

Advisory Committee Discussion of GDP vs. GDI Dennis Fixler, May 7, 2010

• Flow of estimates given in the following table

Quarterly Measures of Economic Activity [billiions of dollars]

Timing:	Q + 1 month	Q + 2 months	Q + 3 months	Q+5 months	Timing:	Q + 1 month) + 2 month	Q + 3 months	Q+5 months		
Period	Advance	Second	Third	QCEW	Period	Advance	Second	Third	QCEW		
		Gross domestic pro	duct		Gross domestic income						
2006Q1	13,020.9	13,037.4	13,042.3	n.a.	2006Q1	n.a.	13,004.1	13,019.3	13,070.3		
2006Q2	13,193.9	13,209.7	13,197.3	n.a.	2006Q2	n.a.	13,286.2	13,269.3	13,161.6		
2006Q3	13,308.3	13,327.1	13,322.6	n.a.	2006Q3	n.a.	13,331.6	13,327.9	13,299.1		
2006Q4	13,487.2	13,449.9	13,458.2	n.a.	2006Q4	n.a.	n.a.	13,465.4	13,501.2		
2007Q1	13,613.0	13,620.2	13,620.2	n.a.	2007Q1	n.a.	13,623.2	13,630.4	13,618.2		
2007Q2	13,755.9	13,774.7	13,768.8	n.a.	2007Q2	n.a.	13,856.3	13,857.6	13,809.5		
2007Q3	13,926.7	13,967.3	13,970.5	n.a.	2007Q3	n.a.	13,901.1	13,895.6	13,885.7		
2007Q4	14,080.8	14,084.1	14,074.2	n.a.	2007Q4	n.a.	n.a.	13,934.3	13,962.1		
2008Q1	14,185.2	14,195.6	14,201.1	n.a.	2008Q1	n.a.	14,062.6	14,071.2	14,107.3		
2008Q2	14,256.5	14,312.5	14,294.5	n.a.	2008Q2	n.a.	14,200.7	14,196.4	14,157.8		
2008Q3	14,429.5	14,420.5	14,412.8	n.a.	2008Q3	n.a.	14,260.0	14,250.0	14,262.6		
2008Q4	14,264.6	14,200.3	14,200.3	n.a.	2008Q4	n.a.	n.a.	14,007.3	13,998.1		



- One of the main improvements in the flow of source data has been the provision by BLS of QCEW data on a flow basis—now we obtain these data about two months after the reference quarter— and we reopen the third estimate. This replaced a procedure of the annual provision of these data which often times led to large revisions.
- The table shows that the receipt of the QCEW data affects the third estimates of GDI and that the revisions are both positive and negative.
- Because true value unknown cannot speak of accuracy and so go to the concept of reliability. The last is examined within the context of the revision patterns to the vintages of the GDP estimates.
- BEA publishes these studies regularly in the SCB about every 3 years



Mean Revisions to Successive Vintages of Estimates of Quarterly Changes in Current-Dollar GDP to Later Vintages of Estimates, 1983-2008 /1/

[Percentage points]

		Vintage of revision used as standard										
Vintage of estimate	Second	Third	1st annual	2nd annual	3rd annual	Latest						
Advance	0.19	0.19	0.19	0.25	0.29	0.39						
Second		0.00	0.01	0.06	0.11	0.21						
Third			0.00	0.05	0.09	0.21						
1st annual				-0.01	0.03	0.21						
2nd annual					0.05	0.22						
3rd annual						0.18						

1. 2007 for 1st annual, 2006 for 2nd annual, 2005 for 3rd annual.



Mean Revisions to Successive Vintages of Estimates of Quarterly Changes in GDI to Later Vintages of Estimates, 1983-2008 /1/ [Perentage Points]

	Vintage of Revision Used as Standard									
Vintage of estimate	Second	Third	1st Annual	2nd Annual	3rd Annual	Latest				
Advance										
Second/2/		0.00	-0.05	-0.12	0.00	0.07				
Third			-0.04	-0.10	0.02	0.10				
1st Annual				-0.06	0.02	0.14				
2nd Annual					0.09	0.23				
3rd Annual						0.15				

- 1. 2007 for 1st annual, 2006 for 2nd annual, 2005 for 3rd annual.
- 2. No fourth quarter observations after 1994.



- The two revision patterns are generally the same; the differences in mean revision magnitudes are small.
- Standard deviations tell a similar story.

Standard Deviations of Revisions to Successive Vintages of Estimates of Quarterly Changes in Current-Dollar GDP to Later Vintages of Estimates, 1983-2008 /1/

[Percentage points]

		Vintage of revision used as standard									
Vintage of estimate	Second	Third	1st annual	2nd annual	3rd annual	Latest					
Advance	0.66	0.78	1.31	1.39	1.46	1.45					
Second		0.33	1.10	1.20	1.33	1.38					
Third			1.05	1.18	1.32	1.41					
1st annual				0.79	1.04	1.33					
2nd annual					0.65	1.20					
3rd annual						1.08					

1. 2007 for 1st annual, 2006 for 2nd annual, 2005 for 3rd annual.



Standard Deviations of Revisions to Successive Vintages of Estimates of Quarterly Changes in GDI to Later Vintages of Estimates, 1983-2008 /1/

[Perentage Points]

		Vintage of Revision Used as Standard									
Vintage of estimate	Second	Third	1st Annual	2nd Annual	3rd Annual	Latest					
Advance	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.					
Second		n.a.	n.a.	n.a.	n.a.	n.a.					
Third			1.13	1.35	1.53	1.63					
1st Annual				1.06	1.39	2.01					
2nd Annual					0.96	1.53					
3rd Annual						1.28					

1. 2007 for 1st annual, 2006 for 2nd annual, 2005 for 3rd annual.



