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CREATIVE ECONOMY EMPLOYMENT IN THE EU AND THE UK

A COMPARATIVE ANALYSIS

Max Nathan, **Andy Pratt** and **Ana Rincon-Aznar**

December 2015

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SUMMARY

Analysts and policymakers have long complained of the dearth of internationally comparable statistics on the creative industries because it has made it impossible to benchmark the performance of different countries. In January 2014, the Department for Culture, Media and Sport (DCMS) adopted the Dynamic Mapping methodology for classifying some industries as 'creative' and others not, for the purposes of producing the UK's Creative Industries Economic Estimates (DCMS, 2014). This methodology is based on the theoretical and empirical argument that the creative industries are *"those industries that specialise in the employment of creative talent for commercial purposes"* (Bakhshi, Hargreaves and Mateos-Garcia, 2013) – that is, have unusually high proportions of their workforce employed in creative occupations ('creative intensity'). Through its use of Standard Industrial Classification (SIC) codes and labour force survey data, the Dynamic Mapping methodology was designed to enable the production of internationally comparable statistics (Bakhshi, Freeman and Higgs 2013).

This report is part of a larger Nesta project to compare the size, growth, and industrial and occupational structure of the UK's creative economy with other countries. The creative economy is defined as employment in the creative industries, plus creative jobs that are embedded outside the creative industries in the wider economy.

The report makes two contributions. First, we compare the size and growth of the creative industries between 2011 and 2013 in the UK and in the European Union (EU) on a consistent basis. Second, we explore the structure of the creative economy across six large European economies (France, Germany, the Netherlands, Poland, Sweden and the UK) where the occupational data are sufficiently rich, by comparing the distributions of creative intensity across industries.

Our approach is as follows. We crosswalk UK creative occupation codes identified by DCMS to their International Standard Classification of Occupations (ISCO) equivalents. Although UK and EU industry codes are identical to the 4-digit level, 4-digit typologies are not available from Eurostat in the pan-EU Labour Force Survey data (henceforth EU LFS) used in this study. A crude shift from 4-digit to larger 3-digit industry codes may include sectors with low creative intensities, leading to inflated estimates of jobs in the creative industries. We therefore 'parse' the UK creative industry 4-digit Standard Industrial Classification (SIC) codes identified by DCMS, to produce a smaller number of best-fit 3-digit codes that can be used across EU countries. We then assemble estimates of national employment in the creative economy and creative industries, separating out creative jobs and non-creative jobs (Higgs, Cunningham and Bakhshi (2008) call this the 'Creative Trident'). We use employment microdata from workforce surveys (the EU Labour Force Survey (EU LFS) and the UK Annual Population Survey (APS)) to produce our estimates.[3] We then analyse creative intensities of different industries, and a series of sensitivity checks, to explore the differences between countries.

It is important to be clear about what the parsing process does and its implications for the analysis. Specifically, we identify and remove from the analysis those SIC3 codes (3-digit SIC codes) with the least overlap with the 4-digit SIC4 codes that make up the DCMS classification. Creative occupations' employment estimates are, of course, unaffected by these steps, although estimates of creative economy employment, and their decomposition into creative industries employment and embedded creatives outside of the creative industries, are affected. Consequently, the UK numbers in the following tables do not exactly match the published DCMS Creative Industries Economic Estimates.

We use APS data (minus second jobs) and the 4-digit SICs in the DCMS classification to assess the effect of the change of moving to 3-digit SICs. The overall effect of the parsing process in the UK is large: the estimated share of creative economy employment in the whole workforce is 2.3 percentage points higher than when using the 4-digit APS data.[4] This means that while we try our best through our parsing procedure to minimise the magnitude of false positive creative industry employment arising from the use of 3-digit SIC codes (employment that is incorrectly classified as being in creative industries), we are unable to eradicate it.

A further constraint is that the employment data at 4-digit ISCO level necessary to construct estimates of creative jobs is not available in some countries, but is available at the lower 3-digit resolution. This is the case with Bulgaria, Cyprus, Denmark, Greece, Italy, Latvia, Portugal and Spain for the 2011–2013 period that we consider in this report, and for Germany and Belgium in 2011. For these years, employment in only one creative occupation is counted in these countries, leading to employment in creative occupations (and consequently in the creative economy) being understated. Creative industry employment numbers are, however, unaffected by this.

As a result, at the level of the EU member states (EU-28) as a whole and for those countries affected, this report presents employment estimates only for the creative industries, not the creative economy (in the cases of Germany and Belgium we are able to present creative economy and occupations estimates for 2012–2013 where the occupations data is available at the 4-digit ISCO level).

Table A presents our headline results for the EU and UK creative industries for the period 2011–2013 (Figure A charts these numbers for the proportion of the workforce). It shows that the creative industries account for a higher proportion of the UK workforce (7.58 per cent) than they do in the EU as a whole (5.21 per cent – both figures 2011–13 average). The average annual employment growth of UK creative industries outstripped that of EU creative industries, at 6.1 per cent per annum (p.a.) versus 1.8 per cent p.a. over 2011–2013.

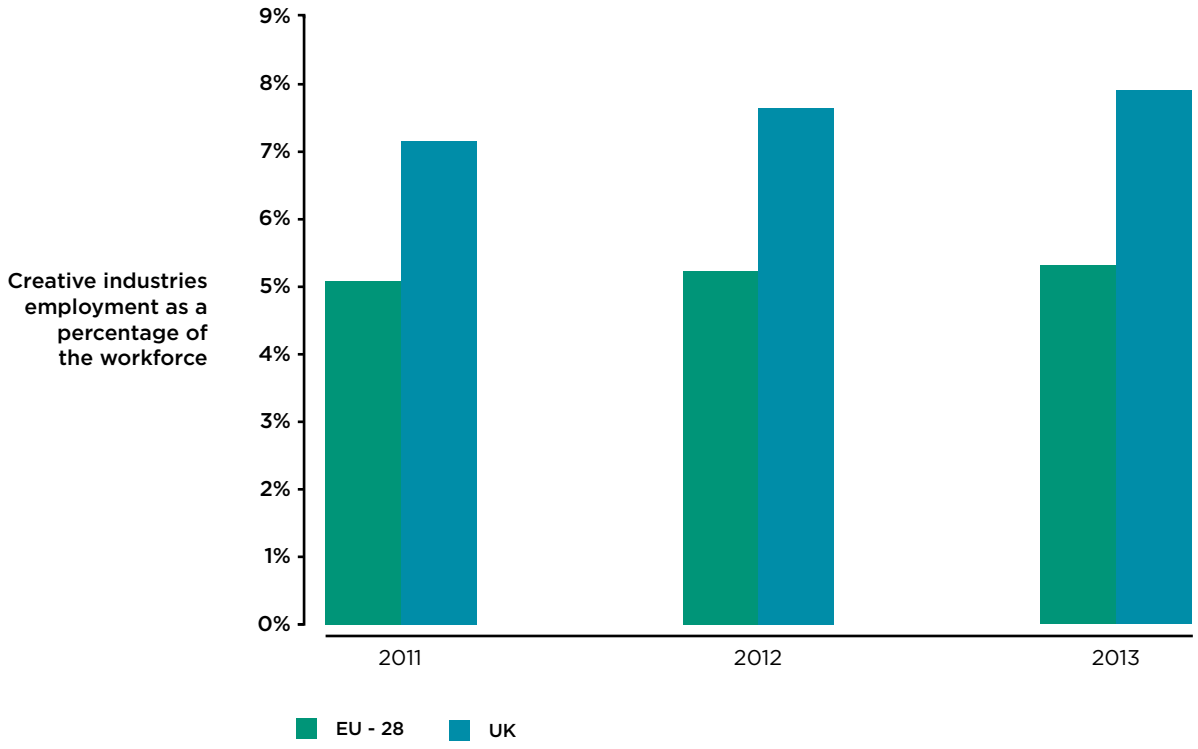
TABLE A: **CREATIVE INDUSTRIES EMPLOYMENT IN THE EU AND UK, 2011–2013**

Year	Creative industries EU-28		Creative industries UK	
	total	% all employment	total	% all employment
2011	11,005,000	5.10%	2,081,000	7.17%
2012	11,252,000	5.23%	2,240,000	7.65%
2013	11,398,000	5.31%	2,343,000	7.91%
2011-13 Average	11,218,000	5.21%	2,221,000	7.58%

Source: EU Labour Force Survey.

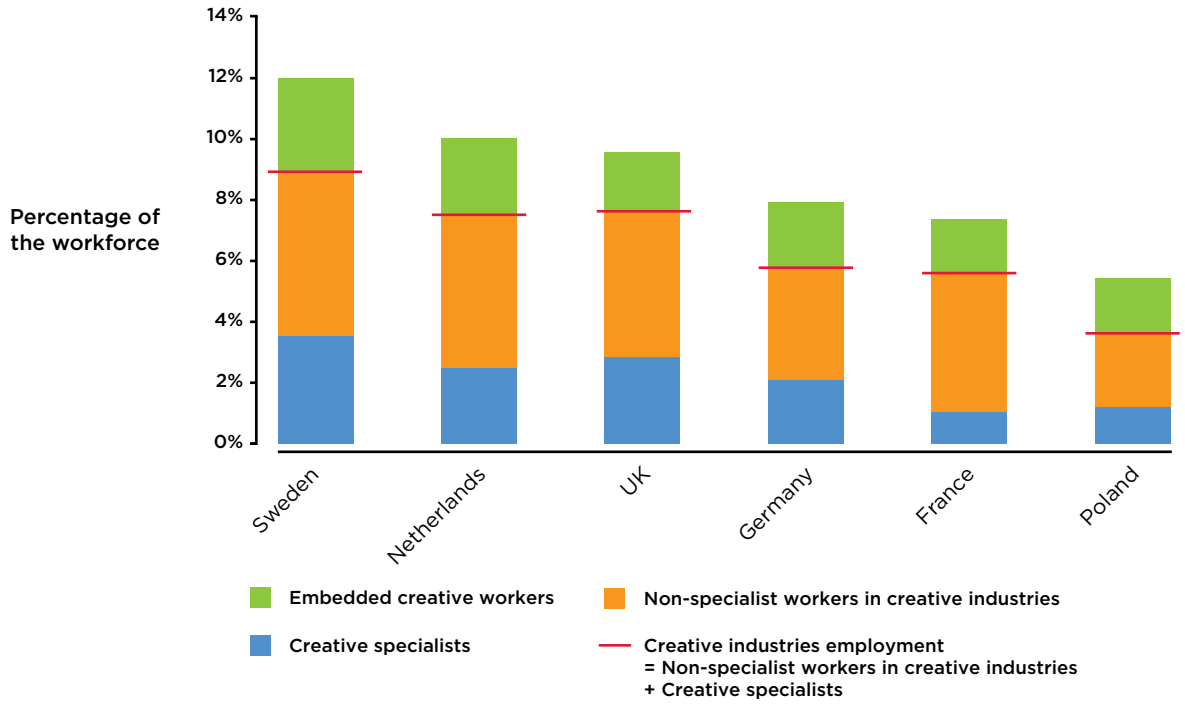
Notes: Figures exclude small cells and volatile codes. UK figures use 3-digit SIC codes and exclude second jobs, so for these and other reasons (see above) do not directly correspond to the official UK figures.

FIGURE A: CREATIVE INDUSTRIES EMPLOYMENT IN THE EU AND UK AS A PROPORTION OF THE WORKFORCE, 2011–2013



Of the six EU member states for which we consider the creative economy (including the UK), Sweden has proportionately the largest creative economy workforce (11.9 per cent in 2013), followed by the Netherlands (10.9 per cent), the UK (9.93 per cent), Germany (8.0 per cent), France (7.5 per cent) and then Poland (5.6 per cent). All of the comparator countries experienced growth in their creative economy workforces between 2011 and 2013. Creative intensity turns out to be highest in Sweden (0.398 across all industries between 2011 and 2013), followed by the UK (0.367), Germany (0.357, in 2012–2013), the Netherlands (0.335), Poland (0.323), and France (0.184). According to our estimates, the UK, Netherlands and Sweden have more creative workers inside the creative industries than outside;[5] Germany has slightly more creative workers outside creative industries than inside them; and Poland and France have substantially greater numbers of creative workers outside than inside creative industries. Figure B plots these numbers. For reference, Appendix 4 provides the average 2011-2013 Creative Tridents for all EU member states where occupations data are available at the 4–digit ISCO level.

FIGURE B: EMPLOYMENT IN THE CREATIVE ECONOMY AND ITS COMPOSITION



Notes: with the exception of Germany which is based on the average of 2012–2013 data all other countries figures are an average of 2011–2013 data.

Figure B shows that there is great variation in creative industries' employment share of the workforce too: Sweden's creative industries, again, have the largest employment share (8.9 per cent 2011-2013 average), followed by the UK (7.6 per cent), the Netherlands (7.5 per cent), Germany (5.7 per cent), France (5.6 per cent) and then Poland (3.6 per cent). France experienced a slight shrinkage in its creative industries' employment share between 2011 and 2013, down 0.17 percentage points. In Sweden, the creative industries' workforce share remained roughly constant. The UK, Netherlands, Poland and Germany, in contrast, all experienced growth in their creative industries workforce shares.

