Measuring the economic impact of an intervention or investment

Paper One: Context & rationale

December 2010
Executive summary

This paper forms the first of a series which aim to complement IEF+ (and other guidance\(^1\)) by examining the sources, existing methods and concepts which surround the measurement of an IOI consistent with those used to produce official Gross Value Added (GVA) estimates.

This paper was drafted prior to recent announcements from the coalition government about plans for abolishing Regional Development Agencies (RDAs) and changes to the approach to setting targets and monitoring progress. GVA is a key economic measure which is likely to be used in some way to assess interventions at a range of geographical scales and the authors feel the papers will remain relevant with the move to increasingly local decision making. However, readers should consider this context when reviewing the paper.

The need to deliver value for money when delivering IOIs has created demand from regional and sub-regional decision makers for a consistent and robust method of determining the economic impact of an IOI. The devolution of economic development powers to regional and sub-regional organisations, and the framing of PSA targets in terms of the Office for National Statistics (ONS) Regional Accounts GVA estimates, has brought methodologies which produce GVA estimates sharply into focus.

Methods previously used to assess an IOI are often pragmatic; previous methods have estimated approximate GVA using net employment gain and multiplying this by average (mean) GVA per filled job for the region, or, adding together net increases in total salaries and business profits. The number and

\(^1\) Other guidance includes HMT's The Green Book: Appraisal and Evaluation in Central Government; OGC's Gateway Review for Programmes & Projects; Scottish Executive’s Additionality & Economic Impact Assessment Guidance Note; BIS’ Guidance for Using Additionality Benchmarks in Appraisal; Research to Improve the Assessment of Additionality, and Self assessment as a tool to measure the economic impact of BERR policies - a best practice guide.
simplicity of methods used to estimate GVA for a range of IOIs\textsuperscript{2} has resulted in estimates of the impacts of IOI that are often inconsistent. As a result estimated impacts of IOIs may not be directly comparable, making prioritisation based on these estimates problematic.

The range of approaches to estimating the economic impact of an IOI highlights the lack of authoritative guidance on the calculation of GVA estimates for an IOI\textsuperscript{3}. The key aim of these papers is to provide greater clarity and encourage greater consistency in the calculation and use of GVA and other metrics to assess economic impacts. This should contribute to improvements in the assessment and prioritisation of proposed IOIs, the monitoring of IOIs that are underway, and the evaluation of IOIs that have been completed.

A range of published metrics designed to measure economic activity, including the internationally recognised Gross Domestic Product (GDP) and GVA are described in this paper. Investigations have revealed that GDP, and GVA measures that are conceptually consistent with ONS Regional Accounts can not be provided at the level of the IOI.

As it is not feasible to use measures consistent with published estimates of GVA, alternate options must be investigated. Two options for measuring the economic impact of an IOI are identified as:

- creating a methodology which is broadly consistent with international standards for measuring GVA, to produce an approximate GVA estimate for an IOI;

\textsuperscript{2} Examples of evaluations which have estimated GVA include: Inner City Solutions (2008); PriceWaterhouseCoopers (2008, 2009a, 2009b); Regeneris Consulting (2008).

\textsuperscript{3} Since writing, the department for Business, Innovation and Skills published practical guidance (RDA Evaluation:Practical Guidance on Implementing the Impact Evaluation Framework) to improve the process of evaluating interventions made by Regional Development Agencies.
• using a basket of indicators or assessing factors which impact on GVA to provide an indication of which IOIs will likely have the greatest impact on GVA.

Any approach must take into account related issues, including, amongst others: data consistency and quality; direct, indirect and induced impacts; and price inflation.
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1. Introduction

This paper forms the first of a series which aim to complement IEF+ (and other guidance\(^4\)) by examining the sources, existing methods and concepts which surround the measurement of an IOI consistent with those used to produce official Gross Value Added (GVA) estimates. The following sections will provide the context and rationale for the series of papers.

1.1. Devolution to the regions: Regional and Sub-regional investment decisions

Government and other public bodies invest directly and undertake other forms of intervention in the public realm\(^5\), transport infrastructure, and the wider economy. To ensure the appropriateness of these IOIs, public organisations require robust and appropriate quantitative data on which to base IOI decisions.

Over the past ten years, there has been significant change in the level at which many key economic development decisions have been made. The creation of Regional Development Agencies\(^6\) (RDAs) in 1999, via the Regional Development Agencies Act 1998\(^7\), can be seen as a key point in the devolution of decision making to the English regions. More recently, the Sub National review\(^8\) in 2007, outlined a vision for devolving key responsibilities

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\(^4\) Other guidance includes HMT's The Green Book: Appraisal and Evaluation in Central Government; OGC's Gateway Review for Programmes & Projects; Scottish Executive's Additionality & Economic Impact Assessment Guidance Note; BIS' Guidance for Using Additionality Benchmarks in Appraisal; Research to Improve the Assessment of Additionality, and Self assessment as a tool to measure the economic impact of BERR policies - a best practice guide.

\(^5\) Public realm has been defined in this instance as the space between and within buildings that are publicly accessible, including streets, squares, forecourts, parks, public art and open spaces.

\(^6\) More information on Regional Development Agencies is available at http://www.englandsrdas.com/


and funding to sub-regional organisations, including Local Authorities, and partnerships.

These regional and sub-regional bodies and partnerships have been, or will be tasked with various remits, including leading on economic development, and developing the skills of the workforce. These remits are commonly fulfilled through a series of IOIs targeting areas where there is a perceived need for intervention.

