

National Accounts' Revisions Analyses: A Summary to April 2005

Emily George and David Obuwa

Office for National Statistics

1. Introduction

Since February 2004, ONS has been providing users with a range of information about revisions in its First Releases (see Jenkinson 2004). The aim is to help users interpret the latest National Accounts estimates, by giving them information on how estimates have been revised in the past. The inclusion of this information also fulfils commitments made to the Statistics Commission following the Review of Revisions to Economic Statistics.

The revisions information appears in a standard form in the background notes of each First Release, accompanied by explanations of any special features if necessary. Tables containing information on the revisions since the last release (entitled 'R tables') are accompanied by summary statistics showing information on revisions made over a period of 5 years. These summary statistics are supported by spreadsheets containing the raw data, which are made available to users via the web. From December 2004 these spreadsheets have been supplemented by revisions triangles, which contain a fuller data set for each indicator, showing how the estimate has changed over time and allowing the user to produce more detailed revisions analysis themselves (see Jenkinson and George 2005). More detailed analysis of revisions to GDP was published in January's Economic Trends (George 2005), and analysis of revisions to the Balance of Payments was published on the ONS website in May (Turner 2005). Further articles for other key series are to follow.

This document aims to present summary results of the revisions analyses published to date in ONS First Releases; and a summary of user feedback to this information.

2. Audits of results

Twenty-three First Releases now contain revisions information; of these 18 contain revisions analysis, this includes the three GDP releases, which are counted as one for the analysis below (as they contain the same data). Therefore the analysis in this summary uses **16 First Releases**. The releases contain analysis of between one and five series each.

Audits of the 16 first releases will be performed monthly from January 2005, and comprise of monitoring the number of mean revisions that are significantly different from zero, and comparing the latest revisions with the mean and standard deviation over 5 years. National Accounts Group have completed six audits so far, August 2004, October 2004, and then monthly from January to April 2005; the first two giving a count of significant mean revisions only.

Each audit result refers to the most recent publication at the end of the month in question. Latest data is available on www.statistics.gov.uk at the end of the month. So the audit performed in April 2005, will include monthly publications published in April 2005, but for quarterly releases, will include the March release.

2.1 Mean Revisions

The results of the first six audits of results are attached as **Annex A** and summarised in **Table 1**. They show that the same indicators consistently produce significant mean revisions; however in the case of GDP, statistical significance appears to be fluctuating over time (this issue is explored in more detail in **Section 3**).

One of the series highlighted in **Table 1** as consistently showing a significant mean revision is 'Public Sector Net Debt (PSND) as a % of GDP'. The factors underlying this are explained in the appropriate first release (Public Sector Finances). PSND itself is rarely revised, so the revisions are mainly driven by revisions to the GDP data used. In particular, the calculation is a centred average, and so uses Treasury forecasts of GDP for periods where ONS does not have outturn data. These forecasts deliberately have a "prudent and cautious" audited assumption, e.g. they calculate a central forecast estimate and then reduce its growth by 0.25%.

2.2 'RAG' Analysis

Table 1 and **Annex A** also show the results of a quality control analysis entitled 'Red Amber Green' (RAG) analysis. In this the latest revision (as published in the R table of each publication) is compared to limits based on mean revisions and standard deviation of revisions.

Control limits for each series were set using the mean revision and standard deviation from the latest five year window of data in November 2004; these limits will be developed over time to ensure relevance but for the period of this article have remained fixed. The RAG analysis involves comparing the latest revision to these limits. A revision within 2 standard deviations of the mean are considered insignificant (green), a revision between 2 and 3 standard deviations (amber) requires further investigation and greater than 3 standard deviations is classified as unusual (red).

For example, the picture below shows the RAG chart used to analyse the latest revisions to GDP growth: Results to date have all been green.

