

THE OECD QNA-MEI REVISIONS DATABASE

1. Objective of this public OECD database

Users of quarterly national accounts of OECD countries are interested in the reliability of the first (and subsequent) estimates of GDP and its expenditure components. The OECD Statistics Directorate has published several one-off studies on this issue of “revision analysis” and organized a special workshop in 2004¹.

The present QNA-MEI Revisions Database is in the continuation of these studies.

This database allows users to have access to the basic data on revisions of QNA as published at OECD and to derive statistics that allow assessing the reliability of QNA in an internationally comparable way. The background (and bibliography) of the present database is fully explained in: *Revisions in Quarterly GDP of OECD Countries, Tommaso Di Fonzo, University of Padova/OECD, STD/NAES(2005)24*.²

This database will be updated by the OECD Secretariat every year. At this point (October 2005) the database only covers 18 countries and quarterly GDP. The country coverage is constrained by the history of QNA in some OECD countries, which is too recent to allow deriving meaningful summary statistics. Resource depending, it is envisaged to extend the database to the main components of expenditure.

Warning: Some statistical offices publish their own assessment of revisions. The OECD measure of revision may differ from a given country’s measure in part because of the technical delay between the publication at national level and the publication in the OECD MEI publication. The objective of this database is not to replace OECD member countries’ own assessments, which will probably be more precise than the OECD’s measure. It is simply to give a permanent source for international comparisons.

2. The QNA-MEI revisions dataset

The ongoing OECD QNA-MEI Revisions database is a real-time dataset for revisions analysis coming from the OECD monthly publication *Main Economic Indicators* (MEI).

The main characteristics of MEI can be summarized as follows:

- MEI is published in paper format since the early 1960’s.
- The collection of the successive editions provides long time series for key short-term economic statistics for most OECD countries, e.g.:
 - Quarterly GDP and expenditure components
 - Indices of industrial production & Composite Leading Indicators
 - Retail Trade, Consumer and Producer Prices

¹ http://www.oecd.org/document/23/0,2340,fr_2825_495684_33729303_1_1_1_1,00.html.

² <http://www.oecd.org/dataoecd/13/49/35440080.pdf>

- Wages, employment and unemployment
 - Interest rates, exchange rates, monetary aggregates
 - Business tendency and consumer opinion surveys
 - International trade and international finance
 - Balance of payments
- In particular, the MEI database has time series going back until the late 1950's and early 1960's for several of the larger OECD countries for many key economic variables. Electronic monthly 'snapshot' databases are available in user friendly format back until February 1999 at least until 1995.

MEI monthly snapshots in principle provide historical data on subsequent releases on a wide range of key variables. They therefore provide a coherent set of variables representing the 'information set' available at successive monthly intervals. It should be noted that a monthly snapshot is most likely frequent enough to pick up all releases of economic statistics as they are seldom revised twice within one month – although there are likely to be some exceptions. In particular, it is to be noted that MEI is commonly published during the first week of the month. Due to this fact, it is not guaranteed that the first number published in MEI is really the first number ever released. Also, any measure of timeliness derived from the database may be biased by this "publication filtering".

2.2. Data and terminology issues

In this database, revision is defined as the difference between a later (more recent) estimate and an earlier estimate. This is often expressed as 'Later minus Preliminary', and written as $L-P$.

There is some inconsistency between practitioners in the use of terms such as 'latest' and 'final'. For example, for quarterly GDP estimates, some countries use the term final to distinguish between 'firm' quarterly estimates (generally published around 90 days after the end of the quarter in question) and preliminary or flash estimates (published much more quickly). Other countries take the view that whilst there is a possibility that an estimate could be revised due to methodological improvements or re-basing, the estimates can never be considered as final.

In the context of our datasets, it was decided to use the term 'latest' to denote the 'latest available estimate of GDP published on MEI at least 36 months after the first published estimate'. The revision process is evaluated at 1, 2 and 3 years after the first published estimate (the corresponding estimates are labelled as Y_1 , Y_2 and Y_3 , respectively). In the earlier OECD analysis (Ahmad *et al.*, 2004) the successive revisions between P (the first published estimate on MEI) and L (the latest estimate) are considered as the values published on MEI of December for the years $t+1$, $t+2$ and $t+3$ (D_1 , D_2 and D_3 , respectively), where t denotes the year to which the reference quarter belongs. The database contains of course P and both sets: Y_1 , Y_2 and Y_3 and D_1 , D_2 and D_3 .

Table 1 presents the current (October 2005) data availability for GDP in the QNA-MEI Revisions Database.

Table 1: Data availability for GDP (constant prices, seasonally adjusted) in the QNA-MEI revisions database. Period under review: MEI published in May 1995 – August 2005.