Interventions vary in terms of their geographical scale and domain\(^9\). Interventions by RDAs in recent years include assisting individual businesses and investment in the public realm. Inevitably and justifiably, the use of public money is heavily scrutinised; investments and interventions must demonstrate value for money both before and after their inception. As a result, regional and sub-regional organisations need to evaluate and monitor the economic value of their IOIs, in an accurate and consistent way.

The next section briefly describes a range of methods which have been used to evaluate the economic impact of an IOI in order to introduce the current perspective on evaluation.

**1.2. Measuring investments or interventions: Estimates of GVA**

Methods used to assess an IOI are pragmatic; some involve estimating approximate GVA using net employment gain and multiplying this by average (mean) GVA per filled job for the region, or, adding together net increases in total salaries and business profits. The number and pragmatic nature of methods used to estimate GVA for a range of IOIs\(^10\) has resulted in estimates of the impacts of IOI that are often inconsistent. As a result the estimates

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\(^9\) Domain has been used to refer to public, private and environment.

\(^10\) Examples of evaluations which have estimated GVA include: Inner City Solutions (2008); PriceWaterhouseCoopers (2008, 2009a, 2009b); Regeneris Consulting (2008).
may not be directly comparable, making prioritisation based on these estimates problematic\textsuperscript{11}.

The diverse range of approaches to estimating the economic impact of an IOI highlights the lack of authoritative guidance on the calculation of GVA estimates for an IOI. As Office for National Statistics (ONS) Regional Statisticians, the authors have a remit to provide users with authoritative, independent advice on the use of statistics and data. As part of this remit the authors have undertaken this work to provide greater clarity on the use of GVA and the calculation of GVA for an IOI.

Such guidance will enable and encourage consistent and comparable estimates of the impact of IOIs. It will assist a range of stakeholders, including government departments such as the Department for Business, Innovation & Skills (BIS), regional and sub-regional organisations, such as Regional Development Agencies and Local Authorities, to more accurately prioritise IOI decisions.

The next section details how the authors propose to tackle the provision of guidance on assessing the economic impact of an IOI.

1.3 The two paper approach

The production of guidance comprised two papers, delivered over 2009 and 2010. This approach enabled issues to be examined systematically and in some detail to produce a set of guidance which adequately covers the subject. It also had the advantage of enabling a large range of stakeholders to comment and feedback on drafts of the papers during their development, ensuring their views were considered.

\textsuperscript{11} Since writing, the department for Business, Innovation and Skills published practical guidance (RDA Evaluation: Practical Guidance on Implementing the Impact Evaluation Framework) to improve the process of evaluating interventions made by Regional Development Agencies.
2. Aims

This section will briefly discuss the aims of the two papers, before examining the aims of the first paper in more detail.

2.1. Aims of the three paper series

The papers will assume a robust justification for the IOI has already been made and will concentrate on developing a framework for measuring the economic impact of an IOI.

The papers will not consider other important impacts of an IOI, such as its strategic, environmental or social impacts or its achievability\(^{12}\). Limiting the scope of the papers in this series allows the production, of a set of papers that can describe what is required to produce estimates of economic impacts of an IOI; an in-depth investigation would be difficult should the scope be widened to encompass every conceivable impact of an IOI. However, it is feasible that other impacts of an IOI, for example social impacts, could be examined in future papers, or by other authors.

The series will comprise two papers, with the broad aims of:

1. introducing and defining the topic (Paper 1).
2. describing key metrics for measuring economic activity (Paper 1)
3. analysing methods for measuring the economic impact of an IOI (Paper 2)

2.2. Aims of paper one

The aims for the first paper in the series are to:

\(^{12}\) It is widely recognised that economic indicators are imperfect measures of progress and well-being, and work is ongoing on the development of complementary indicators. See Allin (2007) and ONS working paper: Measuring Societal Wellbeing in the UK. The impact of UK economic activity on the environment is currently measured through the ONS Environmental Accounts.
• introduce the context and rationale for measuring the economic impact of an IOI.
• outline official metrics currently used to measure economic activity at varying scales (national, regional, sub-regional), and methods which are currently used to evaluate an IOI
• introduce issues to consider when measuring impacts in terms of GVA

The paper is primarily focused on the application of official statistics, where the authors can add insight and value through their unique position as ONS employees. It is not concerned with locally collected information, surveys, reports, or consultations.

3. Defining an Investment or Intervention

An IOI is defined in this study as:

An activity which has the potential to impact on the economy of a locality over a finite period.

Examples include:

• investment directly into a business site(s) with the aim of creating or safe-guarding jobs

• the creation of office space for business

• the creation of public art which may increase tourism

This definition has been chosen to encompass the widest possible number of interventions and recognises that many evaluations are undertaken over a finite period.
In order to examine how one might best measure the economic impact of an IOI, conventional metrics used to value economic activity should be explored. The next section outlines some of the key metrics used to measure economic activity, including Gross Domestic Product (GDP) and GVA.

4. Measuring economic activity

This section aims to provide a brief introduction to the key metrics used for valuing economic activity. The section will define key metrics, explaining how they are calculated and introduce some of their inherent limitations. It aims to identify data sources that have the potential to estimate the economic impact of an IOI. The second paper in the series will be a technical paper examining possible methodologies for quantifying the economic impact of an IOI and will provide more detailed evaluation of methods and concepts.

4.1 Measuring economic activity: Gross Domestic Product

GDP is the key economic metric used to measure all economic activity within a geographical area over a given period, and is used extensively to compare different national economies on a consistent basis. In the UK, ONS produces estimates of GDP on an internationally consistent basis. GDP can be calculated using one or more of three possible approaches: the income, production, and expenditure approaches. Appendix 1 shows how GDP is calculated from its components.

