

Methodological Issues Arising for the Office for National Statistics from the Recession

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Introduction

1. The current world recession reflects the most serious global economic turmoil for over 60 years and economic management is a critical issue for the UK.
2. Whilst clearly the levels of statistics (unemployment, GDP, prices etc.) are affected by the recession, this paper examines the potential effects on the *quality* of key UK measures, for which the Office for National Statistics (ONS) is responsible
3. ONS has evaluated the potential challenges faced at each stage of the Statistical Value Chain (SVC). Following this initial scoping, ONS has identified its priorities for methodological work to ensure that the quality of UK economic statistics is maintained at a critical time.

Initial scoping analysis using the Statistical Value Chain

4. ONS generally describes the chain of statistical production in terms of the SVC. This is a simple sequential list, starting with the decision to undertake a statistical collection or statistical analysis through to end of the cycle which is archiving.
5. The table below sets out briefly the 15 stages of the SVC and ONS' scoping of potential effects due to the recession. These are largely related to business surveys and economic statistics, but not exclusively.

Table 1: Potential impact of recession on statistical methodology, by SVC
(Note: lines in red colour are highest priority)

SVC Step	Potential impact of recession
1. Decision to undertake a collection or analysis	<ul style="list-style-type: none">• no impacts identified here
2. Collection design	<ul style="list-style-type: none">• no impacts identified here
3. Accessing administrative data	<ul style="list-style-type: none">• administrative data may be more out-of-date than under normal conditions (bias)
4. Sample design	<ul style="list-style-type: none">• sample designs less optimal (variance)
5. Implementing design	<ul style="list-style-type: none">• more deaths and fewer births• treatment of large companies in administration (bias, coherence) Task 2• more frequent changes in industry classification or size-band Task 3• more changes of stratum when register "frozen" fields are updated in January Task 3

6. Implementing collection	<ul style="list-style-type: none"> • higher rates of unit non-response (bias, variance) Task 12 • higher rates of item non-response for some items (bias, variance) • poorer quality of responses (bias) • increased respondent burden to maintain sample sizes (cost) • increased 'churn' of samples to maintain sample sizes (variance of change)
7. Editing and validation, derivation and coding	<ul style="list-style-type: none"> • imputation and construction assumptions not valid (bias) Task 4 • fewer units in imputation classes (variance) • non-response problems exacerbated (bias, variance) • higher rate of violating validation rules (cost) • ad hoc changes to editing and validation rules • ad hoc, temporary changes to systems
8. Weighting and estimation	<ul style="list-style-type: none"> • need to adjust for fewer births and more deaths (bias) Task 5 • poor relationship between response variables and auxiliary variables (variance) • potential for more or more extreme outliers (bias, variance) • smaller stratum sample sizes from reduced response or population (bias, variance) • effect of changed migration patterns on population counts (bias)
9. Analysis of primary outputs	<ul style="list-style-type: none"> • more unusual movements or comparisons • comparisons against similar statistics may be less reliable (coherence) • bigger differences between surveys and administrative sources (coherence)
10. Index number construction	<ul style="list-style-type: none"> • major revisions to index when rebasing to or from a recession year (bias) • effect of major business failures or reclassifications on weights (bias) Task 7
11. Time series analysis	<ul style="list-style-type: none"> • change in seasonality, trend or level (bias, variance) Task 8 • forecasting goes awry (bias) Task 8 • more outliers occur (variance) • benchmarking less effective (variance)
12. Further analysis (across datasets etc)	<ul style="list-style-type: none"> • reduced accuracy of short-term output indicators as measures of GVA (bias) Task 13 • product breakdowns from previous years' PRODCOMs no longer valid (bias) • major revisions to GDP when supply-use balancing applied for a recession year (bias) • major changes in inputs (eg. migration) may impact on accuracy of analytical outputs (eg. population estimates). Task 6
13. Confidentiality and disclosure	<ul style="list-style-type: none"> • smaller achieved samples means more disclosive cells
14. Dissemination of data and metadata	<ul style="list-style-type: none"> • need to consult with or inform users on changes to methods • reported changes past a turning point may be misleading Task 9
15. Data archiving and ongoing management	<ul style="list-style-type: none"> • need to justify and document ad hoc changes to methods Task 11 • ad hoc changes to systems may not be documented

Potential work programme

6. ONS had already been considering likely implications some time in advance of the general fall in GDP. For example, the intervention in 2008 of the UK Government in taking large shares of struggling banks had direct consequences for their classification as private/public owned. The failure of several large UK retailers in 2008 required careful and consistent handling, although such issues had been handled before and procedures existed.