MEI editions		Vintages			#	Countries
First	Last	First	Last			
May-95	Aug-05	95q1	05q2	124	1: USA	
May-95	Aug-05	94q4	05q1	124	13: AUS, CAN, CHE, DNK, ESP, FIN, FRA, GBR, ITA, JPN, NLD, NOR, NZL	
Nov-95	Aug-05	95q2	05q1	118	1: DEU	
Nov-96	Aug-05	95q4	05q1	106	1: PRT	
Mar-97	Aug-05	96q3	05q2	102	1: BEL	
May-97	Aug-05	96q4	05q2	100	1: KOR	
Oct-03	Aug-05	03q2	05q1	23	1: CZE*	
Nov-03	Aug-05	03q2	05q1	22	1: AUT*	
Apr-04	Aug-05	03q4	05q1	17	1: GRC	
Nov-04	Aug-05	04q2	04q4	10	1: IRL	
Aug-05	Aug-05	05q1	05q1	2	1: HUN	
May-95	Sep-00	94q4	00q2	65	2: SWE, TUR	
May-95	Sep-00	94q4	00q1	65	1: MEX	
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* Previously published vintages are not considered: CZE: 99q1 from MEI July-99 to 00q1 from MEI Sep-00; AUT: 94q4 from MEI May-95 to 00q1 from MEI Sep-00.

As it is clear from table 1, for the time being sensible revisions analyses can be conducted only for 18 countries over 30, that is where at least 100 successive vintages of data are available. Thus the database is limited to the revisions to GDP (q-o-q rates of changes, seasonally adjusted) for the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, United Kingdom and USA.

In order to avoid spurious comparisons and to deal with an homogeneous revisions dataset³, the first published 95q1 estimate will be considered as the starting point of the revisions analysis for 14 countries (the above 13 and USA)⁴ over 18. For similar reasons the analyses involving Portugal, Belgium and Korea will be conducted using the first published estimates for 96q1, 96q4 and 97q1, respectively. The starting quarter for the revisions analysis of German GDP will be in turn 95q2⁵.

³ The estimates of GDP for 94q4 published in the May-95 edition of MEI are true 'first published estimates' for only 5 countries over 13, and precisely: Australia, Denmark, France, Italy, Netherlands. For the remaining 8 countries (Canada, Finland, Japan, New Zealand, Norway, Spain, Switzerland, United Kingdom) an estimate of GDP in 94q4 was published earlier on MEI April-95. Furthermore, on MEI April-95, the published 94q4 estimates of GDP for Finland and Norway are not seasonally adjusted. In the same edition, for New Zealand an index number for the 'Real Domestic Product' (seasonally adjusted, base 1990=100) has been published for 94q4.

⁴ The 95q1 estimate of the USA GDP has been published for the first time on the May-95 edition of MEI.

⁵ Other data issues raised from Portugal, where the December $t+1$ series is incomplete because no GDP

2.3. Organization of the database

For each country, there are two files. Using the Canadian example, the first file is named CAN_GDP, and the second file is named CAN-revsread.

CAN_GDP:

This database includes the primary data necessary for the calculation of revisions. The first worksheet of GDP in levels (table 2) is used to obtain the QoQ rates of change (table 3), based on which the “revisions triangle” (table 4) is calculated, from which a “revisions spreadsheet” is immediately extracted (table 5). This revision spreadsheet contains the sequence of estimates for a given quarter (Y1, Y2, Y3, and D1, D2, D3).

CAN_revsread

This database starts with the revision spreadsheet of the preceding file. It is used to calculate summary statistics on revisions for various comparisons, as shown in table 6.

- Appendix 1 explains the notation used and the mathematical expression of the summary statistics.
- Appendix 2 describes the current data availability in the QNA-MEI Revisions Database.
- Appendix 3 describes the months of publication of the first estimates of quarterly GDP

data for 1999 was published on MEI Dec-00, and from Norway, whose December $t+3$ series is incomplete due to the fact that no value for the 98q4 GDP was published on MEI Dec-02, so that the 99q1 quarter-on-quarter growth rate cannot be calculated.

Table 2: An excerpt from the QNA-MEI revisions database: level estimates

Revisions QNA-MEI dataset (OECD)

CANADA, Gross Domestic Product (constant prices, seasonally adjusted)

