REVISIONS IN QUARTERLY GDP OF OECD COUNTRIES: AN UPDATE

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Introduction

This paper examines the revisions histories of eighteen OECD member countries for the first estimates of constant prices, seasonally adjusted quarter-on-quarter GDP growth rates as published in successive monthly issues of the OECD publication: *Main Economic Indicators* (MEI) from May-95 to May-09. The paper builds on work previously done and presented at the OECD Working Party on National Accounts in October 2005[1] (Di Fonzo 2005b).

As in previous papers, the analysis covers 18 countries by exploiting data contained in the OECD *Main Economic Indicators Original Release Data and Revisions Database;* now available on the OECD website. This database encourages the development of revisions analysis on an internationally comparable basis for quarterly national accounts.

The present study is focused on quarterly GDP, and countries included are those for which the revisions record is long enough to permit sensible statistical analysis. They are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, United Kingdom and USA. The available revisions database permits analysis of the size and direction of the revisions for each country, and to perform comparisons across countries. For full organisational and methodological aspects readers can refer to Di Fonzo (2005a, 2005b).

There is often speculation that an increase in timeliness for official statistics leads to an increase in revisions and a decrease in quality. Another purpose of this brief paper is to outline a number of revision analysis variables that can be used to test this hypothesis and secondly to publicise the OECD Original Release Data and Revisions Database and the revision tools that countries can use to analyse revisions to their official statistics.

This website (http://stats.oecd.org/mei/default.asp?rev=1) provides access to time series data for 21 key economic variables as originally published in each monthly edition of the MEI from February 1999 onwards. This real-time database enables users to perform real-time data analysis of econometric models and to study the magnitude and direction of subsequent revisions to published statistics. Data for all OECD member countries, the Euro area, China, India, Brazil, South Africa and the Russian Federation are available. Automated programs to perform revisions analysis are provided.

Notations

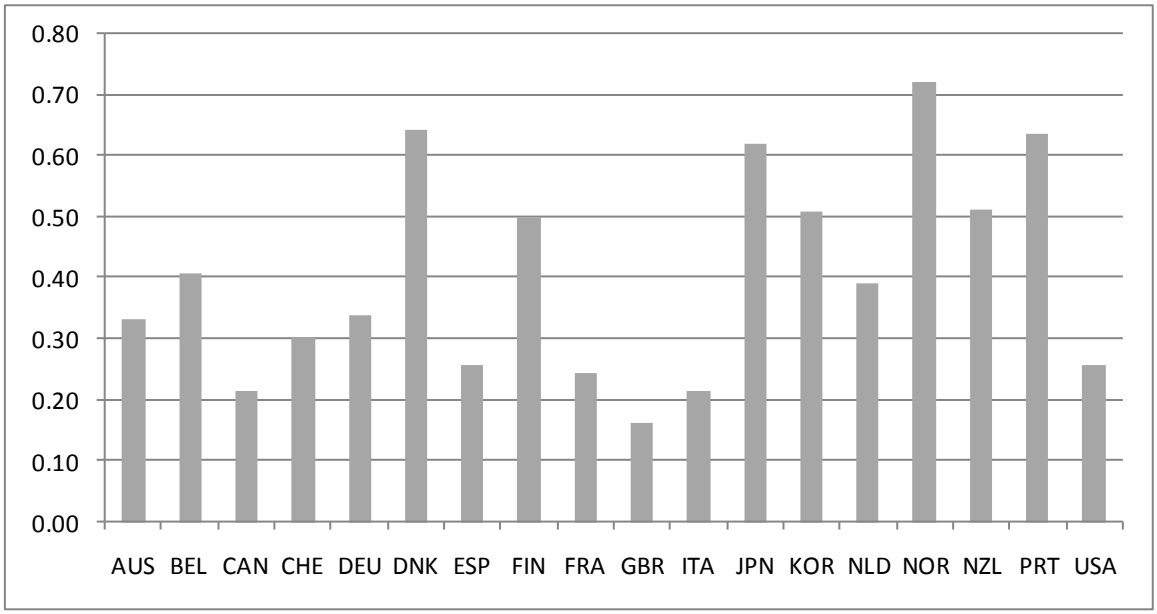
The following are used:
P: First published estimate of GDP,
L: Latest published estimate of GDP (at least 3 years after the first),
Y1: Estimate published 1 year later,
Y2: Estimate published 2 years later,
Y3: Estimate published 3 years later,
Y1_P: Revision between Y1 and P,
Y2_P: Revision between Y2 and P,
Y3_P: Revision between Y3 and P,
L_P: Revision between L and P.