4.2 Using GDP to quantify the impact of an investment or intervention

GDP is a broad aggregate measure of economic activity within an economic territory, and as such, cannot be calculated at the level of an individual

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business\textsuperscript{14}; this renders GDP an infeasible metric for measuring economic activity at a sub-national or industry level, including IOIs.

However, a related metric, GVA, is used across government to measure national, regional and sub-regional economic performance. GVA is widely recognised by Her Majesty’s Treasury (HMT), BIS, and regional and sub-regional policy makers as a measure of local economies. The use of GVA to measure IOIs will be explored further in the next section.

4.3 Measuring economic activity: Gross Value Added

At a micro-level GVA is the contribution of each individual producer, industry or sector to the economy. At an aggregate macro-level it provides a summary measure of the complex interactions of the economy. GVA for the UK is estimated and published by ONS and estimates feed into the calculation of GDP, see Appendix 1. GVA is used extensively to compare national and sub-national economies on a consistent basis. Within England it is used to assess regional economies and the performance of their development agencies against Public Service Agreements (PSAs)\textsuperscript{15}.

The framing of performance targets in terms of GVA has understandably thrust GVA into the consciousness of regional and sub-regional policy and decision makers. As a result, quantifying the economic impact of an IOI using GVA has considerable appeal. Nevertheless, measuring economic impacts using GVA raises conceptual and technical issues. These issues will be discussed in the next section which explains GVA and explored in more detail in subsequent papers.

\textsuperscript{14} Regional Input-Output tables would allow the calculation of GDP by region but these are currently unavailable. More information on Input-Output tables can be found in Input Output Analyses 2006.

4.3.1 Explaining Gross Value Added

Understanding GVA and its calculation is essential when trying to measure economic impact. A simple way to explain GVA is to describe it in the context of a traditional manufacturing process:

During a manufacturing process goods, energy, and services are changed or consumed. The associated costs are termed "Intermediate Consumption". At the end of the process the business has a product(s) (or "Output") for sale or for its own use.

For example, if Output comprises a wooden chair, then Intermediate Consumption includes the cost of wood, glue, screws, and other materials used in its manufacture, plus the cost of rental, utilities, transport, legal and business services, insurance, marketing, and other consumables.

Selling the product (Output) generates revenue from which costs associated with the production of the product (Intermediate Consumption) can be met. The balance of Output less Intermediate Consumption is the firm’s GVA\(^{16}\).

Out of GVA, the firm will likely pay wages, salaries, national insurance contributions, and possibly redundancy and other costs associated with employment (collectively these employee related costs are known as Compensation of Employment (CoE)). Firms also pay taxes on production\(^{17}\), such as business rates, motor vehicle duties and regulatory fees. Subtracting Intermediate Consumption, Taxes (less Subsidies) and CoE from Output leaves a residual that can broadly be described as profit/loss (technically known as Gross Operating Surplus (GoS)).

GoS is disbursed in various ways, such as payment of corporation/income tax and dividends. Firms may also invest in buildings, machinery and vehicles,

\(^{16}\) This example does not take into account subsidies and other instruments that can distort the market.

\(^{17}\) More information regarding taxes on production can be found on page 144 of UK Input-Output Analyses 2006.
and engage in other financial transactions (e.g. loans, deposits, dealing in bonds, shares, or other securities). A full sequence of accounts\textsuperscript{18} for the UK can be found in the National Accounts (Blue Book), showing how at an aggregate (national) level GVA is generated and used by businesses.

This is a simplified explanation of GVA using the production approach and does not reflect some of the conceptual complexities involved in its measurement (e.g. treatment of inventories of materials and unsold finished goods, product taxes, or own-account production).

\textbf{4.3.2 Calculating Gross Value Added}

In principle, aggregate GVA can be calculated using either the income, production or expenditure approach (see appendix 1 for the underlying principles behind these three methods). ONS produces balanced estimates of UK level GVA at current basic prices on an internationally consistent\textsuperscript{19} basis using all three approaches in the National Accounts Supply and Use Tables (SUTs). Data from many surveys and certain administrative sources feed into those estimates. UK GVA by industry is calculated using the Income and Production approaches. Currently, only the income approach is used for regional and sub-regional (Regional Accounts) estimates of total GVA and GVA by industry. Appendix 2 provides an example of published regional GVA and its components and Figure 2 details the availability of GVA and its components.

GVA estimates produced by ONS at regional and sub-regional levels differ from national level estimates published in the National Accounts in terms of their scope, geographical scale and industrial granularity\textsuperscript{20}. Figure 2 outlines the estimates available for each geographical scale.

\textsuperscript{18} Accounts include: Goods & Services, Production, Distribution and Use of Income, Accumulation including Capital.

\textsuperscript{19} Information is produced on an internationally consistent basis using European System of Accounts methodology \url{http://circa.europa.eu/irc/dsis/nfaccount/info/data/esa95/esa95-new.htm}

\textsuperscript{20} Industrial granularity refers to the breakdown of industry using the Standard Industrial Classification (SIC), for example, 1 digit SIC is coarser than 4 digit SIC.
GVA is estimated at regional (NUTS1\textsuperscript{21}) and sub-regional level (both NUTS2 and NUTS3 - former county level). When published, these estimates lag the current year by one and two years respectively. A top-down approach which allocates national level estimates to NUTS1, 2 and 3 levels within a coherent framework is used to produce GVA estimates. Due to data volatility, the preferred measure of GVA is the headline measure which uses a five period moving average\textsuperscript{22,23}.