Levels

CAN		Relating to period	1994 Q3	1994 Q4	1995 Q1	1995 Q2	1995 Q3	1995 Q4	1996 Q1	1996 Q2	1996 Q3	1996 Q4	1997 Q1	1997 Q2	1997 Q3	1997 Q4	1998 Q1	1998 Q2	1998 Q3	1998 Q4	1999 Q1	1999 Q2
		First estimate	600.5	609.2	610.4	609.1	613.6	612.9	612.2	614.4	618.9	624.2	629.5	637.6	603.8	609.9	616.0	619.0	630.7	640.4	657.7	664.8
		December t+1	602.5	609.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	793.4	803.5	812.2	817.9	831.5	833.7	839.0	848.9	865.3	872.4
		December t+2	598.9	606.3	608.7	607.2	609.0	610.4	772.4	773.6	779.1	783.5	799.3	807.8	819.3	825.8	834.1	836.4	842.4	855.1	951.3	957.9
		December t+3	598.9	606.3	767.2	766.8	767.6	770.0	774.3	777.5	785.6	791.2	800.0	809.9	821.5	828.6	908.3	911.9	922.2	936.7	949.9	960.4
		1 year later	602.5	609.4	608.7	607.2	609.0	610.4	612.5	614.7	619.8	777.4	786.5	794.6	812.2	817.9	824.4	833.7	839.0	848.9	865.3	872.4
		2 years later	598.9	606.3	608.7	607.2	609.0	762.4	763.6	765.1	779.1	783.5	793.4	807.8	819.3	825.8	834.1	836.4	842.4	855.1	951.3	957.9
		3 years later	749.7	756.6	760.3	758.7	767.6	770.0	772.4	777.5	785.6	791.2	800.0	810.0	821.5	828.6	834.1	911.9	922.2	936.7	949.9	960.4
unit	level	Latest estimate	617.5	624.8	632.5	632.5	632.6	636.3	637.4	640.7	650.6	659.1	667.5	677.5	689.2	696.9	708.3	710.7	720.7	735.9	750.6	761.7
1986 Can\$ bln	AR	May-95	600.5	609.2																		
1986 Can\$ bln	AR	Jun-95	600.5	609.2																		
1986 Can\$ bln	AR	Jul-95	602.5	609.3	610.4																	
1986 Can\$ bln	AR	Aug-95	602.5	609.4	610.4																	
1986 Can\$ bln	AR	Sep-95	602.5	609.3	610.7	609.1																
1986 Can\$ bln	AR	Oct-95	602.5	609.3	610.7	609.1																
1986 Can\$ bln	AR	Nov-95	602.5	609.3	610.7	609.1																
1986 Can\$ bln	AR	Dec-95	602.5	609.3	611.4	610.5	613.6															
1986 Can\$ bln	AR	Jan-96	602.5	609.3	611.4	610.5	613.6															
1986 Can\$ bln	AR	Feb-96	602.5	609.3	611.4	610.5	613.6															
1986 Can\$ bln	AR	Mar-96	602.5	609.3	611.0	609.7	611.6	612.9														
1986 Can\$ bln	AR	Apr-96	602.5	609.4	611.0	609.7	611.6	612.9														
1986 Can\$ bln	AR	May-96	602.5	609.4	611.0	609.7	611.6	612.9														
1986 Can\$ bln	AR	Jun-96	598.9	606.3	608.7	607.2	609.0	610.4	612.2													
1986 Can\$ bln	AR	Jul-96	598.9	606.3	608.7	607.2	609.0	610.4	612.2													
1986 Can\$ bln	AR	Aug-96	598.9	606.3	608.7	607.2	609.0	610.4	612.2													
1986 Can\$ bln	AR	Sep-96	598.9	606.3	608.7	607.2	609.0	610.4	612.4	614.4												
1986 Can\$ bln	AR	Oct-96	598.9	606.3	608.7	607.2	609.0	610.4	612.4	614.4												
1986 Can\$ bln	AR	Nov-96	598.9	606.3	608.7	607.2	609.0	610.4	612.4	614.4												
1986 Can\$ bln	AR	Dec-96	598.9	606.3	608.7	607.2	609.0	610.4	612.0	613.9	618.9											
1986 Can\$ bln	AR	Jan-97	598.9	606.3	608.7	607.2	609.0	610.4	612.0	613.9	618.9											
1986 Can\$ bln	AR	Feb-97	598.9	606.3	608.7	607.2	609.0	610.4	612.0	613.9	618.9											
1986 Can\$ bln	AR	Mar-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2										
1986 Can\$ bln	AR	Apr-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2										
1986 Can\$ bln	AR	May-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2										
1986 Can\$ bln	AR	Jun-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.5									
1986 Can\$ bln	AR	Jul-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.5									
1986 Can\$ bln	AR	Aug-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.5									
1986 Can\$ bln	AR	Sep-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.9	637.6								
1986 Can\$ bln	AR	Oct-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.9	637.6								
1986 Can\$ bln	AR	Nov-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.9	637.6								
1986 Can\$ bln	AR	Dec-97	598.9	606.3	608.7	607.2	609.0	610.4	612.5	614.7	619.8	624.2	629.9	637.6								
1992 Can\$ bln	AR	Jan-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	785.3	795.7	803.8							
1992 Can\$ bln	AR	Feb-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	785.3	795.7	803.8							
1992 Can\$ bln	AR	Mar-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.4	796.3	804.0	809.9						
1992 Can\$ bln	AR	Apr-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.4	796.3	804.0	809.9						
1992 Can\$ bln	AR	May-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.4	796.3	804.0	809.9						
1992 Can\$ bln	AR	Jun-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	816.0					
1992 Can\$ bln	AR	Jul-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	816.0					
1992 Can\$ bln	AR	Aug-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	816.0					
1992 Can\$ bln	AR	Sep-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	815.4	819.0				
1992 Can\$ bln	AR	Oct-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	815.4	819.0				
1992 Can\$ bln	AR	Nov-98	749.7	756.6	760.3	758.7	759.9	762.4	763.6	765.1	772.8	777.4	786.5	794.6	803.0	808.6	815.4	819.0				
1992 Can\$ bln	AR	Dec-98	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.0	827.0	830.7			
1992 Can\$ bln	AR	Jan-99	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.0	827.0	830.7			
1992 Can\$ bln	AR	Feb-99	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.0	827.0	830.7			
1992 Can\$ bln	AR	Mar-99	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.4	827.5	831.1	840.4		
1992 Can\$ bln	AR	Apr-99	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.4	827.5	831.1	840.4		
1992 Can\$ bln	AR	May-99	754.6	761.6	767.2	766.8	767.6	770.0	772.4	773.6	779.1	783.5	793.4	803.5	812.2	817.9	824.4	827.5	831.1	840.4		
1992 Can\$ bln	AR	Jun-99	754.6	761.6	767.2	766.8	767.6	770.0														