[1] http://www.oecd.org/dataoecd/13/49/35440080.pdf

Results – for Comparison

The results are shown in the following figures.[2] It should be noted that for all analysis the following countries data does not start in 1995.1 – Belgium (BEL) 96.4; Germany (DEU) 95.2; Portugal (PRT) 1996.1; Korea (KOR) 1999.4.

Figure 1: Mean absolute revision: 1995.1-2008.4
Revisions between three years later estimates (Y3) and the first published estimates (P)
of q-o-q GDP growth rates



The mean absolute revision measures the dimension of the revision Rt and it is defined as:

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

where Lt is the later estimate, Pt is the earlier estimate, $R_t = L_t - P_t$ is the revision and n is the number of observations. This statistics means that if it is small, the mean of the absolute difference between Lt and Pt is small and then that there are reliable estimates.

Figure 1 shows three country groupings, the first group consists of those countries with lower mean absolute revisions below 0.35 – Australia, Canada, Switzerland, Germany, Spain, France, United Kingdom, Italy and the United States. The second group has higher absolute revisions, 0.35 to 0.60 – Belgium, Finland, Korea, Netherlands, and New Zealand. The final group consists of those countries with absolute revisions over 0.60 – Denmark, Japan, Norway and Portugal.

The relative mean absolute revision allows one to assess the relative robustness of the two estimates, as it measures the proportion of Pt revised in Lt. It is calculated as:

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

[2] Statistics are given here for the whole period from 95.1.

Figure 2 shows the same range of countries and data using the relative mean absolute revision. This statistic is interesting for international comparisons because, in difference with the mean absolute revision, it takes into account the average size of growth in the given period for the given country, high growth numbers will probably result in higher absolute revisions.

Figure 2: Relative mean absolute revision: 1995.1-2008.4
Revisions between three years later estimates (Y3) and the first published estimates (P) of q-o-q GDP growth rates

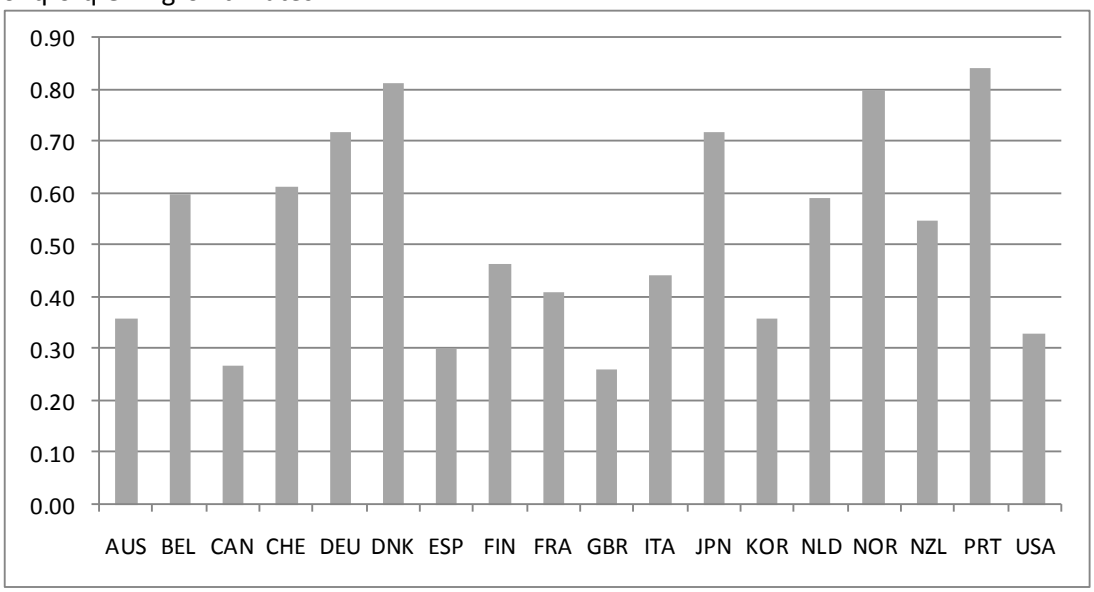
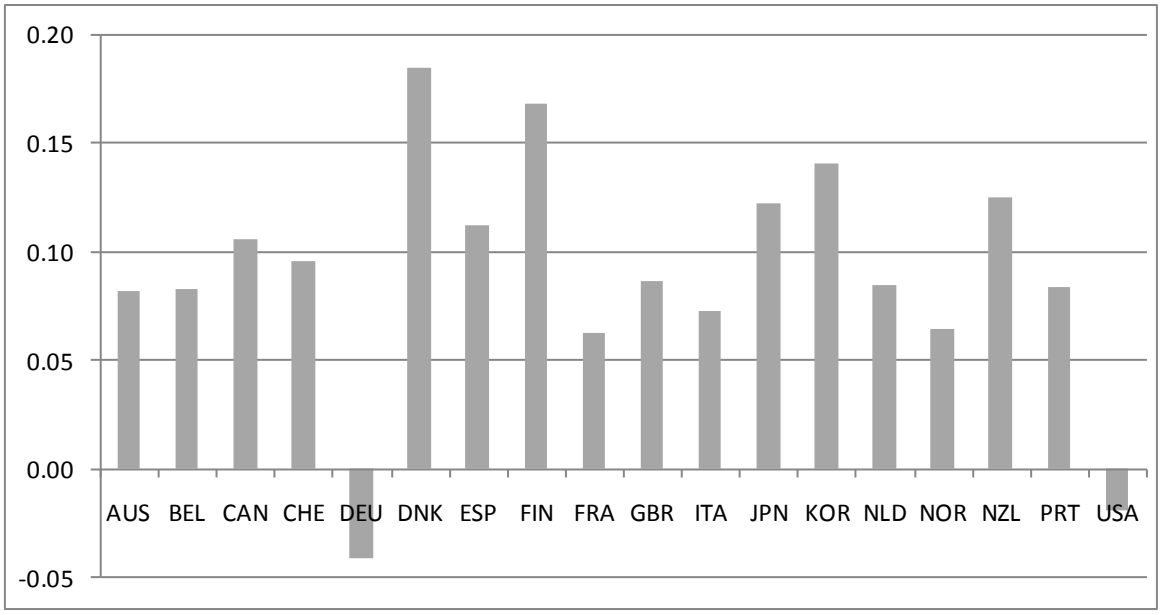