<table>
<thead>
<tr>
<th>Geography</th>
<th>Whole economy</th>
<th>By industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UK\textsuperscript{1}</td>
<td>NUTS\textsuperscript{2,3} 1</td>
</tr>
<tr>
<td><strong>Latest year\textsuperscript{4}</strong></td>
<td>T-1</td>
<td>T-1</td>
</tr>
<tr>
<td>Compens. of employees</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Taxes less subs. on production</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Gross op. surplus (incl. Mixed income, Gross trading profits and surpluses, Non-market capital consumption, Rental income, Holding gains)</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

| Number of Industry groups published (SIC 03\textsuperscript{3}) | 108 | 31 | 17 | 6 |

**Published components, by industry:**

<table>
<thead>
<tr>
<th></th>
<th>Compensation of employees</th>
<th>Taxes less subs. on production</th>
<th>Gross op. surplus (incl. Mixed income, Gross trading profits and surpluses, Non-market capital consumption, Rental income, Holding gains)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>✓</td>
<td>✓</td>
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Footnotes:

1. Published as part of the United Kingdom National Accounts (the Blue Book) by ONS
2. Published by ONS Regional Accounts.
4. T = year of publication

**Figure 2: Availability of Gross Value Added estimates by components and geography**

\textsuperscript{21} Nomenclature of Units for Territorial Statistics (NUTS) regions, for more details see http://www.statistics.gov.uk/geography/nuts.asp
\textsuperscript{22} The unsmoothed GVA series are available from ONS.
\textsuperscript{23} More information on the methodology underlying the creation of Regional Accounts GVA estimates can be found in the Regional Accounts Methodology guide.
The detail available from the GVA estimates is insufficient to enable assessment of IOI impacts at sub-NUTS3 level – the level at which many IOIs’ impacts are evident. This lack of detail vitiates the use of ONS Regional Accounts GVA estimates to assess IOI. As a consequence, alternative sources of GVA data need to be examined to determine what data are available at the levels at which IOIs typically impact.

The next section outlines additional sources of GVA data which may have potential for use in measuring the economic impact of an IOI.

4.4 Alternative sources of GVA estimates from ONS

ONS Regional Accounts GVA estimates do not provide the required geographical break down to allow an estimate of the GVA associated with an IOI below NUTS 3 level. This section investigates alternate official GVA estimates to identify secondary data sources that may enable assessment of the economic impact of IOIs.

4.4.1 The Annual Business Inquiry (ABI)

An alternative source of GVA data is the Annual Business Inquiry (part 2). The Annual Business Inquiry (ABI) is conducted in two parts: one dealing with employment, the second with financial information. The financial inquiry covers approximately two thirds of the UK economy including: Agriculture (part), Hunting, Forestry and Fishing; Production; Construction; Distribution and Service industries (excluding the Financial and Insurance Services industries and some public and government bodies). The coverage of the employment inquiry is wider.

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24 Secondary data is data that has been collected in the past or for another purpose.
25 Development of ABI - methodology including sampling
26 The Annual Business Inquiry dealing with employment (ABI/1), and the Business Register Survey (BRS) were replaced by the Business Register and Employment Survey (BRES) in August 2009. The first estimates from BRES are expected in 2010.
The Annual Business Inquiry and other business surveys conducted by ONS use the Inter-Departmental Business Register (IDBR) as the frame from which their samples are selected. The IDBR contains information on all UK PAYE and VAT-registered businesses registered in the UK with HM Revenue & Customs (HMRC). The register contains a great deal of basic information, and is used as a key source of data on business activity, as it covers approximately 99 per cent of economic activity. However, there are significant problems associated with the use of IDBR-based variables as time series, as measures of economic activity, or to assess the impact of interventions. For example, the register does not include small businesses without employees whose turnover is below the VAT threshold, and may exclude small enterprises in which interventions have been made.

Data collected and published through the ABI are used to produce an approximate estimate of GVA at basic prices. This measure is approximate as it does not allow for certain National Accounts concepts such as, for example, the full range of taxes, subsidies and incomes earned-in-kind which are incorporated in the Regional Accounts GVA estimates. In addition, there are coverage, valuation, quality and coherence adjustments which must be made before approximate GVA will be consistent with that produced by ONS Regional Accounts. However, the ABI survey estimates form a substantial part of source data used by ONS National Accounts to compile GVA.

4.4.2 Alternatives to published economic metrics

An alternative for measuring an IOI in terms of GVA would be the creation of a GVA estimate using data from other sources (primary or secondary) and

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27 Information held on the Inter-Departmental Business Register is commercially sensitive and is not released without strict disclosure controls being applied, ensuring commercially sensitive information is not released. Equivalent data is not readily available from alternate sources.
28 Primary data refers to data collected for the first time to meet a specific purpose which is not available elsewhere.
applying a consistent robust methodology that closely matches the concepts and approaches to estimating GVA applied within the National Accounts framework.

A more radical alternative would be to measure outcomes such as employment creation, productivity enhancement, and improvement in skills which impact directly on GVA. Such an approach would allow policy makers to assess IOI in terms of the potential impact on GVA, rather than attempting to accurately and robustly estimate GVA for an IOI. These alternate methods along with existing estimates of GVA will be examined in the second paper.

The following section is designed to highlight the complexities surrounding the measurement of economic impact, and will introduce issues which could be considered when attempting to calculate GVA for an IOI. Decisions and assumptions on these issues (and others) must be overtly stated in any methodology, to ensure users are aware of limitations associated with the method.

5. Issues to consider when estimating GVA: an introduction

As there is a desire to determine the economic impact of an IOI in terms of GVA, it is important that issues which affect the calculation of GVA are understood. This section will introduce important issues which will be considered further in the second paper in the series.