Table 3: An excerpt from the QNA-MEI revisions database: quarter-on-quarter growth rates

**Revisions QNA-MEI dataset (OECD)
CANADA, Gross Domestic Product (constant prices, seasonally adjusted)
QoQ rates of changes (%)**

Relating to period	1994 Q4	1995 Q1	1995 Q2	1995 Q3	1995 Q4	1996 Q1	1996 Q2	1996 Q3	1996 Q4	1997 Q1	1997 Q2	1997 Q3	1997 Q4	1998 Q1	1998 Q2	1998 Q3	1998 Q4	1999 Q1	1999 Q2
First estimate	1,4	0,2	-0,3	0,5	0,2	0,3	0,3	0,8	0,7	0,8	1,2	1,0	0,7	0,9	0,4	0,4	1,1	1,0	0,8
December t+1	1,1	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	1,3	1,3	1,1	0,7	0,7	0,3	0,6	1,2	1,2	0,8
December t+2	1,2	0,4	-0,3	0,3	0,2	0,3	0,2	0,7	0,6	1,0	1,1	1,4	0,8	0,7	0,3	0,7	1,5	1,6	0,7
December t+3	1,2	0,7	0,0	0,1	0,3	0,3	0,4	1,0	0,7	1,2	1,2	1,4	0,9	1,0	0,4	1,1	1,6	1,5	1,1
1 year later	1,1	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,6	1,2	1,0	1,1	0,7	0,8	0,3	0,6	1,2	1,2	0,8
2 years later	1,2	0,4	-0,3	0,3	0,3	0,2	0,2	0,7	0,6	1,3	1,1	1,4	0,8	0,7	0,3	0,7	1,5	1,6	0,7
3 years later	0,9	0,5	-0,2	0,1	0,3	0,3	0,4	1,0	0,7	1,2	1,2	1,4	0,9	0,7	0,4	1,1	1,6	1,5	1,1
Latest estimate	0,9	0,9	0,0	0,0	0,4	0,1	0,4	1,2	1,0	1,0	1,2	1,3	0,9	1,3	0,3	1,1	1,7	1,6	1,2
May-95	1,4																		
Jun-95	1,4																		
Jul-95	1,1	0,2																	
Aug-95	1,1	0,2																	
Sep-95	1,1	0,2	-0,3																
Oct-95	1,1	0,2	-0,3																
Nov-95	1,1	0,2	-0,3																
Dec-95	1,1	0,3	-0,2	0,5															
Jan-96	1,1	0,3	-0,2	0,5															
Feb-96	1,1	0,3	-0,2	0,5															
Mar-96	1,1	0,3	-0,2	0,3	0,2														
Apr-96	1,1	0,3	-0,2	0,3	0,2														
May-96	1,1	0,3	-0,2	0,3	0,2														
Jun-96	1,2	0,4	-0,3	0,3	0,2	0,3													
Jul-96	1,2	0,4	-0,3	0,3	0,2	0,3													
Aug-96	1,2	0,4	-0,3	0,3	0,2	0,3													
Sep-96	1,2	0,4	-0,3	0,3	0,2	0,3	0,3												
Oct-96	1,2	0,4	-0,3	0,3	0,2	0,3	0,3												
Nov-96	1,2	0,4	-0,3	0,3	0,2	0,3	0,3												
Dec-96	1,2	0,4	-0,3	0,3	0,2	0,3	0,3	0,8											
Jan-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,3	0,8											
Feb-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,3	0,8											
Mar-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7										
Apr-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7										
May-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7										
Jun-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,8									
Jul-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,8									
Aug-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,8									
Sep-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,9	1,2								
Oct-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,9	1,2								
Nov-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,9	1,2								
Dec-97	1,2	0,4	-0,3	0,3	0,2	0,3	0,4	0,8	0,7	0,9	1,2								
Jan-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,0	1,3	1,0							
Feb-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,0	1,3	1,0							
Mar-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,1	1,3	1,0	0,7						
Apr-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,1	1,3	1,0	0,7						
May-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,1	1,3	1,0	0,7						
Jun-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,9					
Jul-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,9					
Aug-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,9					
Sep-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,8	0,4				
Oct-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,8	0,4				
Nov-98	0,9	0,5	-0,2	0,2	0,3	0,2	0,2	1,0	0,6	1,2	1,0	1,1	0,7	0,8	0,4				
Dec-98	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4			
Jan-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4			
Feb-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4			
Mar-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4	1,1		
Apr-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4	1,1		
May-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4	1,1		
Jun-99	0,9	0,7	0,0	0,1	0,3	0,3	0,2	0,7	0,6	1,3	1,3	1,1	0,7	0,8	0,4	0,4	1,1		
Jul-99	0,9	0,8	-0,1	0,2	0,5	0,3	0,4	1,0	0,7	1,0	1,1	1,4	0,8	0,7	0,3	0,6	1,2	1,0	
Aug-99	0,9	0,8	-0,1	0,2	0,5	0,3	0,4	1,0	0,7	1,0	1,1	1,4	0,8	0,7	0,3	0,6	1,2	1,0	
Sep-99	0,9	0,8	-0,1	0,2	0,5	0,3	0,4	1,0	0,7	1,0	1,1	1,4	0,8	0,7	0,3	0,6	1,2	1,0	0,8