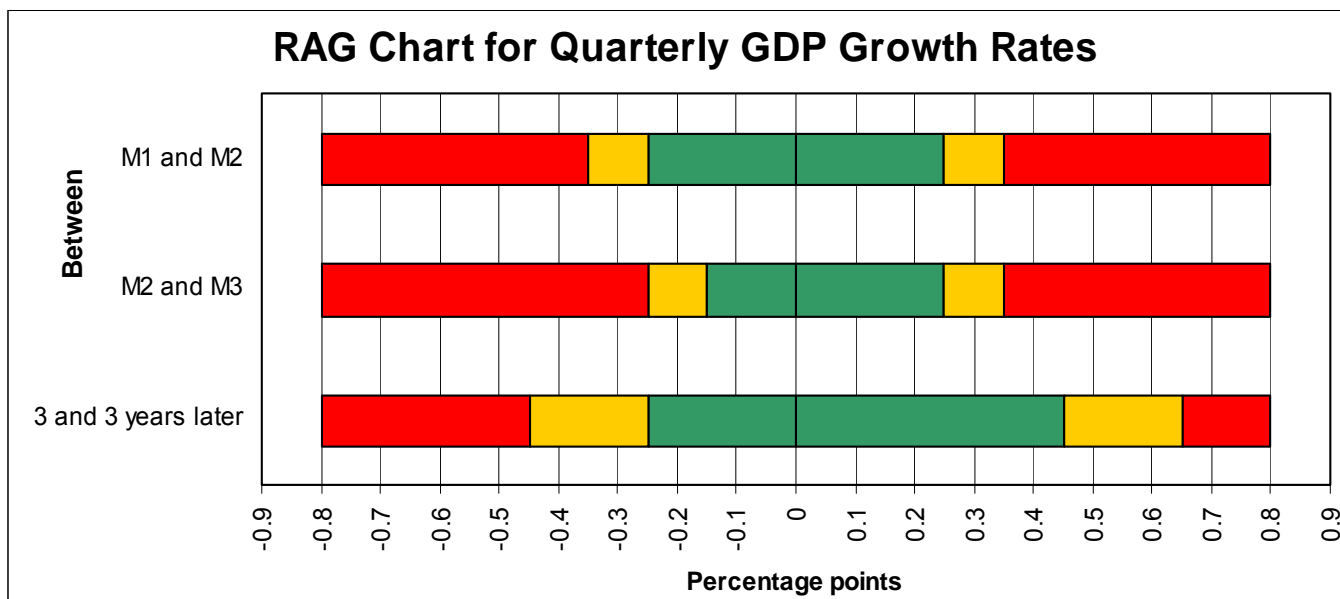


Table 1: Audits of results in First Releases

Date of Audit	No. of Significant Mean Revisions at time of audit	Which indicators are significant	Results of RAG Analysis
August 2004	5 / 16 releases (31%) 6 / 48 indicators (13%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP Month two estimates, after 1 month • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • Not carried out
October 2004	5 / 16 releases (31%) 6 / 48 indicators (13%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP Month three estimates, after 3 years • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • Not carried out
January 2005	5 / 16 releases (31%) 6 / 48 indicators (13%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP Month three estimates, after 3 years • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • 26 series analysed. • All were 'green'
February 2005	5 / 16 releases (31%) 7 / 48 indicators (15%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP month three estimates, after 3 years and month two estimates, after 1 month • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • 26 series analysed. • All were 'green'
March 2005	5 / 16 releases (31%) 7 / 48 indicators (15%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP month three estimates, after 3 years and month two estimates, after 1 month • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • 26 series analysed. • All were 'green'
April 2005	5 / 16 releases (31%) 7 / 48 indicators (15%)	<ul style="list-style-type: none"> • Public sector net debt as a percentage of GDP • Total trade exports and total trade imports (but not total trade balance) • Workforce jobs • GDP month three estimates, after 3 years and month two estimates, after 1 month • Earnings from Overseas visitors to the UK 	<ul style="list-style-type: none"> • 26 series analysed. • All were 'green'

3. GDP results

Table 2 is summary of revisions analysis published in GDP First Releases since the policy was launched in February 2004.

Key points are:

- Between February 2004 and April 2005, the mean revision between M1 and M2 is not statistically significant in any publication.
- Mean revisions between M2 and M3 are significant between April 2004 and September 2004, not significant from October to December 2004, and then significant again since January 2005.
- Mean revisions between M3 and '3 years later' are significant in the February and March 2004 releases, not significant from April to September 2004, and significant again from October 2004 to April 2005.
- All GDP FR publications have featured at least one significant mean revision, and the most recent publications have featured two significant mean revisions.
- In the analyses published in the FRs, all mean revisions between M1 and M2 are negative and all M2 to M3, and M3 to '3 years later' revisions are positive.

First Release publication date	Between M1 & M2			Between M2 & M3			Between M3 & 3 years later		
	Test Significant?	Mean Revision	Mean Absolute Revision	Test Significant?	Mean Revision	Mean Absolute Revision	Test Significant?	Mean Revision	Mean Absolute Revision
Feb-04	No	-0.02	0.06	No	0.04	0.07	Yes	0.10	0.16
Mar-04	No	-0.02	0.06	No	0.04	0.07	Yes	0.10	0.16
Apr-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
May-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
Jun-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
Jul-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
Aug-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
Sep-04	No	-0.02	0.06	Yes	0.05	0.07	No	0.09	0.16
Oct-04	No	-0.02	0.06	No	0.04	0.06	Yes	0.09	0.16
Nov-04	No	-0.02	0.06	No	0.04	0.06	Yes	0.09	0.16
Dec-04	No	-0.02	0.06	No	0.04	0.06	Yes	0.09	0.16
Jan-05	No	-0.02	0.06	Yes	0.05	0.06	Yes	0.10	0.16
Feb-05	No	-0.02	0.06	Yes	0.05	0.06	Yes	0.10	0.16
Mar-05	No	-0.02	0.06	Yes	0.05	0.06	Yes	0.10	0.16
Apr-05	No	-0.02	0.06	Yes	0.05	0.06	Yes	0.11	0.17

Sensitivity analysis performed on GDP revisions shows how choice of sample period can significantly alter the overall picture. **Charts 1, 2 and 3** (derived from data used in George (2005) and published on the ONS website in GDP revisions triangle) overleaf demonstrate the volatility of the test results. It is because of this volatility that we use a standard sample length and revision window of five years for bias estimates in our first release (in order to be transparent about the choice of sample).

