Methodology

Allsopp Regional GVA(P) Project: Methods Development of Regional GVA on a production basis

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Summary

Following the review of Economic Statistics for Policymaking by Christopher Allsopp in 2003, the Office for National Statistics (ONS) committed to implement the findings and recommendations of the review in full. One of the main recommendations was for the development and production of regional gross value added on a production basis at constant price. This article is a major step forward in that aim. This paper provides a review of the methodological options, and recommends the most suitable, for the calculation of current and constant price regional GVA by industry on a production basis, GVA(P), for each NUTS 1 region of the UK. The driving principle for the methods review is to match the national GDP/GVA approach where possible. This project is only part of the overall Allsopp implementation program.

Contents

1. Introduction

1.1. This review forms part of the project to produce a regional GVA production measure to meet recommendation 2 of the Allsopp report "Review of Statistics for Economic Policymaking". This states: "Present estimates of regional Gross Value Added (GVA) are not of sufficient quality to support analysis of the Government 's policy objective to increase growth in the regions. Each region and country (at NUTS 1 level) should have annual baseline data for GVA at current prices and in chained volume terms, which would be derived according to the production approach."

1.2. The regional GVA(P) project forms part of a broader strategy for developing regional statistics which was introduced following the Allsopp report. In putting together this strategy, which involved consultation with a number of government departments and EU statistics offices, 4 options for the production of constant price regional GVA(P) were identified.
These options include details of how to produce current price GVA(P) which can then be converted to constant prices using appropriate deflators, either national or regional. (See Appendix B for algebraic representations). This paper does not include a discussion of deflation methodology, and the assessment of deflators forms a later stage of this project. Producing regional deflators is outside the scope of this project.

1.3. The strategy adopted in developing a methodology for regional GVA(P) is to follow the methodology employed to derive the national estimates where possible, and use the best available data sources and methods.
There is a trade off between the ideal approach and pragmatism surrounding the data available. Ideally business surveys would be designed to collect data for GVA(P) and prices regionally. However given financial constraints and initiatives to reduce the burden on business like the Better Regulation Executive[1], this approach is not practical and consequently the options under review are focussed on existing data only.

1 The Better Regulation Executive work across government to reduce and remove unnecessary regulation from the public, private and voluntary sectors.

2. Options

2.1. Option 1 would involve estimating indicators of output. This is then deflated and GVA is estimated by applying the national ratio of output to GVA to the regional output figure. However, this approach does not provide "annual baseline data for GVA" baseline measure as recommended by the Allsopp report, and is only fit for purpose if supported by an annual baseline measure produced using a regional accounts framework. Consequently option 1 is not recommended. as it would not provide a measure of regional GVA(P) that would meet recommendation 2 of the Allsopp report.

2.2. Option 2 involves estimating GVA at current prices for each industry in each region and then to deflate using an implied GVA deflator from national data.
While this makes assumptions concerning the similarity of amounts and prices of products produced and consumed by an industry across regions, it is the only option currently available, in terms of data availability, for some industries such as Financial Intermediation.

2.3. Option 3 is to introduce double deflation at the aggregate level. Output would be deflated at the product level for each industry while intermediate consumption for an industry would be deflated using a national deflator. Gross value added would then be calculated as the difference between the two deflated values.
This makes fewer assumptions than option 2 and should provide more accurate constant price data. Also it is easier to obtain quality regional indicators for output than for intermediate consumption.

2.4. Option 4 is to use double deflation at a detailed level. This involves deflating output as for option 3 as well as deflating estimates of intermediate consumption by product for each industry in each region.
This should in theory produce the most accurate current and constant price data of all the options and closely matches the National Accounts methods, and therefore it is conceptually the best approach. However, for many industries data is not available at a sufficient level of detail and potentially quality.

2.5. For the purposes of reviewing Options 2, 3 and 4, the Manufacturing, Financial Intermediation and Education industries have been selected. The data sources and methodologies associated with these apply to several other industries, but not the whole economy. A list of potential data sources covering the whole economy, together with the industries for which they could be used, is included in Appendix A.

3. Recommendations

3.1. The review of the 4 approaches concludes that a hybrid of options 2, 3 and 4 would be the most suitable, based on the availability and fitness for purpose of the data required. This represents a top down approach whereby indicators of regional economic activity are applied to national data to obtain a current price series, and deflators used to obtain a constant price series. This is the recommended approach to be used in the production of regional GVA(P) at current and constant prices.
While using a combination of approaches may lead to a lack of clarity regarding methodology and data sources, this permits the use of the most appropriate regional data available for each industry and as far as possible follows the methodology used to produce GVA(P) at the national level.

3.2. As part of the process of quality assuring the proposed methods and data sources, an inter-departmental Technical Advisory Group has been established. As well as providing technical expertise and advice, this group will provide the quality criteria to be used in reviewing the estimates of GVA(P) obtained using the different options.

3.3. The initial plan is to try to produce annual data for each year back to 1995 and constrained to Blue Book 2006. However the lack of national deflators for years before 1998 may mean that this is the earliest year for which constant price data can be produced.
The review of data requirements timetabled to be completed by June 2007 will include an assessment of the availability of data prior to 1995, as well as an assessment of data sources required to provide coverage of the whole economy.

ANNEX A - Detailed Analysis Of Options

4. Option 1 - Short Term Indicator Approach

Methodology and data requirements

4.1 Under this option short term indicators would be used to produce current price estimates of regional output by industry which would be deflated to give a constant price measure of output.

4.2 Short term indicators of output could in theory come from ONS surveys as well as non-ONS data sources which provide, among other things, monthly data on the turnover/sales of businesses, and the regions in which those businesses operate. This monthly regional turnover would be used as an indicator of changes in output by region at current prices. The rate of increase or decrease would be applied to a benchmark output measure, and constant price data would be obtained by applying deflators to the current price output.
Both current and constant price GVA would then be estimated by applying the national ratio of output to GVA for an industry to the regional output figure.

4.3 Appendix B contains an algebraic representation of this methodology, which simplifies the above by stating that the change in output is multiplied by a benchmark measure of GVA, which is then deflated to obtain constant price GVA. This simplification incorporates the cancelling out from both numerator and denominator of the output benchmark figure.

Methodology - Welsh Short Term Indicators Approach

4.4 ONS currently produce estimates of output for the majority of the Welsh economy, using a number of short term data sources including the Monthly Production Index, the Monthly Inquiry into the Distribution and Service Sector, and a number of volume series. The latter includes data on activities such as engine production from the ONS Motor Vehicle Production Inquiry.
The output for an industry is then converted to GVA by applying the ratio of output to GVA for that industry, which in the short term is assumed to remain constant. However, over the longer term this assumption becomes weaker owing in part to transfers in intermediate processes between industries.

4.5 Why use this approach?

- The methodology already exists within the ONS as used by Welsh Short Term Indicators Branch.
- In theory this is the least demanding of the 4 options in terms of the data used. However this assumes that the surveys and non-ONS data sources used to produce Welsh GVA provide the necessary detail for, or have an equivalent in, the remaining NUTS 1 regions.

