



# Enhancing Public Understanding of Revisions to Preliminary Estimates

## The U.S. Post-Recession Perspective on Revisions

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# Why does BEA revise its estimates?

- Improve accuracy of the estimates by incorporating the most complete and reliable source data
  - Benchmarking indicators to annual surveys
  - Replacing trends or indirect indicators with comprehensive source data
- Provide a more detailed picture of the economy
- Make improvements to methods used for preparing the estimates

# Revisions are not errors

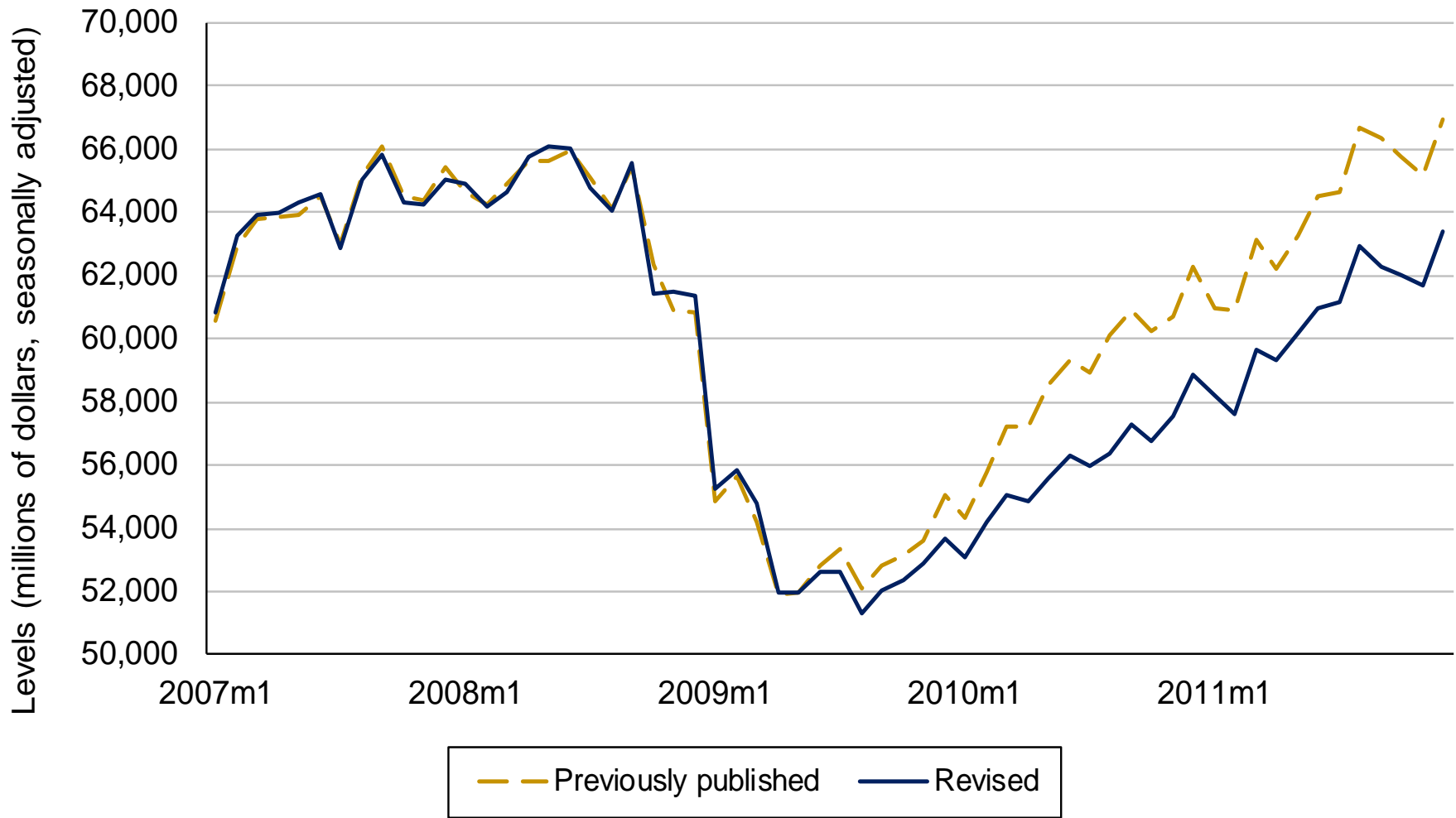
- Schedule is determined and is a commitment
- “Error correction” is a term that is reserved for true errors
- Main cause: availability of more complete and revised data