Figure 3: Mean revision (Rbar): 1995.1-2008.4
Revisions between three years later estimates (Y3) and the first published estimates (P) of q-o-q GDP growth rates



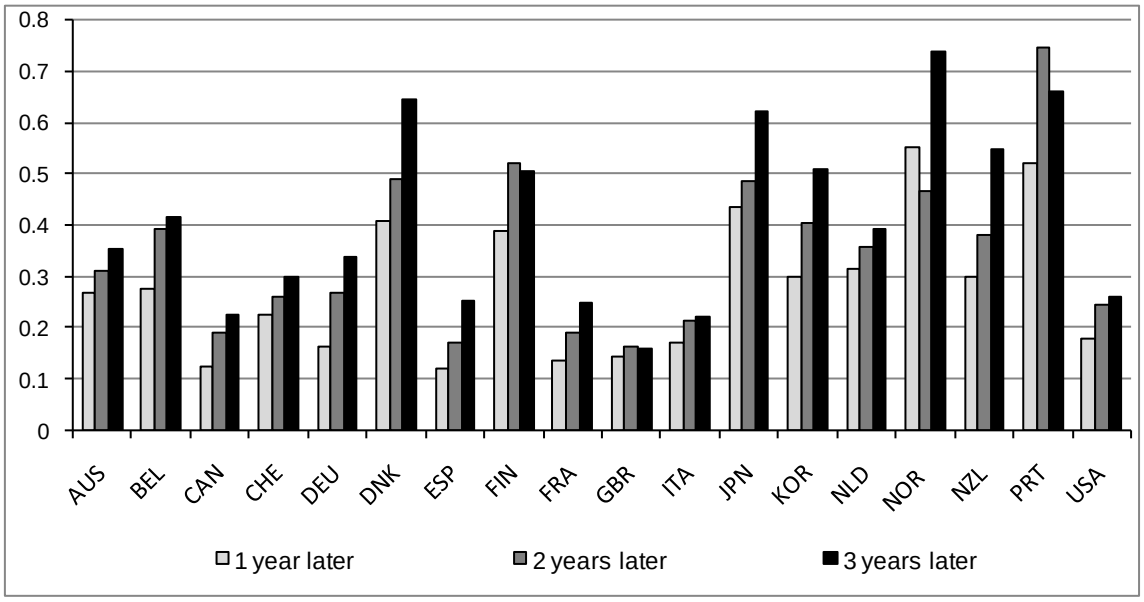
The mean revision is defined as $\bar{R} = \frac{1}{n}\sum_{t=1}^{n}(L_t - P_t) = \frac{1}{n}\sum_{t=1}^{n} R_t$. It presents the average difference between two estimates of the same target, but made in different instants of time. This statistic needs to be associated with a test of significance to fully see if the revision is statistically significant or not.

