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The UK's International Creative Trade: A Review of the Official Data Sources

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Abstract

As the Creative Industries gain pace at the national and international level, evidence-informed policies and strategies are becoming ever more critical. A priority in the UK's Industrial Strategy for the creative industries is to strengthen its international competitiveness. As this is an area still requiring considerable research development, this paper aims to review the most relevant official data on creative trade. In particular, we consider national and international data sources. While the former are designed in line with the UK creative industries definitions and policy, the latter aim at internationally standardised comparisons and, therefore, may be affected by classification and concordance issues. Nevertheless, both are needed to carry out research for industry, practitioners and policymakers in the creative industries. We conclude this work by pointing out some data gaps.

Key Words: creative industries; creative trade, data sources, systematic literature review, text mining.

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1. Introduction

Under the Creative Industries Sector Deal, the UK's Industrial Strategy[1] aims to foster the development and international competitiveness of the creative industries, and in particular their ability to export. Assessing the effectiveness of creative industries policies depends on the availability of data to gather the needed empirical evidence. National departments and statistical offices around the world, as well as international institutions, have made considerable efforts to create a reliable description of these industries in official statistics and reports. This task, however, is made difficult issues that specifically affect the creative industries more than other parts of the economy.

The first issue for the UK's creative industries, which is especially relevant when looking at international comparisons, is the general lack of consensus, on an international basis, as to what defines the creative industries and creative goods and services. For example, some countries prefer to use the term cultural industries because it denotes the roots in national values and an element of national cultural expression. Others prefer the term creative economy to emphasise the significance and contribution that these industries make to the broader economy. The UK has a well-established definition of the creative industries, as formulated by the Department for Digital Culture Media and Sport (DCMS), and measurement efforts are more advanced than in many other nations. However, even in the UK, definition issues affect the statistical measurement, as is evident when one looks at the considerable overlap in the official statistics between the Cultural, Digital and Creative Industries.

At the international level, the situation is even more complicated. The cultural and creative sectors are seen as representative of a national identity more than other sectors, and definitions are often charged with political meaning.[2] As a result, internationally agreed definitions and standardised measurements of the creative industries are complex and variable. Nevertheless, both are crucial to make the international comparisons needed to inform national policies and guide international coordination

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[1] The UK's government and the Creative Industries sector, through the Creative Industries Council (CIC), have agreed a Sector Deal to unlock growth for creative businesses with investment of more than £150 million. The Sector Deal is available at https://www.gov.uk/government/publications/creative-industries-sector-deal

[2] See for example the Introduction to the DCA (1994) setting the first national cultural policy in Australia's history and also laying the foundations for a Creative industries definition, available at: https://webarchive.nla.gov.au/awa/20031212212026/http://www.nla.gov.au/creative.nation/intro.html

efforts. The problems emerge, in particular, when one tries to draw inference from the international data for specific national purposes, as discrepancies end up making comparisons that are only partially informative.

The second issue is that it can be difficult to measure trade in creative goods and services on a national and an international level because the reporting of international creative transactions can be elusive. This is because the creative industries are skill, technology, intellectual property rights (IPR), service and digital intensive. Therefore, even if there were an agreed definition, continuous changes in these features would require continuous reassessment of what constitutes creative goods and services, posing further challenges for statistical accounting in international transactions. For example, as the skill requirements of goods and services continuously change, driven by technological progress, so does their creative content. Some of these issues emerge in the measurement of trade in services, a difficult task for non-creative services, but further complicated in this part of the economy by the creative industries' fast and pervasive digitalisation of content and delivery modes, such as streaming.

The third issue is that the definition of what constitutes the creative sectors may change due to changes in production and consumption driven by new technologies. As a result, their measurement in the Balance of Payments account may require international standards to adjust frequently. For example, the change from CDs/DVDs/Blue Rays to the internet and streaming platforms or the shift from newspapers to digital news subscriptions are some examples of this change and how goods can become services.

Fourthly, the production of creative goods and services is characterised by the need for a contemporaneous, variegated and vertically differentiated skill set, as famously discussed by Caves (2000) in the "motley crew" and "time flies" principles. This means that the production of creative goods and services can be subject to complicated and variable business and export modes.

Many of the above issues are well-known and discussed by international organisations including United Nations Conference on Trade and Development (UNCTAD) in their Creative Economy Reports (2008, 2010, 2018), which aim to produce reliable representations of the creative economy on a global scale.

The lack of extensive and reliable data has, however, considerably hampered research in international trade in the creative industries. This is particularly evident when one considers not only the creative industries relative to the rest of the economy but also specific subsectors. For example, those subsectors, like music and movies, where the industry has traditionally produced a lot of data, have received far more attention than those that are not as data-rich (see Fazio, 2020). The evidence base is, again, scarce both at the national level, when one considers the relationship between creative industries and the rest of the economy, and at the international level, when one considers trade relations between nations and how these affect trade in creative industries. This is an even more critical challenge because of the creative industry's increasing importance in terms of value-added and share of trade.

Official national data at the sector and subsector level can be used to draw an overall picture of the UK creative industries in the global economy and gather interesting policy insights. However, when sectors, firms and products are characterised by pervasive heterogeneity (as is likely in the case the creative industries) in terms of modes of production, consumption, delivery and international regulation, the picture drawn from the macro data is inevitably partial. Microdata may be more helpful for creating a picture of the creative industries, especially in terms of firm- and product-level differences, as it is now well evidenced in the international trade literature for other parts of the economy, especially manufacturing. As mentioned above, however, international comparisons can be useful when it comes to looking at the UK's standing relative to other countries. It is particularly important for the UK to understand its position in the global economy in a post-Brexit world.

In light of all these issues, the main objective of this paper is to review the most relevant datasets available from official sources and discuss their ability to provide the much-needed evidence base for the international dimension of the UK's creative industries. Several other datasets are collected by non-governmental sources. This data could be complementary to the official data and reviewing it would also be beneficial, but we deliberately leave these out of the current work. This paper aims to be a useful one-stop reference for scholars and practitioners interested in UK creative international trade. At

the same time, however, the paper aims at highlighting some data gaps and informing future directions of activity in terms of data collection exercises.

With the above objectives in mind, the rest of the paper is organised as follows. Firstly, in section two, we provide a general discussion on definitions and measurement issues. Section three presents and comments on UK sources of data. Section four reviews data on UK trade from international sources. Section five discusses the data gaps and concludes the paper.

2. Creative Industries: definitions and measurement

As mentioned above, in comparison to other countries, the UK has a well-established definition of the creative industries and its subsectors. This is the basis for all official data produced by the Department for Digital Culture Media Sport (DCMS) together with the Office for National Statistics (ONS). While this data provides a rich picture of the sector and its subsectors concerning value-added, employment, trade, and business demographics, understanding the UK's position relative to other countries still requires looking at the international data. Although it is possible to map the creative industries according to the UK's national definition, this is unfortunately impossible on an international scale, and international comparisons will inevitably involve trade-offs. One of the main reasons for this is the mentioned lack of a commonly agreed definition.

2.1. National approach, definition, and classification

As reported by Boix-Domènech and Rausell-Köster (2018, p. 20), the term Creative Industries originates in Australia (DCA 1994). Its use was then adopted by the United Kingdom, which needed to find new bases for growth for its post-industrial economy (DCMS 1998; O'Connor 2007). The creative industries were formally defined in the Government's 2001 Creative Industries Mapping Document (DCMS, 2001) as those *"…which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property"* (DCMS, 2016b).

Accordingly, the DCMS Creative Industries Economic Estimates combined industry codes for the designated sectors with occupational data from 2003 onward, which was also the approach adopted in a few other countries, for example, the Hong Kong Baseline Study

(CCPR, 2003) and the Ontario Design Study (Vinodrai, 2009). The UK case extracted data from the annual Labour Force Survey, while the Hong Kong study used Population Census data and cross-tabulated creative occupations within Standard Industry Classification (SIC) codes at the three-digit level. "The Creative Trident" method, which differentiated creative workers into three groups based on their "occupational situations", was developed by the Queensland University of Technology group led by Stuart Cunningham (Cunningham and Higgs, 2008, p. 11). This Queensland group also collaborated with Nesta in the influential "Beyond the Creative Industries" study (Higgs, Cunningham and Bakhshi, 2008), which led to the re-classification of the creative industries based on "creative intensity", an approach which is the basis of DCMS's definition of the creative industries. Specifically, the Creative Industries Economic Estimates Methodology paper (DCMS 2016a) sets out the methodology used to determine which industries are considered "creative" (on the grounds of the above-mentioned principle of "creative intensity"). The method involves three steps:

Step 1: Identification of the creative occupations, using the occupation data from the Annual Population Survey (APS), which is itself derived from the Labour Force Survey (LFS). These are defined by the Standard Occupational Classification, SOC 2010, introduced in the 2011 data.[3]

Step 2: Calculation of the share of creative jobs for each industry (creative intensity).

Step 3: Identification of creative industries (at 4 digit SIC code level) as those with creative intensity above a specified threshold.

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[3] Bakhshi *et al.* (2013) propose criteria which can be used to assess which occupation codes should be considered creative for measurement purposes. SOC codes are subject to review by the ONS, and therefore the Creative Occupations are also subject to change over time as the SOC codes change. In 2020 a new standard SOC 2020 was introduced to replace SOC 2010. This is described at https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassification soc/soc2020. A few creative occupations have been re-classified by the new SOC 2020, e.g., "Advertising directors" are now included with "Marketing and sales directors", as digital techniques and social media are causing these roles to merge. Many associate professional occupations have been reclassified as professional occupations, thus "Graphic designers", coded 3421 under SOC 2010, has been recoded 2142 as "Graphic and multimedia designers" in SOC 2020, and "Architectural and town planning technicians", previously coded 3121, has become "Chartered architectural technologists, planning officers and consultants" coded 2452 in SOC 2020.
Some occupations have been aggregated and some others have been disaggregated. See table A2 for more details. Interestingly, in SOC 2020 code 1255 (Managers and directors in the creative industries) appears, which does not find a correspondence in SOC 2010. It is clear that a new assessment of the creative content of occupations is needed, since in the new classification some creative occupations have been lumped together with non-creative ones, and, vice-versa, some occupations have been disaggregated.

These three steps have led to the identification of the following creative industries sub-sectors: "Advertising and marketing", "Architecture", "Crafts", "Product design, graphic design and fashion design", "Film, TV, video, radio and photography", "IT, software, video games and computer services", "Publishing and translation", "Museums, galleries, and libraries", "Music, performing arts, visual arts and cultural education". Table A1 in the Appendix reports the list of both the creative occupations and the creative industries and Table A2 further presents the correspondence between the creative occupation in SOC 2010 and the newly introduced SOC 2020.

2.2. International approaches, definitions and classifications

At the international level, definitions of creative industries are slightly different, at least in their detail. For the European Parliament (2016: 10) creative industries are defined as "*those industries that are based on cultural values, cultural diversity, individual and/or collective creativity, skills, and talent with the potential to generate innovation, wealth and jobs through the creation of social and economic value, in particular from intellectual property*". This is a very similar definition of creative industries to the one by DCMS seen above, but with the inclusion of cultural values and cultural diversity and, according to Boix-Domènech and Rausell-Köster (2018), represents the creative industries as the evolution and structural changes of the cultural industry due to the emergence of new technologies and new products.