- In principle GDP and GDI should give the same measure of aggregate economic activity—they don't in practice
- Difference is defined as the statistical discrepancy—can view as the net sum of measurement error in their respective components
- The components of GDP and GDI are highly correlated over time
- The determinants of the discrepancy since 1984 are different from those in the period 1970-1983
- Improvements to NIPA estimates in the 1999 and 2003 comprehensive revisions may have eliminated some previous sources of measurement error
- Multicollinearity obscures which components are the prime contributors to the discrepancy.



- How do the revisions in GDP and GDI perform around turning points?
- Does taking an average help our understanding?
- First examine how growth rates of GDP and GDI correlate with some business cycle indicators



Correlation Between Growth rates of GDP, GDI and selected Bus. Cycle Indicators, 1983Q3 to 2009Q4	NOMINAL GDP	NOVINAL CEX	NOVERMILEVALOMAENI	PVI_SERAICES_PAYROLL	MG_BVR.OMBNI	OII-ER EVALOAVENI	PERSONM_INC_LT	IDK_INDUSTRIA_PROD	MFG_SALES_SA	RETAIL_SALES	NON_MFG_IDX	RCSSION
NOMINALGDP Correlation p-value	1.00											
NOMINALGDI	0.77 0.00 -	1.00										
NONFARM_EMPLOYMENT	0.73 0.00	0.77 0.00	1.00									
PVT_SERVICES_PAYROLL	0.69 0.00	0.73 0.00		1.00								
MFG_EMPLOYMENT	0.68 0.00	0.74 0.00		0.87 0.00 -	1.00							
OTHER_EMPLOYMENT Gds prod-manuf+gov	0.68	0.67 0.00		0.75 0.00	0.65 0.00	1.00						
PERSONAL_INC_Less TRANS	0.65 0.00	0.76 0.00		0.67 0.00	0.71 0.00	0.57 0.00	1.00					
IDX_INDUSTRIAL_PROD	0.50 0.00	0.60 0.00		0.71 0.00	0.82 0.00	0.57 0.00	0.56 0.00	1.00				
MFG_SALES	0.75 0.00	0.69 0.00		0.58 0.00	0.64 0.00	0.43 0.00	0.46 0.00	0.49	1.00			
RETAIL_SALES	0.65 0.00	0.58 0.00		0.55 0.00	0.47 0.00	0.45 0.00	0.41 0.00	0.40 0.00	0.67 0.00	1.00		
NON_MFG_IDX ISM Index	0.57 0.00	0.66		0.58 0.00	0.65 0.00	0.56 0.00	0.57 0.00	0.51 0.00	0.46 0.00	0.37 0.01	1.00	
RECESSION	-0.62 0.00	-0.66 0.00		-0.72 0.00	-0.70 0.00	-0.60 0.00	-0.60 0.00	-0.61 0.00	-0.44 0.00	-0.40 0.00	-0.55 0.00	1.00



- All the correlations are statistically significant
- First two columns show that the correlation with several indicators is mildly stronger with GDI
- Second, look at revisions around turning points
- Following table shows the mean absolute revisions around the last 6 recessions
- Computed in two ways: averages of the weighted levels and averages of the weighted growth rates
- Blue shading is row max and red shading is row min



 Using nominal levels and combining; revisions in both directions but not in the same direction for both GDP and GDI all of the time

Mean Absolute Revisions

[Percentage points]

	GDP\$	GDI\$.25P+.75I	.33P+.67I	.5P+.5I	.67P+.33I	.75P+.25I
Prior	3.24	1.79	1.51	1.46	1.48	1.54	1.57
Peak	2.68	2.06	1.41	1.20	0.77	0.64	0.66
After	1.21	1.21	0.73	0.57	0.41	0.59	0.74
Prior	2.86	1.99	2.15	2.71	2.32	2.44	2.55
Trough	2.89	3.72	3.35	3.26	3.07	2.88	2.79
After	2.43	1.11	1.28	1.34	1.52	1.70	1.83

Note: Peaks and troughs are quarters containing NBER peaks and troughs.

The peaks are 1969:III, 1973:IV, 1980:I, 1981:I, 1990:II, and 2001:I. The troughs are 1970:IV, 1975:I, 1980:III, 1982:III, 1991:I, and 2001:IV.



 A less computationally intensive approach—take the weighted averages of the growth rates

Averages of the Weighted Growth Rates

		<u> </u>		<u> </u>	-		
	GDP\$	GDI\$.25P+.75I	.33P+.67I	.5P+.5I	.67P+.33I	.75P+.25I
Prior	2.49	1.79	1.74	1.76	1.92	2.11	2.21
Peak	1.24	1.88	1.37	1.20	0.86	0.80	0.86
After	1.03	1.23	0.81	0.67	0.57	0.66	0.75
Prior	1.72	1.49	2.44	1.49	1.49	1.51	1.56
Trough	2.64	2.66	1.95	2.22	2.23	2.24	2.24
After	2.94	1.59	1.00	2.04	2.27	2.49	2.60



- Using Mean Absolute Revision as the standard, both tables show that there is something to taking the weighted average of GDP and GDI.
- Also suggests that GDI alone is a bit more informative around troughs
- Important to bear in mind that above tables were at the aggregate level
- How would the weighted average behave at the component level?
- Above tables show that it can make a difference whether one uses an average of the component levels or an average of the growth rates of the components
- Furthermore, the component movements could be inconsistent with the aggregate movement