Reassuringly, in all five UK comparator countries, the distribution of creative intensity appears to be bimodal, providing some support for the transferability of the key insight from the UK Dynamic Mapping study that creative intensity serves as a discriminator between creative and non–creative industries.

The analysis presented in this report adds to a small number of previous studies that provide comparative analyses of Europe's creative economy (Clifton and Cooke, 2009; Evans, 2009; King, Mellander, and Stolarick, 2009; O'Connor and Kong, 2009).[6] However, notwithstanding the limitations associated with a lack of pan–EU employment survey data at the 4–digit SIC level and gaps in occupational data at the 4–digit ISCO level, we think our work represents the most ambitious attempt to date. We conclude that there is an urgent need for more detailed occupation and industry information in labour force datasets across EU member states to enable future international comparisons at the degree of resolution that is more commonly available in national data sets, and we suggest this is a priority for Eurostat to consider.

1. INTRODUCTION

This report looks at the creative industries of the EU, UK and other member states between 2011 and 2013. Where possible, it also provides estimates of creative economy employment (i.e. the number of workers employed in the creative industries plus those employed in creative occupations outside of the creative industries). It does this using the EU Labour Force Survey (EU LFS). This analysis has a companion report that delivers comparative estimates for the US and Canadian creative economies (Nathan, Kemeny, Pratt, and Spencer, forthcoming).

The starting point for the analysis in this report is the Dynamic Mapping methodology for classifying and measuring the creative economy developed by Bakhshi, Freeman and Higgs (2013) (henceforth BFH), and which has been adopted by the UK government to generate the official creative economy estimates (Department for Culture Media and Sport, 2014). This methodology is based on the principle that the creative industries are *"those industries that specialise in the employment of creative talent for commercial purposes"* (Bakhshi, Hargreaves and Mateos-Garcia, 2013) – that is, have unusually high proportions of their workforce employed in creative occupations (creative intensity). The BFH analysis has five stages:

I. Determine the set of 'creative occupations', defined using 4-digit Standard Occupational Classification (SOC) codes *o = 1, ... o* for the set of all 4-digit occupation codes O. To do this, BFH subjectively score 4-digit SOC codes in a 'Creative Grid', whose criteria are drawn from a review of the creative work literature and identify five task-level features of creative work. BFH then score a longlist of occupations, keeping those 4-digit SOCs that score four or more out of five in terms of task content.

II. Calculate total employment in each 4-digit Standard Industrial Classification (SIC) code (SIC4) industry cell *i* across the set of all 4-digit industries I = 1, ... i. Work out the 'creative intensity' of each industry. This is specified as the share of creative occupations' employment in industry *i*, or E_{coi}/E_i (where E_{coi} is employment in creative occupations in industry *i* and E_i is all employment in industry *i*).

III. Set a creative intensity 'threshold', where industries with creative intensities above this threshold are denoted 'creative' industries, and the rest are denoted 'non-creative'. BFH use a probabilistic procedure to identify this threshold as 30 per cent for the UK over the period studied.[7] They also exclude some 'volatile' industries where creative intensity is not consistently above the threshold, or where codes are based on particularly small samples following official guidance.

IV. Calculate creative industries and creative economy employment following Higgs et al's (2008) Creative Trident approach. Specifically, creative economy employment is given by the sum of creative industries employment (E_{ci}), and all creative jobs in other industries ('embedded' jobs, or E_{coi} across all non-creative industries *i*).

V. BFH also employ an extensive series of sensitivity checks, which include varying the set of 'seed' occupations (e.g. classifying occupations as creative if they meet a fewer number of the criteria specified in the Creative Grid), varying the set of industries deemed 'creative', varying the creative intensity threshold, and replicating the results using the Annual Survey of Hours and Earnings (ASHE) business survey, instead of labour force survey data.

BFH find just under 2.5 million creative economy jobs in the UK in 2010 using Annual Population Survey (APS) data. This estimate is based on SOC 2000 codes. Bakhshi, Davies, Freeman and Higgs (2015) (hence BDFH) update these estimates for the period 2011–2013, using the set of 4–digit SOC2010 codes and SICs adopted by the DCMS in its Creative Industries Economic Estimates. They find 2.6 million creative economy jobs in 2013. It is important to note that following a public consultation, the DCMS includes in their estimates some SOC2010 codes that, according to BFH, would not score high enough on the Creative Grid to be deemed 'creative', and some SIC codes whose creative intensity is lower than 30 per cent. So, the results in BDFH are not strictly consistent with an application of the Creative Grid and intensity analysis in BFH, although for the most part the occupations and industries involved are the same. Appendix 1 sets out the DCMS–designated 4–digit creative occupations and creative industries.

This detailed, multi–year structured comparative exercise is the first of its kind that we are aware of, although there are other, simpler studies on creative occupations (King, et al., 2009), the creative industries (Falk et al., 2011), and creative industry clusters (Boix, Capone, De Propris, Lazzeretti, and Sanchez, 2014; Boix, Hervás–Oliver, and De Miguel–Molina, 2012).[8] There is also a broader comparative literature for the creative industries and creative economy (Clifton and Cooke, 2009; Evans, 2009; O'Connor and Kong, 2009; Pratt, 2000), as well as previous analysis using industries and occupations as proxies for creative (or cultural) economy activity, notably Markusen et al., (2008), Gordon and Beilby–Orrin (2006) and KEA European Affairs (2006).

The rest of this report is structured as follows. Section 2 sets out how we make use of the Dynamic Mapping to derive an EU comparison, and introduces our EU and UK datasets. Section 3 takes the reader through the crosswalking and parsing exercise for occupations and industries. Section 4 provides headline results for EU and UK creative industry employment, 2011–2013 trends, and the decomposition of creative industries by sector. Section 5 subjects the EU results to a series of robustness checks. Section 6 compares the creative economy, and its components, in the UK and five selected EU member states: France, Germany, the Netherlands, Poland and Sweden. Section 7 concludes. Annexes 1–4 provide supporting material.

2. EXTENDING THE DYNAMIC MAPPING APPROACH

We use the DCMS classifications and the key insights from the Dynamic Mapping to derive estimates of employment in the creative industries, and where possible the creative economy, in the EU member states. Our workflow is as follows:

- **First**, we crosswalk the set of DCMS creative occupations to internationally consistent International Standard Classification of Occupations (ISCO) codes. (We also use this step in our forthcoming North America–UK analysis).
- **Second**, we perform a parsing exercise on the DCMS classification of creative industries. The UK and other EU member states use a harmonised industrial coding system (SIC/NACE) to the 4-digit level,[9] but the pan-EU data supplied by Eurostat is not available at this level of resolution. We therefore 'translate' from the 4-digit UK codes, using parsing rules to generate 3-digit best-fit equivalents.
- **Third**, we compare employment levels, shares and trends across the UK and EU, and look at specific UK comparator countries among EU member states (noting where there are gaps in the data). We do this for the creative industries as a whole, for specific creative industry sub-sectors and, where possible, the creative economy and its components (i.e. the Creative Trident). We also subject our main results to a series of sensitivity tests.

Producing internationally consistent creative economy employment estimates requires us to address a number of data-related challenges. Foremost, we need data at a sufficiently high level of resolution to identify the employment in individual creative occupations and industries over time. In this case, where the data allow, we also want to produce estimates for the EU as a whole, as well as individual member states, some of which we use as comparator countries to the UK. We discuss these issues in sections 2.1 and 2.2 below.

Our estimates will also be sensitive to the crosswalking/parsing rules we adopt. It is important to understand in some detail why this is the case, in order to correctly interpret the results. For occupations, we need to translate UK occupational codes (SOC2010) to the international ISCO 2008 standard: to do this, we use official concordance tables developed by the UK Office for National Statistics and the EU. In almost all cases, we have a 1:1 match from a given UK cell to its international equivalent, but there are a couple of cases where the match is not perfect. Section 3 explains the decisions we make in these cases.

For industries, as we explain below and in Section 3, EU industry coding is harmonised up to the 4-digit level across member states using the NACE system, but the EU LFS available from Eurostat is only available at 3-digit level. This means we are unable to work with the 4-digit SIC codes, but need to find best-fit 3-digit SIC equivalents. A crude shift from 4-digit to larger 3-digit industry codes will mechanically increase the size of creative industries (and creative economy) employment (since industry blocs are bigger) and decrease the count of embedded jobs (since overall employment in creative jobs is fixed and the set of 'non-creative' industries shrinks). Our parsing process compensates for this by removing the 3-digit SIC codes (SIC3) with the least overlap with the DCMS 4-digit codes (SIC4). That is, we keep the best-matching codes and discard the rest. Section 3 also explains how we do this. Our preferred approach uses a conservative inclusion restriction, which generates creative economy estimates closer to DCMS (2014); we also run a sensitivity test with an even more conservative inclusion rule, which generates substantially smaller estimates (Section 4). Section 5 contains details.

2.1 Datasets

We use 2011–2013 EU LFS data, plus UK APS microdata (used in the original Dynamic Mapping study by BFH and subsequent work by BDFH) for robustness checks on the UK estimates and to aid interpretation of the EU results. We summarise the key features of these datasets below.

For the main analysis we use 2011–2013 data from the EU LFS. We face three practical considerations. First, where the data allows, we want to compare the UK's creative industries and economy with that of specific EU member states. Second, we want the flexibility to vary the set of country comparators. Third, we work within the parameters of available pan–EU data: the richest labour force survey data for EU member states is held by individual national statistical agencies, and it would be a major undertaking to collate these, and in a way that is consistent across countries.[10]

For all of these reasons, we use bespoke aggregates from the large, cross–country EU LFS dataset compiled by Eurostat. The EU LFS is the largest European household sample survey, providing a mixture of quarterly and annual information across all 28 member states (Eurostat, 2014).[11] The EU LFS generates 1.8 million household observations per quarter, or 7.2 million observations per year, covering between 0.2 per cent and 3.3 per cent of households depending on the survey country in question (for example, the UK Labour Force Survey covers 0.16 per cent of all households). The sampling frame is people aged 15 and over, in private households (excluding conscripts).[12] The questionnaire covers a broad range of issues, including personal and demographic information, location, country of origin, human capital and labour market outcomes (economic activity, employment and wages).

Construction of the EU LFS is naturally more complex than working with data for a single country. National statistical institutes select the sample, conduct the analysis and then send anonymised results to Eurostat, which synthesises the output.[13] Eurostat has co–ordinated common conventions (for example, on occupation and industry coding) but member states also have a number of opt–outs (for example, on levels of geographical detail that can be made available). For this analysis, Eurostat provided us with a series of industry–by–occupation cells, based on the original microdata, across all EU member states for the years 2011 to 2013.[14]

As is clear from this brief overview, the EU LFS has many features that make it ideal for the questions we want to answer.[15] There are also some limitations in using the EU LFS data, however, that we need to adjust for. First, the EU LFS contains no information on second jobs: in robustness checks using the UK APS, we therefore adjust the APS data to remove second job information and align the samples. Second, as highlighted above, the dataset uses NACE industry codes that are identical to UK SICs to the 4–digit level, but the data are only made available at the 3–digit level. Our parsing approach, outlined in the next section, creates best–fit 3–digit matches to the creative industries identified by BFH and DCMS (2014). We interpret our results accordingly. For these reasons and others, the APS estimates we report in this study are not identical to the DCMS's published creative economy estimates. Third, as household samples vary substantially across contributing countries, Eurostat places heavy restrictions on the availability of sub–national industry and occupational aggregate data in some countries. This means that sub–national estimates are not presented in this report.

We need to deal with two further issues in the EU LFS data. First, we run our analysis with and without cells that Eurostat flags as potentially problematic. It turns out these make little difference to the aggregate (EU–28) results, but they are more noticeable in the analysis of some individual countries, and this affects our choice of member states for more detailed analysis (see below).[16] Second, for some countries in certain years, occupational codes are only coded to 3–digit resolution in the EU LFS (Germany and Belgium in 2011; Bulgaria, Cyprus, Denmark, Portugal, Greece, Italy, Latvia and Spain in 2011–2013). In these cases, occupational data is provided with 4–digit ISCO codes ending in zero (e.g. 1330, 2510), but where the data represents larger 3–digit codes (e.g.133, 251). In one case (e.g. 133 and 1330), the 3–digit and 4–digit codes

cover the same occupations, so there is no issue. However, in all other cases (e.g. 251 and 2510) it is not possible to observe the creative occupational information we need (e.g. 2511–2513), so that jobs in almost all creative occupations are in this case ascribed to non–creative employment.

The effect of the 3–digit resolution in the occupational coding for these countries for these years is to understate creative occupations and creative economy employment totals, as well as estimates of creative intensities. However, there is no effect on creative industry employment, as employment estimates are derived from all creative industry employees, not just those in creative occupations, and so any misallocated workers are 'allocated back'.

At the individual country level where this issue affects all three years of the data, we therefore present creative industry employment statistics only. Where 2011 alone is affected (as in Germany and Belgium) we present creative occupations and economy employment statistics for 2012–2013. At an EU–28 level, owing to this issue affecting a number of larger countries e.g. Italy and Spain, we present statistics only for employment in the creative industries, not the creative economy.