UNCTAD (2008: 4) defines the creative industries with quite some detail as "*cycles of creation, production and distribution of goods and services that use creativity and intellectual capital as primary inputs; constitute a set of knowledge-based activities, focused on but not limited to arts, potentially generating revenues from trade and intellectual property rights; comprise tangible products and intangible intellectual or artistic services with creative content, economic value and market objectives; are at the cross-road among the artisan, services and industrial sectors; and constitute a new dynamic sector in the world trade*". As pointed out by Boix-Domènech and Rausell-Köster (2018) the term "creative industries" here goes beyond the cultural sector to include media and ICTs, following the structural changes due to the growth and development of the new technologies.

The definition of the creative industries adopted by different countries often reflects cultural, social, and economic differences.[4] Some industries that may be highly creative-intensive in one country are not necessarily highly creative-intensive in others. This adds a further layer of complication to the construction of international indicators.

Bille (2012a, 2012b) uses the Danish approach as an example of the definitional difficulties of measuring cultural or creative work. Beginning with artists, and drawing on Frey and Pommerehne (1989), she observes that the most commonly used objective criteria include income, membership of groups and associations and professional qualifications, while the more hard-to-reach measure of "time spent on artistic work" is rarely used.[5]

Bille's scope for inclusion is based on occupations depending on artistic creativity incorporating the following job functions: Actors and Directors, Architects, Crafters and Designers, Dancers, Musicians, Photographers, Visual artists, Writers. Then, she selects artistic and creative education qualifications that feed into the above jobs. Again, these are directly linked to skills enabling the production of creative content rather than technical, conservation or interpretative knowledge. Thirdly, she aims to investigate whether creative workers are employed in the creative industries and selects eleven tightly restricted creative content and outputs: Advertising, Architecture, Design, Film, Independent arts, Music, Photography, Publishing, Television and Radio, Theatre, Visual arts.

Like the pre-creative intensity DCMS list, the inclusion of some of these creative sub-sectors seems arbitrary, being based only on the production of creative content, rather than on a propensity for wealth creation through intellectual property. Bille uses these categorisations to measure the scale and distribution of creative workers across the Danish economy.

As shown by Bille (2012b), the creative industries policy and measurement agenda in Scandinavia has not been named as such but instead uses the broader term of

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[4] See UNCTAD (2010) for a detailed international comparison.

[5] Subjective criteria may also be considered such as the quality of art, reputation, recognition, which nevertheless have measurable indicators such as awards and reviews. Bille uses Statistics Denmark data, which are official statistics collected, in almost all cases, for reasons other than measuring the creative industries. People are assigned occupations according to their highest source of income, which would exclude many part-time creative workers.

"experience economy"[6]. This categorisation includes the creative industries as recognised in the UK, as well as cultural institutions, events, play tools and theme parks, sport, and tourism sectors that were, not un-controversially, excluded from the DCMS classifications listed above.

The political-economy agenda will always play a considerable role in the development of these sorts of definitions. For example, in Denmark these sectors are seen as generating value for other sectors, as well as their own, and being related to regional development (Ministry of Science, Technology and Development, 2005). Bille shows how similar groupings are adopted in Sweden and Norway. The challenge for this "experience economy" approach is to operationalise the consumption of experiences since businesses need to know which elements render an experience meaningful for the individual consumer. But since an experience is purely subjective, the borders of the experience economy industries are fluid. Bille and Lorenzen (2008) attempt a demarcation of the experience economy, which however is recognised to not be definitive.

UNCTAD (2008) has also illuminated the role of developing countries and emerging economies in the creative industries. Focusing necessarily on trade flows dominated by physical goods, and less so on the intangibles of the creative industries, "creative goods" certainly form a part of the creative economy. However, these often represent the lower value-added activities of the chain, while design, marketing, and intellectual property ownership account for the majority of the value added (UNCTAD, 2010, p. 100). Nevertheless, UNCTAD's first report on trade in the creative industries in 2008 highlighted some interesting results. The world's leading exporter of creative goods was in fact China, with a market share of 19% of total world exports, with other Asian countries among the fastest growing. In response, the sceptics could point out that manufacture is not creativity at its source. The difficulty of assessing trade and output in developing countries is exacerbated by the informal nature of much of their creative economy, particularly in the arts and crafts sectors. Yet, these countries saw an increase in their share of creative

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[6] Pine and Gilmore (1999) with their book 'The Experience Economy' were the first to introduce the concept that experiences are a new source of value creation for businesses, an add-on to various consumer products and services (Bille 2012b). Experiences are inherently personal, they pertain to the individual sphere, requiring an individual engagement on an emotional, physical, intellectual, or even spiritual level. (Pine and Gilmore 1999),

goods trade. In general, the UNCTAD reports have shown the creative industries to be among the most dynamic sectors in world trade.

Table 1 shows the most common classifications for the creative industries as reported in Jones *et al.*, (2015, p. 29-30). It is evident the range of groupings, from narrow in the WIPO (2003) case which is based on the importance of copyright usage, to very broad in UNESCO's (1986) case, with the inclusion of cultural heritage, environment/nature, and socio-cultural activities (such as association and community work). DCMS (2013) and UNCTAD (2008) definitions are meanwhile broad in the direction of IT, software, and specialised design services. For a thorough comparison across sectoral definitions, also refer to UNCTAD (2010).

Much of this discussion on approaches and definitions has necessarily been centred on classifications and groupings. This reflects the work of government economic advisors and policymakers who have decided that accounting for the creative industries as a part of the economy ought to be a regular practice. Classifications are, of course, crucial for measurement, in that including or excluding specific sectors can make massive differences in this accounting, for example, as previously mentioned, in the DCMS case with IT-oriented sectors or travel and tourism in Scandinavia.

Table 1: The most common definitions of Creative Industries

UNESCO (1986)	WIPO (2003)	Americans for the Arts (2005)	KEA (2006)	UNCTAD (2008)	DCMS (2013)
Socio-cultural activities					
Environment and nature					
Sports and games					
Cultural heritage		Museums and collections	Heritage	Heritage	
Printed matter and literature	Press and literature	Publishing	Books and press	Publishing and printing media	Publishing
Music and performing arts	Music, theatrical productions, operas	Performing arts	Performing arts	Performing arts	Performing arts and entertainment
			Music		Sound recording and music publishing
Visual arts (including arts and crafts)	Visual and graphic arts	Visual arts/ photograp	Visual arts	Visual arts	
Photography	Photography				Photography
Cinema	Motion picture and video	Film	Film and video	Audiovisual media	Motion pictures, video and television programmes
Radio and television	Radio and television	Radio and television	Television and radio		Programming and broadcasting
	Advertising services		Advertising	Functional creations: Design new media such as software digital content and games, creative services such as architecture and advertising digital services and recreational services	Advertising
					PR and communication
					Translation and interpretation
		Design	Design		Specialised design
			Architecture		Architecture
	Software and databases		Video games		Software publishing
					Computer programming
					Computer consultancy
	Copyright collective management societies	Art schools and services			Cultural education

(Source: Jones *et al*. (2015), p. 29-30)

2.3. National vs international data sources: comparability and measurement standards

It is important to track any variations in definitions when looking at an international analysis of creative industries, especially when considering bilateral transactions. The DCMS creative industries classifications can potentially be recreated in international data since most of these data uses harmonized international sector codes (SIC). The underlying assumption in this process would be that internationally the same occupations will map into the same industries in terms of creative intensity, which, in turn, would require the division of labour within industries to be the same across countries.[7]

From a practitioner perspective, it may be possible to compare and analyse information on creative sectors across countries, as long as a fine-grained breakdown of the data is available, ii) the classification used by the various countries/institutions are directly or indirectly comparable and iii) changes that affect classifications over time are carried out so that data remains comparability relevant over time. These three aspects are clearly intertwined and, indeed, they have been already recognised and discussed by statisticians and economists (see, for instance, Ascher and Whichard, 1991).

As will be discussed more fully in later sections of this paper, the first issue is likely the most relevant, as the UK data sources are at a more advanced stage of development compared with their international counterparts. It is often the case that sufficiently detailed breakdowns of the data are unavailable, as will be discussed later in relation to international input-output tables and some trade flow data. In turn, this flaw may reflect the under-development of and difficulties in producing statistics for services, a sizable and growing part of the creative industries.

This issue is related to the previous issues of creative industries definitions, as a common international framework would be beneficial for the production of statistics. On top of this, the availability of further breakdowns of the data would make it easier to separate goods and services data when classification standards blend them together. For instance, some classifications (e.g. NACE, ISIC) assign codes based on "economy activity", a concept which is grounded on the production process rather than on the

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[7] The DCMS definition is based on four-digit SIC codes, which are themselves based on NACE Rev 2. In principle comparable data could be generated for all countries that also use the NACE system of industrial classification. Problems arise in part because data is not always reported at the 4-digit level – 3 digit industries combine creative and non-creative activities.

final product obtained. As an example, consider the following NACE Rev2 code: "Publishing of newspapers" (58.13), accounting for "… *the publishing of newspapers, including advertising newspapers, appearing at least four times a week. Publishing can be done in print or electronic form, including on the Internet*".[8] Because this classification embeds goods and services content, it becomes hard to separate these two different components (see, also, Fazio, 2020, on this point).

One of the consequences of technological changes on classification standards has been to make it difficult to properly track sector figures. Classification standards may be outdated as service activities become increasingly important, especially in the creative industries, making the reporting of transactions particularly difficult in some creative sub-sectors. A good example is that of the "Other business services" category in the Balance of Payments Manual (BPM) standards for services activities. This category includes activities like photographic services, translation and interpretation, and publishing. Using this category makes it impossible to obtain detailed information on services activities – a point related with the first issue – which may lead to underestimated figures in many sectors, such as publishing, music, or movies, where a shift from goods to services is taking place.

3. Official UK Data sources

3.1. Macro Data from the Department of Digital Culture Media and Sports (DCMS)

DCMS is responsible for publishing the sector statistics on the creative industries.[9] All statistics are produced by aggregating from the 31 four-digit SIC codes to the nine sub-sectors starting, in most cases, from data coming from the surveys administered by the Office for National Statistics (ONS). We describe these surveys in the next sections.

DCMS publishes a variety of economic indicators which allow us to obtain a snapshot on creative industries employment, Gross Value Added (GVA), international trade (imports and exports) and business demographics.[10] The data spans different time periods,

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[8] See https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF and https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf for details on, respectively, NACE Rev.2 and ISIC Rev.4 classifications.

[9] See https://www.gov.uk/government/collections/dcms-sectors-economic-estimates.

[10] As such, this description is based on the methodology discussion contained in DCMS (2019b), as well as on the documents reporting facts and figures for each topic and the related quality assurance report (e.g., concerning international trade see, DCMS, 2019a and DCMS, 2019c).

depending on the indicator considered (mainly reflecting the processing times of the different underlying data sources) and are available for the creative industries, as well as for nine creative sub-sectors (as defined by DCMS). The sub-sectoral data on employment, GVA and business demographics are also available on a regionally disaggregated level, based on UK NUTS-1 regions. The published trade data allows for a breakdown of exports and imports figures across international destination/origin, covering worldwide trade based on eleven aggregated world regions (e.g. Asia, North America, Europe, Latin America, etc.), as well as detailed trade flows for forty six countries.