The last few points on the charts are consistent with the results published in GDP first releases, as shown in **Table 2**. The periods shown in **Chart 1**, for example are the same 5 years samples used in the 'Between M1 and M2' revisions published in first releases. The "**End Date**" on the x-axis of **Charts 1-3** gives the date of the last quarter used in the sample.

So in the April 2005 FR: "The analysis of revisions between month 1 and month 2 uses month 2 estimates published from May 2000 (2000q1) to February 2005 (2004q4). The analysis of revisions between month 2 and month 3 uses month 3 estimates published from June 2000 (2000q1) to March 2005 (2004q4). And the analysis [of the revisions to GDP growth between the estimate published three months after the end of the quarter and the equivalent, estimate three years later] uses month 3 estimates first published from June 1997 (1997q1) to March 2002 (2001q4)." (Reference: GDP Preliminary Estimate, 2005 Q1, April 2005). The results for this sample are the last points on **Charts 1 to 3**, for example, in **Chart 1**, 2004 Q4 is the last label on the x-axis.

Note that revisions analysis published in First Releases will always use the latest possible data, excluding the data that is published in the current release. Additionally for GDP, a single sample will be used in three First Releases, as effectively each analysis is updated once a quarter. For example the two 'non significant' points on **Chart 3**, are shown as six 'No' entries in the eighth column of **Table 2**. Hence only the last six points on each chart have been published since the revisions information was included in ONS First Releases.

Chart 1 demonstrates that mean revisions between M1 and M2 have been negative or zero for all five year samples ending between 1997 Q4 and 2004 Q4, ranging from zero to -0.04 . Only two of these samples are statistically significant, those with end dates 1999 Q3 and 1999 Q4, prior to publication of such revisions analysis in First Releases. These both have mean revision -0.03 percentage points, and absolute mean revision 0.05 percentage points. This suggests that there was a period of consistently negative revisions between M1 and M2 in the late 1990s, but that revisions in this period have been more variable in their direction in later years.

Both mean revisions and mean absolute revisions are quite volatile, but have remained steady in recent times, including all of those published in first releases.