In all other cases we present creative economy estimates, and their decomposition according to the Creative Trident, either in the main text or in an appendix.

As mentioned above, we use APS data in some of the robustness checks. The APS is the largest household survey in the UK and combines waves 1 and 5 of the UK's quarterly Labour Force Survey with annual local data for England, Scotland and Wales (Office for National Statistics, 2015). Each year, the APS contains around 320,000 observations on respondents aged 16 or over, and provides very rich information on socio–economic indicators for individuals and their households. The APS includes information on second jobs and on self–employed people, common features in creative industries and occupations (and a principal reason why it is the basis for Nesta's Dynamic Mapping and the DCMS's Creative Industries Economic Estimates).

2.2 EU comparator countries

We conduct national analysis on five EU member states for comparison with the UK. The selection of countries is partly informed by the quality of the available EU LFS data. We roughly divide the EU into mainland European, Scandinavian, and Eastern European countries that have more recently joined the Union. Within these groupings we select countries with the largest populations according to the most recent country–level data (2014 or 2015).[17] For mainland Europe, these are France, Germany, Italy, Spain and the Netherlands; for Scandinavia, Sweden; and for accession countries, Poland. As discussed above, both Italy and Spain suffer from data limitations as well as a relatively high incidence of 'problem cells' as flagged by Eurostat. We therefore drop these countries from the comparator set and select The Netherlands, which is the next largest country by population in the bloc. Our final set of comparator countries is therefore France, Germany, the Netherlands, Poland and Sweden.

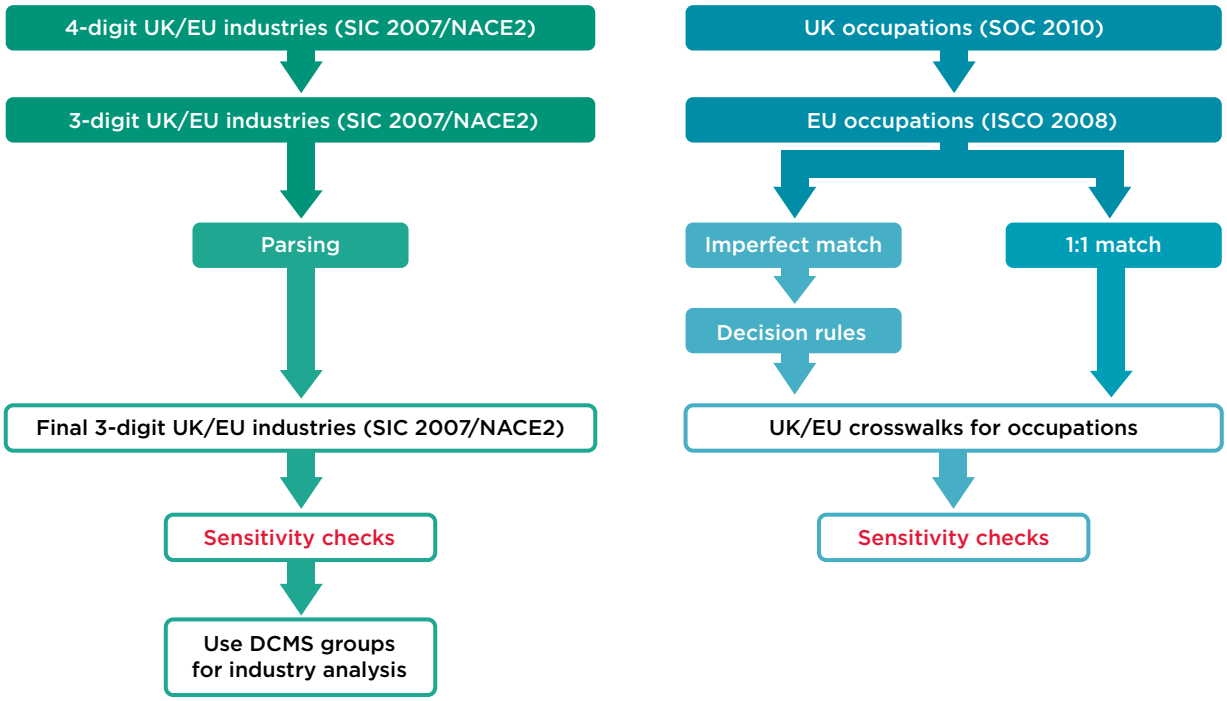
3. CROSSWALKING AND PARSING CREATIVE OCCUPATIONS AND INDUSTRIES

This section of the report explains how we create lists of EU creative occupations and industries by crosswalking from the UK codes specified by DCMS. As in many countries, different national industry and occupation systems have evolved in parallel over time.[18] In recent years, there has been a series of efforts to 'back fit' these into international standardised typologies such as ISCO (for occupations), ISIC (for industries) and, within this, NACE (for EU countries).[19]

In our forthcoming North American analysis, we have used these international standards to create a bridge from UK to US coding systems. Here, we have a different task. In the case of occupations, we can go directly from UK SOC2010 codes to ISCO 2008 codes, as these are used in the EU LFS data. As we show below, the concordance table produces 1:1 matches in almost all cases.

For industries, all EU member states use the NACE coding system, which has four levels of detail: the UK's SIC 2007 typology therefore is identical to NACE up to the 4-digit SIC4 level.[20] However, pan-EU datasets such as the EU LFS are only available at the SIC3 level. That is, the EU LFS data gives 3-digit SIC/NACE 'group' fields, but the UK creative industries are defined using 4-digit SICs ('classes') in the DCMS statistics. Since doing a simple shift from 4- to 3-digit industries will bias our estimates, we need to streamline, or 'parse', the DCMS categories to develop best-fit 3-digit equivalents that can be applied across all countries in the EU data. Our basic workflow is set out in Figure 1. The left-hand column covers industries, and the right-hand column occupations.

FIGURE 1 **CROSSWALK WORKFLOW**



3.1 Occupations

For occupations, we crosswalk UK SOC2010 codes to the most recent ISCO08 occupation coding. We use the standard concordance table developed by ONS.[21] Appendix 2 sets out the resulting crosswalk. The 30 4-digit SOC codes designated by DCMS as creative, map to 31 4-digit ISCO codes. In the majority of cases we have a 1:1 match. In two cases (3417, Photographers, audio-visual and broadcasting equipment operators, and 3422, Product, clothing and related designers), the SOC codes match on to two ISCO codes. We find one case where the crosswalk appears to have been made in error (5449, Other skilled trades not elsewhere classified) and correct for this. We also identify some candidate codes for sensitivity checks: these are discussed in Section 5.

3.2 Industries

For industries, we need a slightly different approach. As all EU member states use the same industry codes, no crosswalking is required. However, we need a suitable way to move from 4-digit SIC/NACE codes to the larger 3-digit SIC/NACE codes for which EU LFS data is available. As discussed above, shifting from 4-digit to larger 3-digit industry codes will automatically increase the size of creative industries employment, since the new industry units are larger. In some cases the 3- and 4-digit codings will be identical (if, say, because there is no disaggregation of a 3-digit code into 4-digit code), or will closely resemble each other (if almost all of a given 3-digit cell's components are used in the relevant 4-digit list). In other cases, 3-digit codes will contain 'irrelevant' industries or false positives (e.g. SIC4 industry cells left out of the DCMS list on the basis of low intensity).

Our parsing process removes these codes to leave us with a list of 'best fit' 3-digit creative industries. This process needs to be handled in a way that is transparent and consistent, so that the effects can be easily understood by readers and tested in sensitivity checks.

We use this variation to develop a simple inclusion rule, made up of the following steps:

1. We start with the DCMS 4-digit SIC/NACE creative industry codes.
2. For each DCMS 4-digit code, we retrieve each corresponding 3-digit code and all relevant 4-digit codes for that code cell.
3. For each of the relevant 3-digit codes, we retain it if at least 50 per cent of the 4-digit codes under it appear in the DCMS 4-digit list, and exclude it otherwise.

Appendix 3 sets out the parsing process and the resulting industry set. Overall, it transforms the 33 DCMS 4-digit industry codes into 17 unadjusted 3-digit codes, and then to 15 parsed SIC3 codes. The parsing process means we lose cultural education (SIC 85.52), which slightly shrinks the 'Music, visual and performing arts' industry group; in the UK, this group has a creative intensity in the 2013 APS data of 0.371. We also lose SIC 32.12, Manufacture of jewellery and related articles, which has a creative intensity of 0.601 in the 2013 APS. The exclusion of these creative industries is far from ideal, but necessary if consistent industrial codes are to be used across countries without including a very large number of false positive industries that are self-evidently not 'creative' in terms of workforce characteristics.

In working with 3-digit industry codes, some loss of precision is unavoidable. Nonetheless, the resulting list of industries provides reasonable coverage of creative industry activities. The varying intensities of the omitted UK industries emphasises that our preferred specification is designed to both minimise false negatives (excluding creatively intense activities) and false positives (including low creative intensity activities). In robustness checks we experiment with a much tougher inclusion rule (at least 75 per cent of the 4-digit codes underlying each 3-digit code must be in the DCMS 4-digit list).

4. THE CREATIVE INDUSTRIES IN THE EU AND THE UK

This section of the report provides headline information on creative industry jobs in the EU–28 as a whole and in the UK, and employment trends between 2011 and 2013.[22]

4.1 EU and EU–28 Creative industries: levels, shares and trends

Table 1 presents employment estimates for the UK and EU creative industries between 2011 and 2013. The left hand panel shows the EU results and the right hand panel the corresponding UK results.

TABLE 1 CREATIVE INDUSTRIES EMPLOYMENT IN THE EU AND UK, 2011–2013

Year	Creative industries EU-28		Creative industries UK	
	total	% all employment	total	% all employment
2011	11,005,000	5.10%	2,081,000	7.17%
2012	11,252,000	5.23%	2,240,000	7.65%
2013	11,398,000	5.31%	2,343,000	7.91%
2011-13 Average	11,218,000	5.21%	2,221,000	7.58%

Source: EU Labour Force Survey.

Notes: Figures exclude small cells and volatile codes. UK figures use 3-digit SIC codes and exclude second jobs, so for these and other reasons (see above) do not directly correspond to the official UK figures.

Turning to the comparison between the EU and UK, in counts the UK creative industries account for a higher proportion of overall employment (7.58 per cent on average between 2011 and 2013), than the creative industries do of the EU workforce as a whole (5.21 per cent). The UK's creative industries' average annual employment growth outstripped that of the EU creative industries, at 6.1 per cent per annum (p.a.) versus 1.8 per cent p.a. over 2011–2013.

These EU estimates are significantly higher than those in previous studies of the creative industries in EU countries (Falk et al., 2011, KEA 2006). Falk and colleagues estimated that creative industries in the EU–27 employed 6.7 million people in 2008, or around 3 per cent of total employment, using different definitions and countries; the consultants, KEA European Economic Affairs estimated that there were 5.8 million creative industries workers across the EU–25 in 2004, or 3.1 per cent of total employment. There are a number of likely explanations which together account for the discrepancies: we use NACE2 industry codes rather than the NACE1.1 codes primarily used by Falk et al., and KEA; we use ISCO 2008 codes rather than the ISCO88 codes used by KEA; we use 3–digit NACE codes rather than a mix of 3 and 4–digit codes

(Falk et al.) and we use a rather larger set of ISCO and NACE codes than the KEA study;[23] we use harmonised Eurostat labour force survey data which includes the self-employed, rather than business survey data which excludes it (Falk et al.) or non-harmonised employment data (KEA); we look at a more recent time period, and last, but not least, we consider the EU-28 rather than EU-27 or EU-25.

4.2 Creative industries by sub-sector

Table 2 compares the creative industries on a sub-sectoral basis.

TABLE 2 EU/UK CREATIVE INDUSTRIES GROUPS, 2011-2013 COMPARISON

EU-28			
DCMS industry group	Industry employment	% of all creative industries employment	% of all employment
Advertising and marketing	1,923,000	17.14%	0.89%
Architecture	2,302,000	20.53%	1.07%
Design activities	377,000	3.36%	0.18%
Film, TV, video, radio and photography	877,000	7.82%	0.41%
IT, software and computer services	3,022,000	26.93%	1.40%
Publishing	1,001,000	8.93%	0.47%
Museums, galleries and libraries	600,000	5.35%	0.28%
Music, performing and visual arts	1,115,000	9.94%	0.52%
	11,218,000	**100%**	**5.21%**

UK			
DCMS industry group	Industry employment	% of all creative industries employment	% of all employment
Advertising and marketing	445,000	19.98%	1.52%
Architecture	437,000	19.68%	1.49%
Design activities	109,000	4.90%	0.37%
Film, TV, video, radio and photography	211,000	9.50%	0.72%
IT, software and computer services	562,000	25.28%	1.92%
Publishing	190,000	8.63%	0.65%
Museums, galleries and libraries	106,000	7.22%	0.36%
Music, performing and visual arts	161,000	4.81%	0.55%
	2,221,000	**100.00%**	**7.58%**

Source: EU Labour Force Survey, notes otherwise as in Table 1.

