalli, Salvatore Ferragamo and Patrizia Pepe, prominent events such as Pitti Immagine (with fashion shows) and important educational institutions (e.g. Polimoda and the IED Fashion Lab).

S-M Group (fewer than 250,000 inhabitants): Top cities are particularly strong on 'Cultural Vibrancy', with Eindhoven taking the lead. 'Cultural Vibrancy' characterises the top four cities in this group, with the exception of Heidelberg, which displays a stronger 'Enabling Environment' and 'Creative Economy'. Eindhoven, Linz and, to a lesser extent, s'Hertogenbosch perform very well on the 'Creative Economy' indicators, whilst Cork (which ranks first on 'Cultural Vibrancy') has considerable room for improvement on the 'Creative Economy' sub-index. While the rank position on the main Index is very robust for Eindhoven, with a narrow confidence interval, and fairly stable for Linz and s'Hertogenbosch (which might come either second or third under different simulated scenarios), Cork and Lund could take between fourth and seventh position and Heidelberg between fourth and sixth.

Did you know that...?

Eindhoven is a former industrial city, mainly known as the hometown of Philips which helped to attract investors, especially hi-tech companies, to the area, making Eindhoven a major technological and industrial hub. With the project Strijp-S, Eindhoven transformed an industrial area in recession into a creative and cultural quarter where strategic infrastructures have been developed. A large number of cultural and entertainment-oriented festivals animate the city (e.g. ABlive, Carnaval, Koningsdad, EDIT, Fiesta del Sol, UCI ProTour – Eindhoven Team Time Trial, Virus Festival, Park Hilaria, Folkwoods, Reggae Sundance, Lichtjesroute, Marathon, Dutch Design Week, etc.). The city has received several distinctions as a living cradle of culture and creativity: it was Intelligent Community of the Year 2011, the World's Most Inventive City in 2013 and shortlisted for European Capital of Culture 2018.

Linz – once known as one of Austria's most important economic centres thanks to the strong steel and chemical industry located in the city – today offers a broad spectrum of cultural events and high-quality cultural institutions. In 2009 Linz was European Capital of Culture. With more than 2.5 million people visiting the city that year and several newly constructed cultural venues, Linz has reinforced its image as a dynamic city of both culture and industry. Since 1979 Linz hosts the Ars Electronica Festival, which has become one of the most important new media festivals worldwide, attracting nearly 100,000 visitors every year. In 2014 Linz was designated UNESCO City of Media Arts.

's-Hertogenbosch is a medieval city, among the oldest in the Netherlands, featuring a cosy and intimate atmosphere, a beautiful historical centre and a lively city centre with numerous bars and restaurants. It is known as the birthplace of the world famous painter Hieronymus Bosch. The 500th anniversary of the death of the painter in 2016 was used as an important opportunity to link the cultural legacy of the city with contemporary creativity and tourism. In addition to a major exhibition, which then moved to Madrid, other initiatives were initiated – from the Bosch Heritage Experience (to complement the exhibition in cooperation with animation companies) to the Bosch Art Game. The exhibition attracted a record number of nearly 422,000 visitors.

Cork is a multicultural city. It was European Capital of Culture in 2005, attracting over one million people, seven times the city's population, to official events. Recent evolutions in the arts infrastructure include modern additions to Cork Opera House and the Crawford Municipal Art Gallery. The Lewis Glucksman Gallery opened in the autumn of 2004. In 2009 Cork was included in the Lonely Planet's Top 10 'Best in Travel 2010' for its 'sophisticated, vibrant and diverse' spirit.

Heidelberg features a romantic and picturesque cityscape, including Heidelberg Castle and the baroque-style Old Town, which has transformed the city into a popular tourist destination. Heidelberg's creativity is what makes it a unique economic player in Germany. The cultural and creative sectors represent a highly significant part of the overall economic performance of the city, higher than in any other city in the country, with over one-third of the sectors' income coming from the literature and publishing business. In 2013 the Centre of Creative Industries was set up to help launch businesses in the literary field. In 2014 Heidelberg received the title of UNESCO Creative City of Literature. As a UNESCO Creative City, one of its objectives is to invite cultural institutions and artists from other disciplines to participate in joint productions combining literature with music, dance, visual arts, film and media arts.

City leaders by dimensions and indicators

A closer look at the top five cities at the level of dimensions and individual indicators[58] and within the four population groups (see Tables 4a, 4b and 4c) reveals a greater number of 'winners' across Europe (although in some cases scores should be treated with caution because they have been estimated due to missing data – these cases are marked with an asterisk: '*'). Many cities that do not appear in the top five in the overall Index in fact lead in one or more of the constituent dimensions or indicators, showing what European cities are good at and where there might be room for improvement, vis-à-vis peer cities. Only Paris clearly pulls away from all other cities, taking first position on four of nine dimensions.

Overall, 75% of the 155 Cultural and Creative Cities ranked in this first edition of the Monitor are among the top five performers in at least one dimension or indicator related to 'Cultural Vibrancy' or the 'Creative Economy'. This percentage goes up to 83% if considering also the dimensions and indicators underpinning the Enabling Environment sub-index. The Cultural and Creative Cities Monitor thus valorises cities' diverse assets and strengths, giving them the opportunity to learn from each other. No city can reasonably be taken as an absolute model, but all cities can draw useful lessons from each other.

Cultural Vibrancy

The top five cities on Dimension 1.1, Cultural Facilities & Venues, in each population group are Prague, Paris, Barcelona, Milan, and Vienna (out of the 21 ranked cities in the XXL group), Lisbon, Dublin, Copenhagen, Amsterdam, and Athens (out of the 34 ranked cities in the XL group), Venice, Ghent, Florence, Edinburgh, and Ljubljana (out of the 36 ranked cities in the L group), and Cork, Galway, Norwich, Linz, and Eindhoven (out of the 64 ranked cities in the S-M group). On this dimension, in the first three population groups, top positions are more or less equally shared by cities in Northern, Southern and Western Europe. In the smallest population group, the top positions are instead mostly occupied by Northern Europe cities.

Southern and Northern Europe cities, mostly located in Italy and Ireland, clearly lead on Sights & landmarks, Museums and Concerts & shows. In addition to Rome (XXL) and Dublin (XL), which come first on Sights & landmarks in their respective population groups, several non-capital cities take the top position in at least one of these three indicators, notably Venice – which scores top in three of five indicators, namely Sights & landmarks, Museums and Concerts & shows in the L group; Matera – first on Sights & landmarks in the S-M group; Limerick – first on Museums in the S-M group; and Cork and Galway – both first on Concerts & shows in the S-M group. Matera and Limerick will be European Capitals of Culture in 2019 and 2020 respectively, while Cork was European Capital of Culture in 2005 and Limerick was one of the shortlisted candidates in 2020.

From Eastern Europe, Prague* does particularly well on all the indicators underpinning Dimension 1.1, Cultural Facilities & Venues. The capital city of the Czech Republic indeed takes the top position in two of four indicators in its population group (XXL), namely Museums and Concerts & shows, and the second position on Sights & landmarks and Theatres.

A much more varied picture emerges from the indicators Cinema seats and Theatres. On Cinema seats, eight cities scattered across Europe are the top one, namely Barcelona (XXL), Glasgow*, Nantes* and Poznan (XL), Katowice (L) and Eindhoven*, Linz*, and 's-Hertogenbosch* (S-M). On Theatres, 13 cities from all over Europe take either the first or second position, namely Brussels* and Prague*(XXL), Copenhagen*, Genoa*, Turin*, Zagreb, and Zaragoza* (XL), Ghent and Ljubljana (L) and Tampere*, Eindhoven*, Linz* and 's-Hertogenbosch* (S-M).

Paris, Milan, Vienna, Munich, and Lyon (out of the 21 ranked cities in the XXL group), Copenhagen, Stockholm, Amsterdam, Lisbon, and Dresden (out of the 34 ranked cities in the XL group), Florence, Graz, Ghent and Tallinn, Ljubljana, and Nottingham (out of the 36 ranked cities in the L group), and Heidelberg and Leiden, Weimar, 's-Hertogenbosch, Eindhoven, and Linz (out of the 64 ranked cities in the S-M group) head the list of top five cities on Dimension 1.2, Cultural Participation & Attractiveness. On this dimension, more than half of the top positions are occupied by Western Europe cities.

The list of cities taking the top position on Tourist overnight stays is much more balanced as it includes Budapest (XXL), Amsterdam (XL), Florence* (L), and Karlovy Vary and York (S-M), namely two cities out of five located in Eastern Europe (Budapest, Karlovy Vary), one in Southern Europe (Florence), one in Western Europe (Amsterdam) and one in Northern Europe (York). As regards the other underlying indicators, the top performers are mostly based in Western Europe. For instance, on Museum visitors, four of the seven cities taking the first position – namely: Paris (XXL), and Heidelberg, Leiden* and Weimar (S-M) – are based in Western Europe, and predominantly in Germany. Similarly, on Satisfaction with cultural facilities, there are eight top performers from Western Europe with the exception of Glasgow, Poznan and Florence. These are Lyon* and Vienna (XXL), Glasgow, Nantes* and Poznan* (XL), Florence* and Graz (L) and Ostend* (S-M).

Table 4a.
Top five Cultural and Creative Cities by 'Cultural Vibrancy' dimensions and indicators

Top 5 cities by dimension		
Sub-Index	**1. Cultural Vibrancy**	
Dimensions	**D1.1 Cultural Venues & Facilities**	**D1.2 Cultural Participation & Attractiveness**
Size groups		
XXL	Prague-CZ, Paris-FR, Barcelona-ES, Milan-IT, Vienna-AT	Paris-FR, Milan-IT, Vienna-AT, Munich-DE, Lyon-FR
XL	Lisbon-PT, Dublin-IE, Copenhagen-DK, Amsterdam-NL, Athens-EL	Copenhagen-DK, Stockholm-SE, Amsterdam-NL, Lisbon-PT, Dresden-DE
L	Venice-IT, Ghent-BE, Florence-IT, Edinburgh-UK, Ljubljana-SI	Florence-IT, Graz-AT, Ghent-BE/Tallinn-EE, Ljubljana-SI, Nottingham-UK
S-M	Cork-IE, Galway-IE, Norwich-UK, Linz-AT, Eindhoven-NL	Heidelberg-DE/Leiden-NL, Weimar-DE, 's-Hertogenbosch-NL, Eindhoven-NL, Linz-AT

Top 5 cities by indicator		
	Sights & landmarks	**Tourist overnight stays**
XXL	Rome*-IT, Prague*-CZ, Milan*-IT, Paris-FR, Barcelona-ES	Budapest-HU, Paris-FR, Barcelona-ES, Prague*-CZ, Munich*-DE
XL	Dublin-IE, Lisbon*-PT, Copenhagen*-DK, Genoa*-IT, Seville*-ES	Amsterdam-NL, Manchester-UK, Lisbon*-PT, Frankfurt*-DE, Copenhagen*-DK
L	Venice-IT, Aarhus*-DK, Florence*-IT, Edinburgh-UK, Bologna-IT	Florence*-IT, Varna-BG, Venice*-IT, Tallinn-EE, Nuremberg*-DE
S-M	Matera-IT, Limerick-IE, Tartu-EE, Galway-IE, Trento-IT	Karlovy Vary-CZ/York-UK, Bruges*-BE, Granada-ES, Norwich-UK, Limerick*-IE
	Museums	**Museum visitors**
XXL	Prague*-CZ, Paris-FR, Milan*-IT, Barcelona-ES, Brussels*-BE	Milan*-IT/Paris-FR, Berlin-DE, Munich*-DE, Barcelona-ES, Rome*-IT
XL	Lisbon*-PT, Dublin-IE, Amsterdam-NL, Athens*-EL, Copenhagen*-DK	Stockholm-SE, Lisbon*-PT, Copenhagen*-DK, Dresden-DE, Krakow-PL
L	Venice-IT, Florence*-IT, Tallinn-EE, Edinburgh-UK, Bologna-IT	Florence*-IT, Ljubljana-SI, Bilbao-ES, Aarhus*-DK, Nuremberg*-DE
S-M	Limerick-IE, Tartu-EE, Bruges*-BE, Trieste-IT, Weimar-DE	Heidelberg-DE/Leiden*-NL/Weimar-DE, Porto-PT, Granada-ES, Bruges*-BE/Parma*-IT/Tartu-EE, Lund*-SE

Top 5 cities by indicator (continued)		
	Cinema seats	**Cinema attendance**
XXL	Barcelona-ES, Lyon*-FR, Vienna*-AT, Paris*-FR, Budapest*-HU	Vienna*-AT, Paris*-FR, Lyon*-FR, Marseilles*-FR, Warsaw-PL
XL	Glasgow*-UK/Nantes*-FR/Poznan-PL, Bordeaux*-FR/Lisbon*-PT, Athens*-EL, Dublin-IE, The Hague*-NL	Bordeaux*-FR/Lisbon*-PT, Copenhagen*-DK, Dublin-IE, Antwerp*-BE, Athens*-EL
L	Katowice-PL, Graz*-AT, Timişoara*-RO, Las Palmas*-ES, Thessaloniki*-EL	Ghent-BE, Liège*-BE, Tallinn-EE, Timişoara*-RO, Nottingham*-UK
S-M	Eindhoven*-NL/Linz*-AT/'s-Hertogenbosch*-NL, Klaipeda*-LT/Norwich-UK, Mons-BE, Cork-IE, Galway-IE	Cork-IE, Mons-BE/Kalamata*-EL/Waterford*-IE, Eindhoven*-NL/Linz*-AT/'s-Hertogenbosch*-NL, Namur-BE, Bruges*-BE
	Concerts & shows	**Satisfaction with cultural facilities**
XXL	Prague*-CZ, Paris-FR, Barcelona-ES, Vienna-AT, Madrid-ES	Lyon*-FR/Vienna-AT, Munich*-DE, Berlin-DE, Prague*-CZ, Hamburg-DE
XL	Dublin-IE, Lisbon*-PT, Amsterdam-NL, Copenhagen*-DK, Seville*-ES	Glasgow-UK/Nantes*-FR/Poznan*-PL, Amsterdam-NL, Stockholm-SE, Helsinki-FI, Stuttgart*-DE
L	Venice-IT, Ghent-BE, Florence*-IT, Edinburgh-UK, Liverpool-UK	Florence*-IT/Graz-AT, Varna*-BG, Bilbao*-ES, Kaunas*-LT/Nottingham*-UK, Malmö*-SE/Tallinn-EE
S-M	Cork-IE/Galway-IE, Granada-ES, Norwich-UK, Limerick-IE, Avignon-FR	Ostend*-BE, Heidelberg*-DE/Klaipeda*-LT/Leiden*-NL, Lund-SE, Maastricht*-NL, Norwich*-UK
	Theatres	
XXL	Brussels*-BE, Prague*-CZ, Milan*-IT/Paris-FR, Budapest-HU, Barcelona-ES	
XL	Copenhagen*-DK, Genoa*-IT/Turin*-IT/Zagreb-HR/Zaragoza*-ES, Lisbon*-PT, Stockholm-SE, Athens*-EL	
L	Ghent-BE, Ljubljana-SI, Florence*-IT, Aarhus*-DK, Bratislava-SK	
S-M	Tampere*-FI, Eindhoven*-NL/Linz*-AT/'s-Hertogenbosch*-NL, Matera*-IT, Porto-PT, Cork-IE	

Note: the asterisk '*' means that the score has been estimated due to missing data.

Creative Economy

The top five cities on Dimension 2.1, Creative & Knowledge-based Jobs in each population group, are Paris, Munich and Rome, Milan, Madrid, and Cologne (out of the 21 ranked cities in the XXL group), Stockholm, Helsinki, Frankfurt am Main, Copenhagen, and Stuttgart (out of the 34 ranked cities in the XL group), Bologna, Utrecht, Karlsruhe, Nuremberg, and Bratislava (out of the 36 ranked cities in the L group) and Linz, Lund, Eindhoven, 's-Hertogenbosch, and Leuven (out of the 64 ranked cities in the S-M group).

On the underlying indicators, while Paris dominates overall, cities from Northern, Western and Southern Europe take some of the top positions. For instance, together with Paris (XXL), Copenhagen* (XL), Bologna (L) and Perugia (S-M) – cities located in Northern and Southern Europe – come first on Jobs in arts, culture & entertainment. On Jobs in media & communication, there is a clear predominance of cities in Western and Northern Europe among the top one cities, namely: Paris (XXL), Stockholm (XL), Karlsruhe (L) and Lund* (S-M). Munich* (XXL), Frankfurt am Main* (XL), Nottingham (L) and Eindhoven (S-M) – all located in Western Europe, and two in Germany – take the lead on Jobs in other creative sectors. However, two Eastern Europe capitals conquer the first positions, namely Sofia (which comes third on

Jobs in media & communication in the XXL group), and Bratislava* (which is third on Jobs in media & communication and second on Jobs in other creative sectors in the L group).