GDP:Revisions Between M1 and M2 Moving 5 Year Windows

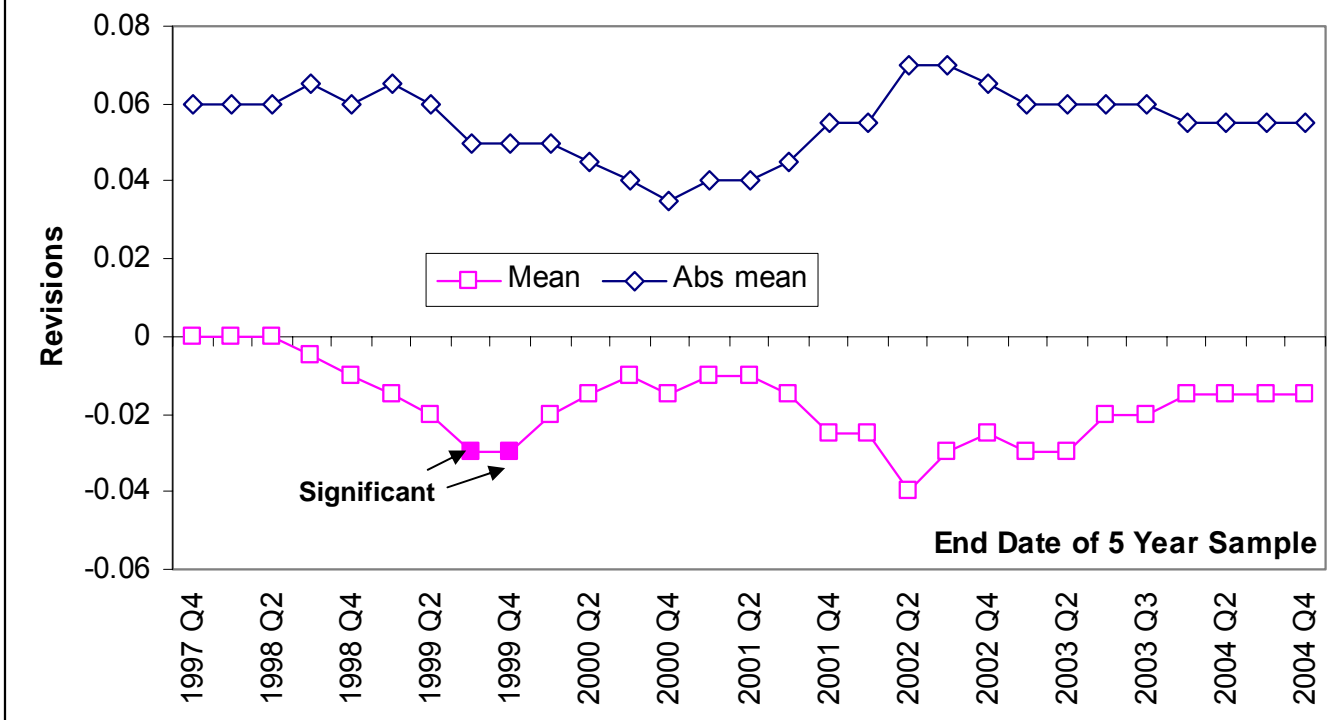


Chart 1: Mean Revisions to GDP Growth between Month 1 and Month 2

Chart 2 shows that all mean revisions between M2 and M3, using five year samples ending from 1997 Q4 to 2004 Q3 have been positive, ranging from 0.005 to 0.05. Five samples, including four of the last five, have been found to be statistically significant. This chart suggests that the mean revision between M2 and M3 is getting larger and more statistically significant over time. Both mean and mean absolute revisions have increased in recent periods, but mean revision by much more so, indicating that while the size of individual revisions is not increasing very much, they are being made more consistently in the upwards direction in later years.

GDP: Revisions Between M2 and M3 Moving 5 Year Windows

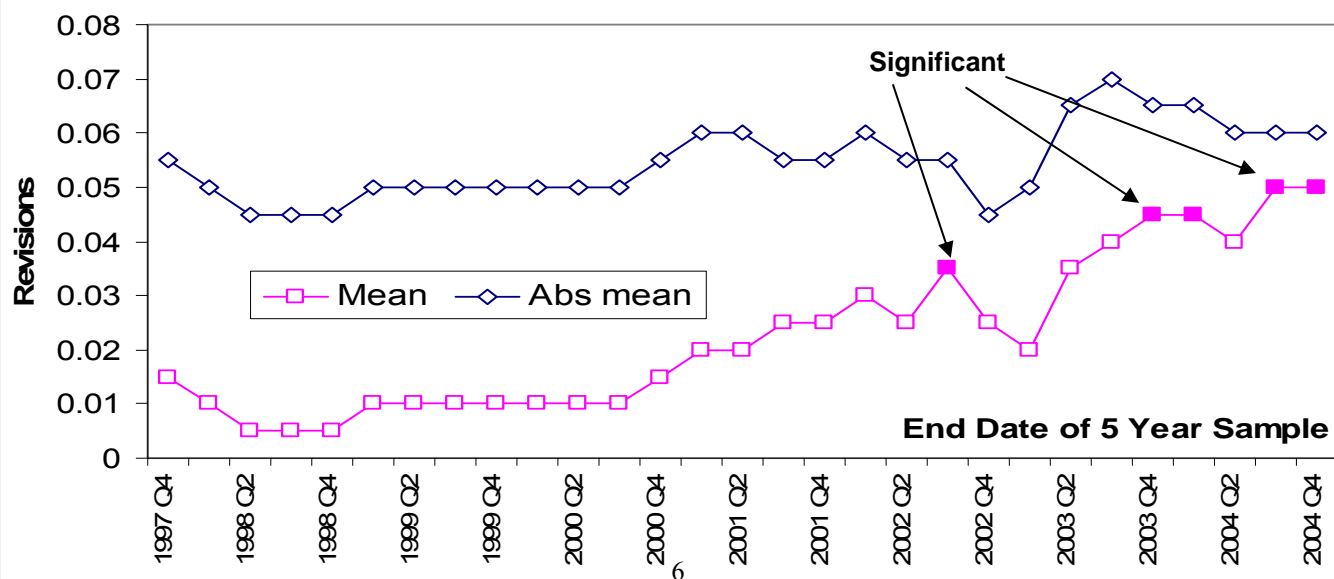


Chart 2: Mean Revisions to GDP Growth between Month 2 and Month 3

Chart 3 shows that mean revisions between M3 and '3 years later' are larger and more consistent than the revisions between early publication [for instance, than those in **Charts 1** and **2**] remaining close to 0.1 percentage points. It is also shown that unlike the short-term revisions, most of the samples show significant mean revisions between M3 and 3 years later. There are two samples which are non-significant, that is those ending in 2000 Q4 and 2001 Q1. Overall, **Chart 3** presents some evidence that mean revisions between M3 and 3 years later have become smaller over time. Mean revisions decline slightly from 1.3 in earlier samples, to 0.09 in later samples, and mean absolute revisions decline from 0.18 to 0.16.