Table 6: An excerpt from the QNA-MEI revisions database. Summary statistics for various comparisons

**Canada, Gross Domestic Product (constant prices, seasonally adjusted)
Common sample**

<i>Summary statistics</i>	<i>Comparisons</i>						
	Y1_P	Y2_P	Y3_P	L_P	Y2_Y1	Y3_Y2	L_Y3
sample	95.1-02.1	95.1-02.1	95.1-02.1	95.1-02.1	95.1-02.1	95.1-02.1	95.1-02.1
n	29	29	29	29	29	29	29
mean absolute revision	0,1497	0,2196	0,2357	0,2757	0,1309	0,1379	0,1249
mean revision (Rbar)	-0,0008	0,0493	0,1413	0,1760	0,0500	0,0920	0,0347
st. dev(Rbar) - HAC formula	0,0393	0,0458	0,0499	0,0567	0,0323	0,0324	0,0298
mean squared revision	0,0478	0,0672	0,0837	0,1113	0,0273	0,0342	0,0324
relative mean absolute revision	0,2103	0,2869	0,2766	0,3158	0,1710	0,1619	0,1431
t-stat	-0,0194	1,0764	2,8321	3,1028	1,5484	2,8364	1,1650
t-crit	2,0484	2,0484	2,0484	2,0484	2,0484	2,0484	2,0484
Is mean revision significant?	NO	NO	YES	YES	NO	YES	NO
Correlation	0,8861	0,8630	0,8748	0,8472	0,9500	0,9516	0,9441
Min Revision	-0,7	-0,5	-0,4	-0,5	-0,2	-0,2	-0,2
Max Revision	0,4	0,5	0,7	0,8	0,4	0,4	0,6
Range	1,1	1,0	1,1	1,3	0,6	0,6	0,8
% Later > Earlier	62,1	55,2	75,9	72,4	55,2	72,4	48,3
% Sign(Later) = Sign(Earlier)	96,6	96,6	96,6	93,1	100,0	100,0	96,6
Variance of Later estimate	0,2166	0,2530	0,2715	0,2844	0,2530	0,2715	0,2844
Variance of Earlier estimate	0,2010	0,2010	0,2010	0,2010	0,2166	0,2530	0,2715
UM %	0,00	3,61	23,85	27,83	9,16	24,78	3,71
UR %	2,70	0,30	0,07	0,01	0,57	0,15	0,95
UD %	97,29	96,08	76,09	72,16	90,27	75,07	95,34

Legenda

P: First published estimate

L: Latest published estimate (at least 3 years after the first)

Y1: Estimate published 1 year later

Y2: Estimate published 2 years later

Y3: Estimate published 3 years later

Appendix 1

Conventional signs	
Country labels	Estimates published on MEI
AUS: Australia	<i>P</i> : First published estimate
BEL: Belgium	<i>L</i> : Latest published estimates (at least 36 months after <i>P</i>)
CAN: Canada	<i>Y1</i> : Estimate published 12 months after <i>P</i>
CHE: Switzerland	<i>Y2</i> : Estimate published 24 months after <i>P</i>
DEU: Germany	<i>Y3</i> : Estimate published 36 months after <i>P</i>
DNK: Denmark	<i>D1</i> : Estimate published in December of year <i>t</i> +1
ESP: Spain	<i>D2</i> : Estimate published in December of year <i>t</i> +2
FIN: Finland	<i>D3</i> : Estimate published in December of year <i>t</i> +3
FRA: France	
GBR: United Kingdom	
ITA: Italy	
JPN: Japan	
KOR: Korea	
NLD: Netherlands	
NZL: New Zealand	
NOR: Norway	
PRT: Portugal	
USA: United States	
	Comparisons
	L_P: Latest vs. First
	Y1_P: 1 Year vs. First
	Y2_P: 2 Years vs. First
	Y3_P: 3 Years vs. First
	Y2_Y1: 2 Years vs. 1 Year
	Y3_Y2: 3 Years vs. 2 Years
	L_Y3: Latest vs. 3 Years
	Y3_Y1: 3 Years vs. 1 Year
	D1_P: Dec. <i>t</i> +1 vs. First
	D2_P: Dec. <i>t</i> +2 vs. First
	D3_P: Dec. <i>t</i> +3 vs. First
	D2_D1: Dec. <i>t</i> +2 vs. Dec. <i>t</i> +1
	D3_D2: Dec. <i>t</i> +3 vs. Dec. <i>t</i> +2
	L_D3: Latest vs. Dec. <i>t</i> +3
	D3_D1: Dec. <i>t</i> +3 vs. Dec. <i>t</i> +1