On Dimension 2.2, Intellectual Property & Innovation, the top five cities in their respective groups are Munich, Paris, London, Hamburg, and Milan (out of the 21 ranked cities in the XXL group), Stuttgart, Helsinki and Stockholm, Copenhagen, Frankfurt am Main, and Gothenburg (out of the 34 ranked cities in the XL group), Malmö, Nuremberg, Karlsruhe, Graz, and Aarhus (out of the 36 ranked cities in the L group) and Eindhoven, Lund, Tampere, Leuven, and Heidelberg (out of the 64 ranked cities in the S-M group), with a clear prevalence of German cities and, overall, of Western and Northern European cities.

As regards the underlying indicators, Northern Europe share more or less equally the top positions on ICT patent applications – the top performers on this indicator indeed are: Munich* (XXL), Stockholm (XL), Malmö (L-group), and Eindhoven and Tampere* (S-M). On Community design applications, Western Europe lead with Paris (XXL), Stuttgart (XL), Aarhus* (L) and Eindhoven (S-M) coming first.

Paris (out of the 21 ranked cities in the XXL group) again takes the top position on Dimension 2.3, New Jobs in Creative Sectors, followed by Brussels and Bucharest, Warsaw, Prague, and Berlin. The top five performers in other population groups are: Vilnius, Lisbon, Amsterdam, Poznan, and Hannover (out of the 34 ranked cities in the XL group), Bratislava, Cluj-Napoca, Edinburgh, Karlsruhe, Mannheim and Nuremberg, and Bochum and Timișoara (out of the 36 ranked cities in the L group), and Umeå, York, Porto, Coimbra and Sibiu (out of the 64 ranked cities in the S-M group). Apart from Paris, two Northern Europe cities and one Eastern European city rank first on this 'dynamic' dimension measuring the number of jobs created by new companies in the reference year.

The best performers on the underlying indicators do not deviate greatly from the results on the overall dimension, with the exception of Brussels, Bucharest and Lisbon (the only Southern city that leads on one of the 'new jobs' indicators). Brussels* and Bucharest* (XXL), Vilnius (XL), Bochum* (L) and Umeå again (S-M), for instance, take the top spot on Jobs in new arts, culture & entertainment enterprises. Paris (XXL), Copenhagen* (XL), Bratislava (L) and Umeå (S-M) lead on Jobs in new media & communication enterprises, while and Paris (XXL), Lisbon* (XL), Bratislava (L) and Umeå (S-M) lead on Jobs in new enterprises in other creative sectors.

Interestingly, many more Eastern European cities take up at least one of the first five positions on Dimension 2.3, New Jobs in Creative Sectors compared to Dimension 2.1, Creative & Knowledge-based Jobs and Dimension 2.2, Intellectual Property & Innovation, such as Bucharest, Warsaw and Prague (second, third and fourth respectively in the XXL group), Poznan (forth in the XL group) and Bratislava, Cluj-Napoca and Timișoara (first, second and fifth in the L group) and Sibiu (fifth in the S-M group). At the indicator level, for instance, Warsaw (XXL) and Poznan (XL) come second, Wroclaw third (XL), Cluj-Napoca second (L) and Iași* third (L) on Jobs in new media & communication enterprises.

Table 4b.

Top five Cultural and Creative Cities by 'Creative Economy' dimensions and indicators

Top 5 cities by dimension			
Sub-Index	**2. Creative Economy**		
Dimensions / Size groups	**D2.1 Creative & Knowledge-based Jobs**	**D2.2 Intellectual Property & Innovation**	**D2.3 New Jobs in Creative Sectors**
XXL	Paris-FR, Munich-DE/ Rome-IT, Milan-IT, Madrid-ES, Cologne-DE	Munich-DE, Paris-FR, London-UK, Hamburg-DE, Milan-IT	Paris-FR, Brussels-BE/ Bucharest-RO, Warsaw-PL, Prague-CZ, Berlin-DE
XL	Stockholm-SE, Helsinki-FI, Frankfurt-DE, Copenhagen-DK, Stuttgart-DE	Stuttgart-DE, Helsinki-FI/ Stockholm-SE, Copenhagen-DK, Frankfurt-DE, Gothenburg-SE	Vilnius-LT, Lisbon-PT, Amsterdam-NL, Poznan-PL, Hannover-DE
L	Bologna-IT, Utrecht-NL, Karlsruhe-DE, Nuremberg-DE, Bratislava-SK	Malmö-SE, Nuremberg-DE, Karlsruhe-DE, Graz-AT, Aarhus-DK	Bratislava-SK, Cluj-Napoca-RO, Edinburgh-UK/Karlsruhe-DE/ Mannheim-DE/Nuremberg-DE, Bochum-DE, Timişoara-RO
S-M	Linz-AT, Lund-SE, Eindhoven-NL, 's-Hertogenbosch-NL, Leuven-BE	Eindhoven-NL, Lund-SE, Tampere-FI, Leuven-BE, Heidelberg-DE	Umeå-SE, York-UK, Porto-PT, Coimbra-PT, Sibiu-RO

Top 5 cities by indicator			
Sub-Index	**2. Creative Economy**		
Dimensions / Size groups	**Jobs in culture, arts & entertainment**	**ICT patent applications**	**Jobs in new arts, culture & entertainment enterprises**
XXL	Paris-FR, Milan*-IT, Rome*-IT, Munich*-DE, Berlin-DE	Munich*-DE, London*-UK, Paris-FR, Berlin-DE, Marseilles*-FR	Brussels*-BE/Bucharest*-RO, Paris-FR, Berlin*-DE, Sofia-BG, Marseilles*-FR
XL	Copenhagen*-DK, Stuttgart-DE, Helsinki*-FI, Stockholm-SE, Frankfurt*-DE	Stockholm-SE, Stuttgart-DE, Helsinki-FI, Dresden-DE, Frankfurt*-DE	Vilnius-LT, Amsterdam-NL, Hannover*-DE, Lisbon*-PT, Rotterdam-NL
L	Bologna-IT, Florence*-IT/ Graz*-AT, Venice-IT, Utrecht-NL, Nuremberg*-DE	Malmö-SE, Nuremberg*-DE, Karlsruhe-DE, Graz-AT, Mannheim-DE	Bochum*-DE, Cluj-Napoca-RO, Utrecht-NL, Montpellier-FR, Timişoara*-RO
S-M	Perugia-IT, Linz*-AT, Weimar-DE, Parma-IT, Brescia-IT	Eindhoven-NL/Tampere*-FI, Lund-SE, Leuven-BE, Heidelberg-DE, Weimar-DE	Umeå-SE, York*-UK, Avignon-FR, Porto-PT, Leuven*-BE
	Jobs in media & communication	**Community design applications**	**Jobs in new media & communication enterprises**
XXL	Paris-FR, Munich*-DE, Sofia-BG, Milan*-IT, Madrid-ES/Rome*-IT	Paris-FR, Munich*-DE, Warsaw-PL, Milan*-IT, Hamburg-DE	Paris-FR, Warsaw-PL, Brussels*-BE/Bucharest*-RO, Sofia-BG, Berlin*-DE
XL	Stockholm-SE, Copenhagen*-DK, Helsinki*-FI, Frankfurt*-DE, Dublin-IE	Stuttgart-DE, Helsinki-FI, Copenhagen*-DK, Poznan-PL, Amsterdam-NL	Copenhagen*-DK, Poznan-PL, Manchester*-UK/Wroclaw-PL, Krakow-PL, Amsterdam-NL
L	Karlsruhe-DE, Utrecht-NL, Bologna*-IT/Bratislava*-SK, Nuremberg*-DE, Ljubljana-SI	Aarhus*-DK, Bologna-IT, Malmö-SE, Mannheim-DE, Karlsruhe-DE	Bratislava-SK, Cluj-Napoca-RO, Iaşi*-RO, Edinburgh*-UK/ Karlsruhe*-DE/Mannheim*-DE/ Nuremberg*-DE, Timişoara*-RO
S-M	Lund*-SE, Linz*-AT, Eindhoven-NL, Groningen-NL, 's-Hertogenbosch-NL	Eindhoven-NL, Perugia-IT, Linz-AT, Lund-SE, 's-Hertogenbosch-NL	Umeå-SE, York*-UK, Groningen-NL, Sibiu-RO, Eindhoven-NL

Top 5 cities by indicator (continued)			
	Jobs in other creative sectors		**Jobs in new enterprises in other creative sectors**
XXL	Munich*-DE, Paris-FR, Madrid-ES/Rome*-IT, Hamburg-DE, Cologne*-DE		Paris-FR, Prague*-CZ, Brussels*-BE/ Bucharest*-RO, Budapest-HU, Warsaw-PL
XL	Frankfurt*-DE, Stuttgart-DE, Helsinki*-FI, Amsterdam-NL, Stockholm-SE		Lisbon*-PT, Vilnius-LT, Hannover*-DE, Poznan-PL, Amsterdam-NL
L	Nottingham-UK, Bologna*-IT/ Bratislava*-SK, Utrecht-NL, Mannheim-DE, Nuremberg*-DE		Bratislava-SK, Edinburgh*-UK/ Karlsruhe*-DE/Mannheim*-DE/ Nuremberg*-DE, Bochum*-DE, Tallinn-EE, Timișoara*-RO
S-M	Eindhoven-NL, Linz*-AT, 's-Hertogenbosch-NL, Leuven-BE, Groningen-NL		Umeå-SE, Porto-PT, Coimbra-PT, York*-UK, Mons*-BE/Waterford*-IE

Note: the asterisk '' means that the score has been estimated due to missing data.*

Enabling Environment

The five best scoring cities on Dimension 3.1, Human Capital & Education in each population group, are Paris, Barcelona, Milan, London, and Madrid (out of the 21 ranked cities in the XXL group), Manchester, Amsterdam, Toulouse, Glasgow, and Dublin (out of the 34 ranked cities in the XL group), Nottingham, Utrecht, Edinburgh, Montpellier, and Karlsruhe (out of the 36 ranked cities in the L group) and Leuven, Nitra, Galway, Heidelberg, and Limerick (out of the 64 ranked cities in the S-M group). Two of the four cities scoring highest in the four population groups are UK cities.

On the underlying indicators, a mix of 'usual' and 'unusual' suspects from across Europe conquers the top position. For instance, Paris (XXL), Poznan (XL), Nottingham (L), and Galway, Limerick and Nitra (S-M) are the number one cities on Graduates in arts & humanities. Paris (XXL), Toulouse (XL), Utrecht (L), and Leuven (S-M) – all cities in Western Europe – hold the first position in their respective population groups on Graduates in ICT. Barcelona, London, and Paris (XXL), Stockholm (XL), Edinburgh (L), and Groningen, Leuven and Lund (S-M) come first on Average appearance in university rankings, with a prevalence of cities in Western and Northern Europe. Barcelona and Poznan are the only Southern and Eastern European cities, respectively, to enter the top rank on these education-related indicators.

Munich, London, Vienna, Birmingham, and Hamburg (out of the 21 ranked cities in the XXL group), Glasgow, Dublin, Copenhagen, Manchester, and Frankfurt am Main (out of the 34 ranked cities in the XL group), Cluj-Napoca, Graz, Ljubljana, Edinburgh and Nuremberg, and Tallinn (out of the 36 ranked cities in the L group), and Rijeka, Galway, Linz, Waterford, and Cork (out of the 64 ranked cities in the S-M group) lead on Dimension 3.2, Openness, Tolerance & Trust, with two of the four number one cities being in Western Europe.

On the underlying indicators many more cities take the lead, including several non-capital cities. For instance, Vienna (XXL), Nantes (XL), Tallinn (L) and Linz (S-M) lead on Foreign graduates with tertiary education[59], with three of the four cities being in Western Europe. Similarly, a majority of cities in Western Europe are number one on Foreign-born population – Brussels and Bucharest* (XXL), Frankfurt am Main* (XL), Malmö (L), and Leiden* (S-M), and People trust – Munich (XXL), Copenhagen*, Glasgow and Nantes* (XL), Florence* and Graz (L) and Lund* (S-M).

A balanced mix of cities in Western, Northern, Eastern and Southern Europe instead come first on Tolerance of foreigners, namely: Hamburg and Munich* (XXL), Stockholm (XL), Cluj-Napoca (L) and Osijek*, Rijeka* and Split* (S-M). The first position on Integration of

foreigners is occupied by cities predominantly in Southern Europe. These are: Birmingham* (XXL), Zagreb (XL), Cluj-Napoca (L) and Osijek*, Split* and Rijeka* (S-M).

D3.3, Local & International Connections, is dominated by Dutch cities as number one: the Hague (XL), Utrecht (L) and s'Hertogenbosch (S-M). The exception is London (XXL). The following cities complete the top five in each group: Cologne, Milan and Paris, Brussels, and Munich (out of the 21 ranked cities in the XXL group), Frankfurt am Main, Essen, Antwerp and Dublin, and Rotterdam (out of the 34 ranked cities in the XL group), Mannheim, Karlsruhe, Bochum, and Ghent (out of the 36 ranked cities in the L group), and Eindhoven, Leiden, Leuven, and Heidelberg Cork (out of the 64 ranked cities in the S-M group).

On the underlying indicators, Western European cities lead, with a predominance of Dutch but also German cities. For instance, London (XXL), Antwerp* and Dublin* (XL), Utrecht[60] (L) and Eindhoven (S-M) come first on Passenger flights. Cologne* (XXL), Essen (XL), Bochum (L) and Eindhoven (S-M) take the lead on Potential road accessibility, and Cologne* (XXL), Essen (XL), Utrecht (L) and Leiden (S-M) on Direct trains to other cities.

On Dimension 3.4, Quality of Governance (and the underlying Quality of Governance index), Munich (XXL), Copenhagen (XL), Aarhus (L) and Lund (S-M) are top in their groups, with strong performances by Northern European cities in three out of four population groups. Northern European cities stand out also when looking at the full 'top five' list in each population group, namely: Munich*, London, Lyon, Hamburg, and Cologne* (out of the 21 ranked cities in the XXL group), Copenhagen*, Helsinki, Stockholm, Gothenburg*, and Rotterdam and The Hague* (out of the 34 ranked cities in the XL group), Aarhus*, Malmö, Utrecht, Ghent, and Nuremberg* (out of the 36 ranked cities in the L group), and Lund, Groningen, Leiden, Leuven and Ostend*, and Maastricht (out of the 64 ranked cities in the S-M group).