Many of the above statistical issues are recognised by DCMS, which, as detailed in their methodological notes, goes to great lengths to produce data that is both reliable at the national level and in line with international statistical standards. Yet, statistics may still be affected by some degree of inaccuracy. Among the issues that can potentially affect the estimates are the following: i) the underlying survey data sources may be subject to sampling uncertainty; ii) the sample design may change over time; iii) issues regarding sectoral concordances may reduce accuracy for some sub-sectors.

Some other issues are specific to certain estimates. For instance, it is generally not possible to obtain GVA figures at the 4-digit SIC codes level used to define the DCMS creative sub-sectors from national supply-and-use tables, which provide a breakdown up to 2-digit SIC codes. Therefore, the DCMS creative sub-sectors' estimates on (regional) GVA are recovered from the Annual Business Survey (ABS), containing information on turnover, employment costs, and capital expenditure.

Further, the trade flows on goods and services are based on different sources and principles, so that DCMS itself recommends not to combine them, nor to compare them as they are different statistics. In particular, trade in goods flows is based on the Intrastat survey and HMRC Customs Handling of Import and Export Freight (CHIEF) system for EU and non-EU flows, respectively.[11] Trade flows are recorded based on the "cross-border principle", meaning that arrival/departure from the UK territory defines imports/exports transactions. Instead, trade in services are estimates based on the "change of ownership principle" and are produced from the International Trade in Services (ITIS) survey

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[11] The Intrastat Survey is an EU-wide survey of trading business. See Section 4.2 for more detail.

administered by ONS.[12] Each source also relies on different classification standards, since service flows are based on the SIC 2007 classification and, as such, directly match into the DCMS sectors. Instead, trade in goods is recorded using the Combined Nomenclature 2008 (CN08) standard, requiring the establishment of concordances to map the trade figures for the DCMS sectors, which is carried out using the SIC 2007 / NACE Rev.2 classifications (the latter equivalent to SIC codes up to the 4-th digit).

The accuracy of trade statistics may also be affected by classification issues. For example, since the classification is based on a primary or main output only, estimates for DCMS sectors may also include trade in non-DCMS sector services undertaken by DCMS sector businesses, and exclude trade in DCMS sector services undertaken by businesses which are not classified as DCMS sectors.

An additional technical issue emerges because, so far, businesses have not been required to report trade of goods from and to EU countries when total value is below a threshold (£250,000 for exports; £1.5m for imports) and such "below threshold trade average" (BTTA) between the UK and the EU must be estimated. In the last estimates, DCMS (2020) has changed the way it estimates DCMS sector trade below this threshold owing to the availability of less granular BTTA estimates for the DCMS sectors. However, these estimates are similar to the ones obtained with the previous method based on more granular BTTA for a data period allowing such comparison (see the publication for more details). Given the small size of creative industries businesses, estimates of the BTTA may be more important than in other sectors. DCMS (2020) reports that removing BTTA trade would have an impact of around 3.6% (5.3%) on the estimates of exports (imports) of DCMS sector goods respectively.

Finally, as a general point, with the exception of non-EU goods trade, DCMS publishes estimates of trade relying on surveys and, therefore, statistics may suffer from the usual limitations associated with observing a sample rather than the actual population.

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[12] For more details on ITIS survey, see Section 3.2.4.

DCMS Estimates	Time period availability	Main data source
Employment	2011-2018	Labour Force Survey (LFS)
GVA	2011-2017	UK Supply-and-Use Table ABS
Business demographics	2010-2019	ABS
Trade in goods	2010-2019	Intrastat Survey and CHIEF
Trade in services	2010-2018	ITIS

3.2. Micro data

In this section, we describe the main national sources of micro-level data. These can be particularly useful when examining the specific features of firms in the creative industries and their international dimension in terms of trade and investment.

3.2.1. Longitudinal Small Business Survey

In 2015 the Department of Business Innovation and Skills (now BEIS) supported by a number of other Departments and Agencies commissioned the first of five waves of the annual UK Longitudinal Small Business Survey or LSBS.[13] The LSBS is a large-scale telephone survey of small and medium business (0-249 employees) owners and managers across the UK. The survey involves a random sample of firms taken from the Inter-Departmental Business Register (registered business/employers) and Dun and Bradstreet records (businesses with no employees), stratified by sector, nation and size of business, where the unregistered non-employers account for 15% of the sample, registered non-employers for 15%, micro-businesses (1-9 employees) for 25%, small businesses (10-49 employees) for 25% and medium-sized businesses (50-249 employees) for 20% (BIS, 2016). Covering 15,502 respondents in 2015, 9,248 in 2016, 6,619 in 2017, 15,015 in 2018 and 11,002 in 2019, the same businesses are resurveyed each year, but the sample is topped up with new businesses each year to maintain representativeness as many businesses drop out. The survey builds on previous Small Business Surveys but is broader in scope and

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[13] Anonymised data from the LSBS waves are deposited in the UK Data Archive.

larger in size. The presence of the firms' 4 digit SIC code can allow the identification of creative businesses, with all the limitations that this entails.

The LSBS contains data on firm characteristics, such as size, sector, number of employees, and ownership structure. It also includes information on each business' recent performance, obstacles, plans and expectations, innovation, finance, technology, use of business support, investment in skills development and exporting activity and export intentions.

The export questions have become more specific over time. In 2015 businesses were asked whether they exported goods and services, and what percentages of their turnover such exports were (distinguishing between goods and services) although there was no indication of country destination.[14] In 2016 questions were added to explore whether SMEs exported goods or services to the EU and, separately, to the non-EU countries, and what percentage was exported to the EU (consequently, knowing the total percentage of turnover exported it is possible to infer the percentage of turnover exported to non-EU countries). But this information on EU/non-EU exports was not broken down between goods and services. In 2018 and 2019 new questions were added to ask whether the exports were directed towards the following destinations: the EU, the US, EFTA countries, Canada, Turkey, South Korea, China, India, and other non-EU countries, however only for the EU it did also ask what percentage of the turnover was exported (BEIS, 2019).

In addition, businesses are asked to specify in which year they started exporting, and if they are not sure, they are given a range of years for exporting duration to select from. They are then asked whether during their exporting period they exported every single year or if they experienced gap years with no exports, and in the latter case they are also asked to specify the reason (a choice among a few reasons suggested by the

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[14] In previous Small Business Surveys (SBSs), which were not longitudinal in nature, the information collected on exporting was even more limited or not consistent from survey to survey, for example in the 2007-08 SBS it was only asked whether the business exported and whether it intended to export in the following two years; in the 2010 survey it was asked to identify its major export markets and what were the barriers to exporting; in the 2014 survey more questions were asked on past and future exporting activity, in addition to the percentage of turnover being exported. The sampling of businesses also changed over time, when the SBS 2014 primary sample source for employers became the Inter-Departmental Business Register (IDBR), whilst previously Dun & Bradstreet's commercial database was the source for all SME interviews, leading to differences in the profile of businesses with the previous SBS. So using these old surveys for comparison over time requires caution.

questionnaire is possible, but there is also the possibility to specify a different reason). They are asked about their future intentions to export or license goods and/or services, and if such intentions exist, SMEs are asked to specify whether this intention is for the immediate future (within the next 12 months) or further into the future. Businesses with no exports and no intention to export are asked a final question on whether they have any goods or services suitable for exporting. This question captures their untapped exporting potential.

The LSBS provides much more limited information on imports. There is no information on imports in the 2015 wave. In the 2016-19 waves SMEs are asked whether they have imported goods or services (without distinguishing the two) from the EU and from non-EU countries. No further question is asked on imports, so it is not possible to know what percentage of their inputs are being imported.

Starting from 2016 the LSBS also asked businesses about the impact of the EU referendum, asking whether its result had impacted on plans previously made for the business, and more specifically in which areas the plans have been affected, in what direction, and with what timeline. A final question asks, on a scale from 1 to 5, how beneficial or detrimental the business perceives the UK exit from the EU to be.

The international dimension of creative industries is explored through a range of questions about the obstacles faced by businesses. For example, the LSBS 2017 asks what challenges a business faces because of the UK's forthcoming exit from the EU. These challenges can be related to the recruitment of skilled and unskilled labour, decreases in investment, uncertainty about future regulatory changes, and uncertainty about future access to EU markets. The LSBS 2018 and 2019 ask whether a business has experienced difficulties in recruiting and retaining skilled EU labour and the same question is asked for unskilled labour. It also asked whether the business experienced an increase in the cost of imports, and an increase in the cost of exports. The business is also asked whether it expected to experience such issues in the future, or whether these were not issues at all. Although the LSBS does not ask the same questions every year, the richness of its data makes it unique in profiling businesses' perceived obstacles caused by Brexit.

3.2.2. The Annual Business Survey

The Annual Business Survey (ABS) is the main structural business survey conducted by the ONS.[15] Prior to 2009, the ABS was known as the Annual Business Inquiry – part 2 (ABI/2), which started in 1995. Every year, the ONS sends ABS questionnaires to around 62,000 businesses in Great Britain, while the Northern Ireland Statistics and Research Agency (NISRA) sends the questionnaires to around 11,000 businesses in Northern Ireland. Businesses are drawn from the Inter-Departmental Business Register (IDBR) and are classified by industry under the SIC2007 industrial classification which was introduced in 2008.

The ABS covers financial variables including turnover, purchases, employment costs, capital expenditure and stocks and some information on international trade in services and goods. Importantly, the sampled businesses are legally required to complete the questionnaire, which considerably reduces response bias issues. The produced statistics help to improve the overall quality of National Accounts and the measurement of Gross Domestic Product (GDP) and the Gross Value Added (GVA).

From 2015 the ABS questionnaire, in its long version, under section E, asks businesses to provide values for acquisitions, and proceeds from the disposal of capital assets.[16] For the creative industries, in particular, the category *h* on intellectual property assets is of interest. This refers to new protected information and specialised knowledge used to facilitate production. It includes in aggregate form all the acquisitions and, separately, the disposals of recordings, films and performances, manuscripts and publications, plans, instructions and designs (e.g. architectural/engineering plans). Although these are acquisitions and disposals that could be domestic as well as international, as the data does not distinguish, it opens up potential explorations of intellectual property in relation to international trade activity.

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[15] See https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/methodologies/annualbusinesssurveyabs

[16] The "long" ABS questionnaires are sent to nearly all businesses with an employment of 250 or more and also to a proportion of selected businesses with lower employment. On the "long" questionnaire, there is a more detailed breakdown of variables such as turnover, purchases and employment costs, while the "short" questionnaire only requires totals.

Section F of the ABS questionnaire is devoted to exports and imports of services. Businesses are asked to provide the value of both exports and imports, while in section G they are asked to indicate whether they exported (imported) goods, without indicating the amount.