Summary indices for the revisions analysis

E: earlier estimate *L*: Later estimate *R*: Revision = *L*-*P*

Index	Mathematical expression
Mean revision	$\bar{R} = \frac{1}{n} \sum_{t=1}^n R_t$
Mean absolute revision	$\frac{1}{n} \sum_{t=1}^n R_t $
Mean squared revision	$\frac{1}{n} \sum_{t=1}^n R_t^2$
Relative mean absolute revision	$\frac{\sum_{t=1}^n R_t }{\sum_{t=1}^n L_t }$
Standard deviation of mean revision – HAC formula	$\hat{\sigma}_{\bar{R}}$, see Di Fonzo (2005)
<i>t</i> -statistic	$\frac{\bar{R}}{\hat{\sigma}_{\bar{R}}}$

The revisions to the earlier estimates of GDP q-o-q growth rates have been summarized using the following statistical indices:

- *Mean revision*

$$\bar{R} = \frac{1}{n} \sum_{t=1}^n (L_t - P_t) = \frac{1}{n} \sum_{t=1}^n R_t$$

where L_t is the later estimate, P_t is the earlier estimate, $R_t = L_t - P_t$ is the revision and n is the number of observations.

- *Mean absolute revision*

$$MAR = \frac{1}{n} \sum_{t=1}^n |L_t - P_t| = \frac{1}{n} \sum_{t=1}^n |R_t|$$

- *Mean squared revision*

$$MSR = \frac{1}{n} \sum_{t=1}^n (L_t - P_t)^2 = \frac{1}{n} \sum_{t=1}^n R_t^2$$

The mean squared revision is a summary measure based on a symmetric and quadratic loss function. It has some properties, mainly an interesting decomposition, which are presented below.

Another indicator which has been generally kept into consideration in revisions analysis (see, for example, Ahmad *et al.*, 2004) is the *Relative mean absolute revision*, defined as

$$RMAR = \frac{\sum_{t=1}^n |L_t - P_t|}{\sum_{t=1}^n |L_t|} = \frac{\sum_{t=1}^n |R_t|}{\sum_{t=1}^n |L_t|}.$$

Less widely used, but potentially very useful are statistics on the range of revisions, on the amount of positive and negative revisions and on the number of times the signs of the earlier and of the later estimates coincide.

To conclude on this point, as far as the evaluation of the significance of the mean revision is concerned, a simple and robust approach based on the Heteroskedasticity Autocorrelation Consistent estimate's variance proposed by Newey and West (1987) can be considered. In this case the standard t test is applied using a robust estimate of the variance of the mean revision, which is calculated in a different way with respect to what is currently done by ONS (Jenkinson and Stuttard, 2004). Technical details on this point can be found in Di Fonzo (2005).

Properties of the Mean Squared Revision

For unbiased preliminary estimates (that is, $E(R_t) = 0$, $t=1, \dots, n$, where the symbol $E(\cdot)$ denotes the expected value), MSR is the variance of the revision. Taking the square root gives the Root Mean Squared Revision ($RMSR$), which is a suitable measure of accuracy

when using a quadratic loss function. The disadvantages of the *RMSR* are that (i) while it has a minimum value of zero, it is unbounded, and (ii) it is unrelated to the variation in the latest estimate. Theil (1966) proposed an inequality coefficient (U) defined as the positive square root of

$$U^2 = \frac{MSR}{\sum_{t=1}^n L_t^2 / n},$$

which takes account of the variation in the most recent series. The coefficient U takes the value one when all the latest figures are zero, which is an interesting property if the index is used on growth rates. For, a value of U between zero and one indicates that the early estimates of growth rates are an improvement over a no-change estimate, while larger values imply poor preliminary estimates. Theil (1961) proposed two alternative decompositions of *MSR* and, following Granger and Newbold (1973), we consider the following:

$$MSR = \bar{R}^2 + (S_p - \rho S_L)^2 + (1 - \rho^2) S_L^2,$$

where \bar{R} is the mean revision, S_L and S_p are the standard deviations of the latest and preliminary estimates, respectively, and ρ is their correlation. Dividing throughout by *MSR* gives

$$1 = UM + UR + UD$$

where

$$\begin{aligned} UM &= \frac{\bar{R}^2}{MSR} \\ UR &= \frac{(S_p - \rho S_L)^2}{MSR} \\ UD &= \frac{(1 - \rho^2) S_L^2}{MSR} \end{aligned}$$

The interpretation of these is helped by consideration of the regression model in which the latest estimate is linked to the preliminary estimate as

$$L_t = \alpha + \beta P_t + u_t, \quad (1)$$

for which the least squares estimators are $\hat{\beta} = \frac{S_{LP}}{S_p^2}$ and $\hat{\alpha} = \bar{L} - \hat{\beta} \bar{P}$, where S_{LP} is the covariance between L_t and P_t . If the preliminary estimates are unbiased, $\alpha = 0$ and