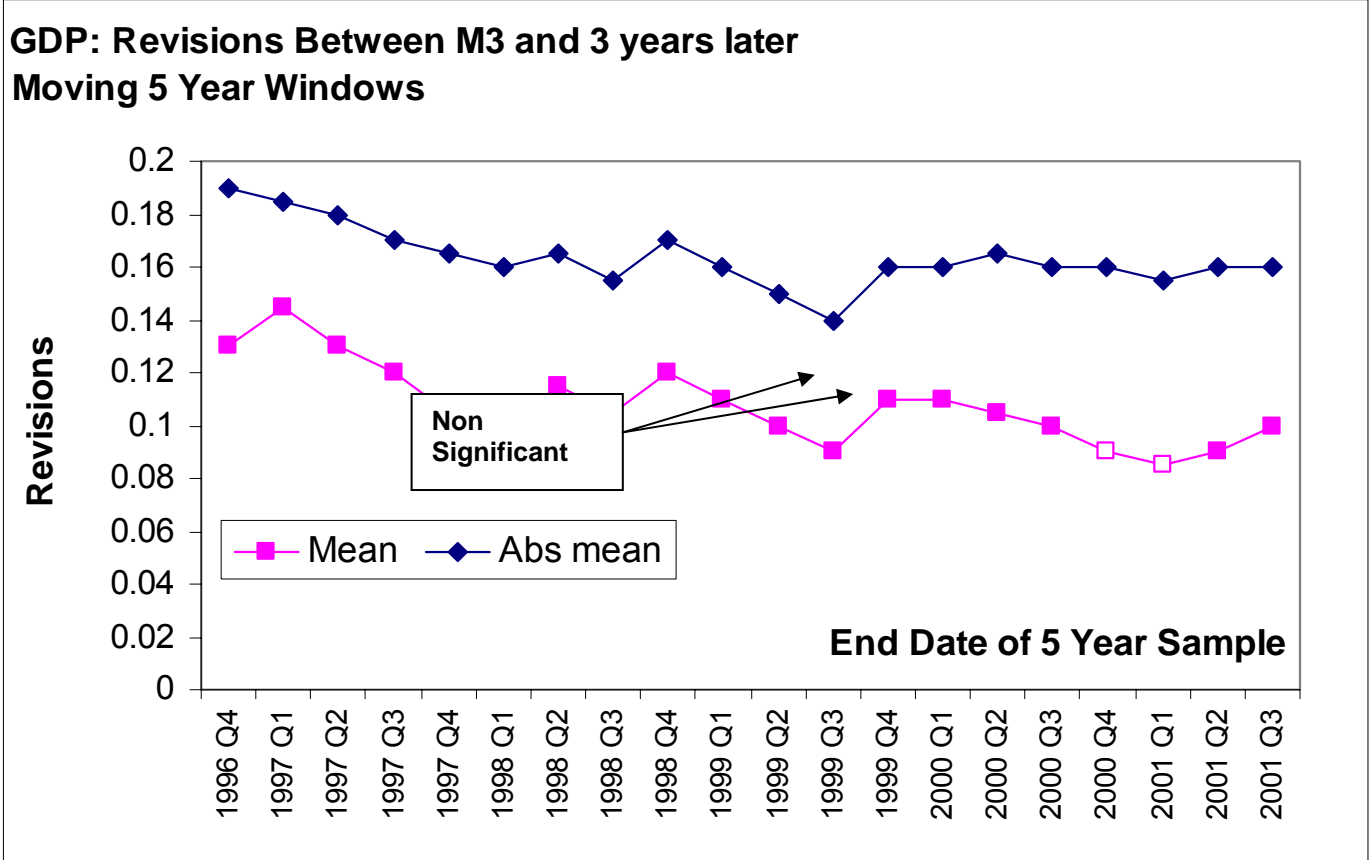


Chart 3: Mean Revisions to GDP Growth between Month 3 and 3 Years Later

Chart 4 shows the actual revisions used in these samples. It shows how revisions made at different stages of GDP production process can offset each other. It is evident that the largest revisions occur between the M3 estimate and the value 3 years later (red bars) and these tend to be upwards revisions (NB revisions between M3 and value 3 years later are only available up until 2001 Q4). This is reflected in the results above.

It also shows that the short-term revisions tend to be smaller and more volatile. It provides support for the theory above, that the revisions between month 2 and month 3 (yellow bars), are not increasing in size, but are being made more consistently in a positive direction.