In broad terms, the employment shares of the industry groups are ranked similarly in both the UK and in the EU as a whole. Tables 3 and 4 break down the industry groups into their component three-digit codes, for the UK and the EU respectively. These tables shed further light on the sub-sectoral differences between the creative industries workforce in the UK and in the rest of the EU.

TABLE 3 UK 3-DIGIT CREATIVE INDUSTRIES, 2011-2013

	SIC07 Descriptor	DCMS group	Creative intensity	Industry employment	Creative employment	% all creative industries employment	% all employment
73.1	Advertising	Advertising and marketing	0.469	129,000	60,000	5.79%	0.44%
70.2	Management consultancy activities		0.162	316,000	51,000	14.19%	1.08%
71.1	Architectural and engineering activities and related technical consultancy	Architecture	0.202	437,000	88,000	19.68%	1.49%
74.1	Specialised design activities	Design activities	0.563	109,000	61,000	4.90%	0.37%
59.1	Motion picture, video and television programme activities	Film, TV, video, radio and photography	0.456	98,000	44,000	4.40%	0.33%
60.1	Radio broadcasting		0.505	16,000	8,000	0.74%	0.05%
60.2	Television programming and broadcasting activities		0.441	52,000	23,000	2.31%	0.18%
74.2	Photographic activities		0.711	45,000	32,000	2.05%	0.15%
58.2	Software publishing	IT, software and computer services	0.33	20,000	7,000	0.90%	0.07%
62.0	Computer programming, consultancy and related activities		0.399	542,000	216,000	24.38%	1.85%
58.1	Publishing of books, periodicals and other publishing activities	Publishing	0.472	171,000	81,000	7.75%	0.58%
74.3	Translation and interpretation activities		0.837	19,000	16,000	0.88%	0.06%
59.2	Sound recording and music publishing activities	Music, performing and visual arts	0.345	12,000	4,000	0.53%	0.04%
90.0	Creative, arts and entertainment activities		0.712	149,000	106,000	6.69%	0.51%
91.0	Libraries, archives, museums and other cultural activities	Museums, galleries and libraries	0.166	106,000	18,000	4.81%	0.36%
				2,221,000	**815,000**	**100.00%**	**7.58%**

Source: EU Labour Force Survey.

Although gaps in the occupations data at 4-digit level mean that it is not possible to make a comparison with the EU-28 as a whole (Table 4), note that employment in the advertising and marketing group in the UK is more dominated by management consultancy jobs, a sector which has much lower creative intensity (0.162) than advertising (0.469).

Computer programming, consultancy and related activities followed by Architectural and engineering activities and related technical consultancy, are proportionately the largest sectors in both the UK and EU–28. Creative, arts and entertainment activities account for 0.51 per cent and 0.49 per cent respectively of the UK and EU workforces.

TABLE 4 EU 3–DIGIT CREATIVE INDUSTRIES, 2011–2013

	SIC07 Descriptor	DCMS group	Creative intensity	Industry employment	Creative employment	% all creative industries employment	% all employment
73.1	Advertising	Advertising and marketing	N/A	801,000	N/A	7.14%	0.37%
70.2	Management consultancy activities		N/A	1,122,000	N/A	10.00%	0.52%
71.1	Architectural and engineering activities and related technical consultancy	Architecture	N/A	2,302,000	N/A	20.53%	1.07%
74.1	Specialised design activities	Design activities	N/A	377,000	N/A	3.36%	0.18%
59.1	Motion picture, video and television programme activities	Film, TV, video, radio and photography	N/A	375,000	N/A	3.35%	0.17%
60.1	Radio broadcasting		N/A	97,000	N/A	0.87%	0.05%
60.2	Television programming and broadcasting activities		N/A	204,000	N/A	1.82%	0.09%
74.2	Photographic activities		N/A	201,000	N/A	1.79%	0.09%
58.2	Software publishing	IT, software and computer services	N/A	238,000	N/A	2.12%	0.11%
62.0	Computer programming, consultancy and related activities		N/A	2,784,000	N/A	24.81%	1.29%
58.1	Publishing of books, periodicals and other publishing activities	Publishing	N/A	863,000	N/A	7.70%	0.40%
74.3	Translation and interpretation activities		N/A	138,000	N/A	1.23%	0.06%
59.2	Sound recording and music publishing activities	Music, performing and visual arts	N/A	53,000	N/A	0.47%	0.02%
90.0	Creative, arts and entertainment activities		N/A	1,062,000	N/A	9.47%	0.49%
91.0	Libraries, archives, museums and other cultural activities	Museums, galleries and libraries	N/A	600,000	N/A	5.35%	0.28%
				11,218,000	**N/A**	**100.00%**	**5.21%**

Source: EU Labour Force Survey.
Notes: No figures are provided for creative intensity and creative employment due to the absence of consistent 4 digit creative occupation information across the EU-28 in the period studied.

5. ROBUSTNESS CHECKS

What explains these apparent differences? If our analysis is robust, we have identified structural differences in creative industry workforces between the UK and the rest of the EU. But before proceeding we need to consider two potentially confounding factors. First, and crucially, we want to make sure that our results are not affected by the use of the EU LFS and sample construction. Second, we need to establish that the results are not an artefact of the parsing process described in Section 3. (We explore this by re-running our main results with a more demanding inclusion criterion, which also allows us to see the role that individual 'marginal' industries play in the process).

5.1 Sensitivity to the use of the EU LFS

Given the substantial data challenges discussed in Section 2, we need to be clear how we interpret and caveat our results. There are three major issues: first, the use of EU LFS data for the UK instead of APS data as in the DCMS Creative Industries Economic Estimates; second, our need to work at a lower level (3-digit) industrial resolution than in the 4-digit DCMS statistics; third, the fact that 4-digit occupational resolution is not consistently available for all countries over the period 2011-2013.

The last issue we address by presenting statistics only where the occupational coding is consistently available. The first and second issues explain why the UK results presented are not directly comparable with the official DCMS estimates. Table 5 shows how these differences affect the estimates. Each panel gives UK employment in creative industries. The left-hand panel contains our estimates using EU LFS data and 3-digit industry cells generated by the parsing rule.

TABLE 5 COMPARING DATASETS AND THE EFFECTS OF THE PARSING RULE ON UK DATA, 2011-2013

Creative industries						
Year	UK, EU LFS using 3-digit SICs		UK, APS using 3-digit SICs		UK, APS using 4-digit SICs	
	total	% all employment	total	% all employment	total	% all employment
2011	2,081,000	7.17%	2,143,000	7.47%	1,457,000	5.08%
2012	2,240,000	7.65%	2,300,000	7.96%	1,585,000	5.48%
2013	2,343,000	7.91%	2,375,000	8.09%	1,597,000	5.44%

Source: EU Labour Force Survey, UK Annual Population Survey.

Notes: Figures exclude small codes and volatile cells. APS data has second jobs removed to align sample with EU LFS. Except where stated, UK figures use 3-digit SIC codes. APS results do not directly compare with official UK estimates.

The middle panel uses the same industry codes on APS data, as used by the DCMS but with second jobs removed to allow direct comparability between APS and EU LFS estimates. This comparison also serves as a sensitivity check on the EU LFS data, which is derived from the same underlying labour force survey data as the APS. We see that the creative industries estimates are broadly similar across the two datasets.

The right-hand panel also uses APS data, but now uses the original 4-digit SIC codes in the DCMS (2014) estimates. (Note again that we have removed second jobs from the APS data so the numbers in the bottom panel are not identical to those in DCMS (2014)). Given the very small differences in the underlying data, comparing the middle and right-hand panels helps us to understand what our parsing rule does to the estimates.

As explained above, shifting to larger industry blocs necessarily raises employment counts/shares in the creative industries relative to the DCMS estimates, since larger industry blocs are used. As a consequence, the amount of creative employment 'embedded' in the wider economy is reduced, as the overall number of individuals employed in creative jobs is unchanged. The parsing rule works to reduce the upwards bias in the creative industry employment estimates by discarding the least 'relevant' SIC3 codes from the set of creative industries used in the analysis. (In the next section we test our parsing assumptions, by reproducing our main results using a more conservative inclusion criterion.)

Table 5 shows – as expected – that the creative industries counts and shares are larger when using 3-digit SIC codes. One interpretation of our EU estimates therefore is that they represent upper bounds for the 'true' estimates that would have been obtained if we had been able to directly replicate the use of higher industrial resolution data as in the DCMS estimates.

5.2 Sensitivity to sample construction

Here, we make a further check on the EU LFS estimates by omitting from the analysis all industry*occupation cells for which Eurostat has placed a reliability flag. These cells are disproportionately concentrated in three member states: the Czech Republic, Italy and Spain. As Table 6 shows, overall estimates for the EU-28 are barely affected by this change. Creative industries job counts fall by only 0.07 percentage points.

Even though the EU-wide industry estimates are little affected by removing flagged cells, their uneven incidence has implications for country level analysis using the EU LFS however (see Section 2), and we take this into account in our choice of comparator countries for the analysis in Section 7.

TABLE 6 **EU LFS SAMPLING FRAME CHECK**

EU-28 average		
Year	Creative industries	
	total	% all employment
2011	10,543,000	5.03%
2012	11,252,000	5.23%
2013	11,398,000	5.31%
Year		**Change**
2011		-0.07%
2012		-0.07%
2013		-0.07%

Source: EU Labour Force Survey.

Notes: As in Table 1. Drops industry*occupation cells flagged 'b' in the EU LFS, which indicates lower reliability.

5.3 Sensitivity to the parsing of industry codes

The estimates are based on a set of best-fit creative industries, derived from the original DCMS list of creative industries using the parsing process set out in Sections 2 and 3. The parsing rules are designed to minimise the effect of shifting to lower resolution industry 'blocs' by: a) removing the least relevant of these blocs from the final set, while b) ensuring creatively intense activities stay in, as far as the less wieldy industry units allow. That is, we want to balance the need to take out industries that are 'false positives' (i.e. industries labelled as creative, but where this identification is tenuous) and the need to avoid 'false negatives' (industries that are evidently

creative, but which are not identified as such). As we have seen, this rule still generates higher creative industries and creative economy employment estimates than the official DCMS estimates. We might therefore be concerned that we are keeping some false positives: industry blocs that do not in fact include much creatively intense activity.

To explore this source of bias, we reproduce our main estimates using a tougher creative industries inclusion threshold of 0.75. That is, we only retain 3–digit SIC codes if the corresponding 4–digit DCMS SIC codes account for at least 75 per cent of their make–up. Applying this parsing rule leads to the exclusion of two additional industry groups: Architecture, and Museums, galleries and libraries. In 2013, 4–digit industries in these groups had average creative intensities of, respectively, 0.692 and 0.218. The new rule also excludes PR and communication activities and thus reduces the size of the advertising and marketing group substantially. This suggests that while a more restrictive inclusion condition removes some false positives, it also generates important false negatives.

TABLE 7 INDUSTRIES ROBUSTNESS CHECK: SWITCHING FROM A 0.5 TO A 0.75 PARSING RULE, 2011-2013

EU-28		
	Creative industries	
Year	total	% all employment
2011	7,059,000	3.27%
2012	7,290,000	3.39%
2013	7,231,000	3.37%

Source: EU Labour Force Survey.

Notes: As in Table 1. Estimates generated using a more conservative parsing rule, which excludes SIC/NACE groups 620 (Computer programming, consultancy and related activities), 702 (Management consultancy activities), 711 (Architectural and engineering activities and related technical consultancy), 910 (Libraries, archives, museums and other cultural activities).

Table 7 shows that the impact of the new parsing rule is as expected: creative industries employment drops dramatically, from 11.4 million to 7.23 million in 2013. Shifts in previous years are of a similar order of magnitude. The drastic changes to the set of sub–sectors that make up the creative industries however, suggest that our original parsing rule is preferable to the more conservative specification. Further research should experiment with alternative parsing rules.

6. COUNTRY COMPARISONS: THE UK, FRANCE, GERMANY, THE NETHERLANDS, POLAND AND SWEDEN

This section shifts the analysis to national level, and develops a descriptive analysis of creative economy employment for the UK and five comparator countries: France, Germany, the Netherlands, Poland and Sweden.[24] As explained in Section 2, we divide the EU into three blocs: mainland Europe, Scandinavia and accession countries. We then choose countries with the largest populations, and assess the quality of EU LFS data in those countries. In the first bloc – mainland Europe – some national level data is potentially unreliable for Italy and Spain, so we move to the Netherlands as our third country after Germany and France. For reference, Appendix 4 provides creative industry figures (and where possible Creative Tridents) for all EU member states, including the UK, based on the EU LFS data.

6.1 Creative economy: levels, shares and trends

Table 8 gives employment headlines for each of these countries, with the UK in the bottom panel. We provide counts and shares for the creative economy, creative industries, and creative workers 'embedded' in other industries. Data covers the years 2011 – 2013 inclusive, except for Germany, where for 2011 we present industry results only (due to the absence of 4-digit resolution occupational coding for Germany in that year.).