4.6 Possibilities for extending the Welsh STI approach to the English regions:

- Design and implement a regional turnover survey which collects regional turnover directly.
- Provide "top ups" to surveys by adding business units specific to individual regions in order to more accurately reflect regional economic activity.
- Include "region" in the design of the survey sample. This may however lead to a considerably larger sample size than at present in order to produce regional data of an acceptable level of quality.

4.7 Problems with extending the Welsh STI approach to the English regions:

- The introduction of new surveys and the expansion of existing survey samples run contrary to the work of the Better Regulation Executive to reduce the existing regulatory burden affecting business.
- Efficiency savings may impact on the short term surveys mentioned.
- The availability of volume series used for the production of Welsh STI's may vary across regions. This would lead to inconsistency between regional estimates.
- From the experience of the team producing Welsh short term indicators these do not, on their own, produce a robust basis for estimation of changes in GVA. Annual benchmark GVA produced in a Regional Accounts framework are required.

4.8 Conclusion:

- Allsopp recommendation 2 states the need for a production measure of baseline annual NUTS 1 GVA at current and constant prices.
- The Short Term Indicator approach does not provide a baseline measure, and is only fit for purpose if supported by an annual baseline measure produced using a regional accounts framework.
- The sources and methodology used to produce the Welsh indicators do not provide sufficient material to produce GVA for the remaining NUTS 1 regions.
- Allsopp recommendation 4 states that in the longer term, once other priorities have been addressed, there may be a case for revisiting the provision

of short term activity indicators, if a significant number of regions or countries have commissioned their own quarterly GVA estimates.

5. Option 2 - Single deflation of GVA.

5.1 - 5.3 Methodology and data requirements

5.1 This option involves estimating GVA at current prices for each industry in each NUTS 1 region and then deflating using an implied GVA deflator from national data.

5.2 A top down approach of applying regional indicators to national statistics would be used to produce current price regional GVA by industry.

- National controls for GVA by industry are obtained which are consistent with the National Accounts Blue Book
- Regional indicators of GVA are obtained from a number of data sources as discussed below in the section on data availability and data quality, as well as in Appendix A.

5.3 Appendix B contains an algebraic representation of this methodology.

5.4 Why use this approach?

- This is the only option available for some industries, eg Financial Intermediation. There is currently no regional data on turnover and changes in inventories, which are required to estimate output, for the Financial Intermediation industry.
- It is easier to deliver than options 3 and 4 since only single deflation of GVA is required.
- This is similar to the current GVA(I) (Income) measure produced by Regional Accounts branch, in that both approaches apply appropriate indicators of regional GVA to national estimates.
- Due to the similarity with the current approach, building systems to produce GVA(P) would be relatively straight forward.
- Data is readily available.

5.5 Assumptions:

- The mix of products produced and consumed by an industry is the same for each region.
- National constant price data is obtained by using double deflation, in contrast to the proposed methodology which uses single deflation. This makes an assumption about the similarity of price movements of different products produced and consumed by an industry.

Data availability

5.6 National and regional data is available for Manufacturing, Financial Intermediation and Education, which allows GVA(P) under option 2 to be produced.

Data quality

5.7 This looks at the criteria listed in the table below only. It will also be necessary to carry out a full quality assurance exercise for each data set, as well as investigating and comparing suitable alternative datasets, before determining whether or not these are fit for purpose.

5.8 ONS data sets:

- Using coverage as an indicator of quality, ABI2 appears to provide better quality GVA estimates for the Manufacturing industry than for Education, owing to the low proportion of national GVA covered by regional GVA for Education, which is 50%, compared to 95% for Manufacturing.
- ASHE and STES should provide data of sufficient quality for estimating the GVA of the Financial Intermediation industry since these are already used in the production of GVA(I) data.

5.9 Non-ONS data sets:

- DCLG appears to provide data of sufficient quality for the local government sector of Education in England, due to the comprehensive coverage of local authorities, and the fact that this is used to calculate national GVA.
- LSC, HESA and DFES data is not currently used for the production of national statistics and there are issues surrounding the fitness for purpose of all of these data

Table 5.1

Availability and quality of regional data for Option 2 - Single Deflation of GVA

	Manufacturing - D	Financial Intermediation - J	Education - M			
Institutional Sector (Included where data sources and methods vary across sectors.)	N/A	N/A	Private (Schools & Nursery Schools)	Local Government (Maintained schools)	NPISH (All colleges including Sixth Form and Further Education Colleges, as well as Higher Education Institutions)	Central Government (includes: City Technology colleges, City Academies, and Higher Education for Health workers)
Data source	ABI2 - GVA	ASHE - Average employee Wages & Salaries STES - Employee numbers	ABI2 - GVA	DCLG - Total Expenditure by service; Compensation of Employees by service.	LSC - College Income & expenditure. HESA - Income & expenditure of Higher Education Institutions.	DFES - Education & Training Statistics: Number of teachers and students. DFES - Compensation of Employees (to be advised).
Data availability. (ie what is available from the data sources stated above in terms of option 2 for the industry and sector specified.)	Estimates of GVA for all manufacturing industries for all NUTS 1 regions.	Estimates of regional wages and salaries for all NUTS 1 regions on a workplace basis. These may be used as regional indicators of GVA(I).	Estimates of GVA for all NUTS 1 regions, mainly for the private sector of the education industry, although some public sector GVA is included.	Estimates of GVA can be calculated for English NUTS 1 regions. The devolved administrations provide similar data for Scotland, Wales and Northern Ireland.	Income and expenditure by category. This may be used to derive estimates of GVA for the English NUTS 1 regions. Data from equivalent bodies (ie Scottish and Northern Ireland Funding Councils, Higher and Further Education Funding for Wales) needs to be identified and reviewed.	Number of teachers and students in City Academies and City Technological Colleges for NUTS 1 regions in England. Availability of Compensation of Employees data to be advised. Data from equivalent bodies in the devolved administrations needs to be identified and reviewed.