3.2.3. Business Structure Database

The Business Structure Database (BSD) is a business level dataset also administered by ONS. Observational units are UK enterprises/local units that are liable for VAT payment and/or whose owner(s) is registered under the PAYE tax collection system.

The dataset relies, again, on primary information contained in the Inter-Departmental Business Register (IDBR) and it is intended to keep track of businesses over time. Records currently span the 1997 to 2018 period. The IDBR records information on about 4 million enterprises (and about 5.5 million local units), which are estimated to account for 99% of UK economic activity.[17]

Alongside several identifiers tracking the sector of activity (at the 5-digits SIC level) and geographical location, relevant information concerns employment (distinguishing between employees and working proprietors) and turnover figures, as well as other business characteristics including information on business births, deaths and proprietorship changes. Observations can be identified by unique IDBR reference number.

As it stands, this source of data is particularly useful to obtain a comprehensive view on structural sectoral characteristics, as well as representing a central reference when working with data sources. To analyse broader topics like international trade, labour outcomes, etc., it may require matching with other data sources.

3.2.4. International Trade in Services Survey

The International Trade in Services Survey (ITIS) - formally called the Overseas Trade in Services Inquiry - has been conducted by ONS since 1996 and targets UK businesses entering international transactions in service activities. It is comprised of a stratified sample (with respect to size and sector of activity) targeting both production and non-

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[17] See https://beta.ukdataservice.ac.uk/datacatalogue/studies/study?id=6697#!/details

production businesses, with the exclusion of those operating in the following sectors: travel and transport; banking and various financial institutions; higher education; and the majority of legal services.[18] In addition, annual trade activities regarding the Film and Television industries were separately reported in the Film and Television Survey up to 2008; since 2009 they have been incorporated into ITIS.

ITIS is administered on a quarterly and an annual basis and feeds directly into the measurement of the UK's Balance of Payments and Gross Domestic Product. Firms surveyed quarterly are not considered for the annual version of the survey, while the resulting sample includes data from both.[19] Currently, the annual survey consists of about 16,500 businesses, while approximately 2,200 businesses participate in the quarterly survey, accounting – as of 2018, i.e. the latest survey - for about 52.6% and 45.7% of total UK services exports and imports, respectively.[20] The annual results are supplemented by information collected via the ABS. First, businesses are filtered starting from those reporting non-zero values in international transactions. This is done by relying on screening questions contained in the ABS. Then a direct sampling is done in "High Propensity Industries" (mainly consultancy firms in the service sector plus the music industry and computer services) and "Known Traders" (a selection of key contributors based on the size of their transactions in the previous reporting period). The quarterly survey targets the companies with the largest transactions in services (identified from the latest annual results) while the annual survey is used for smaller traders, with adjustments to ensure that there are enough contributors to each output group. Each company receives a survey at most once in the same year. Quarterly results are then simply added to the annual survey to calculate the total annual results.

Surveyed businesses are associated with their IDBR reference number, allowing the merging of information on trade participation with business characteristics information available in other datasets. Questions asked in the survey allow a fine-grained breakdown on service exports and imports flows to be obtained by i) 52 service/product

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[18] See ONS (2019) and http://doc.ukdataservice.ac.uk/doc/6711/mrdoc/pdf/6711_user_guide.pdf

[19] Businesses do not necessarily remain in one of the two sampling sets, as the latter are updated based on changes in trade exposure of businesses through time.

[20] It is worth pointing out that the survey has undergone various changes from 1996 onward, especially in terms of the sample of surveyed businesses. For instance, changes in the number of surveyed firms took place in 2001, 2007 and 2010 annual version of the survey (the latter stemming from a corresponding increase in the number of firms surveyed quarterly).

codes[21] and ii) arrival/destination country[22], alongside ancillary information concerning changes in trade exposure experienced by the business, and any changes in the business' structure. This data is, however, only gathered for businesses with at least ten employees. Given that most sub-sectors of the creative industries are dominated by firms with fewer than 10 employees this can be problematic in terms of representativeness of services exporting firms.

3.2.5. Customs data and trade in goods statistics

HMRC collects monthly imports and exports transactions of goods for UK plants, with information on the plant identifier, product code (using the Combined Nomenclature up to 8 digits[23]), statistical value (the value used for trade statistical purposes, i.e. Free on Board or FOB for exports, Cost Insurance Freight or CIF for imports) and net mass (weight in kilograms excluding packaging). Data gathered includes the country of destination for exports and, for imports, both the country of dispatch and the country of origin (i.e. the country where the goods were originally produced - these can be different if goods have been sold to another country before being consigned to the UK), and the port through which the good was shipped. The latter information is not available from other sources on international trade. This information may be useful when combined with the location of creative businesses across the UK. The information from import and export declarations for countries outside the EU is available for 1996 to 2016 and for countries within the EU for 2008 to 2016.

When using this data in the context of business performance, it needs to be linked to other data sources described in this paper. As we have seen previously, information on business' financial performance is collected by the UK's large structural business surveys such as the ABS, gathered for distinct units within enterprises known as reporting units. Data on trade in goods is collected by HMRC and is linked to Value Added Tax (VAT) units. Especially for large businesses, where VAT units and reporting units may be different, linking can be problematic and require additional assumptions and efforts. For example,

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[21] Until 2012 the statistics collected were for 51 service products, from 2013 onwards the number increased to 52 due to a revision in accordance with new international regulations.

[22] Companies are not required to identify the country for transactions less than £10,000.

[23] The Combined Nomenclature (CN) is a tool for classifying goods, set up to meet the requirements both of the Common Customs Tariff and of the EU's external trade statistics. The CN is also used in intra-EU trade statistics.

Wales *et al.* (2018) address this problem and allocates the portion of trade reported by a VAT business unit to its reporting unit structure by drawing on the methods used by ONS to incorporate VAT data in National Accounts. Using data from the HMRC's trade in goods declarations, data from the UK's Inter-Departmental Business Register (IDBR), as well as the ABS, they create a dataset with linked financial and trade in goods data for a large sample of UK businesses from 2008 to 2016.[24] Since the data only captures EU trade in goods on the Intrastat survey for EU trade, it missed non-EU trade, trade in services, or onward shipping in supply chains. Nevertheless, the authors construct the first large business-level dataset linking trade and financial information. Their study also shows the issues involved in linking and analysing this kind of data.

3.2.6. UK Innovation Survey

The UK Innovation Survey (UKIS) is the main source of information on business innovation in the UK and represents the UK's contribution to the Europe-wide Community Innovation Survey (CIS). The survey is primarily intended to cover innovation activities and the context for innovation, as well as the drivers, constraints and skills required for innovation.

UKIS surveys UK businesses with 10 or more employees using a one-stage stratified or systematic random sample, collecting information from approximately 14,000-16,000 enterprises. The survey is voluntary. The survey started in 1994, being conducted every four years, and, since 2007 it has been conducted every other year with the last wave in 2019. Each wave is structured as a cross-section as there is a smaller panel of firms that have participated across multiple waves.

The UKIS 2019 was released in July 2020 and provides the latest available data covering the period 2016 to 2018 for 14,040 businesses. Starting from the third edition of UKIS (released in October 2013), which includes a new version of the 2008-2010 data, full businesses postcodes are available, in contrast to the first two editions, which include only the district postcode (first half of the postcode). This allows for a more detailed geographical investigation of innovation activities.

Creative industries businesses can be identified by their SIC2007 code. The UKIS also contains a range of questions that are used to capture the extent of international

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[24]https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/uk tradeingoodsandproductivitynewfindings/2018-07-06

cooperation for innovation among creative businesses. For example, the UKIS surveys asks whether the business has co-operated on any innovation activities with other businesses within the same enterprise group, suppliers, customers from the private sector, customers from the public sector, competitors, private R&D institutes, universities, government, or public research institutes. For each of these stakeholders, the business is then asked to indicate whether they are regional, national, from the EU or from the rest of the world (choosing as many options as are relevant). The UKIS also collects information on the public financial support for innovation activities; of interest here is the question on whether the business received support from the European Union (EU) institutions or programmes. Finally, businesses are asked to indicate how important different factors were in constraining innovation activities. Among the suggested factors are EU regulations (including standards) and the outcome of the EU referendum (the latter is only available for the UKIS 2017 covering the 2014-2016 period and UKIS 2019).

In addition, businesses are asked to estimate the total value of their exports for a single year (the last year in the survey period, e.g., 2018 when the survey covers 2016-18).

The contribution of creativity to innovation can be further explored by looking at the responses to questions asking about employing individuals by businesses in-house with the following skills, or obtaining these skills from external sources: graphic arts/layout/advertising; design of objects or services; multimedia/web design (e.g. audio, graphics, text, still pictures, animation, video, etc.). In addition to these creative skills three other STEM skills were asked about in the same question: software design, engineering, and maths.[25] Finally, since the data contains the IDBR reference numbers of the firms involved, researchers can link the UKIS to other business survey sources.

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[25] This question on skills was introduced for the first time in the 2008-10 wave of UKIS and it was analysed in the Nesta report by Siepel *et al.* (2016) who explored the fusion of arts and science skills in UK companies and the impact of this combination on firms' performance in terms of growth, productivity and innovation.

3.2.7. E-Commerce Survey

The E-commerce Survey is carried out yearly to measure the use of Information Communication Technologies (ICTs) and electronic trading by businesses located in the UK, including foreign-owned businesses.

Although it has been in existence since 2001, the first wave was classed as 'experimental' and deemed of low quality and the survey was subsequently revised several times through its successive waves. In total, the survey covers approximately 5,000-10,000 businesses every year. The sampling strategy distinguishes businesses with more than 1000 employees from those with less than 1,000 employees. While the first receive the questionnaire every year, the second are randomly selected and, hence, do not necessarily enter the survey each year. Also, for certain years, e.g. 2005, the survey does not include businesses with less than 10 employees, which is relevant as it could exclude a lot of creative industries organisations. The tenth edition (May 2020) has revised the 2010 to 2017 data and added the provisional 2018 data.

Since the sample is selected from the Inter-Departmental Business Register, it is, however, possible to link the E-Commerce Survey to other IDBR-coded surveys. The survey is very rich in terms of information about ICT adoption, download internet speed, and typologies of e-commerce. It also covers some questions pertaining to international trade. Taking as an example the most recent wave of 2018, businesses were asked whether they received orders for goods or services placed via a website or app, by customers in each of the 27 EU countries and the rest of the world; whether the business experienced difficulties selling to other EU countries via a website or app (and a list of potential reasons is provided, including "Restrictions from business partners to sell to certain EU countries"); whether the business received orders placed via EDI type messages (i.e. electronic transmission methods which allow their automated processing) from each of the 27 EU countries or the rest of the world.

Although these questions allow to gather some information on digital international trade, the transaction amounts are not surveyed in the recent waves of the survey, not even for the aggregate EU or the rest of the world. Instead in earlier survey waves like 2001 and 2008 it is possible to know the total percentage value of orders placed over ICT with EU

suppliers or rest of the world suppliers, as well as the total percentage value of orders received over ICT from EU customers or rest of the world customers.