TABLE 8 CREATIVE ECONOMY EMPLOYMENT, 2011–2013: CROSS-COUNTRY COMPARISONS

Germany						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	2,206,000	5.69%	N/A	N/A	N/A	N/A
2012	2,236,000	5.72%	837,000	2.14%	3,073,000	7.86%
2013	2,276,000	5.76%	866,000	2.19%	3,142,000	7.96%

France						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	1,457,000	5.69%	418,000	1.63%	1,875,000	7.32%
2012	1,440,000	5.62%	405,000	1.58%	1,845,000	7.21%
2013	1,407,000	5.52%	515,000	2.02%	1,922,000	7.54%

Netherlands						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	547,000	7.33%	153,000	2.05%	700,000	9.39%
2012	567,000	7.49%	162,000	2.14%	729,000	9.63%
2013	588,000	7.68%	246,000	3.21%	834,000	10.90%

Poland						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	539,000	3.47%	273,000	1.76%	812,000	5.23%
2012	569,000	3.66%	268,000	1.72%	837,000	5.38%
2013	580,000	3.73%	293,000	1.89%	873,000	5.62%

Sweden						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	406,000	8.83%	140,000	3.04%	546,000	11.87%
2012	415,000	8.97%	145,000	3.13%	560,000	12.10%
2013	415,000	8.88%	142,000	3.04%	557,000	11.92%

UK						
Year	Creative industries		Embedded		Creative economy	
	Total	% all employment	Total	% all employment	Total	% all employment
2011	2,081,000	7.17%	547,000	1.88%	2,628,000	9.05%
2012	2,240,000	7.65%	566,000	1.93%	2,806,000	9.59%
2013	2,343,000	7.91%	598,000	2.02%	2,941,000	9.93%

Source: EU Labour Force Survey.
Notes: As in Table 1. German data for 2011 does not have 3-digit occupational resolution so only industry data is presented for that year.

In terms of creative economy job counts, Germany is the closest comparator to the UK, with 3.14 million creative economy workers in 2013, versus 2.94 million in the UK. In terms of workforce shares, the Netherlands is the closest comparator, with 10.9 per cent of employees working in the creative economy in 2013, versus 9.93 per cent in the UK. The Netherlands also has a similar share of workers in the creative industries (7.68 per cent vs. the UK's 7.91 per cent of all workers in 2013). However, in absolute terms the Dutch creative economy comprises just 834,000 workers in 2013, around a third of the UK's creative economy workforce of 2.94 million. Note that Sweden, although having a much smaller creative economy workforce than the UK's (557,000 people in 2013), has the largest creative economy employment share of all countries considered (11.92 per cent in 2013). As we shall see, Sweden's creative industries also have the highest creative intensity.

We now look briefly at each country in turn. Germany's creative economy and creative industries are bigger than the UK's in counts – the only instance of this in the countries we consider – but are smaller in relative terms (7.96 per cent versus 9.93 per cent of the workforce in 2013). Both creative economy jobs (0.09 percentage points) and creative industries jobs (0.04 percentage points) have grown marginally between 2012 and 2013.

France's creative economy and creative industries are smaller than the UK's, both in terms of counts (1.92 million employed in France's creative economy and 1.41 million in its creative industries in 2013, versus 2.94 million and 2.34 million for the UK in the same year) and in terms of employment shares (7.54 per cent for the creative economy and 5.52 per cent for the creative industries in 2013, versus 9.93 per cent and 7.91 per cent respectively in the UK). France is also the only country of those considered to have seen a (small) fall in the share of its creative industries in the overall workforce between 2011 and 2013).

As noted earlier, the Netherlands is closest to the UK in terms of the creative economy's share of the national workforce and the creative industries, but is much smaller in absolute term reflecting its smaller population. The Netherlands has seen continuous job growth in all parts of its creative economy during 2011–2013: the creative economy workforce increased by 1.53 percentage points between 2011 and 2013, compared to 0.88 percentage points in the UK. The Dutch growth seems to have been largely driven by a substantial rise in the share of embedded jobs between 2012 and 2013, a rise of 1.07 percentage points. Eurostat rates Dutch data as some of the best quality in the EU LFS, so on the face of it this result represents a large expansion in creative roles across the wider Dutch workforce.

Poland is perhaps the most economically dynamic of the A8 group of countries that joined the EU in 2004. Poland's creative economy and creative industries workforces are both much smaller than those of the UK – around 30 per cent and 25 per cent of the UK totals, respectively – but about the same size as the Netherlands, at 873,000 (creative economy) and 580,000 (creative industries) in 2013. Of the five countries, Poland also has the smallest creative economy employment shares, at 5.62 per cent of all workers in 2013, compared with 9.93 per cent in the UK. The country has also seen growth in the creative industries and creative economy employment during the study period, but at slower rates than the other countries considered, with the exception of France.

Finally, Sweden represents a distinctive case in the set of six countries. The country has, in absolute terms, a small creative economy workforce – just 557,000 employees in 2013, the smallest of the comparator set and about one–sixth the size of the UK's. The creative economy workforce is seemingly dominated by creative industries employment, which comprises about 75 per cent of the whole (415,000 workers in 2013) and which is approaching Poland (580,000 in 2013) and the Netherlands (588,000) in counts. Both creative industries and creative economy employment shares are higher than in the UK (8.88 per cent vs. 7.91 per cent and 11.92 per cent vs. 9.93 per cent respectively, in 2013). During the study period, growth was, however, close to static in the creative economy workforce (which rose an average of 0.03 percentage points, compared to 0.44 points in the UK) and was actually static in the creative industries between 2012 and 2013.

6.2 Creative Tridents

Table 9 provides Creative Tridents for the study countries, which shed some more light on the internal structure of each's creative economy workforce. As before, countries are stacked in order, while the bottom panel includes the UK again for ease of comparison. All data is averaged over 2011–2013, except for Germany where we present 2012–2013 owing to the absence of 4-digit occupational coding resolution in 2011.

TABLE 9 CREATIVE ECONOMY EMPLOYMENT TRIDENTS: CROSS-COUNTRY COMPARISONS

Germany			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 806,000	Embedded: 851,000	Creatively occupied jobs: 1,657,000
Non-creative occupations	Non-specialists: 1,450,000	Non-creative: 36,183,000	Non-creatively occupied jobs: 37,633,000
All occupations	Working in creative industries: 2,256,000	Working outside the creative industries: 37,034,000	Workforce: 39,290,000
Average intensity	*0.357*		

France			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 264,000	Embedded: 449,000	Creatively occupied jobs: 713,000
Non-creative occupations	Non-specialists: 1,169,000	Non-creative: 23,684,000	Non-creatively occupied jobs: 24,853,000
All occupations	Working in creative industries: 1,433,000	Working outside the creative industries: 24,133,000	Workforce: 25,566,000
Average intensity	*0.184*		

Netherlands			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 190,000	Embedded: 187,000	Creatively occupied jobs: 377,000
Non-creative occupations	Non-specialists: 377,000	Non-creative: 6,806,000	Non-creatively occupied jobs: 7,183,000
All occupations	Working in creative industries: 567,000	Working outside the creative industries: 6,993,000	Workforce: 7,560,000
Average intensity	*0.335*		

Poland			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 182,000	Embedded: 278,000	Creatively occupied jobs: 460,000
Non-creative occupations	Non-specialists: 381,000	Non-creative: 14,696,000	Non-creatively occupied jobs: 15,077,000
All occupations	Working in creative industries: 563,000	Working outside the creative industries: 14,974,000	Workforce: 15,537,000
Average intensity	*0.323*		

Sweden, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 164,000	Embedded: 142,000	Creatively occupied jobs: 306,000
Non-creative occupations	Non-specialists: 248,000	Non-creative: 4,078,000	Non-creatively occupied jobs: 4,326,000
All occupations	Working in creative industries: 412,000	Working outside the creative industries: 4,220,000	Workforce: 4,632,000
Average intensity	*0.398*		

UK, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 816,000	Embedded: 570,000	Creatively occupied jobs: 1,386,000
Non-creative occupations	Non-specialists: 1,405,000	Non-creative: 26,515,000	Non-creatively occupied jobs: 27,920,000
All occupations	Working in creative industries: 2,221,000	Working outside the creative industries: 27,085,000	Workforce: 29,307,000
Average intensity	*0.367*		

Source: EU Labour Force Survey
Notes: As in Table 1. Figures may not sum due to rounding.

Germany has more people employed in creative occupations (1.66 million) compared with the UK's 1.39 million, while creative industries employment is relatively similar: 2.26 million for Germany and 2.22 million for the UK. The German figures are based on slightly more recent data (2012–13 as opposed to 2011–13) which may also inflate them relative to the UK figures. As the German workforce has around ten million more people than the UK's, creative industries and occupations account for a larger proportion of the UK's workforce. Another difference is that creative occupations are more likely to be employed in creative industries (0.82 million) in the UK than outside the creative industries (0.57 million) in the EU LFS data, whereas in Germany the split is more even (0.81 million vs 0.85 million). The creative intensity of the UK (0.367) and German creative industries (0.357) are relatively similar.

France's workforce is similar to the UK's (25.56 million vs. 29.3 million), but it has a far smaller creative industries workforce according to the EU LFS data (1.43 million vs. 2.22 million) and seemingly much fewer creative specialists (264,000 versus 816,000 in the UK), so that its creative intensity is much lower too as a result (0.184, versus 0.367). Conversely, the country has the largest ratio of embedded creative workers to specialists (1.7, versus 0.7 in the UK).

As noted earlier, the Netherlands has much smaller creative economy and creative industries workforces than the UK, reflecting its much smaller overall workforce: 7.56 million vs. nearly 30 million in the UK. However, in terms of internal structure the creative economy workforce is quite similar to that of the UK. In particular, the average creative intensity of the Dutch creative industries is 0.335 (versus 0.367 in the UK), and like the UK, the country has more creative workers in these industries than outside: the ratio of embedded workers to specialists is 0.98, higher than the UK ratio of 0.7 but substantially lower than in France (1.7), Poland (1.5) and Germany (1.06 in 2012–2013).

Poland's workforce is about half the size of the UK's, but its creative industries workforce is around a quarter of the British total, and the country has a lot more embedded creative workers than specialists (with an embedded: specialist ratio of 1.5). Despite this, the average creative intensity in Polish creative industries appears not dissimilar to that of the UK, at 0.323. This might seem surprising for an accession country, but Poland has been the recipient of substantial FDI in recent years, notably from Germany, which will presumably have helped to raise the level of skilled and creative employment opportunities in the country since 2008.

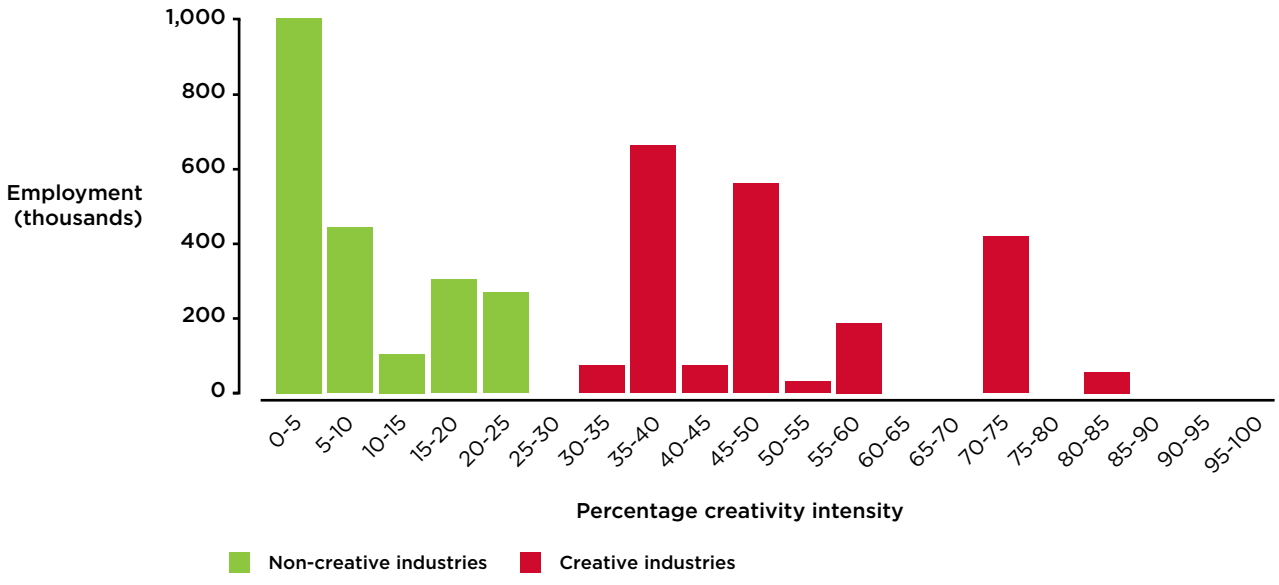
Sweden has a workforce of just 4.6 million, the smallest of the five countries considered here, and accounting for around 15 per cent of the UK's working population. It also has a much smaller creative workforce. However, close to 40 per cent of creative industries workers are creative specialists, which gives Swedish creative sectors a higher average creative intensity than their UK and German counterparts. Like the UK, Sweden also has more creative workers inside the creative industries than outside.

6.3 Creative intensity analysis

We now explore the distributions of creative intensity across industries in the different countries.