5.1 Geographical scale

GVA estimates from official sources (ONS Regional Accounts) are volatile at low geographical levels. Any approach to estimating GVA (whether or not using official data) should produce consistently robust estimates at the scale of the IOI. If this issue is ignored any such approach will be unreliable when assessing an IOI.
5.2 Data consistency and quality

Any data used, whether primary or secondary, must be reliably and consistently collected. Reliability and accuracy will depend upon the data, collection instruments, and, where sampling is involved, on the availability of appropriate sampling frames, and the application of techniques such as stratification. In addition, definitions must be consistent with National Accounts concepts, which often differ from business accounting concepts. An example of the potential impact of these conceptual differences is described in Appendix 3.

Wages and salaries, as recorded in business accounts, form only one part of the national accounts concept of compensation of employees, which also includes national insurance contributions, other pension contributions, and redundancy payments. Items such as tips and goods and services provided by the employer at zero or reduced cost to staff are also included in compensation of employees.

If such issues are ignored then estimates of GVA can only act as approximations, with an implicit assumption that the components not included move in line with those components that are included. This assumption is dubious when considering items like tips, redundancy payments and pension contributions.

5.3 Data collection and availability

Temporal considerations in terms of the data availability and collection must be considered. If any method is designed to estimate value pre- and post-intervention, the data used must be available for collection for a period prior to the impact of the IOI, throughout the life span of the IOI and thereafter.

The issue outlined in section 5.3 relate directly to the concept of persistence used in the Impact Evaluation Framework produced by the Department for Business Innovation and Skills.
5.4 Price inflation

The impact of the IOI may take a considerable period of time to emerge and may be sustained over a long period. Evaluation methodologies that focus on short-term benefits may skew results in favour of projects that appear to deliver within the period the methodology is designed to measure. When estimating the future impact of a project, monetary estimates should be deflated to take account of a predicted level of inflation over the lifetime of the IOI.

5.5 Additionality

Economies do not operate in a vacuum. Any assessment of the impact of an IOI needs to be on a net basis which isolates the impact of the IOI and takes account of what would have happened in the absence of the IOI. A range of factors have been identified as contributing to additionality; these include displacement, leakage, substitution and multiplier effects.

<table>
<thead>
<tr>
<th>Jobs created by Investment or Intervention (IOI)</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of which:</td>
<td></td>
</tr>
<tr>
<td>Jobs created outside region of IOI (leakage)</td>
<td>2</td>
</tr>
<tr>
<td>Jobs created in the region of IOI</td>
<td>20</td>
</tr>
<tr>
<td>Employees created in the region of IOI, of which:</td>
<td></td>
</tr>
<tr>
<td>Jobs filled by people engaged elsewhere in the region’s labour market (displacement)</td>
<td>7</td>
</tr>
<tr>
<td>Jobs filled by people from outside the region</td>
<td>5</td>
</tr>
<tr>
<td>Jobs filled by people not engaged elsewhere in the regions’ labour market</td>
<td>8</td>
</tr>
<tr>
<td>Net jobs created in the region of IOI</td>
<td>(20 –7) = 13</td>
</tr>
</tbody>
</table>

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30 This can be referred to as the counterfactual or deadweight.
31 More detailed information on additionality can be found in the Research to Improve the Assessment of Additionality, and the Additionality Guide – A standard Approach to Assessing the Additional Impact of Projects, produced by the Department for Business Innovation and Skills and English Partnerships respectively.
The simplistic example above, of an intervention that creates new jobs illustrates the potential impact of leakage and displacement effects. At regional level the net impact on the number of jobs in the region may be less than expected, if jobs are filled by people previously employed elsewhere within the region (displacement), or jobs are created outside the region (leakage).

5.6 Appropriateness of a composite indicator

A composite indicator such as GVA, may not be the most appropriate way of measuring the economic impact of an IOI. A better result may be obtained by use of techniques such as compiling a basket of indicators comprising components that directly influences GVA, such as employment, turnover, skills, and productivity. Composite indicators have the advantage of simplifying the interpretation of multiple issues, but at the expense of diminished granularity (which may be desirable when measuring the economic impact of an IOI).

5.7 Direct, indirect and induced impacts

An IOI produces a range of impacts which can be broadly categorised into direct, indirect and induced impacts. Understanding and measuring each of these impacts is essential to assessing the entire impact of an IOI.

Direct, indirect and induced impacts can be summarised as follows:

- Direct impacts occur when additional demand for a unit generates a corresponding unit of output, e.g. production of a chair

- Indirect impacts arise as demand for materials and fuels used to create that additional unit of output generates, in turn, outputs in other industries, e.g. wood, steel, paint, fabric, electricity, gas, water and other materials, fuels, and services used in furniture production. There will be associated increases in labour, profits and capital
• Induced impacts are felt as increases in compensation of employees lead to increased spending on goods and services in the economy.

Direct measures are the simplest of the impacts to measure and understand. Indirect and induced impacts have the potential to be significant and extend far beyond the boundaries of the IOI but, by their nature they are difficult to understand and measure. However, difficulties in collecting data can not negate their importance when determining the impact of an IOI. As a result, assumptions regarding indirect and induced impacts must also be included in any methodology.

6. Methods currently used to evaluate investments or interventions

Various methods have been used to estimate GVA for a range of IOIs\textsuperscript{32}. The methods are often simplistic and based on a simplified version of the income approach to estimating approximate GVA, using total salaries plus total business profits as proxies for CoE and GoS, and rely on official secondary data. Such methods, although applying the principals of calculating GVA can produce estimates that differ greatly from estimates that are fully consistent with National Accounting concepts; see Appendix 3 for an illustration.