Table 5.1 continued

Availability and quality of regional data for Option 2 - Single Deflation of GVA

	Manufacturing - D	Financial Intermediation - J	Education - M			
Data Quality						
Accuracy - The closeness between an estimated result and the known true value.	Quality assurance This is an ONS data source and is used in the current Regional Accounts GVA(I) measure. As such it is quality assured as part of current branch procedures. Coverage This provides coverage of over 95% of the national GVA for Manufacturing in each of years 1998 to 2004.	Quality assurance These are ONS data sources and are currently used within regional accounts branch. They are quality assured under existing branch procedures.	Quality assurance This is an ONS data source but is not currently quality assured as part of Regional Accounts branch procedure. Coverage This provides coverage of approximately 52% of national private sector GVA for Education.	Quality assurance This data source is used in the national accounts but is not currently quality assured as part of Regional Accounts branch procedure.	Quality assurance These are non-ONS data sets which have not been used by Regional Accounts branch before. Coverage Combining LSC and HESA staff costs data provides coverage of 73% in 1999 and 85% in 2004, of national GVA.	To be advised.
Comparability - The degree to which data can be compared over time and domain.	Across regions: Different arrangements for processing ABI2 data in Northern Ireland and in Great Britain may cause a lack of comparability. (section 7.2 Wroe Report.) Over time: From 1998 the ABI2 survey replaced the Annual Census of Production (ACOP) survey. Limited data is available before 1998, in terms of industry and component level.	Across regions: Same treatment across all regions Over time: From October 2004 ASHE replaced the New Earnings Survey (NES). NES data for 1997-2004 has been adjusted in line with ASHE methodology. A lack of comparability may therefore exist with pre and post 1997 data, although this is not believed to be significant at the NUTS 1 level. Also, there are plans to revise NES data back to 1992.	See Manufacturing	Across regions: The data currently provided by DCLG is only provided for English regions. This may create a lack of comparability with the remaining NUTS 1 regions, as the data from these will need to be sourced from the devolved administrations. Over time: The formation of the devolved administrations means that the source of this data has changed. This may impact on comparability.	Across regions: The data currently provided by HESA is for the UK, whereas that provided by LSC is for England only. This may create a lack of comparability with data obtained for Wales, Scotland and Northern Ireland. Over time: Changes over time in the suppliers of the data need to be established (eg the Scottish Funding Council was only established in 2005.)	Across regions: DFES provides data for England only, so potential lack of comparability with data obtained for Wales, Scotland and Northern Ireland. Over time: Changes over time in the suppliers of the data need to be established (eg City Academies started opening in 2002.)

Table 5.1 continued

Availability and quality of regional data for Option 2 - Single Deflation of GVA

	Manufacturing - D	Financial Intermediation - J	Education - M			
Coherence - The degree to which national and regional statistics can be used together.	Data source Same data source is used as for national GVA. Methodology Different methodology is used to derive industry figures for regional and national ABI2 (see note on apportionment of ABI2 to region and industry in appendix D.) National constant price GVA(P) is obtained by using double deflation, in contrast to the proposed methodology which uses single deflation.	Data source Different data source used for national GVA Same data source used for Regional GVA(I) Methodology This approach mirrors that used at the national level, where the income approach is the only approach used to calculate national GVA, owing to a lack of data of sufficient quality to produce a production measure. The estimates produced are included in the production measure of national GVA as published in the blue book. Same methodology is used for Regional GVA(I)	Data source Different data source used for national GVA Methodology Lack of coherence with national data since which uses the income approach.	Data source Same data source is used for national GVA Methodology Same methodology used for national GVA	Data source Different data source used for national GVA Methodology This is the same approach to calculating national current price GVA, but national constant price GVA(P) is obtained by using double deflation, in contrast to the proposed methodology which uses single deflation.	Data source Different data source used for national GVA. Methodology Compensation of Employees data is preferable to numbers of teachers/pupils, since national GVA is calculated by summing costs, of which COE is the largest component.
Completeness - The degree to which all aspects of the accounts that are important to users are covered. (ie can we produce current and constant price GVA(P) back to 1995 under this option?)	Using the methods and sources stated, current and constant price regional GVA(P) can be produced back to 1998 under option 2 for Manufacturing.	Using the methods and sources stated, current price regional GVA(P) can be produced back to 1997 under option 2 for Financial Intermediation. Constant price data can be produced back to 1998.	See Manufacturing	Using the methods and sources stated, current price regional GVA(P) for local government education can be produced back to 1995 under option 2. Constant price data can be produced back to 1998.	Using the methods and sources stated, current and constant price regional GVA(P) for NPISH sector education can be produced. The years for which this can be produced - to be advised.	Using the methods and sources stated, current and constant price regional GVA(P) for central government education can be produced. The years for which this can be produced - to be advised.

6. Option 3 - Double Deflation at aggregate level.

6.1 - 6.3 Methodology and data requirements

6.1 This option involves estimating output by product as well as total intermediate consumption for each industry in each NUTS 1 region, and then deflating these separately. GVA is the difference between output and intermediate consumption.

6.2 A top down approach of applying regional indicators to national statistics would be used to produce current price regional output and intermediate consumption by industry. This would involve allocating both national output and national intermediate consumption by industry to region using an output indicator. Output would be further broken down by product using either national or regional data, and deflators used to obtain constant price data.

- National controls for current price output and intermediate consumption by industry, with a breakdown of output by product, are obtained which are consistent with the National Accounts Blue Book.
- Regional indicators of current price output are obtained from a number of data sources as discussed below in the section on data availability and data quality, as well as in Appendix A.
- Product indicators may be provided by some data sources, such as the Treasury's Public Expenditure Statistical Analyses (PESA), which details expenditure by classification of government activity. However this will be only be useful to the extent that deflators are available for these services.

6.3 Appendix B contains an algebraic representation of this methodology.

6.4 Why use this approach?

- Fewer assumptions than option 2 regarding product structures and prices.
- Double deflation takes advantage of the availability of product deflators to produce more accurate constant price output data.
- Consistent with the approach taken to produce national accounts, in terms of estimating current and constant price output and intermediate consumption separately.

6.5 Assumptions

- The mix of products produced and consumed by an industry is the same across regions, except where regional product data is available.
- The ratio of output to GVA is the same across regions (ie that intermediate consumption has the same regional distribution as output).

6.6 Data Availability

- National data is available for all 3 industries.
- Regional output indicators are available for the Manufacturing and Education industries but not for Financial Intermediation. For Financial Intermediation the income approach is the only approach used to calculate national GVA, owing to a lack of data of sufficient quality to produce a production measure.
- Some product indicators are available for the local and central government sectors of Education.

Data quality

6.7 This looks at the criteria listed in the table below only. It will also be necessary to carry out a full quality assurance exercise for each data set, as well as investigating and comparing suitable alternative datasets, before determining whether or not these are fit for purpose.

6.8 ONS data sets:

- Using coverage as an indicator of quality, ABI2 turnover for Education (90% coverage of the national figure) appears to be better quality than ABI2 GVA for Education (50% coverage of the national figure.)

6.9 Non-ONS data sets:

- As per option 2 for DCLG, LSC & HESA
- PESA may provide a higher quality indicator of output than DFES data does of GVA, owing to the greater coherence with national methodology this provides.