7. By considering the full scope of the SVC, ONS was able to consider and prioritise 13 key tasks:

Task 1. Consider what the methodology research programme into producing statistics during major economic change should involve

ONS has produced a scoping paper setting out what research is necessary and how it might be taken forward. This task has been completed. Essentially this is the content of this paper.

Task 2. Produce internal papers (and follow up actions) relating to large sector reclassifications of UK banks and also business failures

ONS has set up an internal group to agree (and document) a consistent approach across the office to the reclassifications. This will also maintain our capacity to include public sector units in outputs that 'need' them. This covers issues of timing, backcasting (including discontinuity measurement), disclosure, and consultation with key stakeholders. The group has also reinforced existing procedures relating to business failures. This work is largely complete.

Task 3. Analyse the impact of the annual (January) update of business register for classification and other changes

Most ONS business surveys experience register changes at the January update. Our aim is to ensure early warning of potential large scale changes in the register that have the potential to introduce disturbances in survey outputs.

Task 4. Review automated imputation, editing and outlier identification parameters

We are reviewing imputation and editing methodology in the light of expected changes (response rates and period on period change etc.) and also re-examining outlier parameters. The initial analysis shows that response rates are holding up well and that current methods are fairly robust.

Task 5. Analyse assumptions underpinning standard estimation (particularly deaths and births) and potential impact on survey outputs

Because of lags in the register relating to births and deaths, a short-term assumption of births = deaths is made until the register adjusts itself. We are considering whether to amend or retain such estimation parameters.

Task 6. Review population estimation methodology to assess the potential for changes in migration patterns as a result of rapid economic decline to impact on population estimation and thus household survey weights

The recession is clearly having an effect on migration. We need to ensure that this does not cause difficulties with the population estimates. This is under review.

Before the recession began, ONS was already leading a large programme of work improving migration estimates. Elements of this programme are associated with improving methods, sources and timeliness of the statistics to ensure they are appropriate and capable of detecting and measuring changes in patterns quickly.

Task 7. Check outputs to identify where estimation is based on fixed population parameters (such as the Index of Production)

We have identified outputs that do not immediately react to large scale business failures and reclassifications in their population frames and which might therefore be subject to large changes at annual adjustment or criticism for inappropriate methodology. Our preliminary analysis of the effect on weights for some key series indicates that this may not be a problem.

Task 8. Review seasonal adjustment

We are providing guidance for survey output areas on checks to apply to seasonally adjusted series so that irregular components are identified and dealt with appropriately. We are also investigating how best to handle sharp turning points. In advance of the completion of these investigations, we are guiding survey output areas regarding a sensible balance of mathematical and judgmental forecasts.

Task 9. Produce the 'economic story'

We have reviewed our existing ways of providing economic context to our key indicators, using specialist economist skills. Our aim is to have better background and scene setting intelligence (eg. drawing on analysis of notified redundancy information, BBC's recession tracker).

Task 10. Consult other National Statistical Institutions

We have consulted several NSIs and are attempting to identify areas of best practice.

Task 11. Document methods and systems

We will ensure up-to-date internal documentation on any changes to methods or systems applied as a response to effects caused by the recession.

Task 12. Consider effect on non-response

We are monitoring closely the impact of the recession on non-response. To date this has not been a major concern.

Task 13. Analyse assumptions underlying short-term GDP statistics

Our short-term early estimates for GDP necessarily involve a range of assumptions. For example that turnover is a good proxy for value added. We are assessing the effect of the recession on the validity of these assumptions.

Summary

8. ONS is now taking forward the 13 key tasks shown above which it views as its current priorities. However, as the recession and its effects progress, this is constantly kept under review. We have already completed a number of urgent tasks (eg. tasks 1 and 2). The remaining tasks are all under way and we expect to complete them in the first half of 2010.