Figure 2, shows the characteristic bimodal distribution of UK creative employment by creative and non-creative 3-digit industries, with peaks at 0–5 per cent creative workers (non-creative) and 35–40 per cent (creative), first identified in BFH using 4-digit SIC APS data. Figures 3–7 replicate this analysis for the five comparator countries.

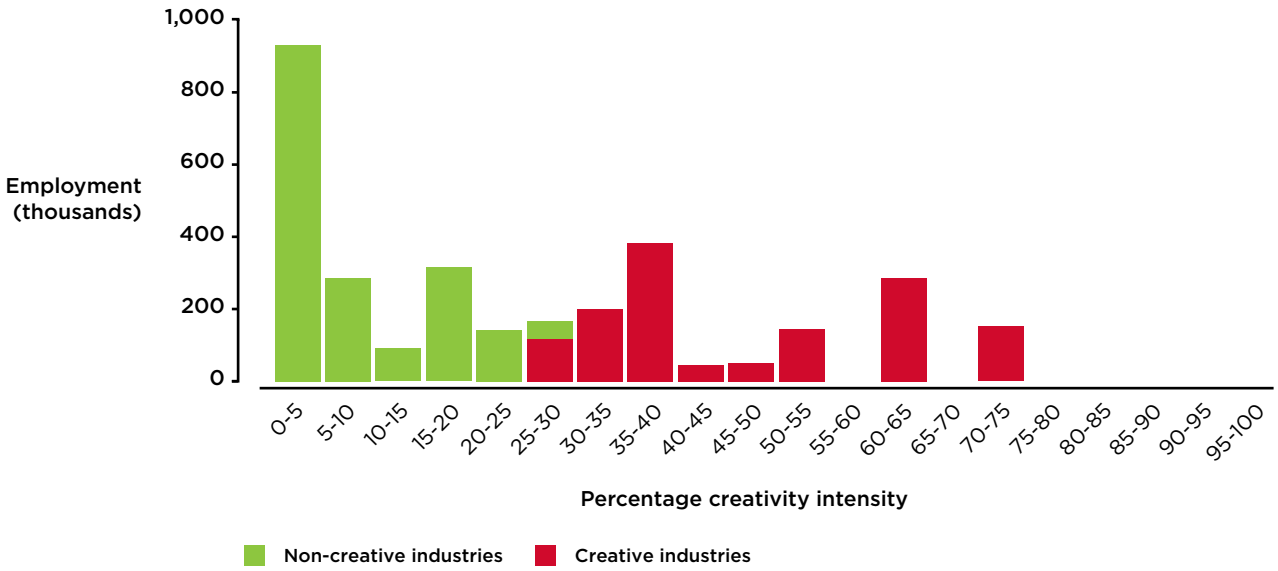
FIGURE 2 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT INDUSTRIES, UK



Source: EU Labour Force Survey.

Figure 3 gives the results for Germany 2012–2013. There is a bimodal distribution of creative occupations between designated creative and non-creative sectors. Like France – and unlike the Netherlands, Poland and Sweden – there is also a great deal of creative work in 'non-creative' industries.

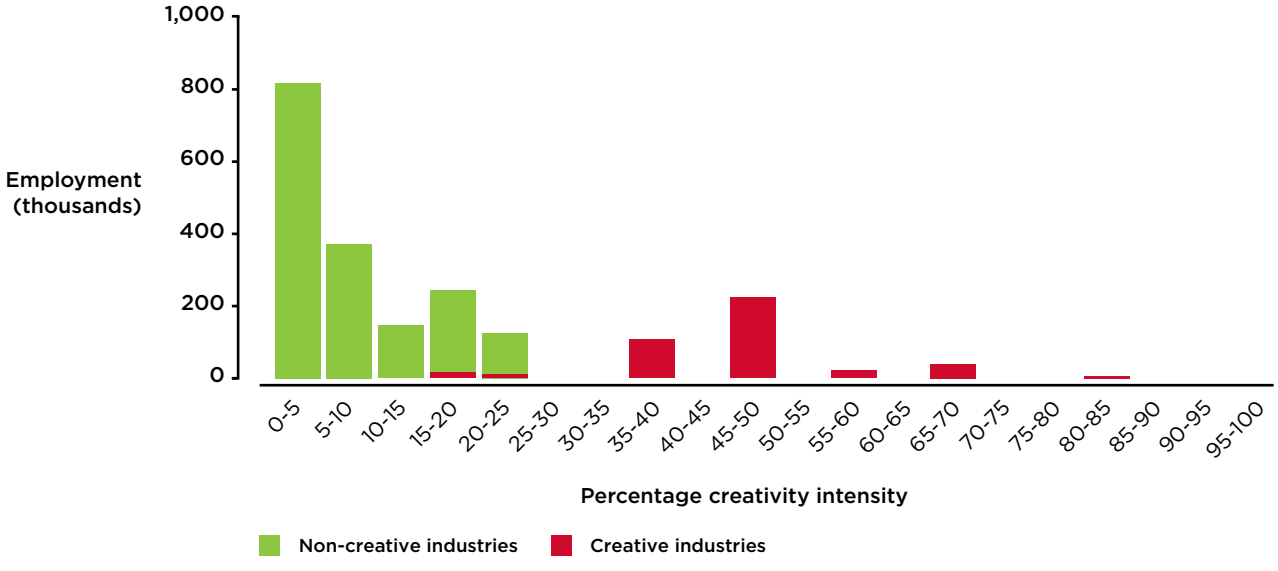
FIGURE 3 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT SIC INDUSTRIES, GERMANY



Source: EU Labour Force Survey.

Figure 4 plots the distribution of creative intensity for France. Here, the distribution of creative intensities is only 'loosely' bimodal – strictly speaking the two peaks both occur in the set of non-creative industries. The average creative intensity for French industry is substantially lower than in the other comparator countries, and we again see that non-creative industries employ a large proportion of creative workers.

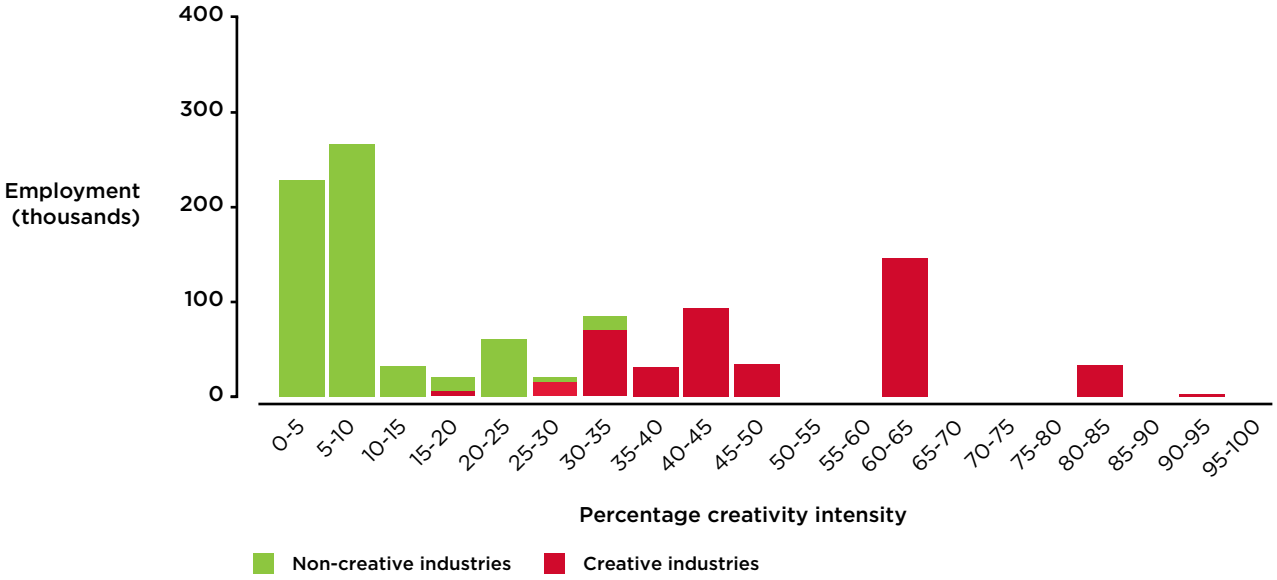
FIGURE 4 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT SIC INDUSTRIES, FRANCE



Source: EU Labour Force Survey.

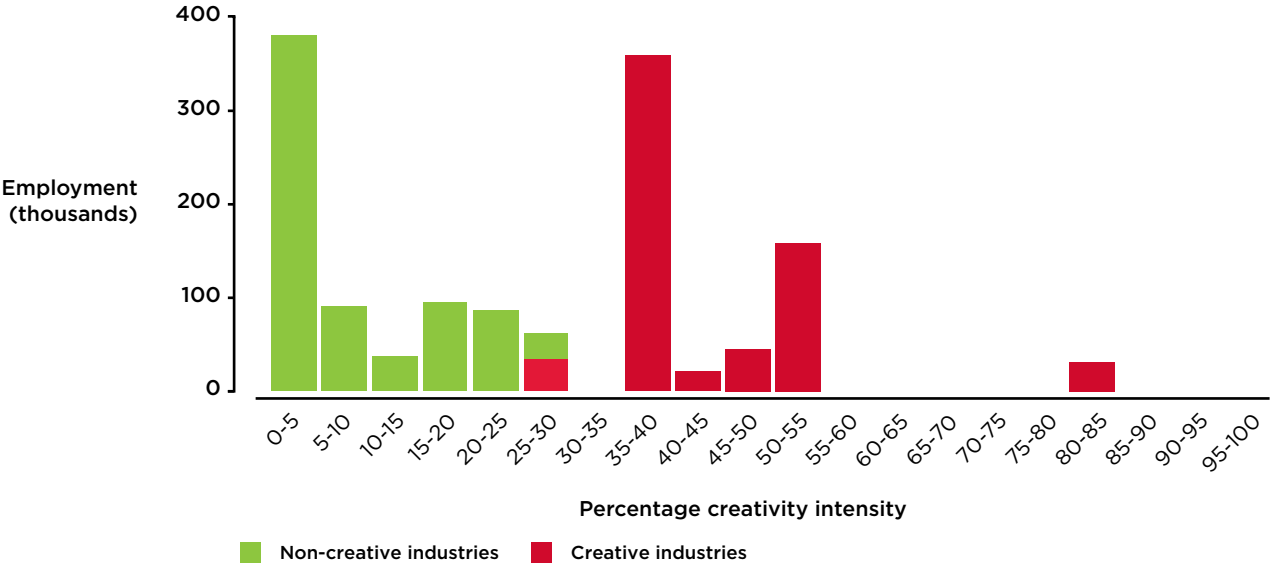
Figure 5 looks at the Netherlands, where average creative intensity is 0.335, relatively close to the UK, and Figure 6 presents the results for Poland, where average creative intensity is 0.323. In both cases the distributions can again be characterised as broadly bimodal.

FIGURE 5 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT SIC INDUSTRIES, THE NETHERLANDS



Source: EU Labour Force Survey.

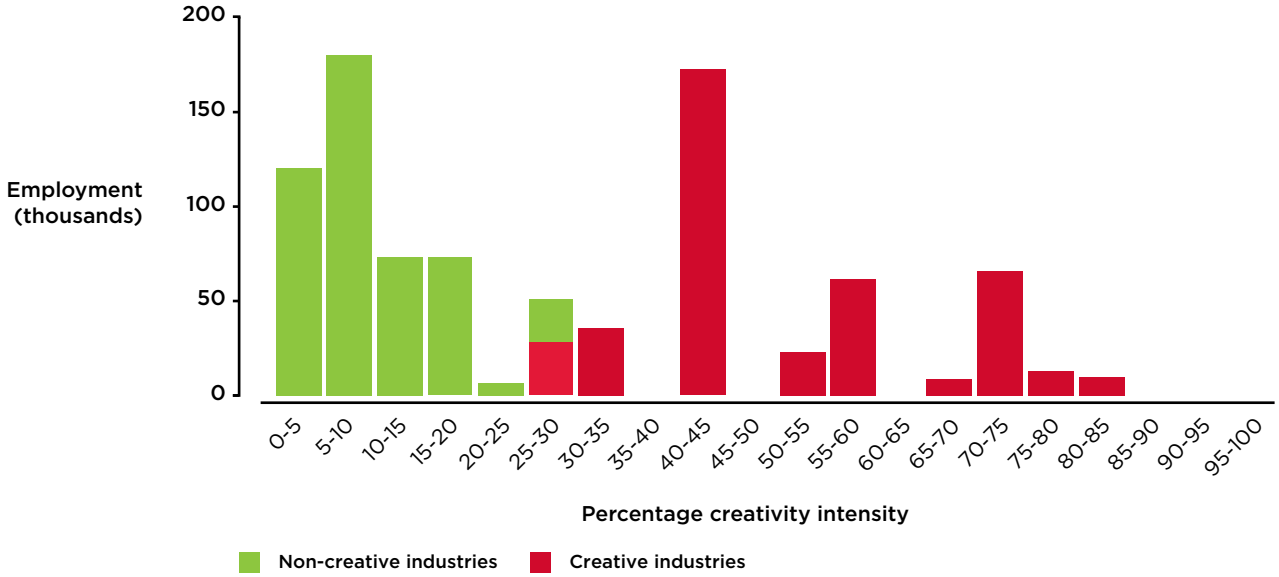
FIGURE 6 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT SIC INDUSTRIES, POLAND



Source: EU Labour Force Survey.