Methods used in previous evaluations often take net employment gain and multiply this by average (mean) GVA per filled job for the region, or an assumed average salary, to create an estimate GVA for the IOI. The use of averages has inherent limitations as there is an assumption that each job created produces no more and no less output than the average – which is unlikely to be the case. In addition, such methods only capture the direct impact of the IOI, ignoring the potentially significant indirect and induced economic impacts (see section 5.7).

\textsuperscript{32} Examples of evaluations which have estimated GVA include: Inner City Solutions (2008); PriceWaterhouseCoopers (2008, 2009a, 2009b); Regeneris Consulting (2008).
The ONS produces annual UK Input-Output Supply & Use Tables (SUTs) as part of the process of compiling and balancing the National Accounts. The published SUTs show GVA and its components (compensation of employees, gross operating surplus, taxes (less subsidies on production) by industry for 108 separate industries. SUTs also form the basis of the Input-Output Analytical Tables.

From these tables, it is possible to derive multipliers showing the effects (direct, indirect and induced, see section 5.7 for more information) of changes to supply and demand for goods and services.

Input-Output Analytical Tables are fundamental inputs to the economic and environmental models produced by proprietary forecasting houses and used by many RDAs.

Other approaches use primary survey data to create an income based GVA estimate by collecting information on increased profits and salaries. The use of primary data removes the generalisations inherent in the use of secondary data. However, any data collected must be consistent with National Accounts concepts in order to produce an estimate comparable with published ONS estimates of GVA (see Appendix 3 for more information).

These analyses and their uses will be discussed in more detail in the second paper. The next section summarises this report and introduces the second paper in the series.

7. Summary

The devolution of economic development powers to regional and sub-regional organisations, and the framing of PSA targets in terms of ONS Regional Accounts GVA estimates, has brought GVA sharply into focus. The need to deliver value for money when delivering IOIs has created demand from regional and sub-regional decision makers for a consistent and robust method of determining the economic impact of an IOI.
Methods used to assess an IOI are pragmatic; some methods estimate approximate GVA by taking net employment gain and multiplying this by average (mean) GVA per filled job for the region, or by adding together net increases in total salaries and business profits. The number and pragmatic nature of methods used to estimate GVA for a range of IOIs has resulted in estimates of IOI impacts that are often inconsistent. As a result, estimated impacts of IOIs may not be directly comparable, making prioritisation based on these estimates problematic.

The range of approaches to estimating the economic impact of an IOI highlights the lack of authoritative guidance on the calculation of GVA estimates for an IOI. The key aim of these papers is to provide greater clarity and encourage greater consistency in the calculation and use of GVA and other metrics to assess economic impacts.

A range of published metrics designed to measure economic activity, including the internationally recognised GDP and GVA, have been outlined. Investigations have revealed that GDP and GVA consistent with ONS Regional Accounts can not be measured at the level of the IOI.

As it is not feasible to use measures consistent with published estimates alternative options must be investigated. Two options for measuring the economic impact of an IOI are identified as:

- creating a methodology which is broadly consistent with international standards for measuring GVA, to produce an approximate GVA estimate for an IOI

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Examples of evaluations which have estimated GVA include: Inner City Solutions (2008); PriceWaterhouseCoopers (2008, 2009a, 2009b); Regeneris Consulting (2008).

• using a basket of indicators or to assess factors that impact on GVA, to provide an indication of which IOIs will likely have the greatest impact on GVA

Each of these approaches must take into account related issues, including, amongst others: data consistency and quality; direct, indirect and induced impacts; and price inflation.

The key findings are that:

• measuring the economic impact of some IOIs is feasible, but standard indicators such as GDP and Regional Accounts GVA estimates cannot be applied directly
• estimates of GVA consistent with Regional Accounts can not be produced at the level of individual businesses and hence IOIs
• two broad methods have been identified as potentially feasible for measuring economic impacts; creating a methodology which aligns with international standards for measuring GVA, or collecting a basket of indicators of factors which impact on GVA
• methods must consider a range of factors, including, amongst others: data consistency and quality; direct, indirect and induced impacts; and price inflation.

The second paper in the series will examine a selection of methods (including those identified above) which could be used to create an estimate of GVA. The aim will be to reveal the inherent limitations of the proposed metrics and to determine whether any are deemed suitable for use when creating an estimate of GVA for an IOI.
Appendix 1: Approaches for estimating Gross Domestic Product

Gross Domestic Product (GDP) can be calculated using three approaches: income, production and expenditure. The tables below list the components of GDP and their value in 2004 (consistent with the 2006 National Accounts (Blue Book)).

A1. The Income approach

GDP as estimated via the income approach (GDP(I)) measures the total income generated by the production of goods and services within the economy. The components of GDP(I) include income earned by companies (corporations), employees, and the self employed. See the glossary for definitions of terminology.

\[
\begin{align*}
\text{£million} & \\
\text{Taxes (less subsidies) on production} & 16,854 \\
\text{plus} \quad \text{Gross operating surplus (including mixed income)} & 378,594 \\
\text{plus} \quad \text{Compensation of employees} & 648,717 \\
\text{equals} \quad \text{Gross value added at current basic prices} & 1,044,165 \\
\text{plus} \quad \text{Taxes (less subsidies) on products} & 132,362 \\
\text{equals} \quad \text{Gross domestic product at current market prices} & 1,176,527
\end{align*}
\]

Source: United Kingdom Input-Output Analyses, 2006

A2. The Production approach

GDP estimated using the output or production approach (GDP(P)) measures total value added via the production of goods and services within the economy.
Total output at basic prices \(2,151,833\) 
less Total intermediate consumption \(1,107,668\) 
equals Gross value added at current basic prices \(1,044,165\) 

plus Taxes (less subsidies) on products \(132,362\) 
equals Gross domestic product at current market prices \(1,176,527\) 

Source: United Kingdom Input-Output Analyses, 2006

A3. The Expenditure approach

GDP estimated via the expenditure approach (GDP(E)) measures the total expenditures on all finished goods and services produced within the economy.

