

## The Measurement of Artistic Originals in the UK

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The measurement of artistic originals such as Film, TV, Books, Music and Art are notoriously challenging, and appropriate treatment generates significant debate in the National Accounts and broader statistical communities. This presentation describes the improvements implemented by the Office for National Statistics (ONS, the UK's National Statistical Institute) in the measurement methods for artistic originals in the UK. The new approach is based on a theoretical model of the economy, comprising an innovation sector upstream (production) and a downstream (consumption and distribution) sector.

Keywords: art, books, film, innovation, music, TV

### 1. Introduction

This paper focuses on estimation of investment in the creation of entertainment, literary and artistic original assets ('artistic originals'). This is classified in the National Accounts as gross fixed capital formation (GFCF), a component of the expenditure measure of gross domestic product (GDP).

The measurement of artistic originals is challenging, both conceptually and because few data are available on market transactions in this area. For the last ten years, ONS has largely used imputed estimates, based on past values. However, Eurostat, the statistical office of the European Union, has recently requested that ONS seek to improve on current estimates. Recent work commissioned by the UK Intellectual Property Office (IPO) and carried out by Imperial College (Goodridge and Haskell, 2011, GH2011) investigated this issue. They found that, using a new approach based on a theoretical model of the economy and improved data sources, the total value of new artistic creation is more significant than has been assumed under the existing model. They estimated that, for 2007, the current approach was likely to underestimate investment in artistic originals by around £1.3 billion (current prices).

In response, ONS has developed improvements to the way that investment in artistic originals is estimated, based on the work by Goodridge and Haskell, and following, where possible, recommendations from Eurostat and the OECD. These improvements cover three areas:

- implementation of a new theoretical model, which consists of an upstream production sector (for example, film production) and a downstream consumption and distribution sector (for example, the cinema industry);
- improved data sources, in some cases replacing imputed data series;
- the use of separate deflators for the production of originals and copies of originals, to reflect differences in their price evolution, in line with OECD recommendations.

In Section 2, the approach to measurement of investment in artistic originals which was used prior to the publication of the UK National Accounts 2013 is outlined. Section 3 describes the new approach to estimating investment in artistic originals, and its implementation in the UK National Accounts. Section 4 presents estimates of the impact on UK GFCF.

### 2. The approach to estimation of investment in artistic originals prior to 2013

Previously, UK estimates for the contribution to GFCF from artistic originals included three components, described below. A cost-based approach was used, except for

estimates of publishing and private sector recording investment, where an estimate based on approximating the return on capital as a fraction of sales was made. Previous estimates included no component for ‘miscellaneous art’, which includes assets such as photography and images, fine art, greetings cards, choreographed routines and theatrical performances. Except where data sources are noted below, data were forecast in recent years.

### 2.1 Broadcasting and recording by the private sector

For private sector recording, which estimates investment in music originals, the assumption was that investment can be modelled as a fraction of sales. Broadcasting by the private sector covered ITV, the UK’s biggest private investor in TV and radio production. ITN provides news content for ITV, which is excluded from estimates of GFCF as its value is short-lived. An input costs approach was used to estimate investment by ITV, and a factor was included to estimate the monopoly power derived from each original series or programme.

$$\begin{aligned} \text{ONS estimate} &= \text{private sector recording} + \text{private sector entertainment} \\ &= (\text{UK sales} \times \text{approximate royalty rate}) + \\ &\quad (\text{costs of ITV programmes} - (\text{costs of networked and ITN} \\ &\quad \text{programmes}/2)) / (\text{advertising revenue as a fraction of total revenue}) \end{aligned}$$

Note that: data were sourced from the ITV Annual Report, and from the UK music trade association, the British Phonographic Industry; the approximate royalty rate was fixed at 0.095; and the ITV component dominated total GFCF in artistic originals, and was large relative to estimates for the BBC.