Finally, Figure 7 plots the results for Sweden. Here, there is clearly a bimodal distribution of creative work, although – as noted earlier – Sweden's creative industries have the highest creative intensities of the group of countries we consider.

FIGURE 7 DISTRIBUTION OF CREATIVE JOBS BY INTENSITY, 3-DIGIT SIC INDUSTRIES, SWEDEN



Source: EU Labour Force Survey.

The finding that each of the five comparator countries exhibits a creative intensity distribution across industries that is broadly bimodal is important. It indicates that creative intensity may be used to reliably discriminate creative and other industries in other parts of the European Union, not just in the UK.

6. DISCUSSION

This report compares employment in the creative industries of the EU and UK between 2011 and 2013. Our main analysis covers the UK and the EU–28, and we extend this to also look in detail at the creative economies within which the creative industries sit in the UK, France, Germany, the Netherlands, Poland and Sweden. We analyse the distribution of creative intensities to further explore cross–country differences, and subject our main results to a series of robustness checks.

To undertake this analysis we have had to develop a number of technical procedures and workarounds and, as such, our estimates should be seen as proof of concept. There is a very high quality match between the UK and international occupational codes that underpin the analysis. However, although UK and EU industry codes are identical at the 4–digit level, we need to use less detailed, best–fit, 3–digit versions to conduct the comparative analysis. This means that the UK estimates presented are larger than those using the most detailed UK industrial classifications, such as in DCMS (2014) and Bakhshi et al., (2015). We use parsing rules to reduce such biases, but we cannot eradicate them. This caveat should be borne in mind when reviewing the results.

Key findings are:

- The creative industries in the UK account for a higher share of workforce employment than in the EU as a whole, at 7.58 per cent versus 5.21 per cent in the 2011–2013 period. However, the distribution of employment shares across the sub–sectors that make up the creative industries is quite similar. The UK's creative industries' average annual employment growth outstripped that of the EU creative industries, at 6.1 per cent per annum (p.a.) versus 1.8 per cent p.a. over 2011–2013.
- The overall EU creative industry employment estimates are significantly higher than in previous published EU studies: the differences are likely to stem largely from these studies using older and/or less precise industry classifications, more restricted and older datasets, smaller country sets or, likely, a combination of all of these.
- Comparisons between countries where occupational data are available at the 4–digit ISCO resolution shed more light on different creative economy structures across the EU.
  - Of the six member states we consider, Sweden has proportionately the largest creative economy workforce (11.92 per cent in 2013), followed by the Netherlands (10.9 per cent in 2013), UK (9.93 per cent), Germany (7.96 per cent), France (7.54 per cent) and then Poland (5.62 per cent).
  - All of the comparator countries experienced continuous growth in their creative economy workforces between 2011 and 2013.
  - Creative intensity turns out to be highest in Sweden (0.398 across all industries between 2011 and 2013), followed by the UK (0.367 over the same period), Germany (0.357 in 2012–2013), the Netherlands (0.335), Poland (0.323) and, finally, France (0.184).
  - On the EU LFS data, the UK, the Netherlands and Sweden have more creative workers inside the creative industries than outside; Germany has slightly more creative workers in non–creative sectors than creative, and Poland and France have large majorities of creative workers employed outside of the creative industries.

- There is variation across countries in the importance of the creative industries workforce too: Sweden's creative sectors account for the largest share of the national workforce (8.88 per cent in 2013), followed by the UK (7.91 per cent), the Netherlands (7.68 per cent), Germany (5.76 per cent), France (5.52 per cent) and then Poland (3.73 per cent). France is alone in having experienced a (small) shrinkage in its creative industries' employment share between 2011 and 2013.
- In all five UK comparator countries, the overall distribution of creative work between creative and non–creative sectors is broadly bimodal. This suggests that the key insight from the Dynamic Mapping approach – that creative intensity can be used to discriminate between creative and other industries, and that this can serve as a practical methodology for classifying creative industries – is not restricted to the UK, but applies in other parts of the EU too, strengthening its case as an international standard.

Alongside our forthcoming companion analysis on the US and Canadian creative economies, we believe our report represents the most ambitious attempt to date to produce internationally comparable statistics on the creative economy. We look forward to receiving feedback.

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APPENDICES

Appendix 1/DCMS creative occupations and industries

TABLE A1 CREATIVE OCCUPATIONS

SOC2010	SOC2010 Descriptor
1132	Marketing and sales directors
1134	Advertising and public relations directors
1136	Information technology and telecommunications directors
2135	IT business analysts, architects and systems designers
2136	Programmers and software development professionals
2137	Web design and development professionals
2431	Architects
2432	Town planning officers
2435	Chartered architectural technologists
2451	Librarians
2452	Archivists and curators
2471	Journalists, newspaper and periodical editors
2472	Public relations professionals
2473	Advertising accounts managers and creative directors
3121	Architectural and town planning technicians
3411	Artists
3412	Authors, writers and translators
3413	Actors, entertainers and presenters
3414	Dancers and choreographers
3415	Musicians
3416	Arts officers, producers and directors
3417	Photographers, audio-visual and broadcasting equipment operators
3421	Graphic designers
3422	Product, clothing and related designers
3543	Marketing associate professionals
5211	Smiths and forge workers
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

Source: DCMS 2014.
Red text = not in Bakhshi, Freeman and Higgs 2013.

TABLE A2 **CREATIVE INDUSTRIES**

SIC07	SIC07 Descriptor
32.12	Manufacture of jewellery and related articles
58.11	Book publishing
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
58.21	Publishing of computer games
58.29	Other software publishing
59.11	Motion picture, video and television programme production activities
59.12	Motion picture, video and television programme post-production
59.13	Motion picture, video and television programme distribution
59.14	Motion picture projection activities
59.2	Sound recording and music publishing activities
60.1	Radio broadcasting
60.2	Television programming and broadcasting activities
62.01	Computer programming activities
62.02	Computer consultancy activities
70.21	Public relations and communication activities
71.11	Architectural activities
73.11	Advertising agencies
73.12	Media representation
74.1	Specialised design activities
74.2	Photographic activities
74.3	Translation and interpretation activities
85.52	Cultural education
90.01	Performing arts
90.02	Support activities to performing arts
90.03	Artistic creation
90.04	Operation of arts facilities
91.01	Library and archive activities
91.02	Museum activities

Source: DCMS 2014.
Red text = not in Bakhshi, Freeman and Higgs 2013..

Appendix 2 / EU creative occupations

TABLE A3 SOC – ISCO CROSSWALK

SOC2010	SOC2010 Descriptor	ISCO08	ISCO08 Descriptor
1132	Marketing and sales directors	1221	Sales and marketing managers
1134	Advertising and public relations directors	1222	Advertising and public relations managers
1136	Information technology and telecommunications directors	1330	Information and communications technology services managers
2135	IT business analysts, architects and systems designers	2511	Systems analysts
2136	Programmers and software development professionals	2512	Software developers
2137	Web design and development professionals	2513	Web and multimedia developers
2431	Architects	2161	Building architects
2432	Town planning officers	2164	Town and traffic planners
2451	Librarians	2622	Librarians and related information professionals
2452	Archivists and curators	2621	Archivists and curators
2471	Journalists, newspaper and periodical editors	2642	Journalists
2472	Public relations professionals	2432	Public relations professionals
2473	Advertising accounts managers and creative directors	2431	Advertising and marketing professionals
3121	Architectural and town planning technicians	3112	Civil engineering technicians
3411	Artists	2651	Visual artists
3412	Authors, writers and translators	2641	Authors and related writers
3413	Actors, entertainers and presenters	2655	Actors
3414	Dancers and choreographers	2355	Other arts teachers
3415	Musicians	2652	Musicians, singers and composers
3416	Arts officers, producers and directors	2654	Film, stage and related directors and producers
3417	Photographers, audio-visual and broadcasting equipment operators	3431 3521	Photographers Broadcasting and audiovisual technicians
3421	Graphic designers	2166	Graphic and multimedia designers
3422	Product, clothing and related designers	2163 3432	Product and garment designers Interior designers and decorators
3543	Marketing associate professionals	2431	Advertising and marketing professionals
5211	Smiths and forge workers	7221	Blacksmiths, hammersmiths and forging press workers
5411	Weavers and knitters	7318	Handicraft workers in textile, leather and related materials
5441	Glass and ceramics makers, decorators and finishers	7314	Potters and related workers
5442	Furniture makers and other craft woodworkers	7522	Cabinet-makers and related workers
5449	Other skilled trades not elsewhere classified	7316	Sign writers, decorative painters, engravers and etchers

Red text = not in Bakhshi, Freeman and Higgs 2013. Purple text = possible error in crosswalk.

Appendix 3 / Parsing SIC/NACE industry codes

TABLE A4 SIC/NACE 4-DIGIT TO 3-DIGIT PARSING PROCESS

SIC07/4	SIC07/4 Descriptor	SIC07/3	Components	Share	Include?
32.12	Manufacture of jewellery and related articles	32.1	32.11 32.12 32.13	0.33 0.33 0.33	N
58.11	Book publishing	58.1	58.11	1.00	Y
58.12	Publishing of directories and mailing lists		58.12	1.00	
58.13	Publishing of newspapers		58.13	1.00	
58.14	Publishing of journals and periodicals		58.14	1.00	
58.19	Other publishing activities		58.19	1.00	
58.21	Publishing of computer games	58.2	58.21	1.00	Y
58.29	Other software publishing		58.29	1.00	
59.11	Motion picture, video and television programme production activities	59.1	59.11	1.00	Y
59.12	Motion picture, video and television programme post-production		59.12	1.00	
59.13	Motion picture, video and television programme distribution		59.13	1.00	
59.14	Motion picture projection activities		59.14	1.00	
59.2	Sound recording and music publishing activities	59.2	59.2	1.00	Y
60.1	Radio broadcasting	60.1	60.1	1.00	Y
60.2	Television programming and broadcasting activities	60.2	60.2	1.00	Y
62.01	Computer programming activities	62.0	62.01 62.02 62.03 62.09	0.50 0.50 0.50 0.50	Y
62.02	Computer consultancy activities				
70.21	Public relations and communication activities	70.2	70.21 70.22	0.50 0.50	Y
71.11	Architectural activities	71.1	71.11 71.12	0.5 0.5	Y
73.11	Advertising agencies	73.1	73.11	1.00	Y
73.12	Media representation		73.12	1.00	
74.1	Specialised design activities	74.1	74.1	1.00	Y
74.2	Photographic activities	74.2	74.2	1.00	Y
74.3	Translation and interpretation activities	74.3	74.3	1.00	Y
85.52	Cultural education	85.5	85.51 85.52 85.53 85.59	0.25 0.25 0.25 0.25	N
90.01	Performing arts	91.0	90.01	1.00	Y
90.02	Support activities to performing arts		90.02	1.00	
90.03	Artistic creation		91.03	0.50	
90.04	Operation of arts facilities		91.04	0.50	
91.01	Library and archive activities	91.0	91.01	0.50	Y
91.02	Museum activities		91.02	0.50	
			91.03	0.50	
			91.04	0.50	

Red text = not in Bakhshi, Freeman and Higgs 2013. Share denotes (number of DCMS SIC4 codes)/(number of SIC4 codes in underlying 3-digit SIC cell).

Appendix 4 / Creative tridents for all EU-28 member states, 2011–2013 averages

Notes: Data is taken from EU LFS aggregates. Totals may not sum due to rounding. Red tables indicate low quality data highlighted by Eurostat. Data for Belgium and Germany is presented for 2012–2013 as 4-digit occupational resolution is only available for these years. Results for Bulgaria, Cyprus, Denmark, Greece, Italy, Portugal, Latvia and Spain are presented for industries only due to the absence of 4-digit occupational resolution for these countries in the EU LFS in 2011–2013.