$\beta = 1$, so that \bar{R} , and hence UM , is zero. That is, UM gives the proportion of MSR due to systematic differences between the preliminary and the latest estimates. For UR we note that

$$S_P - \rho S_L = S_L (1 - \hat{\beta}),$$

so that UR is the proportion of MSR due to the slope coefficient in (1) differing from one. Finally, if (1) gave a perfect fit, then UD would be zero, so UD can be interpreted as the disturbance proportion of MSR or that part of the observed revision which is not explained by the mean or slope error. 'Good' preliminary estimates will have low values of UM and UR and a high value of UD .

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Appendix 2: Data availability for GDP in the QNA-MEI revisions database. Period under review: MEI published in May 1995 – August 2005.

Country	CONSTANT PRICES				CURRENT PRICES					
	Seasonally adjusted		Raw data		Seasonally adjusted		Raw data			
	MEI edition	Vintage	MEI edition	Vintage	MEI edition	Vintage	MEI edition	Vintage		
1	AUS	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
2	AUT	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	sep-00	00q1	feb-00	99q3	sep-00	00q1	feb-00	99q3
		First	nov-03	03q2	oct-00	00q2	nov-03	03q2	oct-00	00q2
		Last	aug-05	05q1	oct-03	03q2	aug-05	05q1	oct-03	03q2
3	BEL	First	mar-97	96q3	-	-	nov-99	99q2	-	-
		Last	aug-05	05q2	-	-	aug-05	05q2	-	-
4	CAN	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
5	CHE	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
6	CZE	First	jul-97	99q1	feb-96	95q3	jul-97	99q1	feb-96	95q3
		Last	sep-00	00q1	jun-99	98q4	sep-00	00q1	jun-99	98q4
		First	oct-03	03q2	oct-00	00q2	oct-03	03q2	oct-00	00q2
		Last	aug-05	05q1	set-03	03q1	aug-05	05q1	sep-03	03q1
7	DEU	First	nov-95	95q2	may-95	94q4	nov-95	95q2	may-95	94q4
		Last	aug-05	05q1	oct-95	95q2	aug-05	05q1	oct-95	95q2
8	DNK	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
9	ESP	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
10	FIN	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	aug-05	05q1	apr-99	98q3	aug-05	05q1	apr-99	98q3
11	FRA	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
12	GBR	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
13	GRC	First	apr-04	03q4	-	-	apr-04	03q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
14	HUN	First	jul-05	05q1	apr-03	02q3	aug-05	05q1	apr-03	02q3
		Last	aug-05	05q1	jun-05	04q4	aug-05	05q1	jun-05	04q4
15	IRL	First	nov-04	04q2	jan-03	02q2	nov-04	04q2	jan-03	02q2
		Last	aug-05	04q4	oct-04	04q2	aug-05	04q4	oct-04	04q2
16	ISL	First	-	-	apr-03	02q4	-	-	apr-03	02q4
		Last	-	-	aug-05	05q1	-	-	aug-05	05q1
17	ITA	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
18	JPN	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
19	KOR	First	may-97	96q4	-	-	may-97	96q4	-	-
		Last	aug-05	05q2	-	-	aug-05	05q2	-	-
20	LUX	First	-	-	aug-05	04q4	-	-	aug-05	04q4
		Last	-	-	aug-05	05q1	-	-	aug-05	05q1
21	MEX	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	sep-00	00q1	aug-05	05q1	sep-00	00q1	aug-05	05q1
22	NLD	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	04q4	-	-
23	NOR	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	aug-05	05q1	sep-00	00q1	aug-05	05q1	sep-00	00q1
24	NZL	First	may-95	94q4	-	-	may-95	94q4	-	-
		Last	aug-05	05q1	-	-	aug-05	05q1	-	-
25	POL	First	-	-	sep-02	02q1	-	-	sep-02	02q1
		Last	-	-	aug-05	05q1	-	-	aug-05	05q1
26	PRT	First	nov-96	95q4	may-95	93q4	nov-96	95q4	may-95	93q4
		Last	aug-05	05q1	oct-96	94q4	aug-05	05q1	oct-96	94q4
27	SVK	First	-	-	feb-01	00q3	-	-	feb-01	00q3
		Last	-	-	aug-05	05q1	-	-	aug-05	05q1
28	SWE	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	sep-00	00q2	aug-05	05q1	sep-00	00q1	aug-05	05q1
29	TUR	First	may-95	94q4	may-95	94q4	may-95	94q4	may-95	94q4
		Last	sep-00	00q2	aug-05	05q1	sep-00	00q2	aug-05	05q1
30	USA	First	may-95	95q1	-	-	may-95	95q1	-	-
		Last	aug-05	05q2	-	-	aug-05	05q2	-	-

Appendix 3: Months of publication on MEI of the first estimates of quarterly GDP (constant prices, seasonally adjusted). Period under review: MEI published in May 1995 – August 2005*.