The figure (3) has a number of interesting points; firstly two countries show negative mean revisions between three years later estimates (Y3) and the first published estimates (P) – Germany and the United States. Only Denmark and Finland show mean revisions above 0.15 with the remaining countries grouped between 0.06 and 0.14.

Results – by Country

The following figure should not be viewed as a comparison across countries because unlike the first three figures the revision analysis period for the countries has not been harmonised (i.e. a common sample size has been used for figures 1, 2 and 3).

Figure 4: Mean Absolute Revisions:
Revisions between one, two and three years later estimates (Y1, Y2, and Y3) and the first published estimates (P) of q-o-q GDP growth rates



Improving Timeliness – Revision Analysis
It is clear from the above graphs and formula that it is possible to undertake revision analysis before and after an improvement has been made to the timeliness of an official statistic to access whether there has been any impact on the revision history. This could provide interesting documentation to users and possibly offer evidence or at least a starting point to answer questions about improving timeliness and its impact on quality. As previously stated, all the analysis undertaken in this paper has come from the OECD Original Release Data and Revisions Database and the tools provided on this website.

OECD Original Release Data and Revisions Database

This database was developed by the Statistics Directorate of the OECD over a number of years and in conjunction with the OECD Short-Term Economic Statistics Working Party (STESWP). As well as providing a full monthly revision history for all OECD member countries the website also provides various tools to allow users to undertake their own revision analysis.

A full user guide is provided: http://www.oecd.org/dataoecd/48/20/36888799.pdf
as is access to all the automated programs required:
http://www.oecd.org/document/17/0,2340,en_2649_34257_36873169_1_1_1_1,00.html

To help users and begin the process of international harmonisation the 2008 meeting of STESWP saw the release of the 'OECD / Eurostat guidelines on revisions policy and analysis':
http://www.oecd.org/document/21/0,3343,en_2649_34257_40016853_1_1_1_1,00.html

Using the automated programs

Having France as an example the automated program produces the following output:

France, Gross Domestic Product (constant prices, seasonally adjusted)								
	Comparisons							
Summary statistics	Y1_P	Y2_P	Y3_P	L_P	Y2_Y1	Y3_Y2	L_Y3	Y3_Y1
Sample	94.4-07.4	94.4-06.4	94.4-05.4	94.4-05.4	94.4-06.4	94.4-05.4	94.4-05.4	94.4-05.4
n	53	49	45	45	49	45	45	45
Mean absolute revision	0.1356	0.1900	0.2470	0.2372	0.1241	0.1391	0.1455	0.1984
Mean revision (Rbar)	0.0110	0.0367	0.0684	0.0674	0.0328	0.0291	-0.0010	0.0538
st. dev (Rbar) - HAC formula	0.0264	0.0309	0.0380	0.0376	0.0220	0.0198	0.0268	0.0320
Mean squared revision	0.0343	0.0587	0.0929	0.0821	0.0269	0.0302	0.0539	0.0572
Relative mean absolute revision	0.2400	0.3269	0.4060	0.4144	0.2136	0.2286	0.2541	0.3260
t-stat	0.4167	1.1892	1.8007	1.7933	1.4930	1.4754	-0.0383	1.6802
t-crit	2.0066	2.0106	2.0154	2.0154	2.0106	2.0154	2.0154	2.0154
Is mean revision significant?	NO	NO	NO	NO	NO	NO	NO	NO
Correlation	0.8979	0.8296	0.7556	0.7184	0.9303	0.9260	0.8583	0.8638
Min Revision	-0.5	-0.5	-0.6	-0.7	-0.5	-0.4	-0.9	-0.5
Max Revision	0.6	0.7	0.7	0.6	0.4	0.4	0.7	0.6
Range	1.2	1.2	1.2	1.3	0.9	0.8	1.5	1.1
% Later > Earlier	49.1	55.1	57.8	64.4	65.3	62.2	46.7	66.7
% Sign(Later) = Sign(Earlier)	94.3	93.9	93.3	88.9	95.9	97.8	95.6	95.6
Variance of Later estimate	0.1749	0.1833	0.2044	0.1434	0.1833	0.2044	0.1434	0.2044
Variance of Earlier estimate	0.1277	0.1360	0.1315	0.1315	0.1875	0.1893	0.2044	0.1936