Table 4c.
Top five Cultural and Creative Cities by 'Enabling Environment' dimensions and indicators

Top 5 cities by dimension			
Sub-Index	**3. Enabling Environment**		
Dimensions / **Size groups**	**D3.1 Human Capital & Education**	**D3.2 Openness, Tolerance & Trust**	**D3.3 Local & International Connections**	**D3.4. Quality of Governance**
XXL	Paris-FR, Barcelona-ES, Milan-IT, London-UK, Madrid-ES	Munich-DE, London-UK, Vienna-AT, Birmingham-UK, Hamburg-DE	London-UK, Cologne-DE, Milan-IT/Paris-FR, Brussels-BE, Munich-DE	Munich-DE, London-UK, Lyon-FR, Hamburg-DE, Cologne-DE
XL	Manchester-UK, Amsterdam-NL, Toulouse-FR, Glasgow-UK, Dublin-IE	Glasgow-UK, Dublin-IE, Copenhagen-DK, Manchester-UK, Frankfurt-DE	The Hague-NL, Frankfurt-DE, Essen-DE, Antwerp-BE/Dublin-IE, Rotterdam-NL	Copenhagen-DK, Helsinki-FI, Stockholm-SE, Gothenburg-SE, Rotterdam-NL/The Hague-NL
L	Nottingham-UK, Utrecht-NL, Edinburgh-UK, Montpellier-FR, Karlsruhe-DE	Cluj-Napoca-RO, Graz-AT, Ljubljana-SI, Edinburgh-UK/Nuremberg-DE, Tallinn-EE	Utrecht-NL, Mannheim-DE, Karlsruhe-DE, Bochum-DE, Ghent-BE	Aarhus-DK, Malmö-SE, Utrecht-NL, Ghent-BE, Nuremberg-DE
S-M	Leuven-BE, Nitra-SK, Galway-IE, Heidelberg-DE, Limerick-IE	Rijeka-HR, Galway-IE, Linz-AT, Waterford-IE, Cork-IE	s'Hertogenbosch-NL, Eindhoven-NL, Leiden-NL, Leuven-BE, Heidelberg-DE	Lund-SE, Groningen-NL, Leiden-NL, Leuven-BE/Ostend-BE, Maastricht-NL

Top 5 cities by indicator (continued)			
	Graduates in arts & humanities	**Foreign graduates**	**Passenger flights**	**Quality of governance**
XXL	Paris-FR, Milan*-IT, Lyon-FR, Warsaw-PL, Marseilles*-FR	Vienna-AT, Munich*-DE, Prague*-CZ, Hamburg-DE, Berlin-DE	London-UK, Milan*-IT/ Paris*-FR, Munich*-DE, Cologne*-DE, Birmingham*-UK	Munich*-DE, London-UK, Lyon-FR, Hamburg-DE, Cologne*-DE
XL	Poznan-PL, Manchester-UK, Krakow-PL, Dublin-IE, Toulouse-FR	Nantes-FR, Bradford-UK, Toulouse-FR, Lisbon*-PT, Manchester-UK	Antwerp*-BE/ Dublin*-IE, Rotterdam*-NL, The Hague*-NL, Frankfurt*-DE, Essen-DE	Copenhagen*-DK, Helsinki-FI, Stockholm-SE, Gothenburg*-SE, Rotterdam-NL/The Hague*-NL
L	Nottingham-UK, Montpellier-FR, Katowice-PL/ Liège*-BE/ Timișoara*-RO, Venice-IT, Bologna-IT	Graz-AT/Tallinn-EE, Nuremberg*-DE, Edinburgh-UK, Liverpool-UK, Saint-Etienne-FR	Utrecht-NL, Mannheim-DE, Karlsruhe-DE, Liège*-BE, Nuremberg*-DE	Aarhus*-DK, Malmö-SE, Utrecht-NL, Ghent-BE, Nuremberg*-DE
S-M	Galway-IE/Limerick-IE/ Nitra-SK, Leuven-BE, Heidelberg-DE, York-UK, Norwich-UK	Linz-AT, Norwich-UK, 's-Hertogenbosch*-NL, Waterford-IE, Avignon-FR	Eindhoven-NL, 's-Hertogenbosch-NL, Heidelberg-DE, Maastricht-NL, Leiden-NL	Lund-SE, Groningen-NL, Leiden-NL, Leuven-BE/ Ostend*-BE, Maastricht-NL
	Graduates in ICT	**Foreign-born population**	**Potential road accessibility**	
XXL	Paris-FR, Barcelona-ES, Madrid-ES, Marseilles*-FR, Sofia-BG	Brussels*-BE/ Bucharest*-RO, London-UK, Vienna-AT, Munich*-DE, Milan*-IT	Cologne*-DE, Brussels-*BE, Berlin-DE, Milan*-IT/ Paris*-FR, Munich*-DE	
XL	Toulouse-FR, Manchester-UK/ Wroclaw*-PL, Glasgow-UK, Athens*-EL, Poznan*-PL	Frankfurt*-DE, Rotterdam*-NL, Stuttgart-DE, Antwerp*-BE, Amsterdam*-NL/ Copenhagen*-DK	Essen-DE, Frankfurt*-DE, Antwerp*-NL/ Dublin*-IE, Stuttgart-DE, Rotterdam*-NL	
L	Utrecht-NL, Karlsruhe-DE, Edinburgh-UK, Nottingham-UK, Bratislava-SK	Malmö-SE, Nuremberg*-DE, Mannheim-DE, Bologna*-IT/ Bratislava*-SK/ Utrecht*-NL, Liège*-BE	Bochum-DE, Mannheim-DE, Liège*-BE, Karlsruhe-DE, Ghent-BE	
S-M	Leuven-BE, Dundee*-UK, Eindhoven-NL, Nitra-SK, Salamanca-ES	Leiden*-NL, Heidel-berg-DE, Galway-IE, Eindhoven*-NL/' s-Hertogenbosch*-NL, Linz-AT	Eindhoven-NL, Maastricht-NL, Heidelberg-DE, Leuven-BE, 's-Hertogenbosch-NL	
	Average appear-ances in universi-ty rankings	**Tolerance of foreigners**	**Direct trains to other cities**	
XXL	Barcelona-ES/ London-UK/Paris-FR, Milan*-IT, Vienna-AT, Berlin-DE/Madrid-ES, Munich*-DE	Hamburg-DE/ Munich*-DE, Bucharest*-RO, London-UK, Birmingham*-UK, Cologne*-DE	Cologne*-DE, Brussels*-BE, Birmingham*-UK, London-UK, Lille-FR	
XL	Stockholm-SE, Amsterdam-NL, Dublin-IE, Glasgow-UK, Gothenburg*-SE/ Valencia-ES	Stockholm-SE, Copenhagen*-DK/ Vilnius-LT, Zagreb-HR, Dublin-IE, Gothenburg*-SE	Essen-DE, Frankfurt*-DE, The Hague*-NL, Hannover-DE, Glasgow-UK	

Dimensions Size groups	Average appearances in university rankings	Tolerance of foreigners	Direct trains to other cities	
Top 5 cities by indicator (continued)				
L	Edinburgh-UK, Graz-AT, Nottingham-UK, Ghent-BE/ Montpellier-FR, Utrecht-NL	Cluj-Napoca-RO, Aarhus*-DK/Kaunas-*LT, Iași*-RO/Timișoara*-RO, Ljubljana-SI, Nottingham*-UK	Utrecht-NL, Mannheim-DE, Bochum-DE, Ghent-BE, Karlsruhe-DE	
S-M	Groningen-NL/ Leuven-BE/ Lund-SE, Leiden-NL, Heidelberg-DE, York-UK, Norwich-UK	Osijek*-HR/Rijeka*-HR/ Split*-HR, Cork*-IE/ Galway*-IE/Limerick*-IE/ Waterford*-IE, Baia Mare*-RO, Lund*-SE, Maribor*-SI	Leiden-NL/Lund-SE, 's-Hertogenbosch-NL, Leuven-BE, Weimar-DE, York-UK	
		Integration of foreigners		
XXL		Birmingham*-UK, Budapest-HU, London-UK, Bucharest*-RO, Madrid-ES		
XL		Zagreb-HR, Glasgow-UK, Bradford*-UK, Manchester-UK, Dublin-IE		
L		Cluj-Napoca-RO, Iași*-RO/Timișoara*-RO, Ljubljana-SI, Edinburgh*-UK/ Liverpool*-UK/ Nottingham*-UK, Kaunas*-LT		
S-M		Osijek*-HR/Rijeka*-HR/ Split*-HR, Baia Mare*-RO, Maribor*-SI, Dundee*-UK/ Norwich*-UK/York*-UK, Szeged*-HU		
		People trust		
XXL		Munich*-DE, Madrid-ES, Barcelona-ES, Hamburg-DE, Cologne*-DE		
XL		Copenhagen*-DK/ Glasgow-UK/ Nantes*-FR/ Poznan*-PL, Helsinki-FI/ Stockholm-SE, Frankfurt*-DE/ Stuttgart*-DE, Manchester-UK/ Wroclaw*-PL, Dublin-IE		
L		Florence*-IT/Graz-AT, Malmö-SE, Ljubljana-SI, Lublin*-PL, Bochum*-DE		
S-M		Lund*-SE, Groningen-NL, Linz*-AT, Rijeka*-HR, Maribor*-SI		

Note: the asterisk '' means that the score has been estimated due to missing data.*

5

How Culture and Creativity relate to City Size, Capitals and Wealth

Size isn't everything. Contrary to what one might expect, population size does not determine a city's performance in culture and creativity. As shown in Figure 17, the relation between the Cultural and Creative Cities (C3) Index scores and population size is very close to zero, meaning that, on average, small and medium-sized cities score relatively well compared to larger ones. For instance, despite having a very similar number of inhabitants, Amsterdam and Łódź score very differently, as shown in the figure. At the average score of 34 we find great dispersion in terms of city size, from cities with fewer than 100,000 inhabitants (Weimar) up to eight million (London).
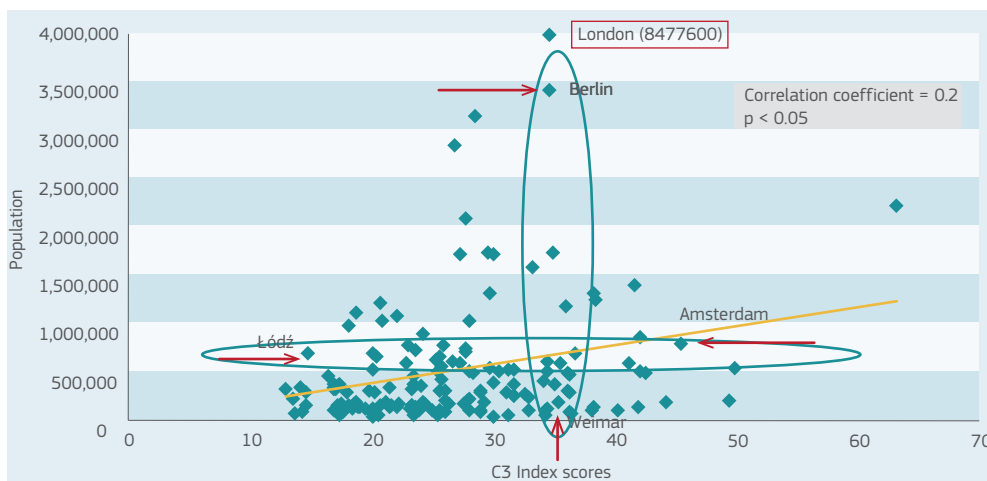
Figure 17.
C3 Index scores and city size (population)

Note: Data on population combine the most recent years available in the period 2011-2014 at city level from Eurostat's Urban Audit.

The inference that size is not the most important factor in being a successful Cultural and Creative City is confirmed at the sub-index level, particularly for 'Cultural Vibrancy' and 'Enabling Environment'.
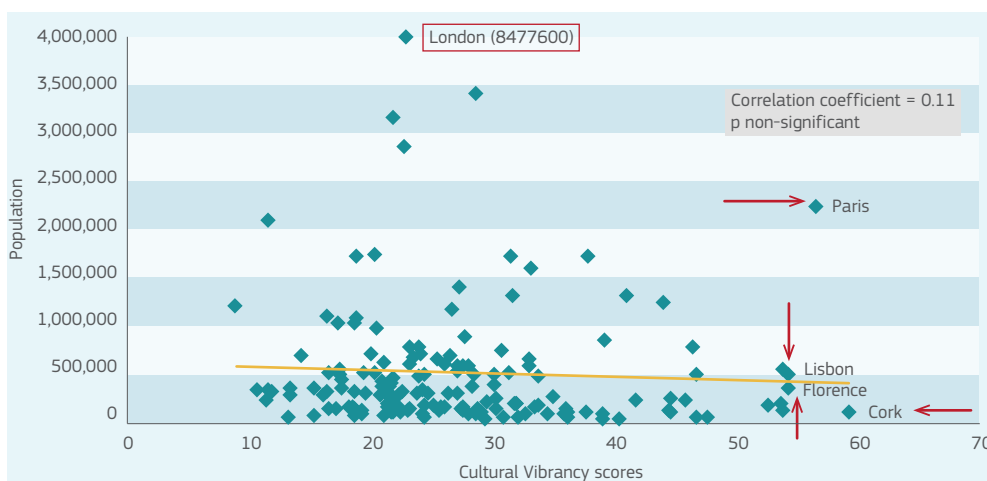
Figure 18.
'Cultural Vibrancy' scores and city size (population)

Note: Data on population combine the most recent years available in the period 2011-2014 at city level from Eurostat (Urban Audit).

Figure 19.

'Enabling Environment' scores and city size (population)

Note: Data on population combine the most recent years available in the period 2011-2014 at city level from Eurostat's Urban Audit.

At the top of the 'Cultural Vibrancy' ranking we indeed find cities as diverse in size as Cork (S-M, 59.2), Paris (XXL, 56.2), Florence (L, 54.4) and Lisbon (XL, 54.3). Similarly, in 'Enabling Environment', the top five are Leuven (S-M, 53.4), London (XXL, 51.5), Utrecht (L, 50.9), Nottingham (L, 49.6) and Dublin (XL, 49.3).

Larger cities do seem to perform slightly better, on average, than smaller cities on 'Creative Economy', as shown by the higher correlation coefficient (Figure 20). Nevertheless, a number of cities with fewer than 500,000 habitants – such as Bratislava, Umeå, Eindhoven, Nuremberg and Karlsruhe, which are highlighted in the figure – perform rather well on 'Creative Economy'.

Figure 20.

'Creative Economy' scores and city size (population)
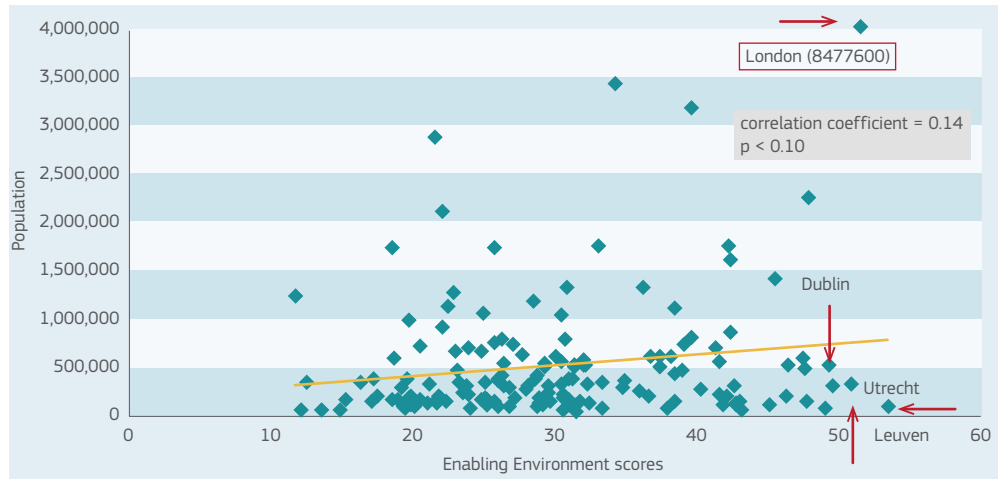
Note: Data on population combine the most recent years available in the period 2011-2014 at city level from Eurostat's Urban Audit.

Capital cities lead but not in all countries. Capitals tend to be the best performing cities on the C3 Index in their respective countries (Figure 21). However, eight countries out of 24[61] are exceptions, with non-capital cities outperforming the capitals, namely in Austria, Belgium, Italy, Germany, Poland, Spain, the Netherlands and the UK. In most cases, the leading cities count fewer than 500,000 inhabitants (Linz, Leuven, Bologna, Florence, Eindhoven, Poznan and Edinburgh). In Germany many cities outperform Berlin, which may be due to Berlin's relatively short history as the capital of a reunited Germany, as well as to the high degree of decentralisation in the German federal state, which gives regions and cities greater powers compared to other European countries.

The gap between the capital and other cities is relatively wide in certain countries, for example, the Czech Republic, France, Lithuania and Slovakia. These countries are also characterised by a high level of variability in their cities' scores, mostly due to the distance between the capital and the rest (Figure 22). A significant gap between the capital and the rest of the country's cities could be a cause for concern, as it may signify a capital city under stress and/or under-exploitation of cultural and creative resources and potential in other cities.
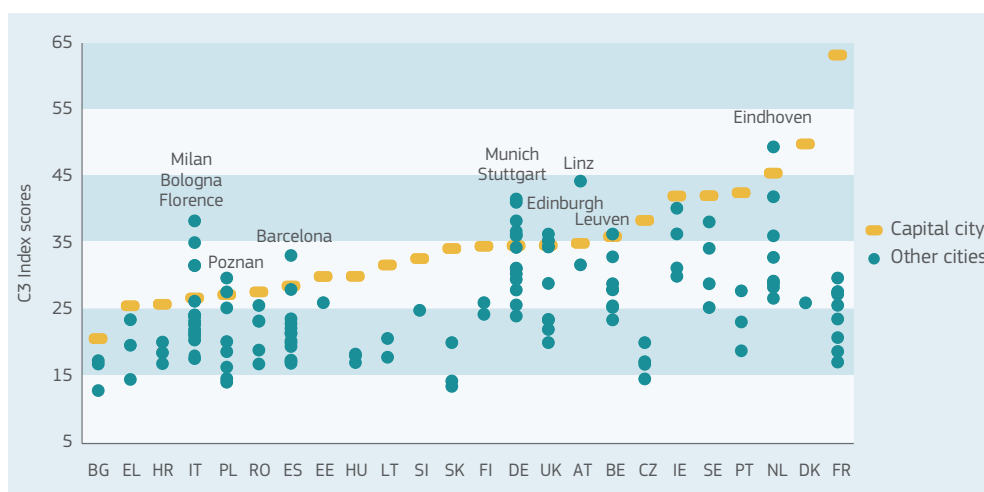
Figure 21.
C3 Index scores within EU countries

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.