Country (covered period)	Q1	Q2	Q3	Q4
Australia (1995.1-2005.1)	July: 97-00,02 June:95,96,01,03-05	October: 97,00-03 September: 95,96,98,99,04	January t+1: 96-03 December: 95,04	May t+1: 98,99 April t+1: 95,96,01-03 March t+1: 97,00,04
Belgium (1996.4-2005.2)	December: 98 September: 99,00 August: 97,01,02 June: 03 May: 04-05	December: 97,98 November: 99-02 September: 03 August: 04-05	March t+1: 98,99 February t+1: 97,00-02 December: 03 November: 04	July t+1: 98 May t+1: 96,97,99-01 April t+1: 03 March t+1: 02,04
Canada (1995.1-2005.1)	July: 95,99,01 June: 96-98,00,02-05	September: 95-04	January t+1: 97 December: 95,96,98-04	March t+1: 95-04
Denmark (1995.1-2005.1)	August: 95-97 July: 98-01 June: 02-05	November: 95,98,99 October: 96,97,00,01 September: 02-04	March t+1: 95,97 February t+1: 96 January t+1: 98-01,03 December: 02,04	May t+1: 95,98,99 April t+1: 96,97,00 March t+1: 01-04
Finland (1995.1-2005.1)	July: 95-03,05 June: 04	November: 98,99 October: 95-97,00-04	January t+1: 95-04	May t+1: 98,99 April t+1: 95-97 March t+1: 00-04
France (1995.1-2005.1)	August: 99 July: 95,97 June: 96,98,00-05	October: 95,97,00,01 September: 96,98,99,02-04	January t+1: 97 December: 95,96,98-04	March t+1: 95-04
Germany (1995.2-2005.1)	July: 96,97,99,00 June: 98,01-05	October: 95-99 September: 00-04	March t+1: 95 January t+1: 96,97 December: 98-04	April t+1: 95,96,98 March t+1: 97,99-04
Italy (1995.1-2005.1)	August: 95-97 July: 98-00 June: 01-05	November: 95 October: 96-02 September 03-04	February t+1: 96,99 January t+1: 95,97,98 December: 00-04	July t+1: 98 May t+1: 95,96 April t+1: 97,99,00 March t+1: 01-04
Japan (1995.1-2005.1)	July: 95-02 June: 03-05	October: 95-01 September: 02-04	January t+1: 95,97,01 December: 96,98-00,02-04	April t+1:95-01 March t+1: 02-04
Korea (1997.1-2005.2)	October: 97 July: 99 June: 98,00-05	October: 97,02 September: 98-01,03,04 August: 05	January t+1: 97,98 December: 99-04	April t+1:97-04
Netherlands (1995.1-2005.1)	September: 98,00 August: 95,96 July: 99 June: 97,01-05	December: 96 November: 95 September: 97-04	February t+1: 95,98 January t+1: 99 December: 96,97,00-04	May t+1: 95,97 March t+1: 96,98-04
New Zealand (1995.1-2005.1)	October: 95 August: 96 July: 97-05	November: 98,99 October: 95-97,00-04	July t+1: 00 February t+1: 95,96 January t+1: 97-99,01-04	July t+1: 00 May t+1: 95,98 April t+1: 96,97,99,01-04
Norway (1995.1-2005.1)	December: 95 October: 02 September: 96 July: 97-01,03,05 June: 04	December: 95 October: 96,97,00-04 September: 98,99	February t+1: 95,97 January t+1: 96,99-04 December: 98	May t+1: 95 April t+1: 98,00,02-04 March t+1: 96-99,01
Portugal (1996.1-2005.1)	February t+2: 99 July t+1: 97 February t+1: 96,00 January t+1: 98 September: 01,02 July: 03,05 June: 04	February t+2: 99 July t+1: 97 February t+1: 96,00 January t+1: 98 December: 01 November: 02 October: 03,04	February t+2: 99 November t+1: 96 July t+1: 97 May t+1: 98 March t+1: 00-02 January t+1: 03,04	February t+2: 99 November t+1: 96 July t+1: 97 June t+1: 01 May t+1: 98,00 April t+1: 02-04
Spain (1995.1-2005.1)	September: 99 August: 95 July: 96-98,00,01 June: 02-05	November: 95,98,99 October: 96,97,00,01,03 September 02,04	January t+1: 95-01 December: 02-04	April t+1:95,96 March t+1: 97-04
Switzerland (1995.1-2005.1)	August: 97 July: 95,96, 98-02 June: 03-05	November: 98,99 October: 95-97,00-04	January t+1: 95-02 December: 03-04	May t+1: 98,99,03 April t+1: 95-97,00,01 March t+1: 02,04
United Kingdom (1995.1-2005.1)	June: 95-05	October: 02 September: 95-01,03,04	December:95-04	March t+1: 95-04
United States (1995.1-2005.2)	May: 95-05	September: 02,04 August: 95-01,03,05	February t+1: 99 November: 95-98,00-05	March t+1: 95,96 February t+1: 97-04

* $t+1$ means that the first estimate was published the year after the one to which the reference quarter belongs.