3.2.8. Business Impact of Covid Survey (BICS)

The 2020 pandemic and its massive repercussions on creative occupations and creative industries, including their international trade activities, need extensive analysis that is not possible using existing statistics. This has prompted efforts by the ONS to collect new statistical information with the Business Impact of COVID-19 Survey (BICS). BICS is a voluntary fortnightly business survey, which aims to capture how UK's businesses' have been affected by the pandemic, in terms of turnover, workforce prices, trade and business resilience. The twelve waves now available, covering the period from 9th March 2020 to 23rd August 2020, contain information on an average of 5,000-6,000 businesses (ranging from 4,596 in the first wave to 7,245 in the sixth wave). Businesses were asked whether they exported/imported goods or services in the last 12 months and during the coronavirus pandemic. From additional questions it is possible to describe whether during the pandemic exports/imports have been more/less than normal, not impacted at all or whether no export/import was possible in the previous two weeks, and what trade challenges businesses have faced (Coronavirus-related transport restrictions, increases in transportation costs, closure of infrastructure used to export goods or services, destination countries changing their border restrictions, other challenges or not challenges), in addition to support measures desired by businesses to face such challenges. Although this is a repeated, unweighted, cross-sectional sample, not representative of the UK business population, this data contains IDBR reference numbers that allow the data to be linked with other surveys to capture a deeper understanding of the economic impact of the pandemic on UK creative businesses. The ONS reports sectoral aggregate statistics that prevents a more precise understanding on the creative industries sub-sectors from being gathered. Based on SIC codes and IDBR reference, it could in theory be possible to obtain a more precise mapping, but with the usual caveat of representativeness.

4. Data from international institutions

Several international institutions produce statistics, both comprehensive and ad-hoc, regarding the creative industries, especially with respect to international trade. These statistics are available at different levels of detail with respect to, for instance, sector classification and time coverage. This section outlines this data.

4.1. IMF Balance of Payment statistics.

The IMF Balance of Payment statistics are the main source of data for information on services trade and transactions from a global perspective.[26] The data is sourced from national authorities and processed by the IMF so that it can issue statistics that are consistent and comparable. International financial transactions are reported as debits or credits to the relevant accounts, analogous to imports and exports of goods. These transactions take place as the counterpart of merchandise/goods trade, but also for international finance and investment, and financial transactions by individuals, firms, and governments. Transactions related to merchandise trade are not disaggregated by product. For this, we refer the reader to the UN Comtrade database, which is discussed below.[27]

Transactions related to international service provision are categorised into ten service types.[28] For the creative industries the categories "charges for the use of intellectual property", "telecommunication, computer, and informational", "other business services", and "personal cultural and recreational" are the most relevant but will also include transactions unrelated to the creative industries. For instance, intellectual property charges will include those related to utility patents, franchises, and trademarks as well as licenses to reproduce or distribute computer and audio-visual services. License to use computer and audio-visual content, but not reproduce or distribute, is contained in the category of "telecommunication, computer and information services" (IMF, 2009, Table 10.4). Another example is services related to architecture, which are included under "other business services", not under "construction" (IMF, 2009, p. 178.). Similar caveats are valid for the other accounts, but clearly argued in the source documentation (IMF, 2009, Chapter 10).

For the UK, data on "charges for the use of intellectual property" are available at quarterly intervals from 1970; other relevant services—telecommunication, computer

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[26] Available at https://data.imf.org/.

[27] The IMF publishes the Direction of Trade Statistics (DOTs) where the value of merchandise exports and imports is disaggregated according to a country's primary trading partners but is not disaggregated by sector.

[28] These are "Transport", "travel", "construction", "insurance and pension", "financial services", "charges for use of intellectual property", "telecommunication, computer and information services", "other business services", "personal, cultural and recreational services", "government goods and services".

and information services and personal, cultural and recreational services—are available at quarterly intervals from 1990.

4.2. Eurostat

Eurostat is another useful source of data, especially for EU members. It provides bilateral data on imports and exports for goods and services primarily where an EU member state is one of the involved parties.[29]   The ultimate providers of the data are the EU member states, either through statistical or customs offices (Eurostat, 2020). For internal EU goods trade this is based on the EU Intrastat survey, since custom declarations are not required within the EU internal market.[30] By following the DCMS criteria for the creative industries, the detailed product level for goods can be used to aggregate the creative industries trade in goods, and similarly for the disaggregated services trade accounts. Note that this requires mapping the sector to goods and services output.

Monthly and annual time series of EU trade data, including at individual product code level, is available from January 1988 for the EU12 countries, and from their year of accession for the other sixteen enlarged EU countries.[31] From reference month February 2020 the UK is no longer included as a reporting country.[32]

Since 2012 Trade by Enterprise Characteristics (TEC) is available on an annual basis. This is compiled by linking intra- and extra EU trade micro-data with business register data and captures the characteristics of importing and exporting businesses such as size, sector of economic activity or level of concentration. There are ten TEC datasets available (see Eurostat, 2020, pp. 62-63, for more detail).

The Eurostat Balance of Payments tables report services trade for different periods, with slightly changing definitions used in the detailed accounts. For the period 2004-2013 a

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[29] Available at https://ec.europa.eu/eurostat. Goods trade are reported in various harmonized systems, such as HS2, HS4, HS6, SITC and CN8, among others. All trade in goods data is stored and publicly available through the Comext database on the Eurostat website.

[30] This is the same survey as discussed in the section on the DCMS providing trade statistics. This data is thought to be reliable since it often runs in conjunction with the declaration for value added tax (VAT) in each country (Eurostat, 2017, p. 13, para 10).

[31] Eurostat publishes many datasets, whose span depends on the reporting countries and additional information provided (like mode of transport or product classification). For detail see Eurostat (2020, Annex 6 — Overview of the Easy-Comext datasets).

[32] The aggregate EU27_2020 succeeds to EU28, which is maintained, although only for reference periods before February 2020 (Eurostat, 2020, p. 92).

breakdown between various trade services is available (following the Balance of Payments Manual BPM5).[33] For the UK, most disaggregated data is available with respect to trade to and from the rest of the world, rather than specific origins and destinations. Bilateral flows are not available due to confidentiality. In terms of creative industries coverage, the accounts include different categories of information services (e.g. news agency services), royalty and license fees, architectural services, and audio-visual services. Following a revision of the account definitions (BPM6), a different table is available for the period 2010-2018. This new version has the potential to give an even more detailed break-down of various services, such as various categories for audio-visual products, audio-visual licenses, and advertising. However, this data is not available for the UK, for which only top categories are available; these corresponds with those reported under BPM5.

4.3. UN Comtrade

The data on merchandise trade from UN Comtrade is similar to that reported by Eurostat; indeed, they use the same national sources.[34] The advantage of UN Comtrade is its global focus, which includes every country in the world with the largest possible range of product-level data, available annually or monthly, and includes all exports and imports for all reporter and partner countries.[35] Although starting with the same information as Eurostat, the trade figures reported by UN Comtrade are not identical by specific month, product code, and bilateral pair observations.[36] Also, monthly data is available in UN Comtrade from 2008, while Eurostat reports monthly data from 2000.

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[33] Table title "International trade in services (since 2004)", code: "bop_its_det". There is a table for 1985-2003 which only contains the aggregate of services trade and transportation services.

[34] Available at https://comtrade.un.org . While UN Comtrade also provides data on services trade, this section of the database is underdeveloped, and the other sources highlighted in this document, notably from the IMF and Eurostat are more suitable when focusing on creative services trade.

[35] The 'reporter' is the country that supplies the data, while the 'partner' is the counter-party to the bilateral trade transaction. For instance, the UK would report its imports from and its exports to France for a specific good over a period. Simultaneously, France reports its exports to and its imports from the UK. Therefore, every flow is recorded twice. Theoretically, these numbers should perfectly match, but there may be discrepancies. Nevertheless, the double reporting of the flows can be leveraged to improve the quality of analysis and inference of the trade data. Note that this feature also holds for the goods trade data of Eurostat, discussed above.

[36] Eurostat's default currency is in Euros while UN Comtrade is in US dollars. Exchange rate adjustments would be feasible, and the underlying EUR – USD exchange rate is provided by Eurostat, the values remain different for specific observations. For general assessment of trends or analysis on the determinants of trade, such differences should not be consequential, but it is beyond the scope of this document to verify this.

The UN Comtrade data on merchandise trade is the most widely used source among empirical trade researchers due to its breath of countries, time periods and its harmonized system of product codes (with different variations of such definitions available too). Nevertheless, as indicated above, additional detail may be gathered by using other sources, such as Eurostat, or, as discussed below, UK specific sources that underlie these international and publicly compiled datasets.

4.4. UNCTAD

The United Nations Conference on Trade and Development (UNCTAD) reports creative sectors trade by country (e.g. see UNCTAD, 2018). Note that the definition used by UNCTAD differs from that used by DCMS (see Section 2). Compiled time-series are available for 2003-2015.[37]   For the UK specifically, there is complete information on exports and imports of creative services, split over five categories,[38] and creative goods, split over seven categories.[39] The methodology is well described in the report (essentially summing the trade statistics for specific goods and services), such that it can be readily extended using the source data from UN Comtrade and IMF balance of Payment statistics. In its latest report, UNCTAD (2018, p. 14) hints at the development of new methodologies to measure trade in Creative Services specifically, but at the time of writing, this has not been published yet.

Therefore, the data that UNCTAD compiled and published is useful to make international comparisons on the performance of creative industries and allows researchers to avoid compiling this data from UN Comtrade and the IMF by themselves. With respect to the use of this data for the UK creative industries, however, the same data is potentially available from other sources and the UNCTAD's definition deviates from that used by DCMS.

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[37] Available at https://unctad.org/en/Pages/statistics.aspx. Goods trade is available for the years 2002-2015 bilaterally, and for Services 2003-2011 at aggregate level. This reflect the issue that the IMF sources do not provide bilateral level transaction data as discussed above.

[38] These are "Advertising, market research and public opinion polling", "Architectural, engineering and other technical services", "Research and Development", "Audiovisual and related services", "Other personal, cultural and recreational services", where the last two are combined as "Personal, cultural and recreational services".

[39] These are "Arts crafts", "audiovisual", "design", "new media", "performing arts", "publishing", "visual arts".

4.5. OECD International Trade in Merchandise and Services

The sector-level data on international trade for services and merchandises is constructed by the OECD in two separate datasets. The Balanced International Trade in Services (BaTIS) dataset contains bilateral service trade data spanning 1999 to 2018 and the Balanced International Merchandise Trade Statistics (BIMTS) reports bilateral trade for merchandises for the 2007-2016 period.[40]

Beyond reporting trade data over different time spans, merchandise and service data are organised using different sectoral classifications. Indeed, BaTIS relies on the Extended Balance of Payments Services classification (EBOPS) 2010 (and previously EBOPS 2002) classification and BIMTS uses the statistical Classification of Products by Activity (CPA).[41] Therefore, merging the two sources of data would require a harmonisation procedure, although concordances directly linking CPA and EBOPS classifications do exist.