The gap between the capital and the second-best city is relatively small in Greece, Ireland and Romania. In these countries the within-country variability is also small, meaning that non-capital Cultural and Creative Cities perform quite well compared to the capital city.
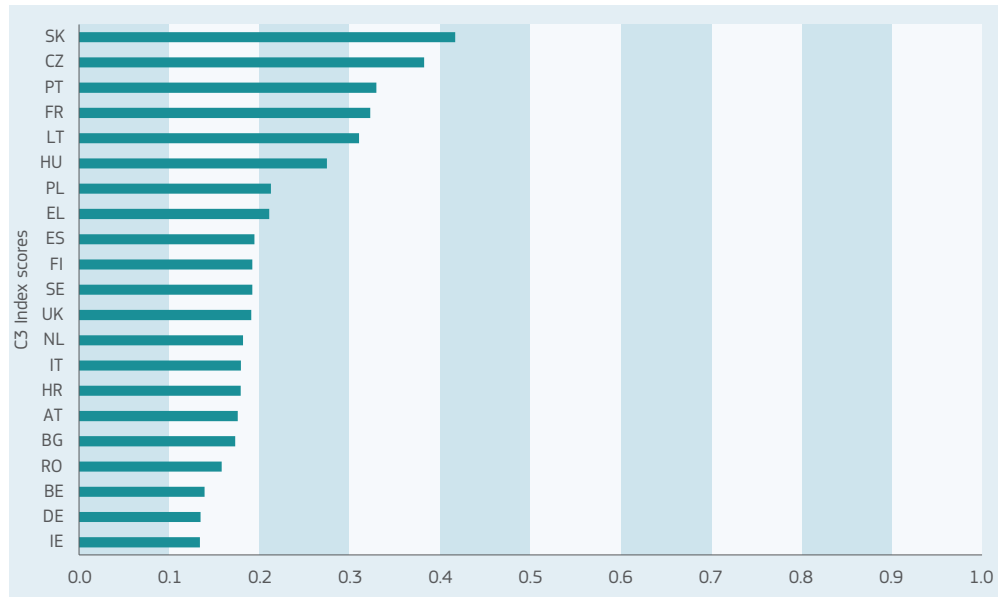
Figure 22.

Coefficient of variation of C3 Index scores by country

Note: ratio between standard deviation and average. Countries with two or fewer cities have been omitted: EE, DK, SI.

Non-capital cities are particularly well positioned on 'Cultural Vibrancy': in fifteen countries cities mostly of medium size outperform capitals on this sub-index. Scores are also rather evenly distributed among cities, as shown by the low within-country variability scores for most of the countries (Figure 24). Bulgaria, Czech Republic, France and Portugal are exceptions with relatively higher within-country variability, most likely due to the strength of the capital cities.

The polycentric pattern of 'Cultural Vibrancy', with strong capitals and non-capital cities in many parts of Europe, is particularly encouraging in terms of the power of smaller or more peripheral areas of Europe to attract and retain educated and creative individuals. According to recent literature, in a post-industrial economy, for the same job and same monetary returns, given a choice, workers would seem to prefer locations with better weather, education, arts, and other amenities[62].

Figure 23.

'Cultural Vibrancy' scores within EU countries

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.

However, on 'Creative Economy' scores, capital cities perform considerably better, with the sole exceptions of capitals in Austria, Italy, Germany, Sweden and the Netherlands. Slovakia, Lithuania and Bulgaria are characterised by a high level of variability (Figure 26), mostly due to the outperforming capital.
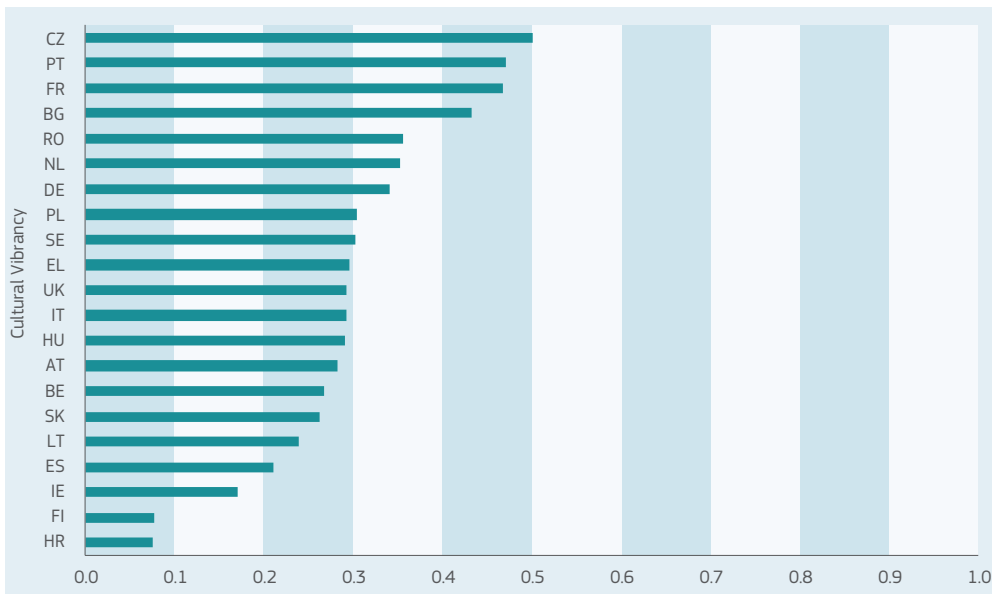
Figure 24.

Coefficient of variation of 'Cultural Vibrancy' scores by country

Note: ratio between standard deviation and average. Countries with two or fewer cities have been omitted: EE, DK, SI.
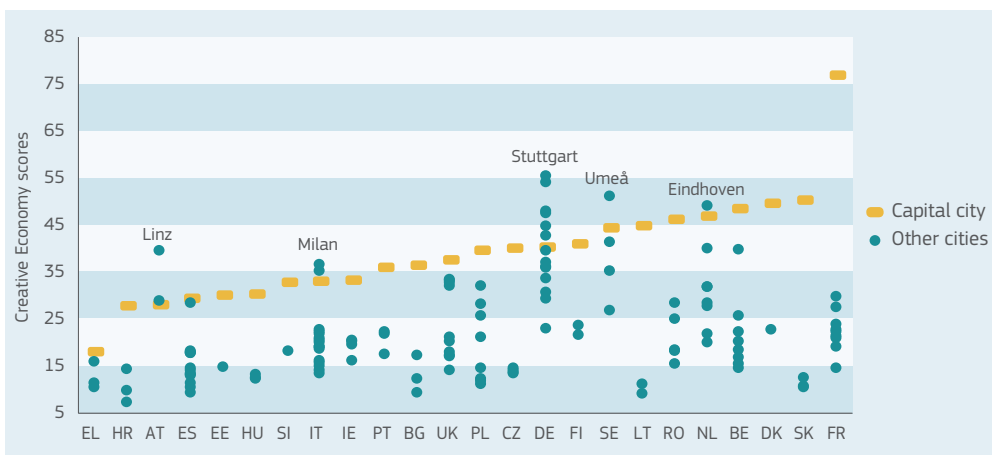
Figure 25.

'Creative Economy' scores within EU countries

Note: cities in Cyprus, Latvia, Luxembourg and Malta omitted due to poor data coverage.
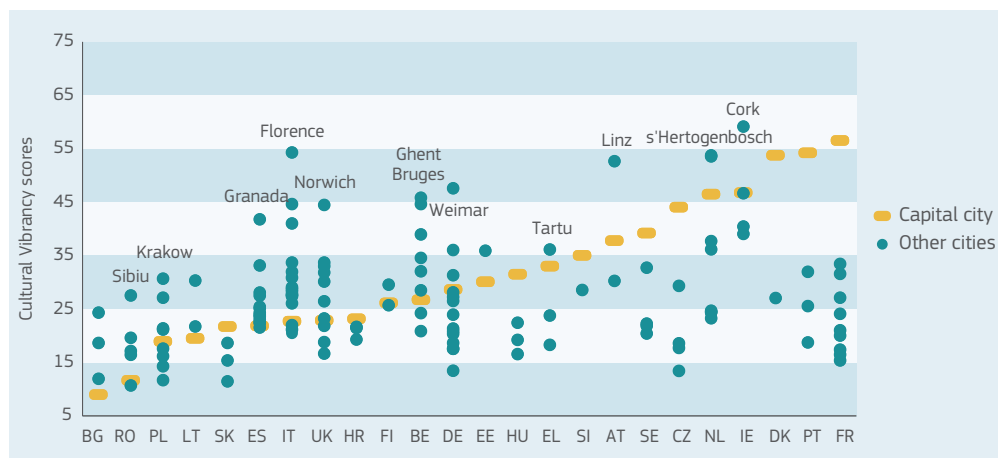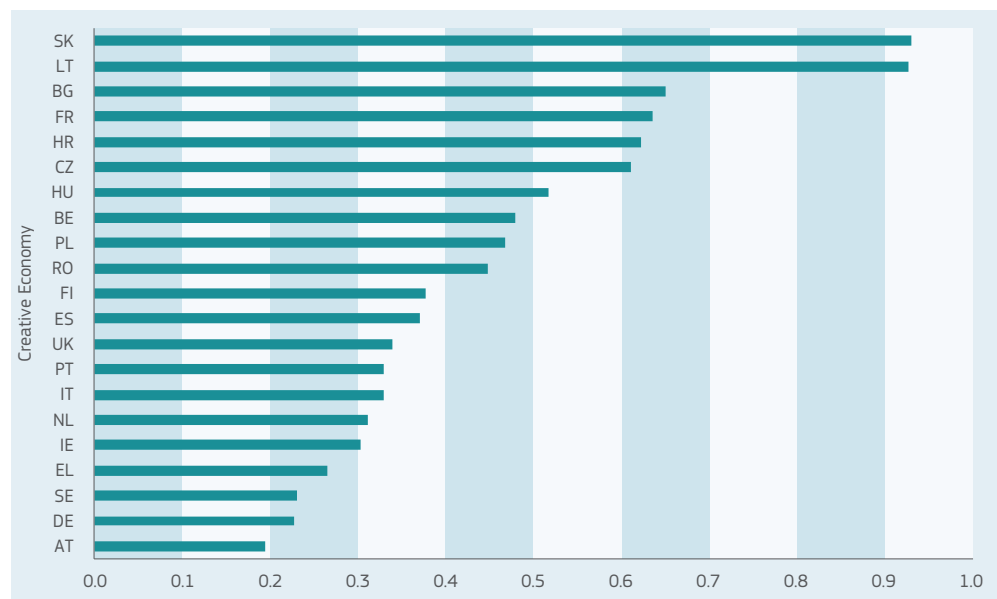
Figure 26.

Coefficient of variation of 'Creative Economy' scores by country

Note: ratio between standard deviation and average. Countries with two or fewer cities have been omitted: EE, DK, SI.

The gap between the capital city and the second-best performer also seems much more significant on 'Creative Economy' scores than for 'Cultural Vibrancy'. This finding might be due to the fact that cultural and creative sectors benefit from agglomeration advantages that are concentrated in capitals. Spreading agglomeration advantages beyond capitals could bring equity gains at national level. National policies (in the domains of, for example, culture, innovation, research and development, education and skills and transport and connectivity) have a major impact upon the attractiveness and relative performance of both capitals and non-capital cities.

Cultural and Creative Cities have more jobs and more human capital. Compared to other European cities with a minimum of 50,000 inhabitants[63], the Cultural and Creative Cities included in the Cultural and Creative Cities Monitor 2017 have:

- 19% more jobs per capita (a difference of 7.55 percentage points (p.p.));
- 73% more students in higher education per capita (4.85 p.p.) and 15% more highly educated people per capita (2.65 p.p.);
- 8% more young people (20-34 years old) per capita (1.76 p.p.);
- 22% more EU foreigners (0.13 p.p.) and 26% more non-EU foreigners (0.56 p.p.[64]) per capita.

Cultural and Creative Cities have more jobs and a diverse work force

Compared to European cities with 50,000 inhabitants or more, the Cultural and Creative Cities included in 2017 Cultural and Creative Cities Monitor have:

+8% young people (20-34 years old)

+73% students in higher education

+22% EU foreigners

+19% jobs

+15% highly educated people

+26% non-EU foreigners

CULTURAL & CREATIVE CITIES

Note: The figures were obtained through econometric analysis, controlling for effects related to: being a capital city or not, city size, unemployment rate, working age population (20-64) in the city, and country and time trends. Although the Cultural and Creative Cities Monitor covers a snapshot of five years (from 2010 to 2015), the estimations refer to different time periods, depending on data availability. Effects on students, highly educated people and foreigners have been computed only for 2011, while effects on young people have been estimated for the period 2010 to 2013, and for workers and jobs for the period 2010 to 2012. However, no causality can be inferred from these results without further analysis.

The latter finding that Cultural and Creative Cities have more foreigners than other cities are particularly interesting in light of the results of a recent study[65] using novel data from the World Bank on migrant stocks – the number of people born in a country other than that in which they live, over the period 1960-2010 – which finds that cultural diversity has a positive impact on real GDP per capita and that the effect of diversity seems to be more consistent in what where previously labelled 'developing countries'[66], which include fourteen EU Member States: Bulgaria, Croatia, Czech Republic, Cyprus, Estonia, Greece, Hungary, Latvia, Malta, Poland, Portugal, Romania, Slovenia and Slovakia.

In high-income countries, Cultural and Creative Cities such as Berlin, London or Barcelona are proving successful at capturing the positive contributions that migrants are ready to make. With the Multaqa project in Berlin[67], for instance, nineteen refugees were recruited and trained as museum guides to provide native-language tours for fellow refugees, with the aim of helping newcomers foster connections between Germany's cultural heritage and their own. Similarly, for Refugee Week, the V&A Museum in London offers visitors an opportunity to see the collection from the perspective of a refugee through guided tours led by refugees from around the world. A Catalonian cooking show, Karakia, filmed in a private home, features recipes from the diverse communities that have come to Catalonia. Karakia has become one of TVC's most popular and widely viewed programmes, averaging 185,000 viewers and a total screen share of 7.2%[68].

Culture and creativity and socio-economic wealth *mutually* reinforce each other. There is a clear positive relation between the C3 Index scores and GDP per capita in comparable euros. The scatter plot shows that higher GDP per capita can be found in the strongest Cultural and Creative Cities (Figure 27). The association remains strong when excluding capital cities.
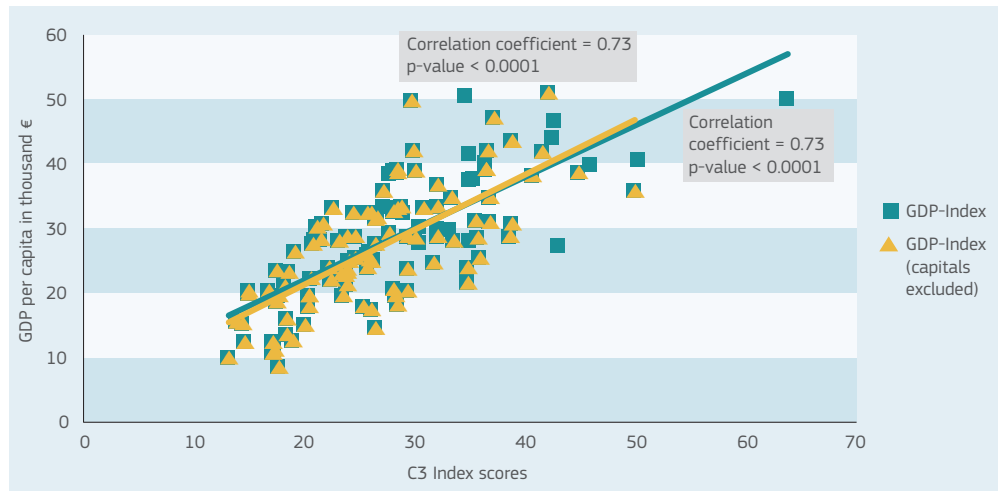
Figure 27.

C3 Index scores and GDP (PPS)

Note: Data on GDP per capita are in PPS (or comparable euros) and combine the most recent years available (2014 and 2015) at metro region level from the European Commission Urban Data Platform (UDP) based on Eurostat and LUISA Modelling Platform. For those cities for which a metro area has not been defined, NUTS 3-level data are used. See the Lexicon for explanation of technical terms. The sample diminishes to N=124 and to N=100 when excluding capital cities due to missing data.