### 2.2 Entertainment, literary and artistic originals by public corporations

The BBC, Channel 4 and S4C are the UK’s Public Service Broadcasters. Estimates of investment are based on costs.

$$\begin{aligned} \text{ONS estimate} &= \text{investment by the UK public broadcasters} \\ &= \text{BBC: (value of new programmes for future sale} - \\ &\quad \text{depreciation of programmes for future sale} + \text{value of programme acquisitions} + \\ &\quad \text{change in value of acquired programmes)} + \\ &\quad \text{Channel 4: (total costs of drama programmes} \times (1 - (\text{total hours} \\ &\quad \text{broadcast} / \text{purchased hours broadcast})) + \text{cost of feature films} + \text{change in value of} \\ &\quad \text{inventories)} + \\ &\quad \text{S4C: (cost per hour of drama programmes} \times \text{hours of drama} \\ &\quad \text{broadcast} + \text{cost per hour of education programmes} \times \text{hours of education broadcast} + \\ &\quad \text{cost per hour of music and arts programmes} \times \text{hours of music and arts broadcast}) \end{aligned}$$

Note that: programmes produced for the BBC’s own use were excluded, and this is likely to be a significant factor; the Channel 4 TV component only included investment in drama; only films produced by Channel 4 were included in UK GFCF; and the component for S4C (the Welsh language broadcaster) did not include children’s programming, or any contribution from programmes translated into English.

### 2.3 Artistic originals in the publishing industry

Estimates of investment by the publishing industry were based on the same assumption as investment in music originals i.e. that investment can be estimated as a fraction of sales.

$$\text{ONS estimate} = \text{UK sales} \times \text{approximate royalty rate}$$

where the approximate royalty rate was fixed at 0.075.

### 3. Improvements to the estimation of investment in artistic originals

#### 3.1 A new approach to the estimation method

The new approach to estimates of investment of artistic originals is based on a theoretical model of the economy. This assumes an upstream innovation sector producing new artistic originals, which are consumed and distributed by a downstream final output sector. For example, films are produced upstream, and are consumed downstream by the cinema industry. In this model, the following relationships are identified.

##### upstream input

investment in the innovation sector = sum of input costs for creating a unique asset

where the input costs are the costs of labour, capital, materials etc..

##### upstream output

gross output from the innovation sector = asset value

=  $\mu$  x (input costs + rental or licence

payments for the use of other originals in the production)

where the use of other originals might be the use of a musical original in a film, and  $\mu$  represents the monopoly power of the artist due to protection through intellectual property rights.

##### downstream output

gross output from final output sector = rental payments for use of asset + labour, capital materials costs etc.

where market equilibrium implies that to rent or licence an asset over T years:

sum of the discounted rental fees over T years = asset value

There is no mark up,  $\mu$ , here, as it is assumed that the final output sector is competitive.

##### total gross output and value added

total gross output = asset value + gross output from final output sector

and

total value added = total gross output – intermediate consumption + adjustment for rental / licence payments

where the adjustment is made to avoid double counting of rental / licence payments.

As little information on market transactions exists, for both conceptual and practical reasons, the preferred methods for estimating investment in artistic originals in this framework are those based on input costs or royalty payments (i.e. licence fees). This avoids the difficulties of matching upstream to downstream activities. Due to the unavailability of sufficient data on royalties in the UK, the new approach being adopted by the UK National Accounts is based on estimates of input costs.

#### 3.2 Implementing the new approach in the UK National Accounts

In the improved methodology, ONS has replaced the three existing components based on industry sector with five new components, based on asset classification. The following subsections outline the approach taken.

##### Film

Estimation of investment in film originals is now based on the production costs of films, in line with the sum of costs approach recommended by the Eurostat Task Force and the OECD. Instead of relying on imputed data for Channel 4 film productions, the new approach is based on a complete universe of UK-certified films produced since

1991. The data sources are the UK Film Council (1998 – present), the British Film Institute (BFI) (1991 – 2001) and a dataset from the-numbers.com, who provide financial information on films, including those not certified. Data from BFI and the-numbers.com provide total costs for over half of all the films produced in the UK. For the remaining films, data on production costs are imputed from US or box office revenues.