Several steps would be required to reconcile bilateral data with information on the UK creative industries (either at the sectoral or business level), which are defined using the SIC classification. Performing such a match would then require: 1) using EBOPS-CPA concordances; 2) employing CPA-NACE Rev2 matching and 3) relying on the substantial equivalence between SIC and NACE Rev2 classification (up to the 4th digit).[42]

4.6. Input-Output Data

One of the main caveats of trade data is that exports are not measured in terms of their Value Added. This can distort the contribution of a country to world trade, especially with the rising importance of Global Value Chains. International efforts are underway to address this problem.

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[40] Data on service trade are produced on the basis of questionnaires passed to member countries and WTO. The EBOPS 2010 questionnaire can be found at:
https://www.oecd.org/sdd/its/tradeinservicesquestionnaires.htm

[41] Further information on the Extended Balance of Payments Services (EBOPS) 2002 and 2010 classifications can be found at: https://unstats.un.org/unsd/tradeserv/TFSITS/manual.htm, while for further details on CPA classification, see
https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=CPA_2008&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC

[42] Correspondence tables can be found at:
https://ec.europa.eu/eurostat/ramon/relations/index.cfm?TargetUrl=LST_REL

One of these efforts is led by the World Input-Output Database (WIOD). WIOD contains time series for international input-output (I-O) tables, obtained by linking national I-O tables, relying on bilateral trade flows, broken down by country and industry. Moreover, socio-economic accounts are separately available for the same sample, including information on outputs and inputs usage, as well as the compensation of production factors. Although it is not the only source of information on international I-O linkages, this one has a good degree of trade-off in terms of the level of detail over the time-geography-industry dimensions.[43]

So far, two WIOD datasets have been released in 2013 and 2016; but they are not directly comparable.[44] We refer here to the more recent of the two, as it comprises a larger set of countries and industries. Specifically, the data is available for the 2000-2014 period for 43 countries, which account for about 85% of World GDP. These include all the EU member states and a selection of other countries, including Canada, China, Japan, Russia, and United States.[45]

The data spans 56 economic sectors defined based on ISIC Rev.4 classification, where each WIOD sector maps to one or more 2-digit sectors of the ISIC classification. It is possible to disentangle inputs vs final demand usage of one industry's production as well as the domestic and foreign flows, allowing measures of trade in value-added to be obtained.

Information on the UK creative industries can be broadly traced for all sectors considered in the DCMS classification and a mapping between SIC and ISIC codes is potentially implementable. However, the two-digit industry breakdown makes it difficult to assign input-output figures to the UK creative sub-sectors as defined by DCMS, as the sub-sectors in the WIOD either group together various creative sectors or – more importantly – include both creative and non-creative activities.

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[43] See Tukker and Dietzenbacher (2013) for a thorough discussion on I-O data sources.

[44] For more details on the 2013 release (and overall description of the WIOD project), see Timmer et al. (2015). Further information on the 2016 release is contained in Timmer et al. (2016) and Gouma et al. (2018).

[45] Information on trade flows regarding countries present in the dataset and those not included is tracked via the inclusion of a "Rest of the World" region.

A similar issue characterises the I-O data released by the OECD. While this data is available for a shorter time span (2005-2016),[46] compared to the WIOD, the OECD data has the advantage of providing a breakdown across 64 countries (plus a Rest of the World region).

Another alternative is the Asian Development Bank multi-regional input-output tables (ADB-MRIO) which has more detail on Asian countries, although the data has a more limited scope with respect to both time and industry dimensions.[47]

4.7. OECD Service Trade Restrictions

As mentioned in the introduction, many of the creative industries are service-intensive. Services are usually less tradable than goods not only because of their intrinsic characteristics, but also because they are usually more subject to restrictions. To understand the competitiveness of the UK creative industries it is important to examine trade restrictions. The main source for this is the OECD Services Trade Restrictions Index (STRI), a database providing information on a broad range of factors affecting the scope for trade in services.

First developed in 2014, the data now covers 5 years (2014-2019). Information is available for all OECD countries plus Brazil, the People's Republic of China, Costa Rica, India, Indonesia, Malaysia, the Russian Federation, and South Africa. In terms of sectors, it covers 22 industrial sectors defined using the ISIC rev4 classification and aggregated thereby, with a coverage of around 80% of trade in services.

The extent to which trade restrictions affect services operation is summarized in ad-hoc indices. This consists of an overall index of services trade restrictions (STRI), which stems from the aggregation of five sub-indices measuring restrictions on:
- The degree of competition (e.g. government control over relevant businesses in a sector)
- Business entry (e.g. foreign equity share limitations)
- People entry (e.g. quotas on contractual services suppliers)
- Regulatory transparency (e.g. time required to register a company)

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[46] See http://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm#access.

[47] See https://www.adb.org/data/icp/input-output-tables.

- Other factors impacting trade in services (e.g. laws encouraging adoption of international standards)

Each index is created by scoring and weighting the various policy measures and regulations being scrutinized (for each sector, country, and year), where those can be either continuous or categorical (ordinal or binary) variables.[48]

Based on the same rationale, the OECD has also developed the same set of measures of service trade restrictions within the European Economic Area (EEA), where the underlying policy measures and regulations considered are those set by European institutions and national governments with respect to the other EEA countries. The dataset covers the same period and sectors as STRI, but only considers the 25 EEA member countries (Benz and Gonzales, 2019).[49]

In relation to the creative industries, the database provides information on services trade restrictions for "Architectural services" (ISIC code 711), "Computer and information services activities" (ISIC codes 62 and 63), "Motion picture, video and television activities" (ISIC codes 5911-5914), "Sound recording and music publishing" (ISIC category 592) and "Television programming and broadcasting activities" (ISIC codes 5911 and 6020).[50] An example of how it is possible to gain insights on the creative industries from the STRI is provided in Di Novo et al. (2020)

For each dataset we discussed, Table 3 below summarises the coverage, the data period, the major themes in the datasets, what information is available for exports and imports, any other notable information and the dataset's main limitations.

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[48] For more details on scoring and methodology, see Geloso Grosso *et al.* (2015).

[49] EEA countries which are not present in the dataset are: Bulgaria, Croatia, Cyprus, Lichtenstein, Malta, Romania and Switzerland.

[50] If one wished to match sectors as defined in DCMS statistics, one could use concordances between NACE Rev2 and ISIC Rev4 classification (SIC codes correspond to NACE codes up to the 4th digit).

Table 3 – A Bird's Eye Comparison of the Reviewed Datasets

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
LSBS	Stratified random sample of small and medium businesses (0-249 employees), registered and unregistered. It is a voluntary survey.	2015-present	Firm size, sector, location, number of employees, and ownership structure. Gender and ethnicity of owners/directors/ partners. Business' recent performance, obstacles, plans and expectations. Innovation, finance, technology, use of business support, investment in skills development Exporting and importing activity and export intentions. Impact of the Brexit referendum.	Percentage of turnover exported in total, broken down between goods and services. Total exports of goods+services broken down towards EU/non-EU countries, but no country specific amount. Only from 2017 some major country destinations are known (with no amount). Exporting start year. Whether continuously exporting every year. Reasons for not exporting in some years. Plans for future exporting.	Whether or not imported goods+services from the EU/ non-EU, but no amount. No information on country of import origin.	The reporting units can be linked to other datasets through the IDBR number. Whether planning to export in the near/ further future Whether planning to grow exports in the future Suitability of goods or services for exporting. Impact of Brexit on future access to EU markets, on the cost of imports, and on the cost of exports.	There is no information on capital. Turnover and number of employees can be given in a band range rather than using precise figures. Some of the questions are not repeated in every wave. Every year the survey needs topping up because of the high rate of attrition.

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
ABS	Around 62,000 businesses in Great Britain and around 11,000 in Northern Ireland. It is a legally compulsory survey.	2009-present Possibility to link it to ABI/2 available for 1995-2008.	Turnover, purchases, employment costs, capital expenditure and stocks Some information on international trade in services and goods.	Value of exports of services Whether they exported goods, without indicating the amount	Value of imports of services Whether they imported goods, without indicating the amount	Values for acquisitions, and proceeds from the disposal of capital assets, including intellectual property assets. The reporting units can be linked to other datasets through the IDBR number.	The information detail varies with the size of businesses (above or below 250 employees). For exports/imports of goods only the exporter/importer status is known.
BSD	UK enterprises/ local units that are liable for VAT payment and/or whose owner(s) is registered under the PAYE tax collection system.	1997-present	Sector, location, employment, turnover, business births, deaths and proprietorship changes.			The reporting units can be linked to other datasets through the IDBR number.	
ITIS	Stratified sample of production and non-production businesses, with exclusion of those operating in travel and transport; banking and various financial institutions; higher education; and the majority of	1996-present Administered quarterly on around 2,200 businesses and annually on around 15,500 businesses (the businesses are different).	Type and value of service imports/exports and the country of origin/destination of the services	Fine-grained breakdown on service exports flows to be obtained by 52 service/product codes and arrival/destination country	Fine-grained breakdown on service imports flows to be obtained by 52 service/product codes and arrival/destination country	Changes in trade exposure experienced by the business, and any changes in the business' structure. The reporting units can be linked to other datasets through the IDBR number.	Businesses can enter or exit the survey depending on their exposure to trade. Business must employ least 10 employees. Companies are not required to identify

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
	legal services. It includes Film and Television industries since 2009.						the country for transactions less than £10,000.
HMRC custom data and trade in goods statistics	All import and export declarations in goods or merchandise.	Monthly data. From 1996 for countries outside the EU From 2008 for countries within the EU	Plant identifier, 8-digit product code Imports and exports of goods.	Value and weight of exports in goods Country of destination, and shipping port.	Value and weight of imports in goods. Country of dispatch and the country of origin, shipping port.		Although it is possible link it to IBDR, it needs apportioning the trade reported by a business' VAT units to its reporting unit structure.
UKIS	One-stage stratified or systematic random sample, covering approximately 14,000-16,000 enterprises. It is a voluntary survey.	1994 – 2019 (Conducted initially every four years, since 2007 every two years)	General business information. Innovation activities and the context for innovation. The drivers, constraints and skills required for innovation.	Total value of exports in the last year covered by each survey period.		Public financial support for innovation activities (domestic vs. EU). It can be linked to other datasets via the IDBR number.	Business must employ least 10 employees.
UKIS (cont.)	Each wave is structured as a cross-section; there is a smaller panel of firms that have participated across multiple waves		Cooperation in innovation activities with a range of stakeholders (international vs. domestic).			The impact of EU regulations (including standards) and the outcome of the EU referendum (UKIS 2017 and 2019 only) on innovation activities. Creative and STEM skills employed.	
E-commerce Survey	One-stage stratified or systematic	2001-present	It is the only survey that measures ICT activity and e-commerce	Some waves gather information on the total percentage	Some waves gather information on the	The reporting units can be linked to other datasets through the	No weighting used, so inferences cannot be drawn for the