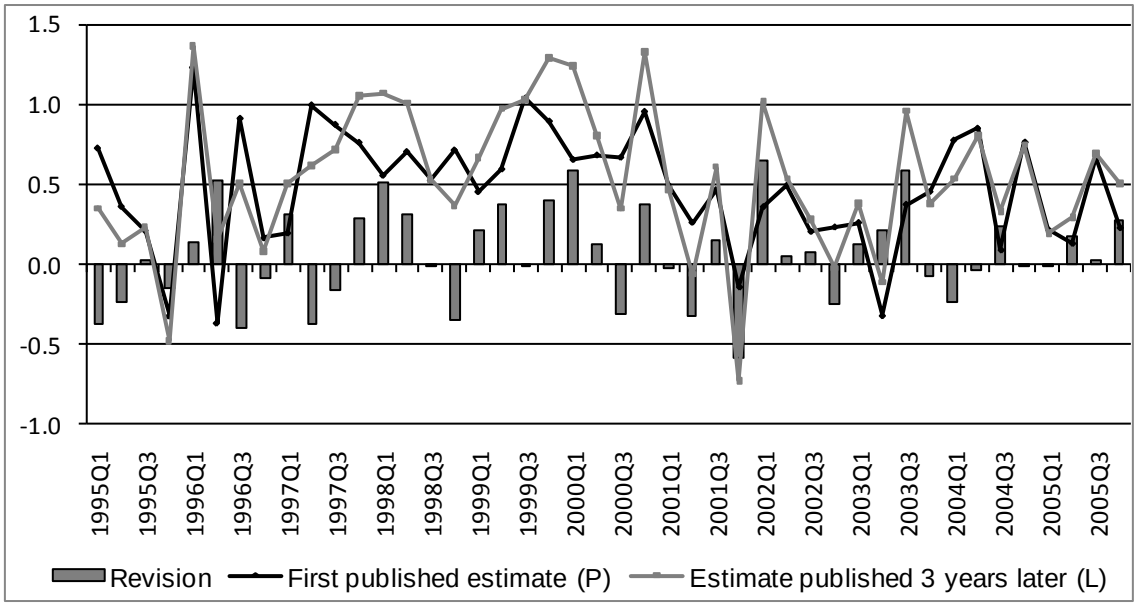
Legend:
P: First published estimate
L: Latest published estimate (at least 3 years after the first)
Y1: Estimate published 1 year later
Y2: Estimate published 2 years later
Y3: Estimate published 3 years later

The program also generates all the required revision triangles for all the summary statistics and allows the user to either download data directly from the OECD or incorporate their own data.

Numerous graphs are generated by the package, for example:

Figure 5: France, Gross Domestic Product (constant prices, seasonally adjusted)

Comparing earlier (P) and later (L) estimates



Summary

This is a brief paper updating past work done on revision analysis to the economic variable quarterly GDP for eighteen OECD member countries. The paper also outlines for users the tools that the OECD has made freely available so that they can undertake their own revision analysis. The paper provides a number of links to these tools including links to the documentation and guidelines that should used in conjunction with revisions analysis.

The recent financial crisis has seen a number of commentators suggest that the timeliness of core economic variables (such as quarterly GDP) needs to be improved to give policy makers a quicker understanding of the situation and how their policies are working (or not). As an example some have suggested that more 'flash estimates' should be made available and earlier. If national statistics offices do indeed attempt to improve the timeliness of their official statistics, another purpose of this paper has been to show that there are tools available that could attempt to measure if in fact there is a trade off between quality and timeliness. Revision analysis is a valid tool that could be used by national statistics offices to measure the before and after situation and hopefully learn from these changes.

Note that all the revision analysis carried out in this paper is available on request including all the spreadsheets etc.

ANNEX - Summary indices for the revisions analysis

The statistical indices used to lead the revisions analysis of GDP q-o-q growth rates are

- *Mean revision*

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

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*

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

This statistic measures the dimension of the revision R_t . If small it means that there are reliable estimates.

- *Relative mean absolute revision*

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

This indicator allows the user to assess the relative robustness of two estimates. It measures the proportion of Pt revised in Lt.

- *% Sign(L) = % Sign(E)*

It gives information about the percentage of quarters for which the earlier estimate of q-o-q growth rate has the same sign as the later one.

Other useful statistics are the range of revisions and the amount of positive and negative revisions.