Table 6.1

Availability and quality of regional data for Option 3 - Double Deflation at aggregate level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Institutional Sector (Included where data sources and methods vary across sectors.)	N/A	N/A	Private (Schools & Nursery Schools)	Local Government (Maintained schools)	NPISH (All colleges including Sixth Form and Further Education Colleges, as well as Higher Education Institutions)	Central Government (includes: City Technology colleges, City Academies, and Higher Education for Health workers)
Data source	ABI2 - Turnover, change in stocks & work in progress, own account capital expenditure, taxes less subsidies on production, insurance claims received.	N/A	ABI2 - Turnover, change in stocks & work in progress, own account capital expenditure, taxes less subsidies on production, insurance claims received.	DCLG - Total Expenditure by service.	LSC - College Income & expenditure. HESA - Income & expenditure of Higher Education Institutions	Treasury: PESA - Departmental group expenditure on services by sub-function, country and region.
Data availability. (ie what is available from the data sources stated above in terms of option 3 for the industry and sector specified.)	Estimates of output for all manufacturing industries for all NUTS 1 regions. ABI2 does not provide product data.	No regional output indicator identified due to problems in comprehensively defining the output of financial intermediaries.	Estimates of output for all NUTS 1 regions. This covers mainly the private sector of the education industry, and excludes the majority of the public sector. ABI2 does not provide product data.	Revenue Outturn reports showing expenditure by service provide estimates of output for English NUTS 1 regions. The devolved administrations provide similar data for Scotland, Wales and Northern Ireland.	Income and expenditure by category. This may be used to derive estimates of output for the English NUTS 1 regions. Data from equivalent bodies (ie Scottish and Northern Ireland Funding Councils, Higher and Further Education Funding for Wales) needs to be identified and reviewed.	Table 7.19 of PESA includes central government total spending and public sector capital spending, which may be used as an indicator of regional output for the English regions. Data from the devolved administrations needs to be identified and reviewed.

Table 6.1 continued

Availability and quality of regional data for Option 3 - Double Deflation at aggregate level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Data Quality						
Accuracy - The closeness between an estimated result and the known true value.	Quality Assurance Estimates of output from regional ABI2 data are not quality assured as part of Regional Accounts Branch procedure. However they represent a component of GVA which is quality assured (see option 2.) Coverage Turnover provides coverage of approximately 110% of national output. This figure reduces to 105% when duties payable are deducted from turnover.	N/A	Quality Assurance As per option 2 Coverage Turnover provides coverage of approximately 93% of national output.	As per option 2.	Quality Assurance As per option 2. Coverage Combining LSC and HESA total expenditure data provides coverage of 97% in 1999 and 107% in 2004, of national output.	Data in table 7.19 of PESA are national statistics. Allocation to region is done on a "for" basis, whereas for the purposes of Regional GVA(P) an "in" basis is required. It needs to be established whether the results are significantly different under the two bases.
Comparability - The degree to which data can be compared over time and domain.	As per option 2.	N/A	As per option 2.	As per option 2.	As per option 2	Across regions: Spending by the devolved administrations not included in table 7.19 of PESA, so potential lack of comparability between regions. Over time: Table 7.19 available back to 2000/01. Need to establish whether a comparable time series exists back to 94/95.

Table 6.1 continued

Availability and quality of regional data for Option 3 - Double Deflation at aggregate level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Coherence - The degree to which national and regional statistics can be used together.	Data source Same data source is used as for national output. Methodology Different methodology is used to derive industry figures for regional and national ABI2 (see appendix C.)	N/A	As per option 2.	As per option 2.	Data source Different data source used for national output. Methodology Same methodology used for national output (ie output = sum of costs.)	Data source Different data source used for national output. Methodology Same methodology used for national output (ie output = sum of costs.)
Completeness - The degree to which all aspects of the accounts that are important to users are covered. (ie can we produce GVA(P) under this option?)	Using the methods and sources stated, current and constant price regional GVA(P) back to 1998 can be produced under option 3 for Manufacturing.	Using the methods and sources stated, Regional GVA(P) cannot be produced under option 3 for Financial Intermediation, owing to the lack of regional indicators for output. Option 2 is the only one possible for this industry.	See Manufacturing	Using the methods and sources stated, current price regional GVA(P) for local government education can be produced back to 1995 under option 3. Constant price data can be produced back to 1998.	Using the methods and sources stated, current and constant price regional GVA(P) for local government education can be produced under option 3. The years for which this can be produced - to be advised.	Regional GVA(P) for central government education could be produced under option 3. The years for which this can be produced - to be advised.

7. Option 4 - Double deflation at detailed level.

7.1 - 7.3 Methodology and data requirements

7.1 This option involves estimating output and intermediate consumption by product for each industry in each NUTS 1 region, and then deflating these separately. GVA is the difference between output and intermediate consumption.

7.2 A top down approach of applying regional indicators to national statistics would be used to produce current price regional output and intermediate consumption by industry. This would involve allocating both national output and national intermediate consumption by industry to region using indicators of regional output and intermediate consumption. Both output and intermediate consumption would be further broken down by product using either national or regional data, and deflators used to obtain constant price data.

- National controls for current price output and intermediate consumption by industry, with a breakdown of both by product, are obtained which are consistent with the National Accounts blue book.
- Regional indicators of current price output and intermediate consumption are obtained from a number of data sources as discussed below in the section on data availability and data quality, as well as in Appendix A.
- Product indicators may be provided by some data sources, such as the DCLG's outturn reports, which detail expenditure by region and classification of government activity. However this will be only be useful to the extent that deflators are available for these services.

7.3 See Appendix B for an algebraic representation of this methodology

7.4 Why use this approach?

- Complies with Eurostat guidelines which state that regional indicators should be as appropriate as possible to the component.
- Fewer assumptions required than options 2 & 3.
- Double deflation at the detailed level takes advantage of the availability of product deflators to produce more accurate constant price data.
- Consistent with the approach taken to produce national accounts, in terms of estimating current and constant price output and intermediate consumption separately.

7.5 Assumptions

- The mix of products produced and consumed by an industry is the same across regions, except where regional product data is available.

7.6 Data availability

- National data is available for all 3 industries.
- Regional output and intermediate consumption indicators are available for Manufacturing and the majority of Education, but not for Financial Intermediation. For Financial Intermediation the income approach is the only approach used to calculate national GVA, owing to a lack of data of sufficient quality to produce a production measure.
- Some product indicators are available for the local and central government sectors of Education.

Data quality

7.7 This looks at the criteria listed in the table below only. It will also be necessary to carry out a full quality assurance exercise for each data set, as well as investigating and comparing suitable alternative datasets, before determining whether or not these are fit for purpose.

7.8 ONS data sets:

- ABI2 purchases for Education provides 170% coverage of the national figure, which suggests there is an issue with using this as an indicator.

7.9 Non-ONS data sets:

- As per option 2 and 3.
- Estimates of intermediate consumption data obtained from HESA and LSC appear to be of lower quality than estimates of output on the basis of coverage provided. This is 205% in 2004, compared with 107% for output.