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
	random sample of approximately 5,000-10,000 businesses. The survey is cross-sectional for firms with less than 10,000 employees, whilst it is in principle longitudinal for firms with more than 10,000 employees.		within UK businesses, including foreign-owned businesses. Each wave focuses on some topic not covered in other waves.	value of orders received over ICT from EU customers or rest of the world customers (no detailed information at country level). Some waves gather information whether customers in each of the 27 EU countries and the rest of the world placed orders for goods or services via two ICT modes (website or 'app' vs. EDI type messages).	total percentage value of orders placed over ICT with EU suppliers or rest of the world suppliers	IDBR number. Some waves gather information on whether the business experienced difficulties selling to other EU countries via a website or 'app' (and a list of potential reasons is provided, including "Restrictions from business partners to sell to certain EU countries");	general business population. Only some of the questions are consistently asked across different years. making any comparison between survey years difficult. The information on international digital trade is still patchy and not detailed enough.
BICS	Information on an average of 5,000-6,000 businesses per wave (ranging from 4,59 the first wave to 7,245 in the sixth wave). IDBR reference numbers allow linking with other surveys.	Voluntary fortnightly, 12 waves from 9th March 2020 to 23rd August 2020,	How UK's businesses' have been affected by the pandemic, in terms of turnover, workforce prices, trade and business resilience	Businesses are asked whether they exported/imported goods or services in the last 12 months and during the coronavirus (COVID-19) pandemic. Whether during the pandemic exports/imports have been more/ less than normal, not impacted at all		What trade challenges businesses have faced (Coronavirus-related transport restrictions, increases in transportation costs, closure of infrastructure used to export goods or services, destination countries changing their border restrictions, other challenges or no challenges). Support measures desired by	Cross-sectional and unweighted. Possible issues of representativeness

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
				or whether no export/import was possible in the previous two weeks.		businesses to face such challenges	
IMF Balance of Payments Statistics	All macro-transactions between countries. BOP data are available for 190 economies.	Annual data starting from 1945 for many IMF members (including the UK). For the UK, data on "charges for the use of intellectual property" are available at quarterly intervals from 1970; other relevant services: telecommunication, computer, and information services and personal, cultural and recreational services–are available at quarterly intervals from 1990.	It is the main source of data for information on trade in services, which are disaggregated in ten main groups: "transport", "travel", "construction", "insurance and pension" "financial services", "charges for use of intellectual property", "telecommunication, computer and information services", "other business services" "personal, cultural and recreational services", "government goods and services. Creative services can to some extent be retrieved from some sub-groups of these groups.	Amount available for selected categories of creative services, recorded as bilateral transactions with most countries in the world.	Amount available for selected categories of creative services, recorded as bilateral transactions with most countries in the world.	As of February 1, 2020 the UK is no longer part of the EU. Data for the UK are no longer included in the EU aggregate.	The Direction of Trade Statistics of the IMF does have a sectoral coverage, so it is not usable for an analysis of creative international trade.
Eurostat	Bilateral Transactions primarily where a EU member	Monthly goods data is available from 2000 onwards, including	Imports and exports for goods and services	Goods exports amounts are reported in various harmonized systems, such as	Goods imports amounts are reported in various harmonized systems, such as HS2, HS4,	Eurostat's default currency is in Euros.	Services trade for different periods are reported with slightly changing definitions

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
	state is one of the involved parties.	at individual product code levels to many (but not all) EU partner countries. Longer time spans are available for annual data. For UK trade of services the most disaggregated data is available with respect to trade to and from the rest of the world, rather than specific origins and destinations.		HS2, HS4, HS6, SITC and CN8, among others. The services exports include different categories of information services (e.g. news agency services), royalty and license fees, architectural services, audio- visual services.	HS6, SITC and CN8, among others. The services imports include different categories of information services (e.g. news agency services), royalty and license fees, architectural services, audio-visual services		used in the detailed accounts. The UK is not reporting the more disaggregated trade services as in BPM6 standards, which breaks down various categories for audio-visual products, audio-visual licenses and advertising, but it is still reporting them according to BPM5 standards.
UN Comtrade	It is similar to Eurostat but includes every country in the world with the largest possible range of data in terms of detailed product codes for exports and imports for all reporter and partner countries	UK trade data available annually since 2002 or monthly from 2008.	Imports and exports for goods and services	Goods exports amounts are reported in various harmonized systems, such as HS2, HS4, HS6 and SITC, among others.	Goods imports amounts are reported in various harmonized systems, such as HS2, HS4, HS6 and SITC, among others.	UN Comtrade's default currency is in US dollars.	While UN Comtrade also provides data on services trade, this section of the database is underdeveloped, and the IMF and Eurostat statistics are more suitable when focusing on creative services trade.
UNCTAD	It reports creative sectors trade by country.	Goods trade is available for the	Imports and exports for goods and services	For the UK there is information on exports amounts of creative services,	For the UK there is information on imports amounts of creative services,	The definition of creative trade used by UNCTAD differs from that used by DCMS	

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
		years 2002-2015 bilaterally, and for services is available for 2003-2011 at aggregated level.		split over five categories, and creative goods, split over seven categories	split over five categories, and creative goods, split over seven categories		
OECD International Trade in Merchandise and Services	The Balanced International Trade in Services (BaTIS) dataset contains bilateral service trade among OECD countries. The Balanced International Merchandise Trade Statistics (BIMTS) reports bilateral trade for merchandises among OECD countries.	BaTIS data are spanning from 1999 to 2018.\n\nBIMTS covers the 2007-2016 period.	Imports and exports for goods and services. BaTIS relies on the EBOPS 2010 (and previously EBOPS 2002) classification and BIMTS uses the CPA classification.	Exports amounts are available but not directly translatable into Creative industries according to the UK definitions.	Imports amounts are available but not directly translatable into Creative industries according to the UK definitions.		Due to the different sectoral classifications used, to obtain statistics on creative trade requires to reconcile bilateral data with information on the UK Creative industries (either at the sectoral or business level), which are defined using the SIC classification
World Input-Output Database (WIOD)	International input-output (I-O) tables, data is available for 56 economic sectors and 43 countries, which are reported to account for about 85% of	The data covered by the WIOD 2016 is for the 2000-2014 period.	In addition to I-O international tables, socio-economic accounts are separately available, including information on outputs and inputs usage, as well as the compensation of production factors	Exports in Value Added become measureable but currently not for the Creative industries.		The 56 economic sectors are defined based on ISIC Rev.4 classification, where each WIOD sector maps to one or more 2-digit sectors of the ISIC classification. Information on the UK Creative industries can	Relying on two-digit industry breakdown makes it difficult to assign input-output figures to the UK creative sub-sectors as defined by DCMS, raising issues of aggregation and mixing creative with non-creative sectors.

Dataset	Coverage	Period covered	Key Themes covered	Export	Import	Other relevant information	Major Limitations
	World GDP. These include all of the EU member states plus other countries, including Canada, China, Japan, Russia and United States.					be broadly retrieved for DCMS sectors by mapping ISIC codes to SIC codes.	
OECD Services Trade Restrictions Index (STRI)	Information is available for all OECD countries plus Brazil, the People's Republic China, Costa Rica, India, Indonesia, Malaysia, the Russian Federation, and South Africa. It covers 22 industrial sectors defined using the ISIC rev4 classification and aggregated thereby, with a coverage of around 80% of trade in services.	It covers 6 years (2014-2019).	The overall index of services trade restrictions (STRI) stems from the aggregation of five sub-indices measuring restrictions on: competition; business entry; people entry; regulatory transparency; other factors impacting trade services.	Information is available for the following creative services trade restrictions: architectural services; computer and information services activities; motion picture, video and television activities; sound recording and music publishing; television programming and broadcasting activities.	Information is available for the following creative services trade restrictions: architectural services; computer and information services activities; motion picture, video and television activities; sound recording and music publishing; television programming and broadcasting activities.	To obtain data for DCMS sectors, concordances between NACE Rev2 and ISIC Rev4 classification could be used.	

Source: Authors' elaboration

5. Conclusions and data gaps

This paper has reviewed the main official sources of data on trade in the UK creative industries. We first concentrated on UK data sources at the macro/sectoral/sub-sectoral level, as produced by DCMS, and at the micro level, mostly produced by the ONS. We then explored official macro and sectoral international data sources. Especially, when using macro/sectoral data, practitioners' quantitative work is affected by the trade-off between the nationally oriented view — faithful to the UK specific definition of the creative industries and its sub-sectors — and the different international definitions and classifications. International comparison is clearly important for a full picture, but they require further international classification concordance to provide a mapping that is useful also from the national policy perspective.

Micro trade statistics, which provide information at the product level or the business level, require mapping the unit level of observation to the SIC/SOC classification, which is not always straightforward, and can be affected by sample under-representation problems. Further, linking the trade data to other sources for analysis is not always straightforward.

Services trade reporting, whether at the micro or macro levels still needs further development. When the data is compiled using surveys, an issue of representativeness may arise when surveys have a firm size cut-off. Such cut offs typically exclude micro-businesses with fewer than 10 employees, which in the context of the creative industries is particularly problematic because a very large proportion of creative industry firms are micro businesses. At the macro-international level, data often comes from national balance of payment statistics, which are particularly underdeveloped for developing countries. International institutions, like UNCTAD are doing more work on this problem, as explained in their annual report (UNCTAD, 2018). In the UK, beginning with micro-level data may be a solution, although caution should be used in terms of representativeness and, also, except for ITIS, questionnaires have not been developed to capture the international activities of service firms.

Some general trends affect data reliability and data updating in the creative industries which also affect data on the UK. One of these is related to the fast pace of technological change, requiring continuous updating of the products and occupations that enter the creative industries and its sub-sectors. Digitalisation is an example of how

modes of production, consumption, ordering and delivery may affect statistical reporting and cause misrepresentation that is substantial where the impact of digitalisation on the sub-sector is more profound. For example, comics publishing is much more substantially impacted than crafts. Technology and digitalisation are continuously causing a shift from physical to digital products and from goods to services production (e.g. a song or a movie from a CD or DVD into a downloadable file and then into a streaming service). Since some sub-sectors (e.g., publishing, music, and movies) are more affected by this trend than others, this may have implications for data reporting. While national statistical offices and government departments, often in coordination with the OECD, are working on the implications of the rise of digital trade for trade statistics, in the context of creative industries research it is important that these efforts also consider the specific nature of the activities that may be particularly affected. A similar issue affects intangibles. The creative industries are copyright-intensive industries. Hence, they have substantial intangible assets and trade transactions have a sizeable intangible component. Again, reliable international statistical reporting requires international accounting standards that need to be continuously updated and coordinated.

An important area of research for the creative industries is the barriers to trade faced by creative firms when accessing international markets and exporting. These factors can be internal to the firm (information, size, experience, internal finance, etc.) or external (expert support, access to external finance, regulations, tariff, and non-tariff barriers, etc.) At present, it is difficult to look at all these factors from official firm-level data because of the challenges in linking different data sources. Nevertheless, this is particularly important to guide internationalisation strategies of businesses and the policies needed to support them. Macro efforts, such as those by the OECD to monitor trade restrictions to the service sectors, provide some guidance to researchers and policymakers, especially in terms of business regulation, foreign investment, and migration, and can inform trade strategies and trade negotiations in a post-Brexit world. However, these efforts are cumbersome, and, because of issues of sectoral concordance, they only provide information about the restrictions faced by some sub-sectors. Again, given the importance of these restrictions for trade expansion and trade policy, future efforts could be made in this direction.