As shown in Figure 28 and Figure 29, the relation between GDP per capita and the C3 Index is strong both within the four population groups and in the four European regions, and particularly so for large (L) cities and for Northern and Eastern European cities.
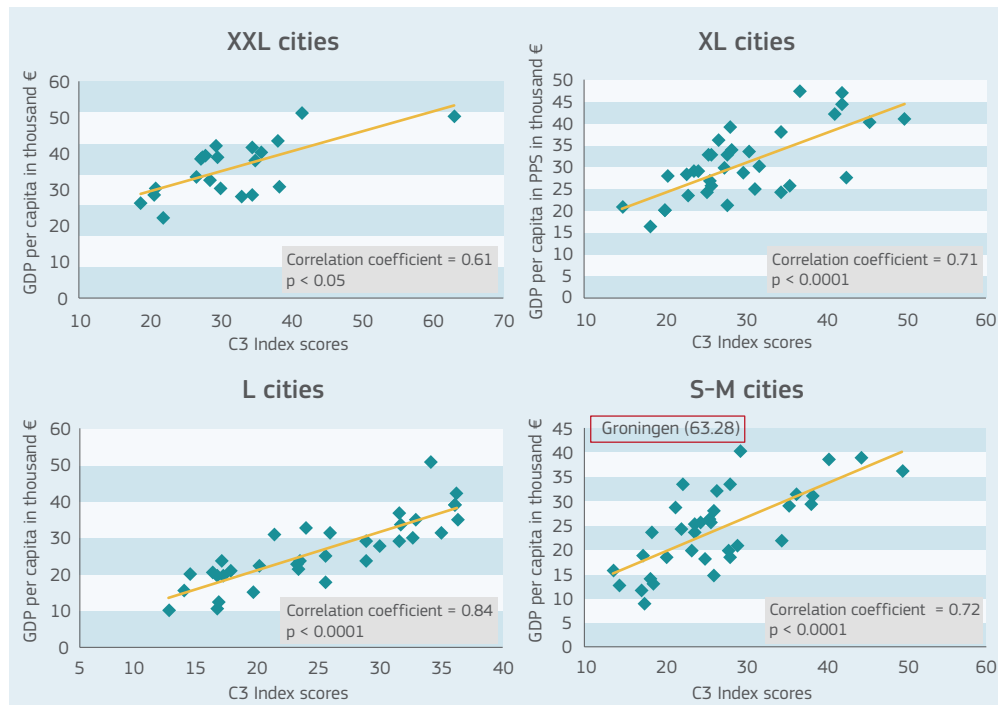
Figure 28.

C3 Index scores and GDP (PPS) across all city groups based on population size
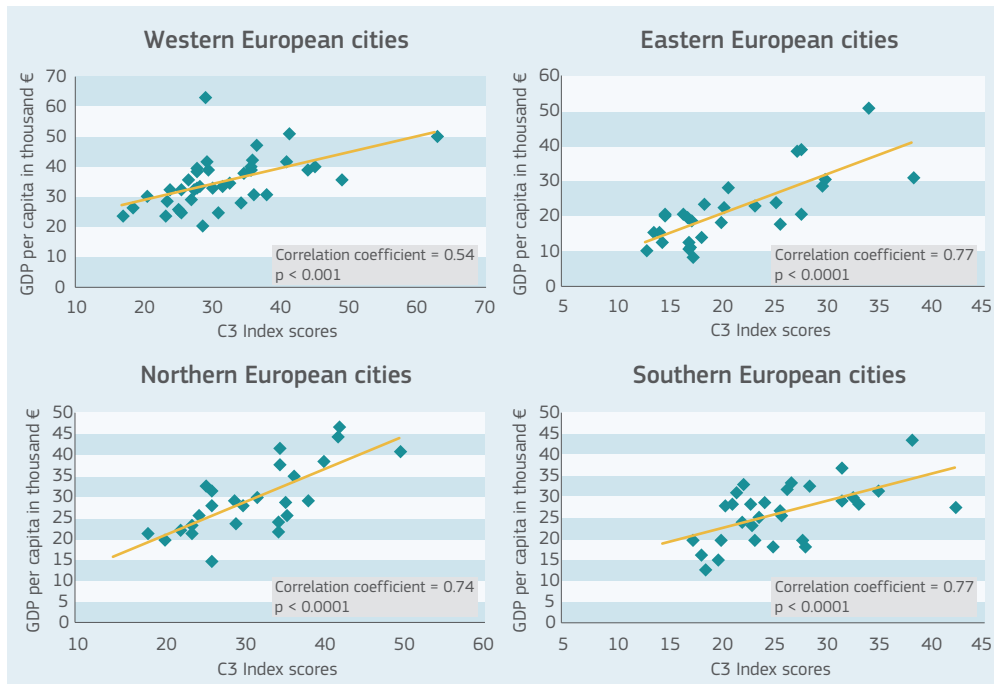
Figure 29.

C3 Index scores and GDP (PPS) across all city groups by geographic region

Note: see Lexicon for geographic regions.

A strong performance in the C3 Index is also strongly and positively related to 'social wealth', approximated by the number of jobs per capita in the cities' economies (Figure 30). The relation holds – and even becomes slightly stronger – for non-capital cities. The analysis per population group reveals that this relation remains robust within all population groups. However, it seems that the relation is strongest for large (L) cities. Although further analysis is needed to understand what drives the relation between the C3 Index and the number of jobs per capita in cities of different sizes (income differentials could be one reason), it seems that the relation becomes much stronger in passing from S-M to L cities but then progressively decreases for XL and XXL cities.
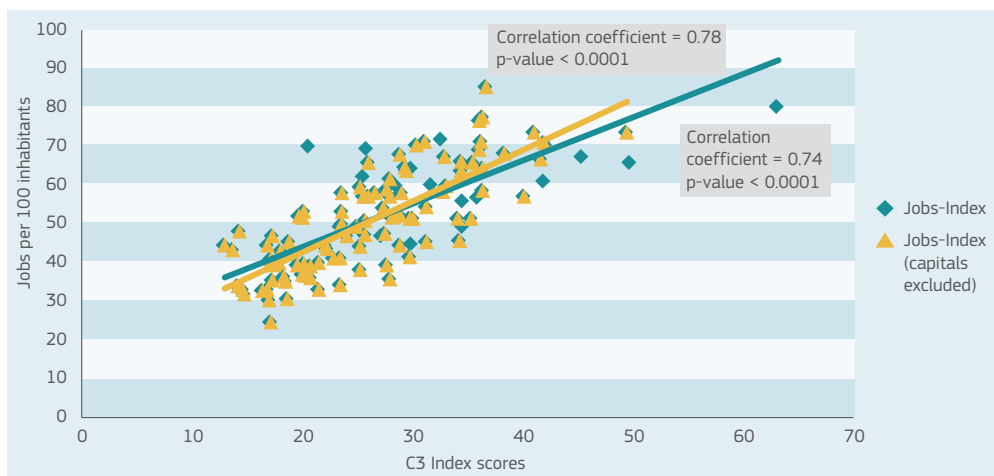
Figure 30.

C3 Index scores and jobs per capita

Note: Data on jobs per capita combine the most recent years available from 2010 to 2014 at city level from Eurostat (Urban Audit). The sample diminishes to N=114 and to N=97 when excluding capital cities due to missing data.
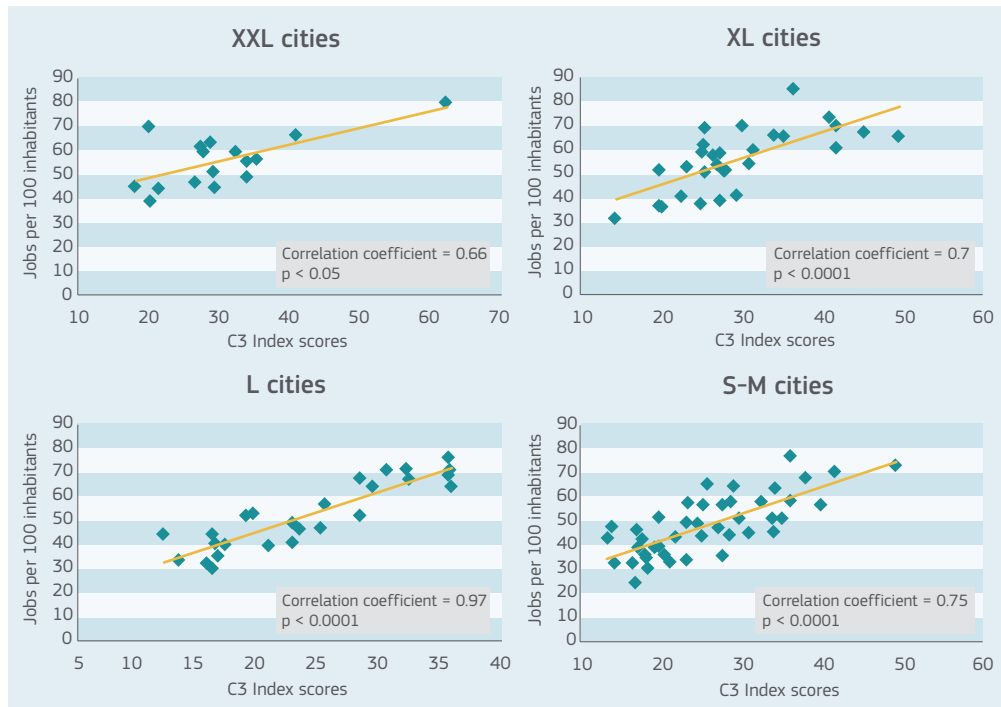
Figure 31.

C3 Index scores and jobs per population group

A less homogeneous pattern, however, can be observed in the various European regions. In Northern and, more particularly, Western and Southern Europe, the relation between the C3 Index and jobs per capita is quite strong. In Eastern Europe, however, this is not the case, as suggested by the nearly flat regression line.
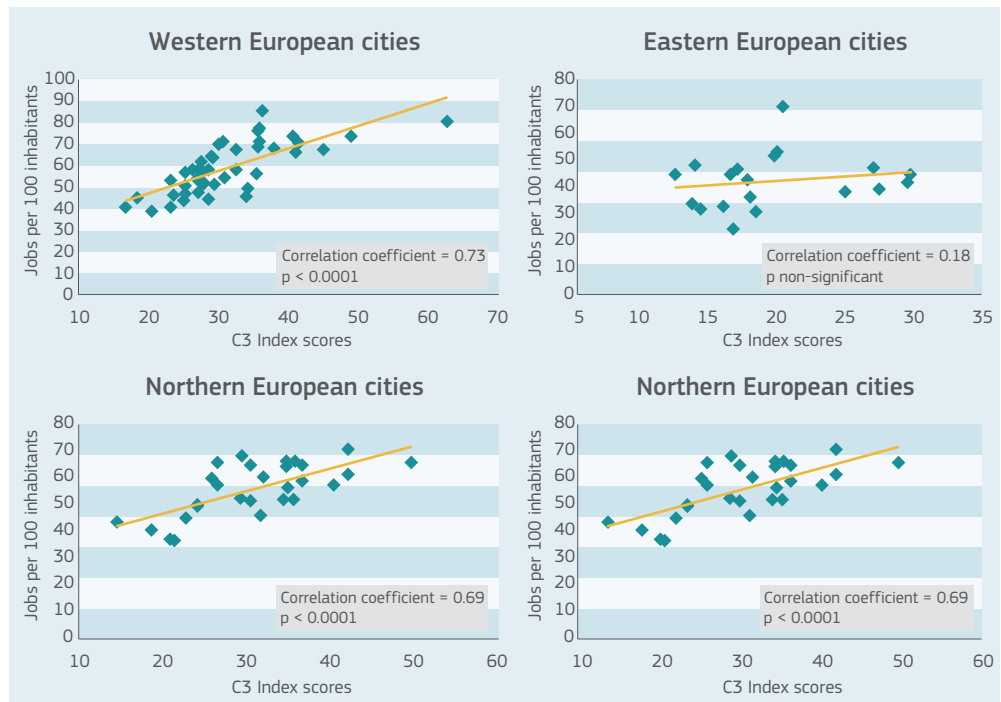
Figure 32.

C3 Index scores and jobs across all city groups by geographic region

Note: see Lexicon for geographic regions.

This finding on jobs is somehow coherent with the finding that the C3 Index's scores are negatively related to the unemployment rate, as shown in Figure 33. The correlation, however, is not particularly strong, and for XXL cities not statistically significant, perhaps due to the fact that keeping unemployment low requires more specific and complementary intervention besides investment in culture and creativity.

Figure 33.

C3 Index scores and unemployment rate

Note: Data on unemployment combine the most recent years available from 2010 to 2014 at city level from Eurostat (Urban Audit). The sample diminishes to N=130 and to N=113 when excluding capital cities due to missing data.
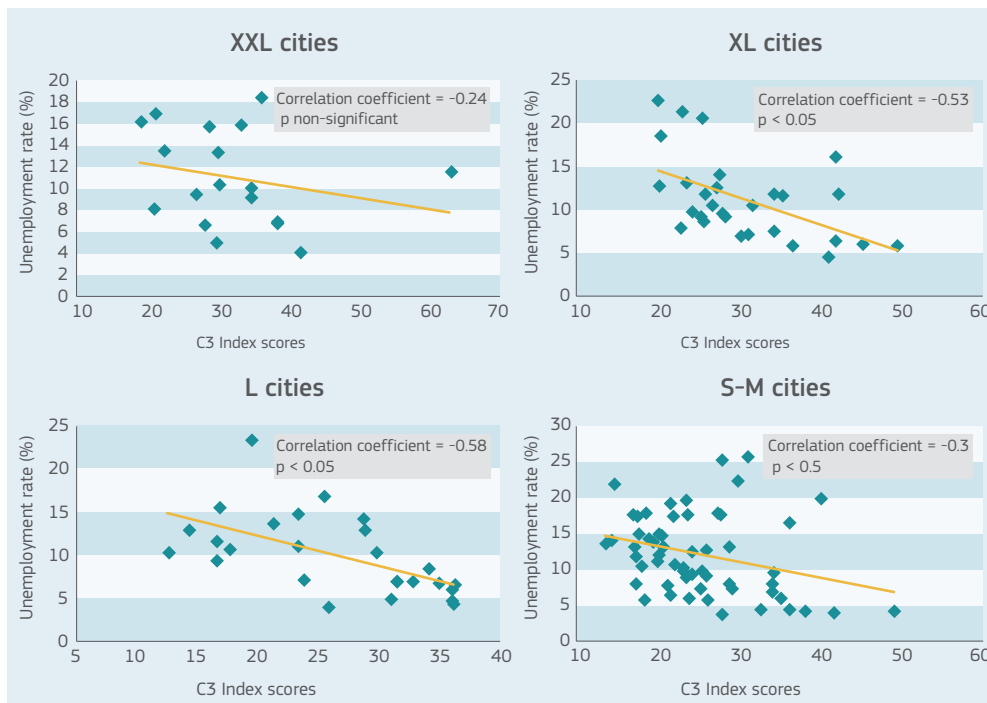
Figure 34.

C3 Index scores and unemployment rate per population group
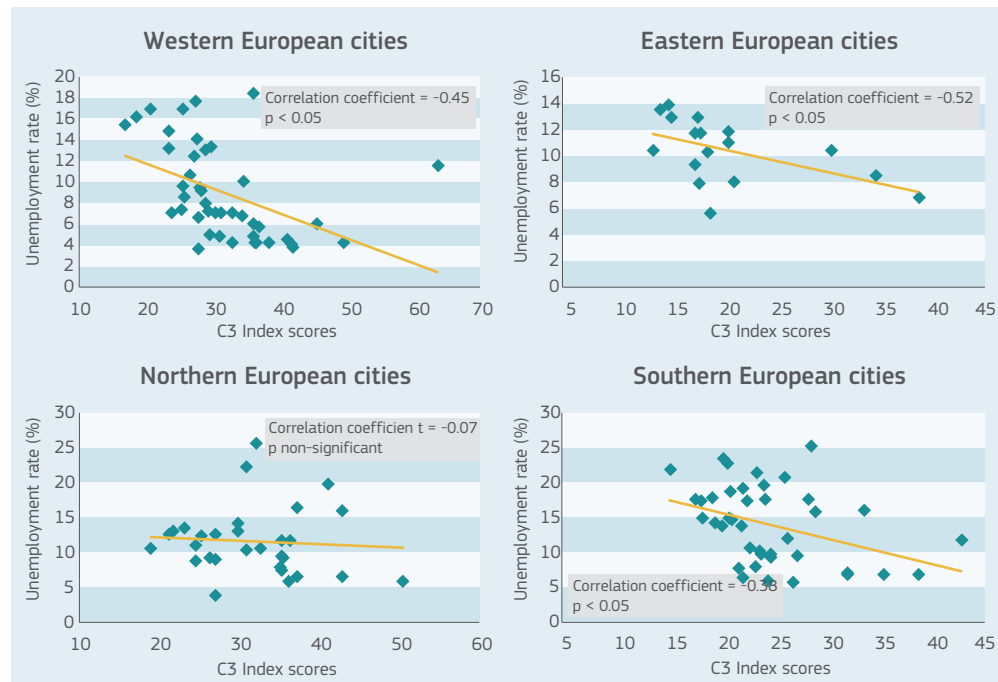
Figure 35.