Table 7.1

Availability and quality of regional data for Option 4 - Double Deflation at detailed level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Institutional Sector (Included where data sources and methods vary across sectors.)	N/A	N/A	Private (Schools & Nursery Schools)	Local Government (Maintained schools)	NPISH (All colleges including Sixth Form and Further Education Colleges, as well as Higher Education Institutions)	Central Government (includes: City Technology colleges, City Academies, and Higher Education for Health workers)
Data source	ABI2 - As per option 3, plus purchases	N/A	ABI2 - As per option 3, plus purchases	DCLG - Total Expenditure by service. Compensation of Employees by service	As per option 3.	To be advised - Possibly a combination of COE and expenditure data as per options 2 & 3.
Data availability. (ie what is available from the data sources stated above in terms of option 4 for the industry and sector specified.)	Estimates of output and intermediate consumption by region for all manufacturing industries for all NUTS 1 regions. ABI2 does not provide product data.	As per option 3.	Estimates of output and intermediate consumption for all NUTS 1 regions. This covers mainly the private sector of the education industry, and excludes the majority of the public sector. ABI2 does not provide product data.	Revenue Outturn reports showing expenditure by service provide estimates of output and intermediate consumption for English NUTS 1 regions. The devolved administrations provide similar data for Scotland, Wales and Northern Ireland	Income and expenditure by category. This may be used to derive estimates of output and intermediate consumption for the English NUTS 1 regions. Data from equivalent bodies (ie Scottish and Northern Ireland Funding Councils, Higher and Further Education Funding for Wales) needs to be identified and reviewed.	An output indicator has been identified as per option 3. Regional Intermediate consumption could be estimated by deducting COE from output. COE data source to be advised as per option 2.

Table 7.1 continued

Availability and quality of regional data for Option 4 - Double Deflation at detailed level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Data Quality						
Accuracy - The closeness between an estimated result and the known true value.	Quality Assurance As per option 3. Coverage As per option 3 for output. Purchases provide coverage of approximately 110% of national intermediate consumption.	N/A	Quality Assurance As per option 2 Coverage As per option 3 for output. Purchases provide coverage of approximately 166% of national intermediate consumption.	As per option 2.	Quality Assurance As per option 2 Coverage Combining LSC and HESA expenditure less staff and depreciation costs data provides coverage of 225% in 1999 and 205% in 2004, of national intermediate consumption.	N/A
Comparability - The degree to which data can be compared over time and domain.	As per option 2.	N/A	See Manufacturing	As per option 2.	As per option 2.	N/A
Coherence - The degree to which national and regional statistics can be used together.	As per option 3.	N/A	As per option 2.	As per option 2.	Data source Different data source used for national output and intermediate consumption. Methodology Same methodology used for national output (ie output = sum of costs.) Intermediate consumption is calculated as a balance at the national level, whereas it can be measured directly using LSC and HESA data.	N/A

Table 7.1 continued

Availability and quality of regional data for Option 4 - Double Deflation at detailed level

	Manufacturing - D	Financial Intermediation - J	Education - M			
Completeness - The degree to which all aspects of the accounts that are important to users are covered. (ie can we produce GVA(P) under this option?)	Using the methods stated, Regional GVA(P) can only be produced under option 4 for Manufacturing by making strong assumptions concerning the similarity of the mix of products purchased.	Using the methods stated, Regional GVA(P) cannot be produced under option 4 for Financial Intermediation, owing to the lack of regional indicators for output and intermediate consumption.	See Manufacturing	Using the methods and sources stated, current price regional GVA(P) for local government education can be produced back to 1995 under option 4. Constant price data can be produced back to 1998.	Using the methods and sources stated, current and constant price regional GVA(P) for local government education can be produced under option 4. The years for which this can be produced - to be advised.	A regional indicator for intermediate consumption needs to be identified in order to produce GVA(P) under option 4.

8. Conclusion and Recommendation

8.1 Option 1 is not suitable mainly due to the fact that the data produced would not meet the requirements of recommendation 2 of the Allsopp report to deliver a measure of regional GVA(P).

8.2 For certain industries option 2 is the only method available for producing GVA. However, where data is available and of sufficient quality, options 3 and 4 are preferable.

8.3 Option 3 is the preferred option for industries where it is easier to obtain quality regional and product indicators for output than for intermediate consumption.

8.4 Option 4 represents the ideal approach but for the majority of industries is not feasible owing to the lack of quality regional and product indicators. An exception may be for the public sector or some industries where data is provided by service at the regional level. The success of this approach will then depend on the availability of the relevant deflators.

8.5 A hybrid of options 2, 3 and 4 is the optimum methodology since this would make use of the best quality available data for each industry. This is illustrated in table 8.1 below

Table 8.1

Proposed methods and data sources by industry	
Industry	Proposed method
Manufacturing	Region: Use ABI2 data to estimate output and intermediate consumption and constrain to national figures Product: Apply national product structure to output Deflation: Double deflation by product for output, and at an aggregate level for intermediate consumption.
Financial Intermediation	Region: Use ASHE and STES data to estimate income GVA and constrain to national figures Deflation: Use implied national GVA deflators
Education	Region: Use a combination of ABI2 and non-ONS data to estimate regional output and intermediate consumption, and constrain to national figures. Product: Apply national product structure to output where there is no regional product indicator. Deflation: Double deflation at a detailed level for both output and intermediate consumption where product data exists.

9. Appendices

Appendix A - Potential Data Sources

	Industry/COFOG	Institutional Sector Split	Geography	Country	Available back to 1995 on a consistent basis?	Measure	Product data
ABI2	5 digit SIC	None	NUTS 1-3	E,S,W,NI	98 (97?) onward	Components of output and intermediate consumption	None
DEFRA	2 digit SIC	None	NUTS 1-3	E,S,W,NI	95 onward	Output and intermediate consumption	4 digit CPA
HMRC - Self employment	A31 (NUTS 1)	None	NUTS 1-3	E,S,W,NI	95 onward	Self employment income	None
HMRC - PAYE	None	None	NUTS 1-3	E,S,W,NI	95 onward	Compensation of employment	None
Financial reports of Public Corporations	5 digit SIC	Public Corporations	NUTS 1	E,S,W,NI	95 onward	Revenue, Cost of Sales, Compensation of Employees	None
STES	15 industry	None	Standard Statistical Regions	E,S,W,NI	96 onward	Number of employees	None
ASHE	2 digit SIC	None	NUTS 1-3	E,S,W,NI	97 onward	Average employee Wages & Salaries	None
Treasury - PESA	COFOG - subfunction	Central and local government.	NUTS 1	E.(Availability of S,W,NI dependent on COFOG)	TBA	Expenditure	COFOG subfunction
DCLG - Revenue Outturn reports; Scottish Executive; Welsh Assembly	Local Government Service	Local government	Local authority	E,S,W	1995	Expenditure. Compensation of Employees	Local Government Service
HESA - Resources of Higher Education Institutions	Specific to Education industry	None	NUTS 1	E, S, W, NI	1995	Income and Expenditure	None
LSC	Specific to Education industry	None	NUTS 1	E	TBA	Income and Expenditure	None
DFES	Specific to Education industry	None	NUTS 1	E	TBA	Income and Expenditure	None

Appendix B – Algebraic Representation of Options for Regional GVA(P)

The following provides an algebraic representation of the four options selected by the project for estimating regional GVA. The five capital letter symbols used in the formulae have these meanings throughout:

G	Gross Value Added (GVA)
O	Output
C	Intermediate consumption (G=O-C)
I	An indicator for the regional distribution of a national economic measure
D	A deflator, used to convert a current price measure to one at constant prices

The subscripts of these five capital letter symbols have these meanings throughout:

r	any of the twelve NUTS1 regions of the UK
i	any of the 123 industry categories (data permitting)
p	any of the 123 product categories (data permitting)

Wherever any of these these subscripts is absent from a capital letter symbol, the measure represented is the average across all categories of the absent variable.