Austria, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 86,000	Embedded: 107,000	Creatively occupied jobs: 193,000
Non-creative occupations	Non-specialists: 145,000	Non-creative: 3,818,000	Non-creatively occupied jobs: 3,963,000
All occupations	Working in creative industries: 231,000	Working outside the creative industries: 3,925,000	Workforce: 4,156,000
Average intensity	*0.372*		

Belgium, 2012–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 38,000	Embedded: 124,000	Creatively occupied jobs: 162,000
Non-creative occupations	Non-specialists: 68,000	Non-creative: 4,284,000	Non-creatively occupied jobs: 4,352,000
All occupations	Working in creative industries: 105,000	Working outside the creative industries: 4,408,000	Workforce: 4,513,000
Average intensity	*0.362*		

Bulgaria, 2012–2013			
	Creative industries	**Non-creative industries**	**All industries**
All occupations	Working in creative industries: 39,000	Working outside the creative industries: 2,900,000	Workforce: 2,939,000
Average intensity	*0.026*		

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Croatia, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 16,000	Embedded: 13,000	Creatively occupied jobs: 29,000
Non-creative occupations	Non-specialists: 46,000	Non-creative: 1,462,000	Non-creatively occupied jobs: 1,508,000
All occupations	Working in creative industries: 62,000	Working outside the creative industries: 1,475,000	Workforce: 1,537,000
Average intensity	*0.258*		

Cyprus, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
All occupations	Working in creative industries: 5,000	Working outside the creative industries: 376,000	Workforce: 381,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Czech Republic, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 67,000	Embedded: 101,000	Creatively occupied jobs: 168,000
Non-creative occupations	Non-specialists: 170,000	Non-creative: 4,548,000	Non-creatively occupied jobs: 4,718,000
All occupations	Working in creative industries: 236,000	Working outside the creative industries: 4,649,000	Workforce: 4,886,000
Average intensity	*0.284*		

Denmark, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
All occupations	Working in creative industries: 92,000	Working outside the creative industries: 2,594,000	Workforce: 2,686,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Estonia, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 8,000	Embedded: 7,000	Creatively occupied jobs: 15,000
Non-creative occupations	Non-specialists: 26,000	Non-creative: 556,000	Non-creatively occupied jobs: 582,000
All occupations	Working in creative industries: 34,000	Working outside the creative industries: 563,000	Workforce: 597,000
Average intensity	*0.235*		

Finland, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 89,000	Embedded: 62,000	Creatively occupied jobs: 151,000
Non-creative occupations	Non-specialists: 113,000	Non-creative: 2,185,000	Non-creatively occupied jobs: 2,298,000
All occupations	Working in creative industries: 202,000	Working outside the creative industries: 2,247,000	Workforce: 2,449,000
Average intensity	*0.441*		

France, 2011–2013			
	Creative industries	**Non-creative industries**	**All industries**
Creative occupations	Specialists: 264,000	Embedded: 449,000	Creatively occupied jobs: 713,000
Non-creative occupations	Non-specialists: 1,169,000	Non-creative: 23,684,000	Non-creatively occupied jobs: 24,853,000
All occupations	Working in creative industries: 1,433,000	Working outside the creative industries: 24,133,000	Workforce: 25,566,000
Average intensity	*0.184*		

Germany, 2012–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 806,000	Embedded: 851,000	Creatively occupied jobs: 1,657,000
Non-creative occupations	Non-specialists: 1,450,000	Non-creative: 36,183,000	Non-creatively occupied jobs: 37,633,000
All occupations	Working in creative industries: 2,256,000	Working outside the creative industries: 37,034,000	Workforce: 39,290,000
Average intensity	*0.357*		

Note: German figures are presented for 2012–2013, due to the absence of 4-digit occupations resolution for this country in 2011 in the EU LFS.

Greece, 2011–2013			
	Creative industries	Non-creative industries	All industries
All occupations	Working in creative industries: 149,000	Working outside the creative industries: 3,597,000	Workforce: 3,746,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Hungary, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 61,000	Embedded: 57,000	Creatively occupied jobs: 118,000
Non-creative occupations	Non-specialists: 94,000	Non-creative: 3,603,000	Non-creatively occupied jobs: 3,697,000
All occupations	Working in creative industries: 155,000	Working outside the creative industries: 3,661,000	Workforce: 3,816,000
Average intensity	*0.394*		

Ireland 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 7,000	Embedded: 26,000	Creatively occupied jobs: 33,000
Non-creative occupations	Non-specialists: 51,000	Non-creative: 1,768,000	Non-creatively occupied jobs: 1,819,000
All occupations	Working in creative industries: 58,000	Working outside the creative industries: 1,794,000	Workforce: 1,852,000
Average intensity	*0.121*		

Italy, 2011–2013			
	Creative industries	Non-creative industries	All industries
All occupations	Working in creative industries: 1,091,000	Working outside the creative industries: 21,642,000	Workforce: 22,733,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Latvia, 2011–2013			
	Creative industries	Non-creative industries	All industries
All occupations	Working in creative industries: 21,000	Working outside the creative industries: 849,000	Workforce: 870,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Lithuania, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 14,000	Embedded: 43,000	Creatively occupied jobs: 57,000
Non-creative occupations	Non-specialists: 42,000	Non-creative: 1,164,000	Non-creatively occupied jobs: 1,206,000
All occupations	Working in creative industries: 56,000	Working outside the creative industries: 1,206,000	Workforce: 1,263,000
Average intensity	*0.250*		

Luxembourg, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 1,000	Embedded: 1,000	Creatively occupied jobs: 2,000
Non-creative occupations	Non-specialists: 10,000	Non-creative: 206	Non-creatively occupied jobs: 216,000
All occupations	Working in creative industries: 11,000	Working outside the creative industries: 207,000	Workforce: 218,000
Average intensity	*0.091*		

Malta, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 2,000	Embedded: 1,000	Creatively occupied jobs: 3,000
Non-creative occupations	Non-specialists: 5,000	Non-creative: 158,000	Non-creatively occupied jobs: 163,000
All occupations	Working in creative industries: 7,000	Working outside the creative industries: 160,000	Workforce: 167,000
Average intensity	*0.286*		

Netherlands, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 190,000	Embedded: 187,000	Creatively occupied jobs: 377,000
Non-creative occupations	Non-specialists: 377,000	Non-creative: 6,806,000	Non-creatively occupied jobs: 7,183,000
All occupations	Working in creative industries: 567,000	Working outside the creative industries: 6,993,000	Workforce: 7,560,000
Average intensity	*0.335*		

Poland, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 182,000	Embedded: 278,000	Creatively occupied jobs: 460,000
Non-creative occupations	Non-specialists: 381,000	Non-creative: 14,696,000	Non-creatively occupied jobs: 15,077,000
All occupations	Working in creative industries: 563,000	Working outside the creative industries: 14,974,000	Workforce: 15,537,000
Average intensity	*0.323*		

Portugal, 2011–2013			
	Creative industries	Non-creative industries	All industries
All occupations	Working in creative industries: 142,000	Working outside the creative industries: 4,408,000	Workforce: 4,550,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Romania, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 35,000	Embedded: 122,000	Creatively occupied jobs: 157,000
Non-creative occupations	Non-specialists: 109,000	Non-creative: 8,923,000	Non-creatively occupied jobs: 9,032,000
All occupations	Working in creative industries: 144,000	Working outside the creative industries: 9,045,000	Workforce: 9,189,000
Average intensity	*0.243*		

Slovakia, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 67,000	Embedded: 101,000	Creatively occupied jobs: 168,000
Non-creative occupations	Non-specialists: 170,000	Non-creative: 4,548,000	Non-creatively occupied jobs: 4,718,000
All occupations	Working in creative industries: 236,000	Working outside the creative industries: 4,649,000	Workforce: 4,885,000
Average intensity	*0.284*		

Slovenia, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 8,000	Embedded: 31,000	Creatively occupied jobs: 39,000
Non-creative occupations	Non-specialists: 15,000	Non-creative: 861,000	Non-creatively occupied jobs: 876,000
All occupations	Working in creative industries: 22,000	Working outside the creative industries: 892,000	Workforce: 914,000
Average intensity	*0.364*		

Spain, 2011–2013			
	Creative industries	Non-creative industries	All industries
All occupations	Working in creative industries: 842,000	Working outside the creative industries: 16,868,000	Workforce: 17,710,000

Note: The creative occupations totals are omitted due to the absence of 4-digit occupations resolution for this country in the EU LFS.

Sweden, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 164,000	Embedded: 142,000	Creatively occupied jobs: 306,000
Non-creative occupations	Non-specialists: 248,000	Non-creative: 4,078,000	Non-creatively occupied jobs: 4,326,000
All occupations	Working in creative industries: 412,000	Working outside the creative industries: 4,220,000	Workforce: 4,632,000
Average intensity	*0.398*		

UK, 2011–2013			
	Creative industries	Non-creative industries	All industries
Creative occupations	Specialists: 816,000	Embedded: 570,000	Creatively occupied jobs: 1,386,000
Non-creative occupations	Non-specialists: 1,405,000	Non-creative: 26,515,000	Non-creatively occupied jobs: 27,920,000
All occupations	Working in creative industries: 2,221,000	Working outside the creative industries: 27,085,000	Workforce: 29,307,000
Average intensity	*0.367*		

ENDNOTES

1. National Institute of Economic and Social Research.
2. City University.
3. For UK data Eurostat uses LFS population weights supplied by the ONS. Eurostat apply some slightly different treatments to UK LFS data to generate EU LFS estimates, which will also account for some differences between the EU LFS and DCMS estimates. For example, first, Eurostat filters for respondents in private households, whereas the LFS/APS includes those in, for example, halls of residence. This excludes 0.4 per cent of the total population. Second, EU LFS data does not count second jobs. In practice, this makes little difference to the estimates, however, as 2013 APS data shows that only 3.89 per cent of those in work in the UK held a second job.
4. Specifically, 2013 APS estimates as set out in the DCMS January 2014 published statistical release.
5. This is not a feature of the official creative economy statistics for the UK which are based on 4-digit SICs and APS data.
6. King et al., (2009) in particular conduct a cross-country analysis for the US, Canada and Sweden, but adopt a much simpler treatment that aggregates occupations into four groups based on Creative Class concepts, and groups industries into four blocs.
7. Specifically, BFH set the threshold so it lies an equal distance between the bimodal distribution of creative occupation employment across industries' creative intensity. The threshold is then used to reclassify industries between creative and non-creative categories, before further sensitivity checks are run. There is no reason to expect this threshold to be the same across countries or indeed over time.
8. King et al., (2009) conduct a cross-country analysis of job structures within industries for the US, Canada and Sweden. They use a single year of data and adopt simple typologies that aggregate occupations into four groups based on Creative Class concepts, and group industries into four blocs. Falk et al., (2011) cover productivity and employment in the creative industries across EU27 countries, between 2000 and 2008. They use business data (rather than labour force data) and use NACE1.1 codes (rather than the current NACE2 codes we use). Boix et al., (2010) compare geographies of creative industry activity in the UK, France, Italy and Spain, using a single year of data (between 1999 and 2007 depending on the country) and two-digit SIC/NACE codes. Boix et al., (2014) extend this analysis using three-digit NACE codes on the same years of data.
9. NACE stands for the Nomenclature of Economic Activities, and is the European statistical classification of economic activities at the industry level.
10. For example, the UK co-authors of the present study – experienced users of official UK microdata – still had to wait ten weeks before securing access to the ONS micro data.
11. For overviews see http://ec.europa.eu/eurostat/web/lfs/overview and http://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey both accessed 23 February 2015). Member states who have joined since 2010 (such as Croatia) provide backdated data.
12. Anyone living in institutions/collective households is excluded. The EU LFS also excludes people in other EU member states carrying out obligatory military or community service.
13. For UK data Eurostat uses LFS population weights supplied by the ONS.
14. Some cells have been suppressed due to confidentiality issues. Typically these involve cells comprising 200-400 observations or less.
15. There are some small differences between the treatment of UK data in the EU LFS and the underlying APS data. For example, Eurostat filters for respondents in private households, whereas the APS includes those in (say) halls of residence. This excludes 0.4 per cent of the total population.
16. A small number of industry*occupation cells are flagged by Eurostat as potentially unreliable, depending on sample size and design in the individual member states. These are disproportionately concentrated in the Czech Republic, Italy and Spain.
17. https://en.wikipedia.org/wiki/List_of_European_Union_member_states_by_population
18. Originally designed for manufacturing sectors, industry codes such as SICs are able to pick out both broad 'industry space' and specific inputs/output industries within these (e.g. optical equipment => cameras => camera lenses). These typologies have, in recent years, been increasingly developed to include service sector activities. It is still rather harder to do this for parts of the economy - such as the creative industries - where activity is much more service-orientated. See ONS (2009) for more detail on the UK system.
19. ILO (2007) gives an overview of ISCO08. UN-DESA (2008) gives an overview of the ISIC4 standard. Eurostat (2008) gives an overview of the EU's NACE typology and its fit within the ISIC system. Use of NACE is mandatory for countries within the European Statistical System.
20. Different member states have developed their own national adaptations to NACE: for example, adding a fifth level to the typology (as the UK has done with SICs). Similar provisions apply to the US and Canada within the NAICS system.
21. ONS (2010) Mapping Standard Occupational Classification 2010 (SOC2010) unit group with size of organisation to ISCO08 unit group, http://bit.ly/1DUa4gj (accessed 9 February 2015).
22. In all results we follow BFH and remove small–sample cells and 'volatile' codes. In BFH, 'volatile' industries are defined as those that move *"from creative to non-creative or vice versa* [in terms of intensity]*, or which change by more than one-fifth relative to its lowest value"* (p35) between 2009 and 2010 (the last year of their analysis). Our data ends in 2013, so we apply this test between 2012 and 2013. 'Small sample' cells are defined for the UK APS data as those where sector employment totals are lower than 800. We apply the same tests to the EU data.
23. KEA use 13 4-digit ISCO88 and nine 3-digit NACE1.1 codes. We use 31 ISCO08 codes and 15 NACE2 codes.
24. For completeness we have also run an intensity analysis on the EU-28 as a whole. Note that this is not a like-for-like comparison with the UK, a single member state. Results are available on request.

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