C3 Index scores and unemployment rate across all city groups by geographic region

Note: see Lexicon for geographic regions.

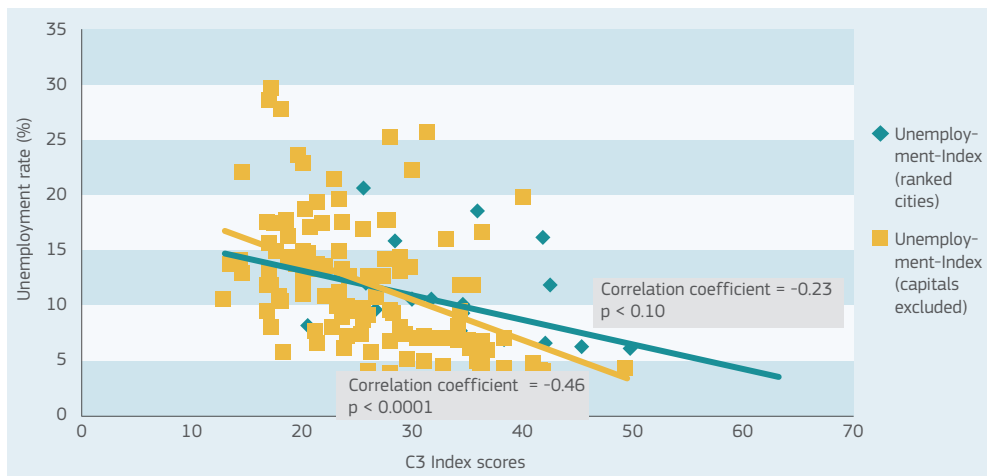**Culture and creativity strengthen growth.** The leading Cultural and Creative Cities show greater GDP growth rates and better recovery from crisis, based on the difference between the average annual growth rate during the period just before the onset of the recent economic crisis (2002–2006) and the period just after the most acute years of crisis (2009–2013). The findings discussed heretofore were based on an analysis of co-movements between variables across cities, but they cannot be considered conclusive on causation. A further step in the analysis was to study causal relationships based on the design and estimation of an econometric regression model.

'[…] culture and creativity indeed play a role in promoting local prosperity at many levels, and it probably could not be otherwise in knowledge-intensive economies and societies like the ones of today, and not only in Europe. This seems to be particularly true […] for cities in transition that are currently re-thinking their local development model'.

Pier Luigi Sacco
Professor of Cultural Economics
IULM/Harvard University

The estimates confirm that culture and creativity, approximated by the C3 Index score, have a positive and statistically significant impact on economic growth over the period 2009–2013. Specifically, a 10%-higher C3 Index score corresponds to a positive difference in economic growth rate of almost 0.07 percentage points, holding all other explanatory variables constant (Figure 36). The estimated impact is that, on average, in 2013, the GDP per capita of European Cultural and Creative Cities was 205 euros higher for each percentage more in the C3 Index, or almost **750 euros higher for each additional point in the C3 Index**.

However, the impact of culture and creativity on economic growth depends to a certain extent on the region. The estimates reveal that the impact of culture and creativity on economic growth is less pronounced in cities in Southern Europe (see the Lexicon for geographic regions). For these cities, for an increase of 10% in the C3 Index score, the economic growth rate increases only by 0.01 percentage points.

Several other variables can explain economic growth, as shown in Figure 36, which displays the variables that have a significant effect on growth over the period 2009–2013. For

example, the growth rate registered before the crisis was significant in explaining economic growth over the period 2009–2013. In fact, those cities that had higher growth during the period 2002–2006 display slightly faster growth over the period 2009–2013. The estimated impact of this variable implies that one additional percentage point registered in economic growth over the period 2002–2006 led, on average, to an increase of 0.14 percentage points in the growth rate for the period 2009–2013.
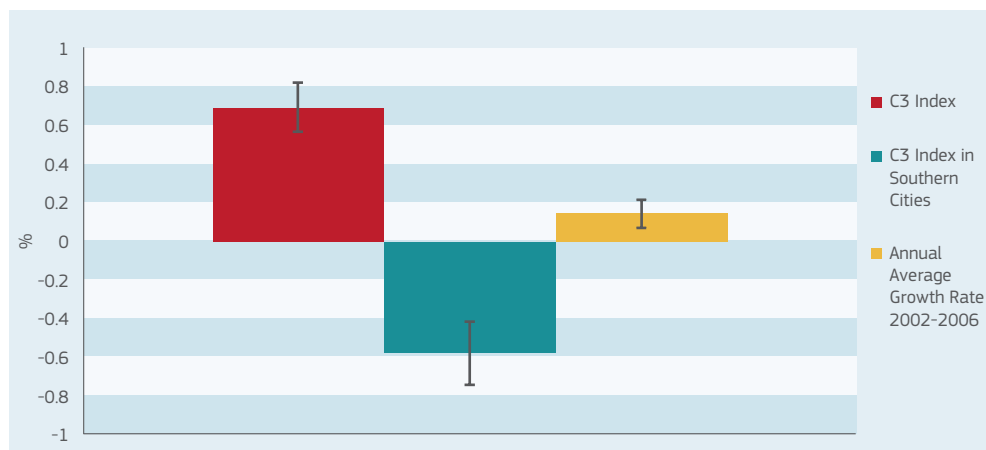
Figure 36.
The C3 Index and other variables contributing to economic growth

Note: (a) An econometric model was used (i) to determine whether culture and creativity (approximated by the C3 Index) generate economic growth for European cities, and (ii) to quantify the impact of these effects. The proposed regression model also takes into consideration other potential explanatory variables, such as the size of the cities, previous levels of economic growth and wealth, population and geographical location, to refine the estimation process and, consequently, to obtain a more precise assessment of the impact of culture and creativity on economic growth. (b) The reported figures refer to the impact of selected variables (listed on the right) on GDP in PPS (or comparable euros) per capita growth rate, in percentage points and for each percentage more in the C3 Index (e.g. a 1%-higher C3 Index score corresponds to a positive difference in economic growth rate of almost 0.007 percentage points, holding all other explanatory variables constant). The bars indicate the confidence intervals of the estimates. (c) Data on GDP 2009-2013 from Eurostat (Regional Statistics at metro-level, and NUTS 3-level for those cities for which a metropolitan area has not been defined). (d) The sample size diminishes to N=150 due to some missing data on GDP. See the Lexicon for an explanation of technical terms.

Culture and creativity are critical for the development of low-income cities. Before the crisis, low-income cities[69] were growing much faster than high-income cities, suggesting that a catching-up process was underway, as predicted by classical economic theory[70]. However, after the crisis, GDP growth slowed down, most notably in low- and very low-income cities (Figure 37).

Low-income cities also register lower-than-average C3 Index scores compared to higher-income cities. This raises the concern that some cities may be facing a 'low-income trap': while they can compete as lower-cost locations, they may lack the means to move into creative and high-value-added activities. Recognising and promoting culture and creativity in low-income cities will be critical to attracting and inspiring the next generation of artists, entrepreneurs and innovators that will help these cities advance to a further stage of development.
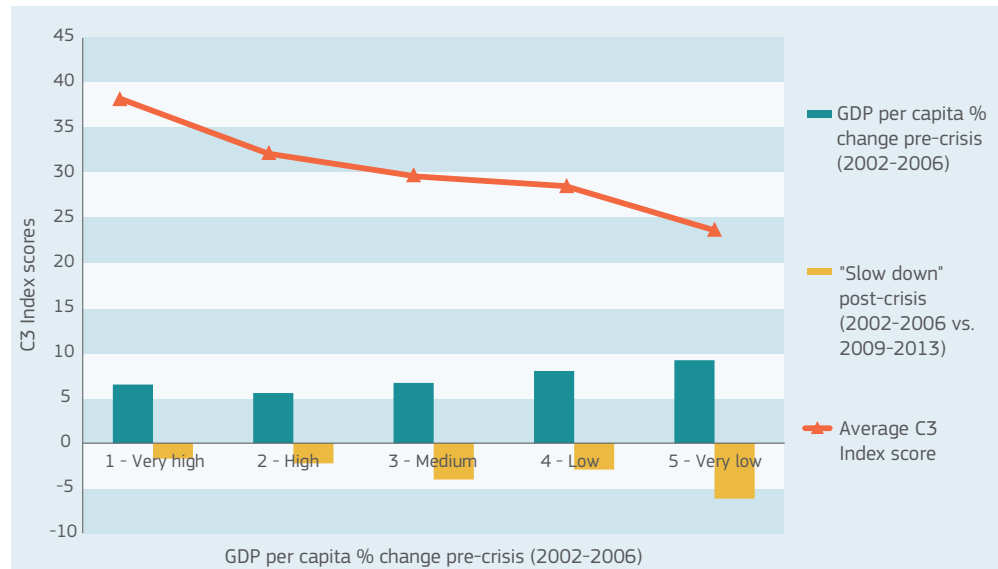
Figure 37.

The C3 Index and GDP per capita growth

Note: (a) The five city groups based on GDP per capita (in PPS) are as follows: 'Very high': more than €35,000 (40 cities); 'High': €30,000–35,000 (26 cities); 'Medium': €25,000–30,000 (38 cities); 'Low': €20,000–25,000 (27 cities); 'Very low': less than €20,000 (37 cities). (b) Data on GDP per capita from Eurostat (Regional Statistics at metro level, and NUTS 3-level for those cities for which a metropolitan area has not been defined). (c) See the Lexicon for an explanation of technical terms.

6

Conclusions
and Future Work

The Cultural and Creative Cities Monitor provides a rich database of detailed and comparable metrics on the 'Cultural Vibrancy', 'Creative Economy' and 'Enabling Environment' of 168 European 'Cultural and Creative Cities' of diverse demographic and economic characteristics.

By considering aspects of city life and environment not strictly related to culture and creativity, the Cultural and Creative Cities Monitor attempts to take a broad view of a 'Cultural and Creative City'. At the same time, by proposing a reasoned structure of weights which values more culture and creativity-related indicators, it ensures that policy makers are encouraged to invest more in culture and creativity as genuine engines of sustainable development and growth, and not only in complementary enablers such as the transport infrastructure or an efficient governance system.

As an assessment tool, the Cultural and Creative Cities Monitor makes it possible to estimate and communicate to the public the importance of culture and creativity for cities' development and resilience. As a comparative measurement tool, it can point to examples of good practice and enable learning by policy makers, businesses or cultural operators. As an extensive source of data, it can inspire researchers to develop new research questions and approaches to understanding the role of culture and creativity in cities.

The principal value added of the Cultural and Creative Cities Monitor is not in establishing rankings, but in helping cities understand the manifold and complex relationships among the many factors that contribute to a city's capacity to produce and disseminate culture and creative content, and to make them attractive and accessible. The Cultural and Creative Cities (C3) Index serves to summarise the overall performance on culture and creativity that does not emerge directly by investigating the nine dimensions separately. Simultaneously, the results of the statistical analysis also point to the value of taking into account the C3 dimensions and indicators on their own merit. By doing so, city-specific strengths and bottlenecks in promoting culture and creativity can be identified and can serve as input for evidence-based policymaking. In this way, the Cultural and Creative Cities Monitor shows that there is no single 'formula' to copy, but rather a spectrum of possibilities along which each city has to position itself on the basis of a deep understanding of its unique characteristics and of the relevant community's priorities and goals.

The first, 2017, edition of the Cultural and Creative Cities Monitor Report essentially shows a 'multi-centric' map of Europe with culture and creativity to be found across many and diverse cities.

The **ideal Cultural and Creative City in Europe** is **a mix of eight cities, mostly of medium size** (fewer than 250,000 inhabitants). It would have the Cultural Venues & Facilities of Cork (IE), the Cultural Participation & Attractiveness and the Creative & Knowledge-based Jobs of Paris (FR), the Intellectual Property & Innovation of Eindhoven (NL), the New Jobs in Creative Sectors of Umeå (SE), the Human Capital & Education of Leuven (BE), the Openness, Tolerance & Trust of Glasgow (UK), the Local & International Connections of Utrecht (NL) and the Quality of Governance of Copenhagen (DK).

In fact, **size does not really matter for cities' performance in culture and creativity**, meaning that, on average, smaller cities can perform as well as larger ones. The exception is Paris, which truly outperforms all other cities covered by the Cultural and Creative Cities Monitor.

Top cities in each group have generally **very good scores across the board but are not necessarily the best in all dimensions** of culture and creativity. The XXL group of cities of more than one million inhabitants shows how widely European cultural assets are distributed: Prague (Eastern Europe) leads on Dimension 1.1, Cultural Venues & Facilities, thanks to its strong performance on Concerts & shows and Museums. Rome (Southern Europe) leads on Sights & landmarks and Brussels (Western Europe) on Theatres. In the L group

(500,000–1,000,000 inhabitants), Venice (Southern Europe) takes the lead on most of the indicators under D1.1, but Katowice (Eastern Europe) leads on Cinema seats and Ghent (Western Europe) on Theatres. In general, the results reveal what cities are good at and where there might be room for improvement, vis-à-vis other cities of similar size.

European diversity provides a learning platform for cities interested in identifying new ideas, approaches and partners to help enrich their cultural and creative ecosystem and strengthen their competitive advantage.

Last but not least, the **leading Cultural and Creative Cities are economically stronger,** demonstrating a strong association with GDP and jobs per capita, suggesting that culture and creativity on one hand and economic and social wealth on the other mutually reinforce each other. This has been true of various culturally and economically vibrant towns, in Europe and worldwide, throughout history, from Renaissance Florence to San Francisco from the '60s on.

Furthermore, culture and creativity contribute to **higher growth rates**. Specifically, a causal model suggests that a 10%-higher C3 Index score corresponds to a higher GDP growth rate of the order of almost 0.07 percentage points.

Last but not least, **culture and creativity** may be particularly **critical for low-income cities**: while such cities were growing more rapidly than others before the crisis, their GDP growth has slowed since the deepest point of crisis, and more than elsewhere. These are also the cities that score least well on the C3 Index. This raises the concern that some cities may be facing a 'low-income trap': while they can compete as lower-cost locations, they may lack the means to move into creative and high-value-added activities. Culture and creativity will be crucial to attracting and inspiring the next generation of artists, entrepreneurs and innovators that will take these cities to the next stage of development.

Future directions

The Cultural and Creative Cities Monitor represents a first attempt towards better measurement and understanding of how Cultural and Creative Cities behave and perform across Europe, based on the most relevant and comparable data available at city level.

The Cultural and Creative Cities Monitor is not intended to be the definitive yardstick of city performance on culture and creativity. Nevertheless, the dimensions and indicators used in this first edition constitute a sound starting point, as confirmed by the good-to-strong correlations between all indicators and their respective dimensions. Furthermore, all dimensions correlate strongly with the three sub-indices and the C3 Index itself. This means that the statistical structure of the C3 Index 2017 is coherent with its conceptual framework. In addition, the reasonably narrow confidence intervals for the majority of the cities' ranks (fewer than +-3 positions for 78% of the cities) imply that the C3 ranks are also, for most cities, robust to changes in modelling assumptions (namely: the chosen weights and normalisation formula).

The Cultural and Creative Cities Monitor is expected to evolve as a 'living tool'. It will be tested thoroughly and continuously enhanced as new and better quality data become available. The domains of 'Cultural Vibrancy' and 'Enabling Environment' in particular are expected to be refined in future versions.

Due to the limitations of current data, the measurement of 'Cultural Vibrancy' is based on a combination of indicators relating to mainly 'conventional' cultural infrastructure (museums, theatres, concert halls, sights and landmarks), tickets sold (at museums and cinemas) and overnight tourists. In the future, this sub-index would seek to include informal cultural venues. A range of non-profit, commercial, public and informal venues and opportunities

for cultural engagement, such as art galleries, multidisciplinary arts centres, cultural clubs of various kinds (for cinema, music, photography, etc.) and dance schools, are important aspects of a community's cultural landscape and an important asset in encouraging more inclusive participation in the practice and consumption of arts and culture, including by amateurs. One possibility could be to explore OpenStreetMap – a collaborative project to create a free, editable map of the world – to identify unconventional cultural venues categorised under labels such as 'amenity=arts_centre', 'club=photography' or 'club=theatre'. This would require the development of an *ad hoc* methodology to retrieve such data for a large number of cities (including rather small ones for which maps might be poor), while ensuring reliability and comparability.

As regards the 'Enabling Environment', in the future this domain would ideally contain information about public funding for culture in a broad sense, as this could be an important factor not only in the health of cultural venues, but also in attracting artists and creative talent. To date it has not been possible to retrieve this kind of data at city level. The cooperation of cities themselves will be crucial to filling this gap. Another potentially interesting variable to consider would be proximity to strong Cultural and Creative Cities, metropolitan areas or capitals as another factor enabling culture and creativity to flourish.