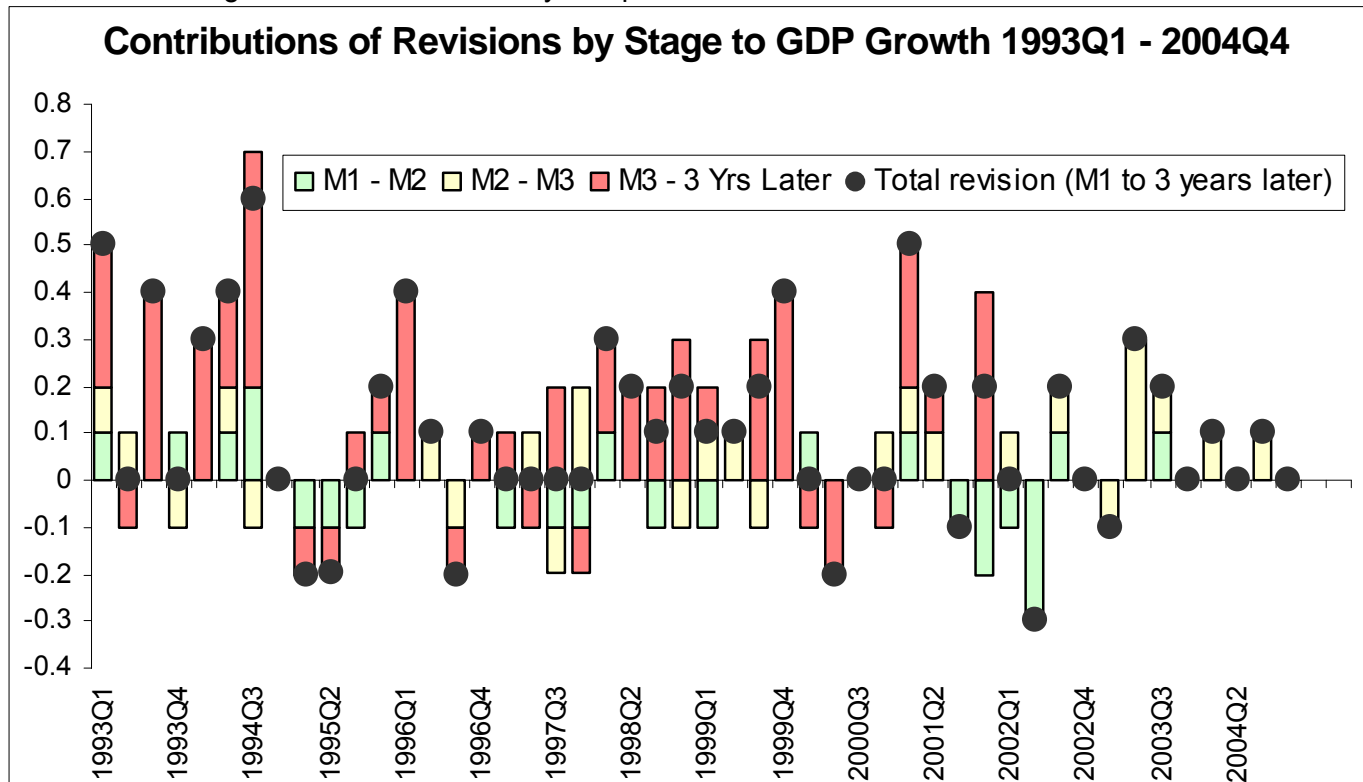


Chart 4: Revisions to GDP Growth M1 - 3 Years later, by Stage
Please note revisions between M3 and value 3 years later are only available up until 2001 Q4.

4. Feedback from Users

The Statistics Commission recommended that ONS devote resources to assessing users' comprehension of, and reaction to, revisions information provided in First Releases. A summary of feedback received to date is provided below.

Please send any general queries or feedback to: gdp@ons.gov.uk. Specific queries should be sent to the owner of that release.

Feedback from Users on Analysis in First Releases

Those responsible for publishing First Releases have had very little feedback from users. Some first release owners have pushed their users to provide feedback, and then the feedback was positive. In some cases the revisions analysis has been used to prompt questions about the cause of any significant t tests, and what ONS are doing about it.

The ONS held an Economic Forum at the Bank of England in September 2004. At this forum the revisions analysis work programme was presented to journalists, and city analysts. The ONS staff members present sought comments from the participants, and when pressed, Bank of England staff in particular said they find the information provided to be a useful tool for them to assess how much dependence to put on a particular indicator.

Feedback from Users on Proposal to Provide Revisions Triangles

The Bank of England has previously produced revisions triangles for GDP expenditure components on their own website, and they were involved in discussions when we were scoping the need to produce these for GDP components. They expressed a keen interest in using the triangles for output components.

At the Economic Forum, the ONS announced the plan to supplement the revisions analysis with more detailed revisions triangles. This announcement, together with media coverage of the event prompted a number of phone calls and e-mails to the ONS from City Analysts expressing their interest in the upcoming revisions triangles.

Feedback from Users following the Provision of Triangles

We have received feedback from users in the City, and HM Treasury that the revisions triangles are "a very useful resource with a range of uses" and they have urged us to maintain and supplement them with additional triangles. Suggestions include current price series, deflators and triangles with a larger time span.

Feedback from Other Statistics Offices

ONS presented the information contained in first releases to counterparts from other NSI's, Eurostat and the OECD at an international workshop in Paris.