Households final consumption expenditure \(732,531\) 
\(\text{plus}\) Non-profit institutions serving households \(28,953\) 
\(\text{(NPISHs) final consumption expenditure}\) 
\(\text{plus}\) Central government final consumption expenditure \(152,325\) 
\(\text{plus}\) Local government final consumption expenditure \(98,383\) 
\(\text{plus}\) Gross fixed capital formation \(194,491\) 
\(\text{plus}\) Valuables \(-37\) 
\(\text{plus}\) Changes in inventories \(4,856\) 
\(\text{plus}\) Exports of goods (EU and non-EU) \(190,877\) 
\(\text{plus}\) Exports of services (EU and non-EU) \(107,817\) 
\(\text{less}\) Imports of goods (EU and non-EU) \(251,770\) 
\(\text{less}\) Imports of services (EU and non-EU) \(81,899\) 
equals Gross domestic product at current market prices \(1,176,527\) 

\(\text{less}\) Taxes (less subsidies) on products \(132,362\) 
equals Gross value added at current basic prices \(1,044,165\) 

Source: United Kingdom Input-Output Analyses, 2006
Appendix 2: Approaches for estimating Gross Value Added

Provisional 2007 headline GVA calculated using the income approach for the North West Government Office Region of England is detailed below, disaggregated into its published components.

\[
\begin{align*}
\text{Compensation of employees} & \quad 73,379 \\
\text{plus} & \\
\text{Gross operating surplus (including mixed income and Taxes (less subsidies) on production)} & \quad 46,289 \\
\text{equals} & \\
\text{Gross value added at current basic prices} & \quad 119,667 \\
\end{align*}
\]

Source: Regional Accounts First Release, 2008
Appendix 3: Estimating Gross Value Added; the impact of conceptual differences

The table below, based on real company account data, illustrates the differences in GVA estimates that can arise as a direct result of different methodologies and concepts being used.

<table>
<thead>
<tr>
<th></th>
<th>£ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
</tr>
<tr>
<td>“Production approach”(^1)</td>
<td></td>
</tr>
<tr>
<td>Net interest</td>
<td>50</td>
</tr>
<tr>
<td>Other income</td>
<td>0</td>
</tr>
<tr>
<td>Output (net interest + other income)</td>
<td>50</td>
</tr>
<tr>
<td>Intermediate costs</td>
<td>140</td>
</tr>
<tr>
<td>GVA1</td>
<td>-90</td>
</tr>
<tr>
<td>Of which:</td>
<td></td>
</tr>
<tr>
<td>Wages etc</td>
<td>160</td>
</tr>
<tr>
<td>Redundancy</td>
<td>40</td>
</tr>
<tr>
<td>Compensation of Employees (CoE, wages etc + redundancy)</td>
<td>200</td>
</tr>
<tr>
<td>Gross operating Surplus (GVA - CoE)</td>
<td>-290</td>
</tr>
<tr>
<td>“Income approach”(^2)</td>
<td></td>
</tr>
<tr>
<td>Net pre-tax profit</td>
<td>-1,360</td>
</tr>
<tr>
<td>Compensation of Employees</td>
<td>200</td>
</tr>
<tr>
<td>Depreciation</td>
<td>20</td>
</tr>
<tr>
<td>GVA2</td>
<td>-1,140</td>
</tr>
<tr>
<td>Difference between GVA estimates (GVA1-GVA2)</td>
<td>1,050</td>
</tr>
<tr>
<td>Impairment charges</td>
<td>1,160</td>
</tr>
</tbody>
</table>

Footnote:
1. GVA = Output - Intermediate costs.
2. GVA = Net pre-tax profit + Compensation of Employees + Depreciation.

The table shows two estimates of GVA derived from a financial company’s accounts. Both estimates are broadly, although not fully, consistent with National Accounting concepts. The table clearly illustrates that estimates can vary markedly depending on the approach used. In this example, the gap between GVA1 and GVA2 increases from £60 million in 2006 to over a billion pounds in 2008. The reason for this large discrepancy is the treatment of impairment charges, revaluation of inventories which are included in net profit.
before tax for company accounts purposes. GVA1 is closer to a National Accounts-consistent estimate. This highlights the complexities around calculation of GVA at a company level using available data.
# Glossary