Sub-indices	Dimensions		Indicators	
1. Cultural Vibrancy		1.1 Cultural Venues & Facilities	1 Sights & landmarks	
			2 Museums	
			3 Cinema seats	
			4 Concerts & shows	
			5 Theatres	
			# Informal cultural venues	Desired
		1.2 Cultural Participation & Attractiveness	6 Tourist overnight stays	
			7 Museum visitors	
			8 Cinema attendance	
			9 Satisfaction with cultural facilities	
2. Creative Economy		2.1 Creative & Knowledge-based Jobs	10 Jobs in arts, culture & entertainment	
			11 Jobs in media & communication	
			12 Jobs in other creative sectors	
		2.2 Intellectual Property & Innovation	13 ICT patent applications	
			14 Community design applications	
		2.3 New Jobs in Creative Sectors	15 Jobs in new arts, culture & entertainment enterprises	
			16 Jobs in new media & communication enterprises	
			17 Jobs in new enterprises in other creative sectors	
3. Enabling Environment		3.1 Human Capital & Education	18 Graduates in arts & humanities	
			19 Graduates in ICT	
			20 Average appearances in university rankings	
		3.2 Openness, Tolerance & Trust	21 Foreign graduates	
			22 Foreign-born population	
			23 Tolerance of foreigners	
			24 Integration of foreigners	
			25 People trust	
		3.3 Local & International Connections	26 Passenger flights	
			27 Potential road accessibility	
			28 Direct trains to other cities	
		3.4 Quality of Governance	29 Quality of governance	
			# Public funds/incentives for culture	Desired

Figure 38.
Future development of the Cultural and Creative Cities Monitor

Next edition

The next edition of the Cultural and Creative Cities Monitor will be released in 2019, in line with the frequency of update of the data sources used. The plan is to update the tool every two years and to ensure that the feedback received from users is reliably incorporated into future editions, subject to data availability.

In addition, an app will be released in the course of 2018 which aims to gather citizens' and tourists' opinions on cities' cultural and creative appeal. This will complement the quantitative evidence and give voice to citizens by allowing them to leave comments and suggestions for local decision makers.

Ultimately, the Cultural and Creative Cities Monitor aims to be a dynamic tool that will enable stakeholders not only to have a 'snapshot' of their city or cities at a particular moment, but also to track progress over time, integrating and valorising as much as possible both quantitative and qualitative information.

Annexes

Annex I: Selected and excluded cities

168 Selected cities

CNTRY	CITY	POP	CNTRY	CITY	POP
AT	Graz	L	FI	Helsinki	XL
AT	Linz	S-M	FI	Turku	S-M
BE	Brussels	XXL	FR	Paris	XXL
BE	Antwerp	XL	FR	Lyon	XXL
BE	Bruges	S-M	FR	Toulouse	XL
BE	Mons	S-M	FR	Bordeaux	XL
BG	Sofia	XXL	FR	Lille	XXL
BG	Plovdiv	L	FR	Avignon	S-M
BG	Varna	L	FR	Marseille	XXL
BG	Veliko Turnovo	S-M	HR	Rijeka	S-M
CY	Nicosia	S-M	HR	Osijek	S-M
CZ	Prague	XXL	HU	Pécs	S-M
CZ	Ostrava	L	IE	Dublin	XL
CZ	Pilsen	S-M	IE	Cork	S-M
DE	Berlin	XXL	IE	Limerick	S-M
DE	Essen	XL	IE	Galway	S-M
DE	Weimar	S-M	IE	Waterford	S-M
DK	Copenhagen	XL	IT	Genoa	XL
DK	Aarhus	L	IT	Florence	L
EE	Tallinn	L	IT	Bologna	L
EL	Athens	XL	IT	Perugia	S-M
EL	Thessaloniki	L	IT	Cagliari	S-M
EL	Patras	S-M	IT	Lecce	S-M
EL	Kalamata	S-M	IT	Matera	S-M
ES	Madrid	XXL	IT	Ravenna	S-M
ES	Zaragoza	XL	LT	Vilnius	XL
ES	Las Palmas	L	LU	Luxembourg	S-M
ES	Santiago	S-M	LV	Riga	XL
ES	Cordova	L	LV	Liepāja	S-M
ES	San Seb.-Donostia	S-M	MT	Valletta	S-M
ES	Burgos	S-M	NL	Amsterdam	XL
ES	Salamanca	S-M	NL	Rotterdam	XL

CNTRY	CITY	POP	CNTRY	CITY	POP	CNTRY	CITY	POP	CNTRY	CITY	POP
NL	Eindhoven	S-M	EE	Tartu	S-M	DE	Cologne	XXL	PT	Coimbra	S-M
NL	Leeuwarden	S-M	ES	Barcelona	XXL	DE	Frankfurt	XL	RO	Iași	L
NL	Maastricht	S-M	ES	Seville	XL	DE	Stuttgart	XL	SE	Gothenburg	XL
NO	Bergen	L	ES	Bilbao	L	DE	Dresden	XL	SE	Malmö	L
NO	Stavanger	S-M	ES	Granada	S-M	DE	Nuremberg	L	SK	Bratislava	L
PL	Warsaw	XXL	FR	Saint-Etienne	L	DE	Bochum	L	UK	London	XXL
PL	Kraków	XL	HU	Budapest	XXL	DE	Karlsruhe	L	UK	Birmingham	XXL
PL	Wrocław	XL	IT	Rome	XXL	ES	Valencia	XL	UK	Manchester	XL
PL	Gdańsk	L	IT	Turin	XL	ES	Lleida	S-M			
PL	Lublin	L	IT	Parma	S-M	FI	Tampere	S-M			
PL	Katowice	L	LT	Kaunas	L	FR	Nantes	XL			
PT	Lisbon	XL	SI	Ljubljana	L	FR	Montpellier	L			
PT	Porto	S-M	UK	Bradford	XL	HR	Zagreb	XL			
PT	Guimarães	S-M	UK	Edinburgh	L	HR	Split	S-M			
RO	Bucharest	XXL	UK	Nottingham	L	HU	Szeged	S-M			
RO	Cluj-Napoca	L	UK	York	S-M	HU	Győr	S-M			
RO	Timișoara	L	UK	Dundee	S-M	IT	Milan	XXL			
RO	Sibiu	S-M	UK	Norwich	S-M	IT	Naples	XL			
RO	Baia Mare	S-M	AT	Vienna	XXL	IT	Venice	L			
SE	Stockholm	XL	BE	Liège	L	IT	Trento	S-M			
SE	Umeå	S-M	BE	Namur	S-M	IT	Trieste	S-M			
SE	Lund	S-M	BE	Leuven	S-M	IT	Brescia	S-M			
SI	Maribor	S-M	BE	Ostend	S-M	LT	Klaipeda	S-M			
SK	Košice	S-M	CH	Zurich	L	NL	The Hague	XL			
SK	Nitra	S-M	CH	Geneva	S-M	NL	Utrecht	L			
SK	Prešov	S-M	CH	Basel	S-M	NL	Groningen	S-M			
UK	Glasgow	XL	CH	Bern	S-M	NL	's-Hertogenbosch	S-M			
UK	Liverpool	L	CY	Limassol	S-M	NL	Leiden	S-M			
BE	Ghent	L	CZ	Brno	L	NO	Oslo	XL			
DE	Hannover	XL	CZ	Karlovy Vary	S-M	PL	Łódź	XL			
DE	Mannheim	L	DE	Hamburg	XXL	PL	Poznań	XL			
DE	Heidelberg	S-M	DE	Munich	XXL	PL	Toruń	S-M			

Legend:

Selection criterion 1 – European Capital of Culture	Selection criterion 2 – UNESCO	Selection criterion 3 – Festival

Cities that met the selection criteria but were not included due to poor data coverage

No.	ECoC cities (shortlisted)	Why not included in the Monitor
1	Dubrovnik (HR)	Not in Urban Audit, < 50,000 inhabitants
2	Elefsina (EL)	Not in Urban Audit, < 50,000 inhabitants
3	Martin (SK)	Not in Urban Audit
4	Paphos (EL)	Not in Urban Audit, < 50,000 inhabitants
5	Pula (HR)	Not in Urban Audit, < 50,000 inhabitants
6	Reykjavík (IS)	Not in Urban Audit
7	Rhodes (EL)	Not in Urban Audit, < 50,000 inhabitants
8	Segovia (ES)	Not in Urban Audit
9	Siena (IT)	Not in Urban Audit
10	Sønderborg (DK)	Not in Urban Audit, < 50,000 inhabitants
11	Istanbul (TR)	Only a few indicators available
	UNESCO Creative Cities	
1	Dénia (ES)	Not in Urban Audit, < 50,000 inhabitants
2	Enghien-les-Bains (FR)	Not in Urban Audit, < 50,000 inhabitants
3	Fabriano (IT)	Not in Urban Audit, < 50,000 inhabitants
4	Idanha-a-Nova (PT)	Not in Urban Audit, < 50,000 inhabitants
5	Óbidos (PT)	Not in Urban Audit, < 50,000 inhabitants
6	Östersund (SE)	Not in Urban Audit, < 50,000 inhabitants
TOT	17	

Annex II: Indicators reviewed and dimensions covered

Monitoring tool name	Country/region level	City level	Human capital, talent & education	Innovation & research	Government & regulations: funding and rule of law	Living conditions	Social capital: openness, tolerance, engagement, support & diversity	Creative output & employment	Technology & ICT	Transportation & accessibility	Economy
Creative Space Index	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smart Cities		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ARC Creative City Index		✓	✓	✓	✓		✓	✓	✓	✓	✓
Cities of Opportunity		✓	✓	✓		✓			✓	✓	✓
Global City Indicators		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Global Power City Index		✓	✓	✓	✓	✓				✓	✓
Landry's Creative City Index		✓	✓	✓	✓	✓	✓	✓			
Quality of Living Survey		✓	✓		✓	✓				✓	✓
Intercultural Cities Index		✓	✓		✓	✓	✓		✓		✓
Urban Indicators for Managing Cities		✓	✓	✓	✓	✓				✓	✓
2014 Global City Index		✓	✓				✓		✓		✓
European Creativity Index	✓		✓		✓		✓	✓	✓		
Sharpie's Creativity Index		✓	✓	✓		✓	✓	✓			
Creative Community Index	✓		✓		✓	✓		✓			
Design, Creativity and Innovation: A Scoreboard Approach	✓	✓	✓	✓			✓	✓			
Regional Competitiveness Index	✓	✓	✓	✓	✓	✓			✓	✓	✓
Arts Index Netherlands	✓	✓	✓		✓	✓		✓			
European Digital City Index	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Creative Grid	✓	✓	✓		✓			✓			
Sustainable Cities		✓	✓			✓	✓			✓	
Human Capital Index	✓	✓	✓		✓	✓	✓			✓	
Global Competitiveness Index	✓	✓	✓	✓	✓				✓	✓	✓
Hong Kong Creativity Index		✓			✓			✓			✓
Cultural Life Index	✓		✓					✓	✓		
City Brands Index		✓	✓		✓	✓	✓	✓	✓	✓	✓
Global Innovation Index	✓	✓	✓		✓			✓	✓	✓	
Florida's Creative Cities Index		✓	✓	✓			✓	✓			
Euro-Creativity Index	✓	✓	✓	✓				✓			
Composite Index of the Creative Economy	✓			✓			✓		✓		
World Knowledge Competitiveness Index	✓			✓	✓				✓		✓
Global Talent Competitiveness Index	✓	✓	✓		✓	✓					
Regional Innovation Scoreboard	✓	✓	✓	✓			✓				
Global Creativity Index	✓		✓	✓			✓				

Globalisation, networks & exchange	Cultural capital & participation	Culture- and recreation-related venues, resources & facilities	Entrepreneurship	Environment & ecology	Input for the CCS	Tourism	Coverage
✓	✓	✓	✓		✓	✓	94%
✓	✓		✓	✓		✓	88%
✓	✓	✓			✓	✓	81%
✓	✓	✓	✓	✓		✓	75%
			✓	✓			69%
✓		✓		✓		✓	63%
✓			✓				50%
	✓			✓		✓	50%
✓	✓						50%
	✓			✓			50%
✓		✓				✓	44%
	✓	✓					44%
	✓			✓			44%
✓	✓				✓		44%
✓	✓				✓		44%
							44%
	✓	✓	✓		✓		44%
		✓	✓		✓		44%
✓		✓			✓		38%
		✓		✓			38%
✓							38%
							38%
	✓		✓				31%
	✓	✓					31%
✓	✓	✓					31%
							31%
							25%
							25%
			✓				25%
							25%
				✓			25%
			✓				25%
							19%

Monitoring tool name	Country/region level	City level	Human capital, talent & education	Innovation & research	Government & regulations: funding and rule of law	Living conditions	Social capital: openness, tolerance, engagement, support & diversity	Creative output & employment	Technology & ICT	Transportation & accessibility	Economy
Green City Index		✓				✓				✓	
European ICT Poles of Excellence (EIPE)	✓	✓		✓							✓
Creative Economy	✓	✓		✓					✓		
Globalisation and World Cities Index		✓									
Worldwide Cost of Living	✓	✓				✓					
Quality of Life Index	✓	✓				✓					
Creative Vitality Index	✓	✓						✓			
Coverage	**53%**	**63%**	**75%**	**53%**	**50%**	**45%**	**43%**	**40%**	**40%**	**40%**	**40%**

Globalisation, networks & exchange	Cultural capital & participation	Culture- and recreation-related venues, resources & facilities	Entrepreneurship	Environment & ecology	Input for the CCS	Tourism	Coverage
				✓			19%
✓							19%
							13%
✓							6%
							6%
							6%
							6%
38%	35%	30%	25%	25%	15%	18%	

Annex III: Guide to the indicators and sources[71]

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-Index 1	**Cultural Vibrancy**					
Dimension 1.1	**Cultural Venues & Facilities**					
1. Sights & landmarks	Points of historical, cultural and or artistic interest, such as architectural buildings, religious sites, monuments and statues, churches and cathedrals, bridges, towers and fountains, divided by the total population and then multiplied by 100,000.	City	2016	2016	99%	TripAdvisor
2. Museums	Number of museums that are open to the public divided by the total population and then multiplied by 100,000.	City	2016	2016	100%	TripAdvisor
3. Cinema seats	Number of cinema seats in the city divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	57%	Eurostat (Urban Audit)
4. Concerts & shows	Number of theatres and other music venues (concert halls, clubs, etc.) and current shows divided by the total population and then multiplied by 100,000.	City	2016	2016	94%	TripAdvisor
5.Theatres	Number of theatres in the city divided by the total population and then multiplied by 100,000.	City	2011-2014	2011	64%	Eurostat (Urban Audit)

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-Index 1	**Cultural Vibrancy**					
Dimension 1.2	**Cultural Participation & Attractiveness**					
6. Tourist overnight stays	Total annual number of nights that tourists/guests have spent in tourist accommodation establishments (hotel or similar) in the city divided by the total population.	City	2010-2014	2014	84%	Eurostat (Urban Audit)
7. Museum visitors	Total number of museum tickets sold during the reference year divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	71%	Eurostat (Urban Audit)
8. Cinema attendance	Total number of tickets sold, referring to all films screened during the year, divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	52%	Eurostat (Urban Audit)
9. Satisfaction with cultural facilities	Percentage of population that is very satisfied with cultural facilities in the city.	City	2015	2015	32%	Flash Eurobarometer 366 by TNS/EC (Survey on 'Quality of life in cities')

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 2	**Creative Economy**					
Dimension 2.1	**Creative & Knowledge-based Jobs**					
10. Jobs in arts, culture & entertainment	Number of jobs in arts, culture- and entertainment-related activities such as performing arts, museums and libraries, divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	81%	Eurostat (Urban Audit)
11. Jobs in media & communication	Number of jobs in media and communication-related activities such as book and music publishing, film production and TV, divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	70%	Eurostat (Urban Audit)
12. Jobs in other creative sectors	Number of jobs in professional, scientific and technical, administrative and support service activities such as architecture, advertising, design, and photographic activities, divided by the total population and then multiplied by 1,000.	City	2011-2014	2011	70%	Eurostat (Urban Audit)

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 2	**Creative Economy**					
Dimension 2.2	**Intellectual Property & Innovation**					
13. ICT patent applications	Three-year average number of ICT patent applications (including: consumer electronics, computers and office machinery, and telecommunications) filed to the European Patent Office (EPO) by priority year divided by the total population and then multiplied by 1 million.	NUTS 3	2010-2012	Average	95%	Eurostat (Regional Statistics)
14. Community design applications	Three-year average number of Community design applications filed to the Office for Harmonization in the Internal Market (OHIM) divided by the total population and then multiplied by 1 million[72].	NUTS 3	2013-2015	Average	82%	Eurostat (Regional Statistics)