Comments were generally positive; ONS has gone further than any of the other NSI's in providing this kind of information to users.

Other comments included:

- ◆ Concern was expressed that the analysis uses too few data points, 30 was recommended as the minimum for carrying out a t-test
- ◆ Eurostat recommended that revisions analysis in press releases should only look at short term changes in data releases and reserve more detailed analysis for articles. For example in the press release for first estimate of GDP growth they would reserve the information to text along the lines of: "in the past the second estimate has led to an average revision of *plus* or *minus* x percentage points".

National Statistics website usage

The ONS website team reported that revisions analysis articles in Economic Trends have received high numbers of hits on the website. For example George (2005) received 169 hits in its first 8 days following publication in Economic Trends.

References

George, E (2005) "Revisions to Quarterly GDP Growth and its Production and Expenditure Components" Economic Trends, No 614, January 2005 (<http://www.statistics.gov.uk/cci/article.asp?ID=1019>)

Jenkinson G (2004) "ONS Policy on Standards for Presenting Revisions Analysis in Time Series First Releases", Economic Trends, No. 604, March 2004 (<http://www.statistics.gov.uk/cci/article.asp?ID=793>)

Jenkinson G and George E "Publication of Revisions Triangles on the National Statistics Website", Economic Trends, No.614, January 2005 (<http://www.statistics.gov.uk/cci/article.asp?ID=1026>)

Turner, E (2005) "Analysis of Revisions to Quarterly Current Account Balance of Payments Data", Non-Journal ONS Article (<http://www.statistics.gov.uk/cci/article.asp?ID=1125>)

For further reading, details of workshops mentioned, and access to all these articles, see the National Statistics website and the pages dedicated to revisions analysis.

(http://www.statistics.gov.uk/about_ns/economic_revisions.asp)



Annex A: Result of 'Audits'

Table I – Significant Mean Revisions of Key Indicators

	Is test significant in August?	Is test significant in October?	Is test significant in January?	Is test significant in February?	Is test significant in March?	Is test significant in April?
Labour Market (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Claimant count	No	No	No	No	No	No
Employment rate	No	No	No	No	No	No
Unemployment rate	No	No	No	No	No	No
Average Earnings	No	No	No	No	No	No
Workforce jobs (Quarterly)	Yes	Yes	Yes	Yes	Yes	Yes
GDP publications (published monthly, quarterly series)			Jan-05	Feb-05	Mar-05	Apr-05
M3 estimates, after 3 years	No	Yes	Yes	Yes	Yes	Yes
M1 - M2	No	No	No	No	No	No
M2 - M3	Yes	No	No	Yes	Yes	Yes
Public Sector Finances (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Public sector net debt as a percentage of GDP	Yes	Yes	Yes	Yes	Yes	Yes
Public sector net borrowing	No	No	No	No	No	No
Public sector current budget	No	No	No	No	No	No
Business Investment (Quarterly)			Dec-04	Dec-04	Mar-05	Mar-05
Business investment - total manufacturing	No	No	No	No	No	No
Business investment - total manufacturing M2 to M3	No	No	No	No	No	No
Total business investment	No	No	No	No	No	No
Total business investment M2 to M3	No	No	No	No	No	No
Balance of Payments (Quarterly)			Dec-04	Dec-04	Mar-05	Mar-05
Current Account Balance	No	No	No	No	No	No
Current Account Credits	No	No	No	No	No	No
Current Account Debits	No	No	No	No	No	No
UK Trade (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Total trade balance	No	No	No	No	No	No
Total trade exports	Yes	Yes	Yes	Yes	Yes	Yes
Total trade imports	Yes	Yes	Yes	Yes	Yes	Yes
Index of Distribution (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Monthly	No	No	No	No	No	No
3 Monthly	No	No	No	No	No	No
Index of Production (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Index of Production (3 month on 3 month)	No	No	No	No	No	No
Index of Manufacturing (3 month on 3 month)	No	No	No	No	No	No
Index of Production (1 month on 1 month)	No	No	No	No	No	No
Index of Manufacturing (1 month on 1 month)	No	No	No	No	No	No
Retail Sales (Monthly)			Dec-04	Feb-05	Mar-05	Apr-05
3 month on previous 3 month	No	No	No	No	No	No
Month on previous month	No	No	No	No	No	No
Motor Vehicle Production (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Non-seasonal car	No	No	No	No	No	No
Non-seasonal commercial	No	No	No	No	No	No
Seasonal car	No	No	No	No	No	No
Seasonal commercial	No	No	No	No	No	No
PPI (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
PLLU 12months % change	No	No	No	No	No	No
PLLU 1 month % change	No	No	No	No	No	No
RNNK 12months % change	No	No	No	No	No	No
RNNK 1 month % change	No	No	No	No	No	No
Investment by Insurance Companies, Pension Funds and Trusts (Quarterly)			Dec-04	Dec-04	Mar-05	Mar-05
Total Net Investment	No	No	No	No	No	No
Productivity (Quarterly)			Dec-04	Dec-04	Mar-05	Mar-05
Whole economy output per job	No	No	No	No	No	No
Whole economy unit wage costs	No	No	No	No	No	No
Overseas Travel and Tourism (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
Overseas resident's visits to the UK, seasonally adjusted	No	No	No	No	No	No
UK residents' visits abroad, seasonally adjusted	No	No	No	No	No	No
Earnings from Overseas visitors to the UK, seasonally adjusted	Yes	Yes	Yes	Yes	Yes	Yes
Expenditure by UK residents visits abroad, seasonally adjusted	No	No	No	No	No	No
Internet Connectivity (Monthly)			Jan-05	Feb-05	Mar-05	Apr-05
All subscriptions	No	No	No	No	No	No
Dial up subscriptions	No	No	No	No	No	No
Permanent Subscriptions	No	No	No	No	No	No
Gross Domestic Expenditure on Research & Development (Annual)			Mar-04	Mar-04	Mar-05	Mar-05
Gross expenditure on R&D in the UK	No	No	No	No	No	No