The glossary briefly covers the terms used within the paper. Anyone requiring more detail should access the glossary contained in the United Kingdom Blue Book.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Business Inquiry</strong></td>
<td>This is an annual ONS survey of businesses covering employment and financial information such as turnover, gross fixed capital formation, inventories, purchases of goods and services, taxes and subsidies, employment costs, and trade in services.</td>
</tr>
<tr>
<td><strong>Basic prices</strong></td>
<td>This price is the preferred method of valuing output and value added. This reflects 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). It excludes any transport charges invoiced separately by the producer.</td>
</tr>
<tr>
<td><strong>Compensation of Employees</strong></td>
<td>This is the total remuneration, in cash or kind, payable by enterprises to employees for work done.</td>
</tr>
<tr>
<td><strong>Deflation</strong></td>
<td>This is the technique used to change values from nominal terms (current prices) into real terms (constant prices or volume), expressing the production (or consumption) of goods and services in the prices of a common year.</td>
</tr>
<tr>
<td><strong>European System of Accounts 1995 (ESA 95)</strong></td>
<td>The European System of National and Regional Accounts is the integrated system of economic accounts, which is the European version of the United Nations System of National Accounts 1993 (SNA 93).</td>
</tr>
<tr>
<td><strong>Exports of goods and services</strong></td>
<td>These are sales of both goods and services to the rest of the world by UK corporations and households as measured on a balance of payments basis. Rent, dividends and interest received from abroad are excluded.</td>
</tr>
<tr>
<td><strong>General government final consumption expenditure (GGFCE)</strong></td>
<td>This is the final consumption expenditure by central government and local government including direct payment for goods and services and payment for the services of government employees. The figures exclude expenditure on grants, subsidies, interest payments and other transfers; expenditure on non-military fixed capital assets and inventories; loans and loan repayments. Expenditure on military weapons and equipment used to deliver them are included in this section and are not part of capital formation.</td>
</tr>
</tbody>
</table>
Gross fixed capital formation (GFCF)  This consists of resident producers’ acquisitions less disposals on fixed (tangible and intangible) capital assets, for example: new buildings, vehicles, ships, aircraft and plant and machinery, either for replacing or adding to the stock of existing fixed assets. Expenditure on repairs and maintenance is excluded but improvements to land are included.

Gross profits and other trading income  This comprises the gross trading profits of companies, gross trading surplus of public corporations, self-employment income and rental income (excluding any rent earned from any land and sub-soil assets). These incomes are measured before providing for depreciation but after deducting holding gains.

Gross Value Added  Gross Value Added (GVA) is the contribution of each individual producer, industry or sector to the economy. It is produced as a summary by the ONS as a measure of the complex interactions of the economy.

Imports of goods and services  These are purchases by UK residents of both merchandise and services from abroad. Rent, dividends and interest paid abroad are excluded.

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. Intermediate consumption excludes fixed assets whose consumption is recorded as consumption of fixed capital.

Inventories  Previously known as stocks, inventories consist of holdings of materials and fuels, work-in-progress, finished goods and goods bought for resale without any further processing.

Market prices  Those prices which purchasers pay for the goods and services they acquire or use, excluding deductible VAT. The term is usually used in the context of aggregates such as GDP.

Mixed income  This is income of persons from unincorporated businesses, mainly farmers, professional people, shopkeepers and other sole traders, and can be either a surplus or a deficit. It thus covers compensation of employees and profits which may or may not be withdrawn from the business. It excludes the operating surplus coming from owner-occupied dwellings.

Nomenclature of Units for Territorial Statistics (NUTS) regions  The Nomenclature of Units for Territorial Statistics (NUTS) provides a single uniform breakdown for the production of regional statistics for the European Union. There are three levels of NUTS in the UK:

- **NUTS1**: Government Office Regions and Wales, Scotland, Northern Ireland.
- **NUTS2**: 37 areas – mainly groups of counties and unitary authorities; can be referred to as sub regions (please note that in some cases these do not correspond exactly to the sub regions in the Regional Economic Strategies produced by RDAs).
- **NUTS3**: 133 areas – principally individual counties and unitary authorities; also known as local areas.
Non-profit institutions serving households (NPISH)

Non-profit institutions serving households include organisations such as charities, religious societies, trade unions and members’ clubs.

Operating surplus (or deficit)

This measures the surplus or deficit accruing from production before taking into account any transfer payments or receipts. For example operating surplus excludes interest, rent or similar charges payable on financial or tangible non-produced assets borrowed or rented by the enterprise.

Output

This consists of those goods or services that are produced within an establishment that become available for use outside that establishment, plus any goods and services produced for own final use.

Subsidies

These are current unrequited payments made by central government, local government or the European Union to a producer or trader having the effect of reducing the selling price below the factor cost of production. They include the financing of deficits on public trading services deliberately run at a loss. There are two types, see subsidies on production and subsidies on products.

Subsidies on production

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

Subsidies on products

Subsidies are payments made from the government to producers per unit of a good or service produced. The objective of paying subsidies is to influence the amount of goods or services produced, or, the prices of the goods and services produced. The inevitable consequence of subsidies is to distort the market for a product.

An example of subsidies on products is the agricultural subsidies paid to farmers prior to 2005. Prior to 2005, farmers were paid a subsidy on production (per tonne of grain or litre of milk produced) which allowed them to sell their products at a price which was typically below the cost to produce the product (grain/milk etc).

Taxes

These are compulsory unrequited payments to central government, local government or the European Union. Taxes on income and wealth such as income tax and corporation tax, and capital taxes like capital gains tax and inheritance tax are not included.

Taxes on production and imports

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

Taxes on products are taxes paid per unit of some good or unit produced or sold. An example of taxes on products is Value Added Tax (VAT). VAT is only paid when a service or good is transacted. For example, VAT is added at the end of the production process as a consequence of the statutory requirement to pay VAT on a product(s), it is not created by the business selling or producing the goods. Central government sets tax policy and collects revenues for the areas they govern. The government as an entity which governs a geographical area receives the VAT, it can therefore only be assigned to the area governed, not a specific geographical location within it.
References


The Office for National Statistics (ONS) is the executive office of the UK Statistics Authority, a non-ministerial department which reports directly to Parliament. ONS is the UK Government’s single largest statistical producer. It compiles information about the UK’s society and economy, and provides the evidence-base for policy and decision-making, the allocation of resources, and public accountability. The Director General of ONS reports directly to the National Statistician who is the Authority’s Chief Executive and the Head of the Government Statistical Service.

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