Last, but not least, 2020 saw the biggest pandemic of modern times, with massive repercussions especially for the creative industries businesses and creative occupations. The extent of these repercussions on international trade need extensive analysis that is not possible using existing statistics. The need for more statistical information has driven the ONS to perform a Business Impact of COVID-19 Survey (BICS). However, again, new data and analysis specific to the creative industries will be crucial to inform recovery strategies by creative businesses and policymakers in such a critical sector of the economy.

Glossary

<u>BEIS</u>: UK's Department for Business, Energy and Industrial Strategy.

<u>BPM</u>: Balance of Payments and International Investment Position Manual, the current one is BPM6, which was launched at the end of 2008.

<u>CIF</u>: Cost Freight and Insurance is one of the most common among the eleven international commerce terms (Incoterms) produced by the International Chamber of Commerce, which allocate the obligations, costs and risks between the seller and the buyer during shipping. In a CIF contract, the seller must pay all the costs, insurance and freight to bring the goods to the named overseas port of destination. The buyer pays costs and takes risk from then on.

<u>CHIEF</u>: Customs Handling of Import and Export Freight. This is the HMRC system recording the movement of goods by land, air and sea. It allows importers, exporters and freight forwarders to complete customs formalities electronically and automatically checks for entry errors. It also identifies which consignments or which goods within a consignment needs to be physically examined or their documentation examined.

<u>CN</u>: Combined Nomenclature, a European classification of goods used for foreign trade statistics. CN08 is based on the Harmonised System (HS) of tariff nomenclature and are 8 digit codes that identify categories of goods. The first 6 digits correspond to the HS code, with the 7th and 8th digits adding further detail.

<u>Creative Economy</u>: it includes both the Creative Industries and all the Creative Occupations outside the Creative Industries

<u>Creative Industries</u>: any industries that are composed of a certain proportion of Creative Occupations, but are inclusive of the non-Creative Occupations in those industries (as listed in Table 1).

<u>Creative Occupations</u>: those identified as being jobs that are creative in nature (as listed in Table 1).

<u>DCA</u>: Australia's Department of Communication and the Arts.

<u>DCMS</u>: UK's Department of Digital Culture, Media and Sports.

<u>FOB</u>: Free on Board is one of the most common among the eleven international commerce terms (Incoterms) produced by the International Chamber of Commerce, which allocate the obligations, costs and risks between the seller and the buyer during shipping. The FOB contract typically stipulates that the seller (consignor) has responsibility for the payment of the freight charges to a named UK shipping port and bears the cost of loading the goods on to a vessel ready to be shipped, whereas the buyer (consignee) assumes all liability and risks for the shipped goods once the voyage begins, including clearing the custom procedures and paying duties and taxes.

<u>HMRC</u>: Her Majesty's Revenue and Customs is the UK's government department responsible for assessing and collecting taxes.

<u>HS</u>: The Harmonized System of tariff nomenclature, or Harmonized Commodity Description and Coding System, is an internationally standardised system of names

and numbers to classify traded products. It came into effect in 1988 and has since been developed and maintained by the World Customs Organization (WCO), an independent intergovernmental organization based in Brussels, with over 200 member countries. The HS is hierarchically organized into 21 sections, 99 chapters, 1244 headings and 5224 subheadings. Section and Chapter titles describe broad categories of goods, while headings and subheadings describe products in more detail.

IDBR: The Inter-Departmental Business Register covers around 2.8m businesses across all the industries of the UK economy and is maintained by ONS using data fed by HMRC. It includes all businesses registered with HMRC either for Value Added Tax (VAT), or for the operation of the UK's payroll tax system – Pay as You Earn (PAYE). As a consequence, the IDBR contains records on a large proportion of the UK's business population, excluding only those which do not have employees and those with turnover below the VAT registration threshold. Each business organisation is identified in the survey data by a unique IDBR reference numbers to keep its anonymity and allowing researchers to combine different business survey sources together.

ISIC: International Standard Industrial Classification of all Economic Activities of the United Nations.

NACE: European Classification of Economic Activities (from the French term "*nomenclature statistique des activités économiques dans la Communauté européenne*"), is the industry standard classification system used in the European Union. The current version is revision 2 and was established by Regulation (EC) No 1893/2006. It is the European implementation of the UN classification ISIC, revision 4.

ONS: UK's Office for National Statistics.

SIC: The United Kingdom Standard Industrial Classification is used in classifying business establishments by the type of economic activity in which they are engaged using up to 5-digit codes. First introduced in 1948, it has been revised in 1958, 1968, 1980, 1992, 1997, and 2003. The UK SIC is a hierarchical five digit system.

SITC: The Standard International Trade Classification is a classification of goods used to classify the exports and imports maintained by the United Nations. It is currently at revision four, introduced in 2006. The SITC is recommended only for analytical purposes since trade statistics are recommended to be collected and compiled in the Harmonized System.

SOC: The United Kingdom Standard Occupational Classification was first published in 1990 to replace both the Classification of Occupations 1980 (CO 80) and the Classification of Occupations and Dictionary of Occupational Titles (CODOT). SOC 90 was revised and updated to produce SOC 2000, SOC 2010 and SOC 2020.

UNCTAD: the United Nations Conference on Trade and Development is a permanent intergovernmental body established by the United Nations General Assembly in 1964 and it is headquartered in Geneva.

UNESCO: United Nations Educational, Scientific and Cultural Organization, headquartered in Paris.

<u>WIPO</u>: the World Intellectual Property Organization is the global forum for intellectual property (IP) services, policy, information and cooperation. It is a self-funding agency of the United Nations, with 192 member states and it is headquartered in Geneva.

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Table A1: The Creative Occupations (4-digital SC2010) and Creative Industries (4-digit SIC2007)

Creative Occupations Group	SOC (2010)	Description	SIC (2007)	Description
Advertising and marketing	1132	Marketing and sales directors	70.21	Public relations and communication activities
	1134	Advertising and public relations directors	73.11	Advertising agencies
	2472	Public relations professionals	73.12	Media representation
	2473	Advertising accounts managers and creative directors		
	3543	Marketing associate professionals		
Architecture	2431	Architects	71.11	Architectural activities
	2432	Town planning officers		
	2435	Chartered architectural technologists		
	3121	Architectural and town planning technicians		
Crafts	5211	Smiths and forge workers	32.12	Manufacture of jewellery and related articles
	5411	Weavers and knitters		
	5441	Glass and ceramics makers, decorators and finishers		
	5442	Furniture makers and other craft woodworkers		
	5449	Other skilled trades not elsewhere classified		
Design: product, graphic and fashion design	3421	Graphic designers	74.10	Specialised design activities
	3422	Product, clothing and related designers		
Film, TV, video, radio and photography	3416	Arts officers, producers and directors	59.11	Motion picture, video and television programme production activities
	3417	Photographers, audio-visual and broadcasting equipment operators	59.12	Motion picture, video and television programme post-production Motion picture, video and television programme distribution
			59.13	Motion picture projection activities Radio broadcasting
			59.14	Television programming and broadcasting activities
			60.10	Photographic activities
			60.20	
			74.20	
IT, software and computer services	1136	Information technology and telecommunications directors	58.21	Publishing of computer games
	2135		58.29	Other software publishing
	2136	IT business analysts, architects and systems designers	62.01	Computer programming activities
	2137	Programmers and software development professionals Web design and development professionals	62.02	Computer consultancy activities
Publishing	2471	Journalists, newspaper and periodical editors	58.11	Book publishing
	3412	Authors, writers and translators	58.12	Publishing of directories and mailing lists
			58.13	Publishing of newspapers
			58.14	Publishing of journals and periodicals
			58.19	Other publishing activities

Creative Occupations Group	SOC (2010)	Description	SIC (2007)	Description
Publishing			74.30	Translation and interpretation activities
Museums, galleries and libraries	2451	Librarians	91.01	Library and archive activities
	2452	Archivists and curators	91.02	Museum activities
Music, performing and visual arts	3411	Artists	59.20	Sound recording and music publishing activities
	3413	Actors, entertainers and presenters	85.52	Cultural education
	3414	Dancers and choreographers	90.01	Performing arts
	3415	Musicians	90.02	Support activities to performing arts
			90.03	Artistic creation
			90.04	Operation of arts facilities

Source: DCMS (2016a, Table 4). Contains public sector information licensed under the Open Government Licence v3.0.

Table A2: Correspondence of Creative Occupations between the 4-digit SOC 2010 and SOC 2020

Creative Occupations Group	SOC (2010)	Description	SOC (2020)	Description
Advertising and marketing	1132	Marketing and sales directors	1132	Marketing, sales and advertising directors
	1134	Advertising and public relations directors	1133	Public relations and communications directors
	2472	Public relations professionals	2493	Public relations professionals
	2473	Advertising accounts managers and creative directors	2494	Advertising accounts managers and creative directors
	3543	Marketing associate professionals	3554	Marketing associate professionals
Architecture	2431	Architects	2451	Architects
	2432	Town planning officers	2452	Chartered architectural technologists, planning officers and consultants
	2435	Chartered architectural technologists		
	3121	Architectural and town planning technicians		
Crafts	5211	Smiths and forge workers	5212	Metal plate workers, smiths, moulders and related occupations[1]
	5411	Weavers and knitters		Textiles, garments and related trades n.e.c.[2]
	5441	Glass and ceramics makers, decorators and finishers	5419	Glass and ceramics makers, decorators and finishers
	5442		5441	Furniture makers and other craft woodworkers
	5449	Furniture makers and other craft woodworkers	5442	Other skilled trades n.e.c.
		Other skilled trades n.e.c.	5449	
Design: product, graphic and fashion design	3421	Graphic designers	2142	Graphic and multimedia designers
	3422	Product, clothing and related designers	3421	Interior designers
			3422	Clothing, fashion and accessories designers
			3429	Design occupations n.e.c.
IT, software and computer services	1136	Information technology and telecommunications directors	1137	Information technology directors
	2135		2133	IT business analysts, architects and systems designers
	2136	IT business analysts, architects and systems designers	2134	Programmers and software development professionals
	2137	Programmers and software development professionals	2141	Web design professionals
		Web design and development professionals		
Publishing	2471	Journalists, newspaper and periodical editors	2491	Newspaper and periodical editors
			2492	Newspaper and periodical journalists and reporters
	3412	Authors, writers and translators	3412	Authors, writers and translators

Creative Occupations Group	SOC (2010)	Description	SOC (2020)	Description
Museums, galleries and libraries	2451 2452	Librarians Archivists and curators	2471 2472	Librarians Archivists and curators

Source: authors' elaboration.

Notes: n.e.c is not elsewhere classified. The codes and descriptions within music, performing and visual arts, film, TV, video, radio and photography are unchanged from SOC 2010 to SOC 2020.

[1] This SOC 2020 code now aggregates creative and non-creative occupations as it includes the SOC 2010 code 5211 as well as 5212 (Moulders, core makers and die casters) and 5214 (Metal plate workers, and riveters).

[2] This SOC2020 code now aggregates creative and non-creative occupations as it includes the SOC 2010 code 5411 as well as 5419 (Textiles, garments and related trades n.e.c.).

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