Advertising and marketing are not included in production costs, as these are counted in a separate intangible asset. In addition, as there are no data on unfinished projects, investment in these cannot be included in the final estimate.

It would be inaccurate to assign all GFCF to the year of production, so it is assumed that the mean length of production time is one year for live action films, and two years for animation.

Finally, as co-productions between UK and non-UK companies are common, some assumptions are made about the split of ownership rights and investment between co-producing countries.

By improving the coverage of film originals, and replacing imputed with actual data, estimates from GH2011 suggest that investment in film originals has been underestimated by a factor of more than five (2007 data, current prices) in the UK National Accounts.

### **TV and radio**

As with film originals, the sum of costs is the preferred approach for TV and radio originals. Virtually all investment in the UK is undertaken by the Public Service Broadcasters (BBC, Chanel 4, S4C). The exception is Sky, for which data are not available. However, investments by Sky in UK stock productions are thought to be small (around £100 million).

GFCF estimates for investment in TV and radio originals are limited to stock programmes, in line with Eurostat / OECD recommendations. These are: arts and classical music; religion; education; factual; drama / soap; entertainment; and children's programmes. News, current affairs, weather and sport are excluded, as their value is generally short-lived.

Data from OFCOM, the independent regulator and competition authority for the UK communications industries, replace the imputed values used by ONS for Channel 4, the BBC and S4C since 2004, and also replace the ITV estimate, which currently includes a mark up for monopoly power. Prior to 2004, the new estimates are consistent with current official estimates. Post 2004, the replacement of imputed data and the removal of the monopoly power mark up leads to divergence. Removal of the mark up, which was largely responsible for the dominance of the ITV component in official estimates, means that the new estimates from GH2011 are slightly lower than official estimates (around £300 million in 2007 current prices).

### **Books**

Ideally, estimates for GFCF in literary originals would be based on royalties, adjusted to account for the rate of return on artistic capital (investment) for publishers. However, data are not available for royalties, so the new approach is based on input costs, derived from the Annual Business Survey (ABS) and the Annual Survey of Hours and Earnings (ASHE). ABS data were used to calculate the average ratio of employment to non-employment costs in the book publishing industry between 1997 and 2007. This ratio is then applied to the earnings of authors reported by ASHE, to estimate total input costs.

Uncertainties remain, as it is not known what the proportion of investment to final goods for consumption is in workers' output, which may result in an over-estimate of investment in literary originals using this method. However, if authors are under-sampled in ASHE, the result might be an underestimate of GFCF.

### **Music**

The approach recommended by the Eurostat Task Force is based on the net present value of future receipts, which requires access to a complete set of UK royalty data. This is currently unavailable, so an alternative approach, based on the estimation of input costs using a similar methodology to that for literary originals is adopted.

Following that methodology, ABS data were used to calculate the average ratio of employment to non-employment costs in the sound publishing and reproduction of sound recordings industries. This ratio is then applied to the earnings reported by ASHE, to estimate total input costs. The relevant occupations are: musicians; arts officers, producers and directors; broadcasting associate professionals; photographers and audio-visual equipment operators; and engineers. Only those occupations in the industries sound publishing or reproduction of sound recordings are included.

However, part of the estimated wages costs represent incomes generated from the use of original assets, for example, in live performances. That is, part of the wages costs will be due to the creation of the asset, and part will be income generated for musicians as a return on that asset. Resolving this uncertainty requires a full set of UK royalties data, which is not available.

### **Miscellaneous artwork**

This category includes assets such as photography and images, artwork, choreography and greetings cards. Little information on these is available, and the separation of the production of assets from the creation of intermediate goods is challenging. However, no estimate is currently included in the official estimate of GFCF, which is therefore underestimated.