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 2	**Creative Economy**					
Dimension 2.3	**New Jobs in Creative Sectors**					
15. Jobs in new arts, culture & entertainment enterprises	Number of persons employed in the enterprises established in the reference year in arts, culture and entertainment activities such as performing arts, museums and libraries, divided by the total population and then multiplied by 100,000.	NUTS 3	2010-2013	2013	43%	Eurostat (Regional Statistics)
16. Jobs in new media & communication enterprises	Number of persons employed in the enterprises established in the reference year in in media and communication activities such as book and music publishing, film production and TV, divided by the total population and then multiplied by 100,000.	NUTS 3	2010-2013	2013	42%	Eurostat (Regional Statistics)
17. Jobs in new enterprises in other creative sectors	Number of persons employed in the enterprises established in the reference year in professional, scientific and technical activities such as architecture, advertising, design and photographic activities, divided by the total population and then multiplied by 100,000.	NUTS 3	2010-2013	2013	43%	Eurostat (Regional Statistics)

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 3	**Enabling Environment**					
Dimension 3.1	**Human Capital & Education**					
18. Graduates in arts & humanities	Average number of tertiary education students (ISCED 2011 levels 5-8) enrolled in the academic years 2010–2011, 2011–2012 and 2012–2013 in arts and humanities courses divided by the total population and then multiplied by 100,000[73].	City	2010-2013	Average	88%	ETER project
19. Graduates in ICT	Average number of tertiary education graduates (ISCED 2011 levels 5-8[74]) in the academic years 2010–2011, 2011–2012 and 2012–2013 in Information and communication technologies courses divided by the total population and then multiplied by 100,000.	City	2010-2013	Average	88%	ETER project
20. Average appearances in university rankings	Average number of a university's appearances in four different university rankings: QS, Shanghai, Leiden and Times.	City	2014	2014	100%	QS, Shanghai, Leiden, Times rankings

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 3	**Enabling Environment**					
Dimension 3.2	**Openness, Tolerance & Trust**					
21. Foreign graduates	Average number of foreign graduates in tertiary education courses in the academic years 2010–2011, 2011–2012 and 2012–2013 as a percentage of the total number of tertiary education graduates (ISCED 2011 levels 5-8[75]) in the same academic years.	City	2012-2013	2012	62%	ETER project
22. Foreign-born population	Percentage of the total population which is foreign-born.	City	2011-2014	2011	73%	Eurostat (Urban Audit)
23. Tolerance of foreigners	Percentage of the population which very strongly agrees with the statement: 'The presence of foreigners is good for this city'.	City	2015	2015	32%	Flash Eurobarometer 366 by TNS/EC (Survey on 'Quality of life in cities')
24. Integration of foreigners	Percentage of the population which very strongly agrees with the statement: 'Foreigners who live in this city are well integrated'.	City	2015	2015	32%	Flash Eurobarometer 366 by TNS/EC (Survey on 'Quality of life in cities')
25. People trust	Percentage of the population which very strongly agrees with the statement: 'Generally speaking, most people in this city can be trusted'.	City	2015	2015	32%	Flash Eurobarometer 366 by TNS/EC (Survey on 'Quality of life in cities')

Variable name	Short explanation	Geo level	Reference period	Mode year	Availability	Source
Sub-index 3	**Enabling Environment**					
Dimension 3.3	**Local & International Connections**					
26. Passenger flights	Number of passenger flights per day, accessible within 90 minutes of travel by road, divided by the total population and then multiplied by 100,000.	City	2013	2013	86%	DG REGIO
27. Potential road accessibility	Computed indicator based on road network data.	City	2012	2012	86%	DG REGIO
28. Direct trains to other cities	Average hourly number of departures between 6:00 and 20:00 of direct trains to other cities or greater cities divided by the total population and then multiplied by 1 million.	City	2014	2014	86%	DG REGIO
Dimension 3.4	**Quality of Governance**					
29. Quality of governance	Computed indicator measuring the quality of government in three areas of public services: education, healthcare and law enforcement.	NUTS 2, NUTS 1 and NUTS 0	2013	2013	96%	DG REGIO

Appendix

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Endnotes

1   Definitions of the 29 indicators can be found in Annex III of the report.

2   https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

3   For more detail, see 'Annex B: Statistical assessment of the Cultural and Creative Cities Index 2017', available for download on the Creative Cities Monitor Online. https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

4   Due to its size, London is not among the 'top' Cultural and Creative Cities because many the Cultural and Creative Cities Monitor indicators are expressed in per capita terms. This approach is primarily intended to enable cross-city comparability but also rewards more 'inclusive' cities which have more cultural and creative assets per inhabitant. As London eclipses other European cities with its population of eight million (almost three times as big as the second largest EU city, Berlin), it does not lead on any dimension in the overall ranking, but does reach seventh place among the 21 cities in its population group.

5   A number of qualifying cities in Cyprus, Latvia, Luxembourg and Malta have been included in the Cultural and Creative Cities Monitor but data coverage was not adequate to calculate quantitative scores. These cities are therefore not ranked and not included in the analysis of the scores that are found in this report; however, qualitative information is provided in their respective online city page and country fact sheet.

6   See Clark, T. N., Lloyd, R., Wong, K. K. & Jain, P. (2002). Amenities drive urban growth. *Journal of Urban Affairs* (24), 493–515; and Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer city. *Journal of Economic Geography* (1), 27-50.

7   Meaning the approximately 800 other European cities with a minimum of 50,000 inhabitants included in Eurostat's Urban Audit, excluding the 168 selected for the Cultural and Creative Cities Monitor.

8   These results are obtained after controlling for effects related to being a capital city or not, city size, job opportunities, and country and time effects, among other things. However, no causality can be inferred without further analysis.

9   However, the results in percentage points for foreigners should be treated with caution as they are outside the traditional bounds of statistical significance.

10   Bove, V., & Elia, L. (2016). Migration, Diversity, and Economic Growth, *World Development* (89), 227–239.

11   The Multaqa project in Berlin invites refugees to offer guided tours in Berlin Museums: http://www.smb.museum/en/museums-institutions/museum-fuer-islamische-kunst/collection-research/research-cooperation/multaka.html.
For Refugee Week, the V&A Museum in London offers visitors an opportunity to see the V&A collection from the perspective of a refugee through tours of museum galleries guided by refugees from around the world.
Karakia (http://www.ccma.cat/tv3/karakia/) is a cooking show filmed in a private home and featuring recipes from the diverse communities that have come to Catalonia. Karakia has become one of TVC's most popular and widely viewed programmes, averaging 185,000 viewers and a total screen share of 7.2%.

12   By contrast with the results presented above, which are based on a simple correlation analysis that does not imply any causal relation, the impact of culture and creativity on GDP growth rate and recovery is based on a causal model.

13   Barro, R. J. & Sala-i-Martin, X. (1995). *Economic Growth*. McGraw-Hill, Inc.

14   See more at: http://ec.europa.eu/regional_policy/en/policy/themes/urban-development/agenda/

15   Today, 72% of EU-28 inhabitants live in cities which produce 68% of all gross domestic product (GDP) in purchasing power standards (PPS, or comparable euros). Source: European Commission (2016). *The State of European Cities 2016*. See the Lexicon for an explanation of technical terms.

16   The necessity as well as benefits of a 'local approach' to policy making are also evident for the CCS. As reported by UNESCO, '[…] municipal policy-making on the creative industries is often more effective in generating results than national strategies, although the latter are of course indispensable in setting up an overarching enabling framework. This is due not only to the complexity of integrating interministerial and cross-cutting policy actions, but more importantly to the ability of municipal and community level support mechanisms to better respond to the local specificities of creative industries, particularly those based on local cultural, artistic, linguistic and natural resources.' Source: UNESCO (2013 Special Edition). *Creative Economy Report - Widening Local Development Pathways*.

17   'There are several reasons why creative industries are concentrated in urban areas. The main factors are: (i) importance of specific local labour markets; (ii) spillovers from one specific creative industry to another; (iii) firms' access to dedicated infrastructure and collective resources; (iv) project-based work; (v) synergistic benefits of collective learning; and (vi) development of associated services, infrastructure and supportive government policies.' Source: European Commission (2010). *European Competitiveness Report*.

18   Despite the crucial importance of these activities in rural areas as a means of improving local economic and social circumstances, the Cultural and Creative Cities Monitor focuses on cities (or densely populated areas). However, some small cities of around 50,000 inhabitants are included in the Monitor, which may offer some insights into the performance of sparsely populated areas.

19   See Pratt, A. (2010). Creative cities: Tensions within and between social, cultural and economic development. A critical reading of the UK experience. *City, Culture and Society* (1), 13-20; and Zukin, S. (1995). *The Cultures of Cities*. Cambridge: MA: Blackwell.

20 TERA Consultants. (2014). *The economic contribution of the creative industries to EU GDP and employment.* In 2010, the European Commission in its European Competitiveness Report estimated its contribution at 3% of GDP and 6.5 million people employed.

21 Source: Eurostat (EU-Labour Force Survey).

22 NESTA (2008). *Creating Innovation: Do the creative industries support innovation in the wider economy?*

23 The OECD, finds, for instance, that arts education contributes to the acquisition of creative and behavioural skills such as close observation, envisioning, exploration, persistence, expression, collaboration and reflection. There is also some suggestive evidence that arts education matters for innovation. In OECD countries, arts graduates are commonly involved in product innovation. Source: OECD (2013). *Art for Art's Sake: The Impact of Arts Education.*

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26 http://ec.europa.eu/regional_policy/en/policy/themes/urban-development/network/

27 https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

28 Bianchini, F. and Landry, C. (1995). *The Creative City.* London: Demos.

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31 Pratt, A. (2010). Creative cities: Tensions within and between social, cultural and economic development. A critical reading of the UK experience. *City, Culture and Society* (1), 13-20.

32 '*A smart city is a place where the traditional networks and services are made more efficient with the use of digital and telecommunication technologies, for the benefit of its inhabitants and businesses.*' (https://ec.europa.eu/digital-single-market/en/smart-cities).

33 See the UN Sustainable Development Goals at https://sustainabledevelopment.un.org/?menu=1300 and, in particular, SUSTAINABLE DEVELOPMENT GOAL 11 - Make cities and human settlements inclusive, safe, resilient and sustainable at https://sustainabledevelopment.un.org/sdg11.

34 Roszak, T. (1969). *The Making of a Counter Culture: Reflections on the Technocratic Society and Its Youthful Opposition.* Anchor Books/Doubleday & Co, Inc.

35 See full list in Annex II.

36 See the Acknowledgements.

37 See the Lexicon for more information on this and other acronyms or abbreviations.

38 See the Lexicon.

39 See 'Annex A: The Cultural and Creative Cities Monitor methodology in ten steps' and 'Annex B: Statistical assessment of the Cultural and Creative Cities Index 2017' available for download from the Cultural and Creative Cities Monitor. Online for more details. https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

40 See 'Annex B: Statistical assessment of the Cultural and Creative Cities (C3) Index 2017' available for download on the Cultural and Creative Cities Monitor Online for more details. https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

41 See also Annex III for further details on the data sources.

42 See e.g. Clark, T. N., Lloyd, R., Wong, K. K. & Jain, P. (2002). Amenities drive urban growth. *Journal of Urban Affairs* (24), 493–515; Blessi, G. T., Grossi, E., Sacco, P. L., Pieretti, G. & Ferilli, G. (2014). Cultural Participation, Relational Goods and Individual Subjective Well-Being: Some Empirical Evidence. *Review of Economics and Finance* (4), 33–46.

43 See Sleuwaegen, L. & Boiardi, P. (2014). Creativity and Regional Innovation: Evidence from EU Regions. *Research Policy* (43), 1508–1522; Nelson, A. C., A., Dawkins, C. J., Ganning, J. P., Kittrell, K. G. & Ewing, R. (2015). The Association between Professional Performing Arts and Knowledge Class Growth: Implications for Metropolitan Economic Development. *Economic Development Quarterly* 30(1), 1–10.

44 For an overview of culture's contribution to innovation, see Rausell Köster, P. (scientific coordinator) (2012). *Culture as a factor for economic and social innovation.* Creative commons.

45 See Annex III for a full definition of the indicators.

46 See similar indicators on universities and graduates used by Sleuwaegen, L. & Boiardi, P. (2014). These are found to be significant predictors of regional innovation and growth.

47 On diversity and tolerance, see Florida, R., Mellander, C. & Stolarick, K., (2008). Inside the black box of regional development: Human capital, the creative class and tolerance. *Journal of Economic Geography* (8), 615–649. On trust, see Besser, T.L. & Miller, N. (2011). The structural, social, and strategic factors associated with successful business networks. *Entrepreneurship and Regional Development* (23), 113–133.

48 Charron, N. Dijkstra, L. & Lapuente, V. (2014). Regional Governance Matters: Quality of Government within European Union Member States, 48 (1), *Regional Studies*, 68–90.

49 Charron, N., Dijkstra, L. & Lapuente, V. (2015). Mapping the Regional Divide in Europe: A Measure for Assessing Quality of Government in 206 European Regions. *Social Indicators Research* (2), 315–346.

50 Approximated by GDP per capita in Purchasing Power Standards (or comparable euros) – see Lexicon.

51 44 European cities are UNESCO Creative Cities. Of the 44, 16 have been included under the "ECoC criterion" and 22 under the "UNESCO criterion". The remaining six have been excluded due to poor data coverage (see Annex I).

52 In order to apply the festival criterion in a coherent way across Europe, only Europe-wide comparable data sources have been used, notably: Platform EFFE (Europe for Festivals, Festivals for Europe) and a Wikipedia page on film festivals in Europe. See more details in the Lexicon.

53 See Annex I for the list of included cities and their respective population group, as well as the list of excluded cities.

54 https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

55 See 'Annex B: Statistical Assessment of the Cultural and Creative Cities Index', available for download on the Cultural and Creative Cities Monitor Online. https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

56 See Annex III of this report for more details on the indicators used.

57 See 'Annex B: Statistical Assessment of the Cultural and Creative Cities Index 2017' available for download on the Cultural and Creative Cities Monitor Online for more details. https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor

58 To interpret the normalised indicators (i.e. understand what they mean in terms of raw data such as the number of museums per capita in a city), see 'Annex C: data, sources, rankings and scores', available for download on the Cultural and Creative Cities Monitor Online platform: https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor-about

59 Number of foreign graduates as a percentage of total graduates at ISCED 2011 levels 5-8 (see the Lexicon for a fuller explanation).

60 The reference airport for Utrecht is Schiphol airport in Amsterdam. From Schiphol there is a direct connection to Utrecht.

61 A number of qualifying cities in Cyprus, Latvia, Luxembourg and Malta have been included in the Cultural and Creative Cities Monitor but data coverage was not adequate to calculate quantitative scores. These cities are therefore not ranked and not included in the analysis of the scores that are found in this report; however, qualitative information is provided in their respective online city page and country fact sheet.

62 See Clark, T. N., Lloyd, R., Wong, K. K. & Jain, P. (2002). Amenities drive urban growth. *Journal of Urban Affairs* (24), 493–515; and Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer city. *Journal of Economic Geography* (1), 27-50.

63 Meaning the approximately 800 other European cities with a minimum of 50,000 inhabitants included in Eurostat's Urban Audit, excluding the 168 cities selected for the Cultural and Creative Cities Monitor.

64 However, the results in percentage points for foreigners should be treated with caution as they do not fall within the traditional bounds of statistical significance.

65 Bove, V. & Elia, L. (2016). Migration, Diversity, and Economic Growth. *World Development* (89), 227–239.

66 In the study, countries are classified according to the definition of the World Bank as of 1 July 2015. Since 2016, the World Bank no longer distinguishes between 'developed' and 'developing' countries. Find out more at: http://blogs.worldbank.org/opendata/2016-edition-world-development-indicators-out-three-features-you-won-t-want-miss

67 Find out more at: http://www.smb.museum/en/museums-institutions/museum-fuer-islamische-kunst/collection-research/research-cooperation/multaka.html.

68 Find out more at: http://www.ccma.cat/tv3/karakia/.

69 The five city groups based on GDP per capita (in PPS) are the following: 'Very high': more than €35,000 (40 cities); 'High': €30,000–35,000 (26 cities); 'Medium': €25,000–30,000 (38 cities); 'Low': €20,000–25,000 (27 cities); 'Very low': less than €20,000 (37 cities).

70 Barro R. J. & Sala-i-Martin X. (1995). *Economic Growth*. McGraw-Hill, Inc.

71 The full metadata table is available at https://composite-indicators.jrc.ec.europa.eu/cultural-creative-cities-monitor/about

72 A Community design is a unitary industrial design right that covers the European Union. A design is defined as the appearance of the whole or a part of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation.

73 ISCED 5: Short cycle tertiary education. ISCED 6: Bachelor's or equivalent programmes. ISCED 7: Master's or equivalent programmes.

74 Ibid.

75 Ibid.

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