The superscripts of these five capital letter symbols have these meanings throughout:

y	relating to data year
y-1	relating to previous year
g	relating to GVA
o	relating to output in value terms
c	relating to intermediate consumption in value terms

1) Option 1 – Based on short term indicators for output

(Note that a baseline value of regional GVA must be available for the previous year)

$$\mathbf{G}_r = \sum_{i=1,123} \mathbf{G}_{ir}^{y-1} \left(\mathbf{I}_{ir}^{y} / \mathbf{I}_{ir}^{y-1}\right) \mathbf{D}_i^{g}$$

Where I_{ir}^{y} = Indicator of output volume for industry *i* and region *r* for data year

I_{ir}^{y-1} = Indicator of output volume for industry *i* and region *r* for previous year

G_{ir}^{y-1} = GVA from industry *i* for region *r* in previous year

D_i^{g} = National deflator of GVA for industry *i*

2) Option 2 – Single deflation

$$\mathbf{G}_r = \sum_{i=1,123} \mathbf{G}_i \mathbf{I}_{ir}^{g} \mathbf{D}_i^{g}$$

Where G_i = National GVA from industry *i*

I_{ir}^{g} = Indicator of GVA for industry *i* and region *r*

D_i^g = National deflator of GVA for industry *i*

3) Option 3 – Double deflation, output and intermediate consumption both modelled on regional output indicators

$$G_r = \sum_{\substack{i=1,123 \\ p=1,123}} O_{ip} I_{ir}^o D_p^o - \sum_{i=1,123} C_i I_{ir}^o D^c$$

Where O_{ip} = National output from industry *i* of product *p*

I_{ir}^o = Indicator of output for industry *i* and region *r*

D_p^o = National deflator of output for product *p*

C_i = National intermediate consumption for industry *i*

D^c = National deflator of intermediate consumption

4) Option 4 – Double deflation, output and intermediate consumption each modelled on respective regional indicators

$$G_r = \sum_{\substack{i=1,123 \\ p=1,123}} O_{ip} I_{ir}^o D_p^o - \sum_{\substack{i=1,123 \\ p=1,123}} C_{ip} I_{ir}^c D_p^c$$

Where O_{ip} = National output from industry *i* of product *p*

I_{ir}^o = Indicator of output for industry *i* and region *r*

D_p^o = National deflator of output for product *p*

C_{ip} = National intermediate consumption by industry *i* of product *p*

D_p^c = National deflator of intermediate consumption of product *p*

Appendix C - Numerical Illustration of methods - Estimation of Current price GVA(P) for the Manufacturing industry

Option 1 – Using a volume indicator to produce regional indices of production.

Iron & Steel production volumes can be used to produce indices for the Iron & Steel Production industry. Table 1 shows the process for calculating these indices, using data for years 1998 and 1999.

Table 1 . Option 1 Production indices for Industry 54 (Iron & Steel) for NUTS1 areas, 1998/1999.

	Iron & Steel Production from the Iron & Steel Statistics Bureau - 1998	Iron & Steel Production from the Iron & Steel Statistics Bureau - 1999	Production index for I54
	Tonnes 000	Tonnes 000	1998 = 100
	a)	b)	c) = b) /a)*100
North East	1873	1698	90.7
North West	206	237	115.2
Yorkshire and The Humber	5042	4879	96.8
East Midlands	558	500	89.5
West Midlands	1298	1091	84.1
East of England	0	0	100.0
London	0	0	100.0
South East	855	695	81.3
South West	2	2	100.0
Wales	6288	6114	97.2
Scotland	334	246	73.6
Northern Ireland	0	0	100.0
UK	16456	15461	94.0

Option 2 – Using an indicator of GVA to regionalise national GVA

Approximate GVA from ABI2 are used to regionalise national GVA for a given year and Input-Output 123 level industry. Table 2 shows the step-by-step process using the example of Industry 8 (Meat Processing) for 1998.

Table 2 . Option 2 Estimates of GVA for Industry 8 (Meat Processing) for NUTS1 areas, 1998.

	National GVA for I8*	ABI2 Estimate of GVA for I8	Regional proportions from ABI2 of I8	Estimated Regional GVA for I8
	£000s	£000s		£000s
	a)	b)	c) = b) / b) for UK	d) = a) x c)
North East		77	3%	79
North West		271	9%	278
Yorkshire and The Humber		341	12%	349
East Midlands		302	10%	309
West Midlands		219	8%	225
East of England		471	16%	483
London		82	3%	84
South East		159	6%	162
South West		403	14%	412
Wales		168	6%	172
Scotland		205	7%	210
Northern Ireland		181	6%	185
UK	2949	2879	100%	2949

* Consistent with Blue Book 2006

Option 3 Using an indicator of Output to regionalise national GVA

Estimates of turnover from ABI2 are used to regionalise national GVA for a given year and Input-Output 123 level industry. Because no separate deflation is being applied, the ABI2 indicator can be applied directly to GVA rather than to national output and intermediate consumption separately.
[*This is an arithmetical shortcut because:*
GVA= O-IC and therefore GVA x I = (O x I) – (IC x I).
Where O = Output; IC = Intermediate Consumption; I = ABI2 indicator]

Table 3 shows the step-by-step process, again using the example of Industry 8 (Meat Processing) for 1998.

Table 3 . Option 3 Estimates of GVA for Industry 8 (Meat Processing) for NUTS1 areas, 1998.

	National GVA for I8*	ABI2 Estimate of Turnover for I8	Regional proportions from ABI2 of I8	Estimated Regional GVA for I8
	£000s	£000s		£000s
	a)	b)	c) = b) / b) for UK	d) = a) x c)
North East		215	2%	63
North West		873	9%	254
Yorkshire and The Humber		1225	12%	357
East Midlands		1041	10%	303
West Midlands		759	7%	221
East of England		1802	18%	525
London		261	3%	76
South East		600	6%	175
South West		1167	12%	340
Wales		578	6%	168
Scotland		821	8%	239
Northern Ireland		776	8%	226
UK	2949	10119	100%	2949

* Consistent with Blue Book 2006

Option 4 Using separate indicators to regionalise Output and Intermediate Consumption

Estimates of turnover from ABI2 are used to regionalise national output for the given year and Input-Output 123 level industry. Similarly, ABI2 estimates of purchases are used to regionalise national intermediate consumption for the given year and Input-Output 123 level industry. Table 4 shows the step-by-step process using the example of Industry 8 (Meat Processing) for 1998.

Table 4 . Option 4 Estimates of GVA for Industry 8 (Meat Processing) for NUTS1 areas, 1998.