The new approach is similar to that taken for the estimation of literary and music originals. ABS data are available for photographic activities, other artistic and literary creation and dance halls and dance instructor services. These industries are not an exact match to the activities we aim to estimate, but they provide a reasonable proxy for overheads in the creation of assets in this category. As for literary originals, the estimated ratio of employment to non-employment costs is applied to the income of choreographers, photographers etc. in ASHE, to estimate production costs.

There are no data on the proportion of inputs that go into the creation of long-lived assets rather than goods for final consumption, so estimation is uncertain. For example, if much of a choreographer's time is spent on instruction and performance, GFCF may be over-estimated. On the other hand, under-representation of the number of choreographers in ASHE may offset this.

### **3.3 Deflation**

Where estimates are based on upstream input costs, the OECD recommend either the use of consumer price indices for copies of originals, or a measure based on the input prices for factors and goods used in the production of originals.

Implied deflators used in the National Accounts suggest that prices for artistic originals are rising significantly faster than goods and services in the wider economy. However, it is likely that improved technologies have made the production of both artistic originals and copies of artistic originals cheaper. Given the belief that a deflator based on the price of copies does not reflect the price of the asset, and that instead it reflects input prices in the productivity in the production of the copy itself, an implied price index for aggregate value added is preferred to the existing method, similar to the value-added deflator used for artistic originals and other knowledge assets used in constructing the NESTA Innovation Index (Goodridge, Haskel and Wallis, 2012).

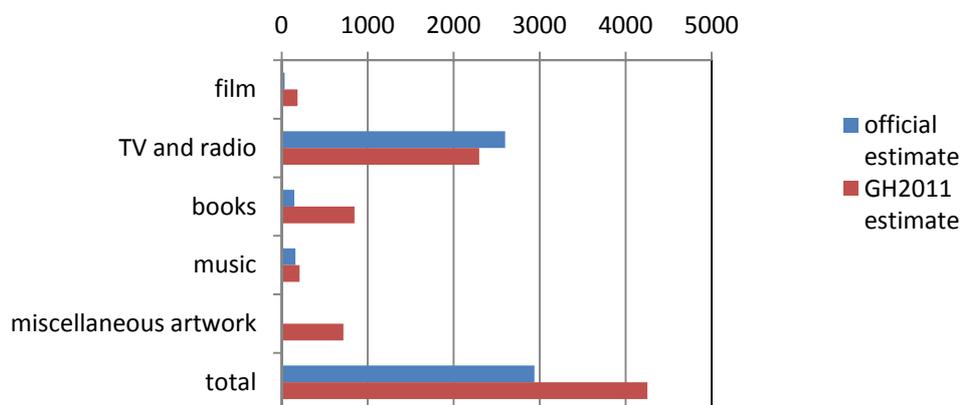
#### 4. The impact of changes to the measurement of artistic originals on UK GDP

Table 1 and Figure 1 show the estimated impact of the new methodology and data sources on the estimation of GFCF for artistic originals. These estimates were derived in GH2011, and are not the official ONS estimates. For all the asset categories except TV and radio, the calculations have resulted in higher estimates of GFCF. The overall increase in GFCF in 2007 (current prices) was estimated to be £1.3 billion.

**Table 1:** the impact of changes to the estimation of GFCF in artistic originals in the UK, 2007, current prices

asset	official estimate / £million	GH2011 estimate / £million	difference / £million
film	34	183	149
TV and radio	2598	2297	-301
books	147	846	699
music	159	209	50
miscellaneous artwork	0	718	718
total	2938	4253	1315

**Figure 1:** the impact of changes to the estimation of GFCF in artistic originals in the UK, 2007, current prices



The improvements to methodology and data sources described in this paper are currently being adopted in the UK National Accounts production systems. New official estimates of GFCF based on the new approaches will be available in the UK National Accounts published in June 2013.

#### References

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