Table II - Rag Scores

	Jan-05	Feb-05	Mar-05	Apr-05
Labour Market (Monthly)				
Claimant count	N/A	N/A	N/A	N/A
Employment rate	N/A	N/A	N/A	N/A
Unemployment rate	N/A	N/A	N/A	N/A
Average Earnings	N/A	N/A	N/A	N/A
Workforce jobs (Quarterly)	N/A	N/A	N/A	N/A
Quarterly National Accounts (Monthly)				
M3 estimates, after 3 years	N/A	N/A	N/A	N/A
M1 - M2	N/A	N/A	N/A	N/A
M2 - M3	Green	Green	Green	Green
Public Sector Finances (Monthly)				
Public sector net debt as a percentage of GDP	Green	Green	Green	Green
Public sector net borrowing	Green	Green	Green	Green
Public sector current budget	Green	Green	Green	Green
Business Investment (Quarterly)				
Business investment - total manufacturing	N/A	N/A	N/A	N/A
Business investment - total manufacturing M2 to M3	Green	Green	Green	Green
Total business investment	N/A	N/A	N/A	N/A
Total business investment M2 to M3	Green	Green	Green	Green
Balance of Payments (Quarterly)				
Current Account Balance	Green	Green	Green	Green
Current Account Credits	N/A	N/A	N/A	N/A
Current Account Debits	N/A	N/A	N/A	N/A
UK Trade (Monthly)				
Total trade balance	N/A	N/A	N/A	N/A
Total trade exports	N/A	N/A	N/A	N/A
Total trade imports	N/A	N/A	N/A	N/A
Index of Distribution (Monthly)				
Monthly	Green	Green	Green	Green
3 Monthly	Green	Green	Green	Green
Index of Production (Monthly)				
Index of Production (3 month on 3 month)	N/A	N/A		
Index of Manufacturing (3 month on 3 month)	N/A	N/A		
Index of Production (1 month on 1 month)	Green	Green	Green	Green
Index of Manufacturing (1 month on 1 month)	Green	Green	Green	Green
Retail Sales (Monthly)				
3 month on previous 3 month	Green	Green	Green	Green
Month on previous month	Green	Green	Green	Green
Motor Vehicle Production (Monthly)				
Non-seasonal car	N/A	N/A	N/A	N/A
Non-seasonal commercial	N/A	N/A	N/A	N/A
Seasonal car	Green	Green	Green	Green
Seasonal commercial	Green	Green	Green	Green
PPI (Monthly)				
PLLU 12months % change	Green	Green	Green	Green
PLLU 1 month % change	Green	Green	Green	Green
RNNK 12months % change	Green	Green	Green	Green
RNNK 1 month % change	Green	Green	Green	Green
Investment by insurance companies, pension funds and trusts				
Total Net Investment	Green	Green	Green	Green
Productivity (Quarterly)				
Whole economy output per job	N/A	N/A	N/A	N/A
Whole economy unit wage costs	Green	Green	Green	Green
Overseas Travel and Tourism (Monthly)				
Visits by overseas residents to the UK, seasonally adjusted	Green	Green	Green	Green
UK residents' visits abroad, seasonally adjusted	Green	Green	Green	Green
Earnings from Overseas visitors to the UK, seasonally adjusted	Green	Green	Green	Green
Expenditure by UK residents visits abroad, seasonally adjusted	Green	Green	Green	Green
Internet Connectivity (Monthly)				
All subscriptions	Green	Green	Green	Green
Dial up subscriptions	Green	Green	Green	Green
Permanent Subscriptions	Green	Green	Green	Green
Gross domestic expenditure on research & development				
Gross expenditure on R&D in the UK	Green	Green	Green	Green