	National Output* for I8	ABI2 Estimate of Turnover for I8	Regional proportions from ABI2 of I8	Estimated Regional Output for I8	National Intermed-iate Cons-umption* for I8	ABI2 Estimate of Purchases for I8	Regional proportions from ABI2 of I8	Estimated Regional Intermediate Consump-tion for I8	Estimated Regional GVA
	£000s	£000s		£000s	£000s	£000s		£000s	£000s
	a)	b)	c) = b) / b) for UK	d) = a) x c)	e)	f)	g) = f) / f) for UK	h) = e) x g)	i) = d) - h)
N East		215	2.1%	223		140	1.9%	145	78
N West		873	8.6%	905		598	8.3%	623	282
Yorks & Humb		1225	12.1%	1269		876	12.1%	912	357
E Mids		1041	10.3%	1079		742	10.2%	772	307
W Mids		759	7.5%	786		538	7.4%	560	226
East		1802	17.8%	1868		1338	18.5%	1393	475
London		261	2.6%	271		180	2.5%	188	83
S East		600	5.9%	622		442	6.1%	460	162
S West		1167	11.5%	1209		763	10.5%	794	415
Wales		578	5.7%	599		412	5.7%	429	170
Scotland		821	8.1%	851		617	8.5%	643	208
N Ireland		776	7.7%	805		594	8.2%	618	187
UK	10486	10119	100%	10486	7537	7241	100%	7537	2949

* Consistent with Blue Book 2006

Appendix D - Regional GVA(P) Project Timetable

Product Number	Product Title	Allsopp Recommendation	Product Leader	Product Team	Start Date	Target Completion Date
P1	Project Initiation Document		John Marais	Jason Murphy	1 August 2006	9 August 2006
P2	Review of options and recommendation of the most suitable for the production of regional GVA measure on a production basis	2	Jason Murphy	TBA	August 2006	31 March 2007
P3	Regional Accounts Methodology guide		John Marais	TBA	October 2006	31 July 2007
P4	Review of data requirements to support a production measure of regional GVA.	2	Jason Murphy	TBA	October 2006	June 2007
P5	Initial Assessment of product/industry deflators from re-engineered National Accounts System.	2	Jason Murphy	TBA	September 2007	April 2008
P6	Experimental production measure regional GVA estimates.	2	Jason Murphy	TBA	April 2007	March 2008
P7	Regional GVA measured on the output/production basis at current and constant prices.	2	Jason Murphy	TBA	April 2008	December 2009

Appendix E - Explanatory Notes

"In" versus "For" bases.
Regional Accounts statistics are produced on an "in" basis, in line with Eurostat requirements, which shows where the economic activity takes place. The regional analyses provided in PESA on the other hand are produced on a "for" basis, and these show where the individuals and enterprises that benefited from public spending are located.
In practice these may produce similar results for certain industries such as Education where the region in which the economic activity takes place is normally the same as the region that benefits from this.
Defence activities are undertaken for the benefit of the UK as a whole, however, and the use of the "for" basis means that a regional breakdown cannot be identified.

Apportionment of ABI2 to region and industry:
ABI2 surveys are sent to a sample of business reporting units and the data received is allocated to regions using local unit data kept on the Inter-Departmental Business Register (IDBR.)
Allocation to industry at the regional level is done using the industry of the local unit in contrast to national ABI2 figures which are allocated to reporting unit industries.
Regional Accounts figures are then constrained to national figures for industries, so that the results are neither local nor reporting unit totals.
(See weblink for details on ABI methodology: http://www.statistics.gov.uk/CCI/article.asp?ID=74)

Top down approach
The following is taken from the Eurostat publication: "Regional Accounts Methods: Gross value added and gross fixed capital formation by activity":
4.1 "The national figure is distributed (to region) using an indicator which is as close as possible to the variable to be estimated. For example, wages and salaries might be allocated to regions using total employment multiplied by average earnings from a different statistical source."
4.3(d) "Top down methods should be generally applied to components, rather than to the total."

Production(Output) approach (GVA(P))
The output or production approach theoretically involves measuring the value of output (volume) of goods and services produced and removing the value or volume of goods and services used up in the productive process. The difference between output produced and intermediate consumption (the goods and services used up or transformed in the production process) is value added or net output:

Main components in GVA(P)	
Output	Turnover + change in inventories + taxes (less subsidies) on production
Intermediate Consumption	Purchases adjusted for changes in inventories of materials and fuels.
GVA	Output - Intermediate Consumption

Income approach (GVA(I))
This involves adding up all income earned by resident individuals or corporations in the production of goods and services, and represents the sum of incomes distributed by resident producer units:

Main components in GVA(I)	
GVA	Compensation of Employees + Gross Operating Surplus + Taxes (less subsidies) on production

Non market sectors (eg Govt.) Output = Sum of costs
This assumes that for every pound spent a pound of output is generated, and involves adding up all costs.

Components in GVA (Non market sectors)	
Output	Compensation of Employees + Capital Consumption + Intermediate Consumption
GVA	Output - Intermediate Consumption.

Institutional Sectors of the UK economy
Local Government
Central Government
Public Non Financial Corporations
Non-Profit Institutions Serving Households
Financial Corporations
Private Non-Financial Corporations
Households

NUTS 1/Government Office Regions
UKC North East
UKD North West
UKE Yorkshire and the Humber
UKF East Midlands
UKG West Midlands
UKH East of England
UKI London
UKJ South East
UKK South West
UKL Wales
UKM Scotland
UKN Northern Ireland

Related documents/publications
"Regional GVA Production Measure Project Initiation Document." - John Marais
"Developing Regional Statistics Following the Allsopp Report" - David Caplan
"Review of Statistics for Economic Policymaking - Final Report" - Christopher Allsopp
"Producing estimates of regional GVA: Why the Welsh Short Term indicators approach is deficient." - Robin Youll
"UK Regional Accounts: Quality Assurance Review" - David Wroe

Appendix F - Project Team & Technical Advisory Group

John Beadle (ONS/Chair)
John Marais (ONS Project Manager)
Glenn Everett (ONS)
Jason Murphy (ONS Project Team Manager)
Sandy Stewart (Scottish Executive)
Catherine Hareb (ONS)
Craig Bickerton (East Midlands Development Agency)
Michelle Furphy (N Ireland Office)
Julian Revell (Welsh Assembly)
Shaun Flanagan (DCLG)
Robin Youll (ONS)
Trevor Fenton (ONS)
Sanjiv Mahajan (ONS)
Stephen Curtis (ONS)
Michael Clary (DTI)
Denis Till (ONS/Secretary, Project Team Member)
Pete Brodie (ONS)
Greg Wiltshire (Volterra - Greater London Authority)
Frank Bowley (HM Treasury)

Appendix G - Glossary

Annual Business Inquiry (ABI)
This is a business survey carried out by the Office for National Statistics. Part 1 collects employment data, while part 2 collects financial information.
The financial information available consists of a number of variables including:
Turnover; GVA; purchases of goods, materials and services; employment costs; and changes in inventories.
(See Appendix A for further details)

Annual Survey of Hours and Earnings (ASHE)
This provides information about the levels, distribution and make-up of earnings and hours worked for employees in all industries and occupations.
The ASHE is a new survey developed to replace the New Earnings Survey (NES) from 2004, including improvements to the coverage of employees, imputation for item non-response and the weighting of earnings estimates.
The ASHE volumes contain UK data on earnings for employees by sex and full-time/part-time workers. Further breakdowns include by region; occupation; industry; region by occupation; and age-groups, for the following variables: gross weekly pay, gross hourly pay, gross annual pay, weekly pay excluding overtime, hourly pay excluding overtime, overtime pay, shift pay, gross hours worked and overtime hours worked.

Basic Prices
These prices are the preferred method of valuing output and value added. They reflect the amount received by the producer for a unit of goods or services excluding any taxes on products and including any subsidies on products. This price includes only taxes on production (for example business rates) and excludes any subsidies on production (for example agricultural set-aside).

Blue Book
The Blue Book is the ONS' key annual publication for national statistics and provides detailed estimates of national product, income and expenditure for the UK. Some tables contain data for the last eighteen years; all tables contain data for the last nine years. It covers value added by industry, full accounts by sector - including financial and non-financial corporations, central and local government and households - and capital formation.
Provides annual figures including lower level of detail to first releases produced for preliminary, provisional and full quarterly estimates of national accounts.

Better Regulation Executive
The Better Regulation Executive aims to minimise bureaucracy for businesses and front-line staff in the public sector and to help charities and the voluntary sector to make a greater contribution to society. It sits within the Cabinet Office and works across government to support and challenge departments and regulators as they reduce and remove regulation across the private, public and voluntary sectors. The Better Regulation Executive also plays an active role in promoting the better regulation agenda in Europe.

Compensation of Employees (COE)
This covers all wages and salaries including certain forms of payments made-in-kind and the pay and allowances in cash and kind of HM Forces. It also includes payments by employers regarded as supplements to wages and salaries, such as contributions to the National Insurance Scheme, employers' contributions to other pension schemes together with redundancy payments and compensation payments eg injury. It excludes certain specific expenses of employment such as travel expenses or cost of special clothing needed exclusively for work.

Classification of the Functions of Government (COFOG)
The UN provides the international standard classifications of the functions of government and these include defence, education and health.

Constant price
Constant price figures express value using the average prices of a selected year, this year is known as the base year. Constant price series can be used to show how the quantity or volume of goods has changed, and are often referred to as volume measures.

Classification of Product by Activity (CPA)
This provides a detailed list of products by economic activity and it relates directly to the European Union's classification structure (NACE rev 1.) As such it is very similar to the Standard Industrial

Classification (see SIC.)

Current price
Current price figures measure value of transactions in the prices relating to the period being measured.
Deflators
These are price indices used to remove price changes from a current price value. The deflator, if chosen with care, will give a good approximation of the price movements that have affected the value series and allow for the calculation of an accurate constant price series.
DFES
Department for Education and Skills
Double Deflation
This is a method for calculating value added by industry at constant prices, which takes separate account of the differing price and volume movements of inputs and outputs in an industry's production process. Output and intermediate consumption are deflated separately.
GDP
This is a measure of the value of goods and services produced in the UK before providing for capital consumption. It is equal to gross value added at basic prices plus taxes (*less* subsidies) on products. Alternatively, it is equal to the sum of total final domestic consumption expenditures *less* imports of goods and services.
GVA
This is a measure of the contribution to Gross Domestic Product (GDP) made by an individual producer, industry or sector. The gross value added generated by any unit engaged in production activity can be calculated as the residual of the units' total output less intermediate consumption, or as the sum of the factor incomes generated by the production process. Net value added is shown after deducting capital consumption.
HESA
Higher Education Statistics Agency
Implied industry deflators.
These are obtained by dividing current price figures by constant price figures for an industry over a period of time. The result is effectively an average across the products and services which that industry produces.
Institutional Sector
The economic accounts split the economy into institutional sectors according to their role in the economy. The main sectors are non-financial corporations (split between public and private), financial corporations (split between public and private), general government (split between local and central), households and non-profit institutions serving households (NPISHs). The rest of the world is also treated as a sector within the accounts.
Intermediate consumption
This represents industries' purchases of goods and services to be used up in the production process (excluding any goods purchased for resale without any further processing), and adjusted for changes in inventories of materials and fuels.
Inventories
These were previously known as stocks. Inventories consist of materials and fuels, work-in-progress and finished goods as well as goods bought for resale without any further processing.
NACE (Nomenclature Generale des Activities Economiques dans les Communautes Europeennes)
The EU standard industrial classification of all economic activities. Introduced by EC Regulation it is obligatory on all member states. The current version is NACE Rev 1.
New Earnings Survey (NES)
(See ASHE)
NPISH
Non-profit institutions serving households include organisations such as churches, trade unions and members' clubs.
NUTS (Nomenclature of Units for Territorial Statistics)
NUTS was created by the European Office for Statistics (Eurostat) as a single hierarchical classification of spatial units used for statistical production across the European Union. At the top of the hierarchy are the individual member states of the EU: below that are levels 1 to 3
Output
This is the value of goods and services together with work-in-progress produced. It is equal to the value

of the industry's sales plus any increase (and less any decrease) in the value of its inventories of finished products and work in progress. Output is thus measured after deducting holding gains. The outputs of the distribution and service trades industries are measured on a 'gross margin' basis.

PESA (Public Expenditure Statistical Analysis)

This is published annually by the Treasury and provides information on government spending plans, as well as an analysis of public expenditure.

Product Indicator

A measure of the product mix output and/or consumed by an industry.

Public Corporations

These are public trading bodies that have a substantial degree of financial independence from the public authority, central or local government that created them.

Purchases

This represents the value of all goods and services purchased during the year.

Regional Indicator

A measure of economic activity by region

Single Deflation

This is a method for calculating value added by industry at constant prices, which uses price indices to deflate current price value added. Unlike double deflation output and intermediate consumption are not deflated separately.

Standard Industrial Classification (SIC)

This is the industrial classification applied to the collection and publication of a wide range of economic and industrial statistics. The current version is SIC(2003), and this is based on NACE Rev 1

STES (Short Term Turnover and Employment Survey)

This is a monthly survey used to collect data on turnover, exports and employees, and for some industries orders on hand.

Stocks and work in progress

(see inventories)

Subsidies on production

These are subsidies based on the levels of productive activity, for example, numbers employed.

Subsidies on products

These are subsidies based on a quantity or value of goods or services sold.

Turnover

Turnover is defined as Total sales and work done. This is calculated by adding to the value of Sales of goods produced, Goods purchased and resold without further processing, Work done and industrial services rendered and Non industrial services rendered

Taxes on production

These are taxes paid by producers, for example business rates, motor vehicle duties and regulatory fees, and are levied according to production, and do not depend on the profitability or otherwise of a company.

Taxes on products

These taxes are defined as product specific taxes, for example value added tax, excise duties, air passenger tax, insurance premium tax and import duties, and are based on the volume or value of production sold.