# Example:

## Benchmarking manufacturing

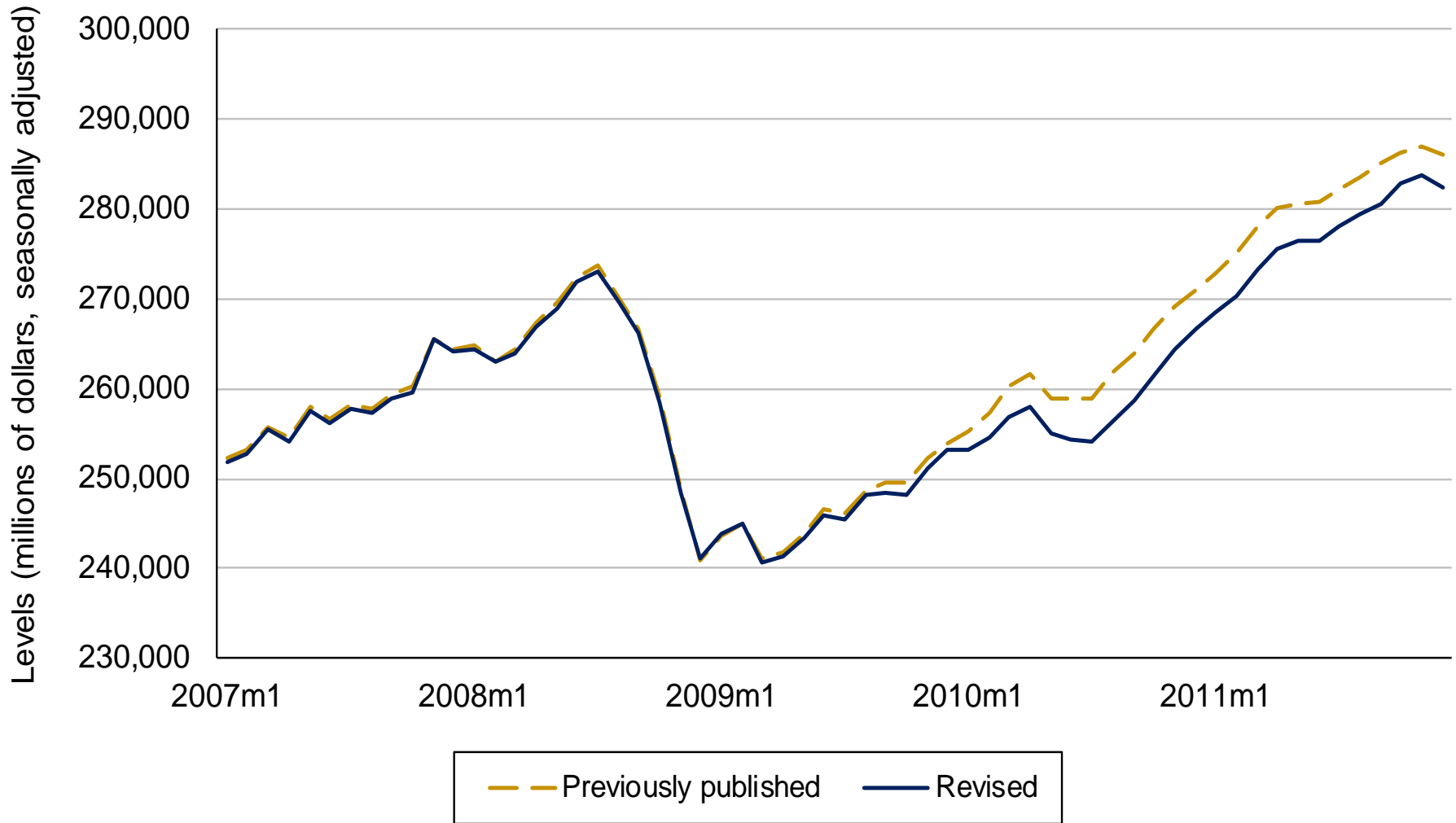
- Indicator: Monthly M<sub>3</sub> (“manufacturers’ shipments, inventories, and orders”)
  - Voluntary reporting
  - 4,300 reporting units with more than \$500 million in shipments (represents 60% of manufacturing)
  - 89 industry categories
  - No product detail
- Benchmark: Annual survey of manufactures
  - Mandatory reporting
  - 50,000 establishments (representing all 328,500 manufacturing establishments)
  - 471 industries
  - 1,384 product classes

# Shipments - Nondefense capital goods excluding aircraft



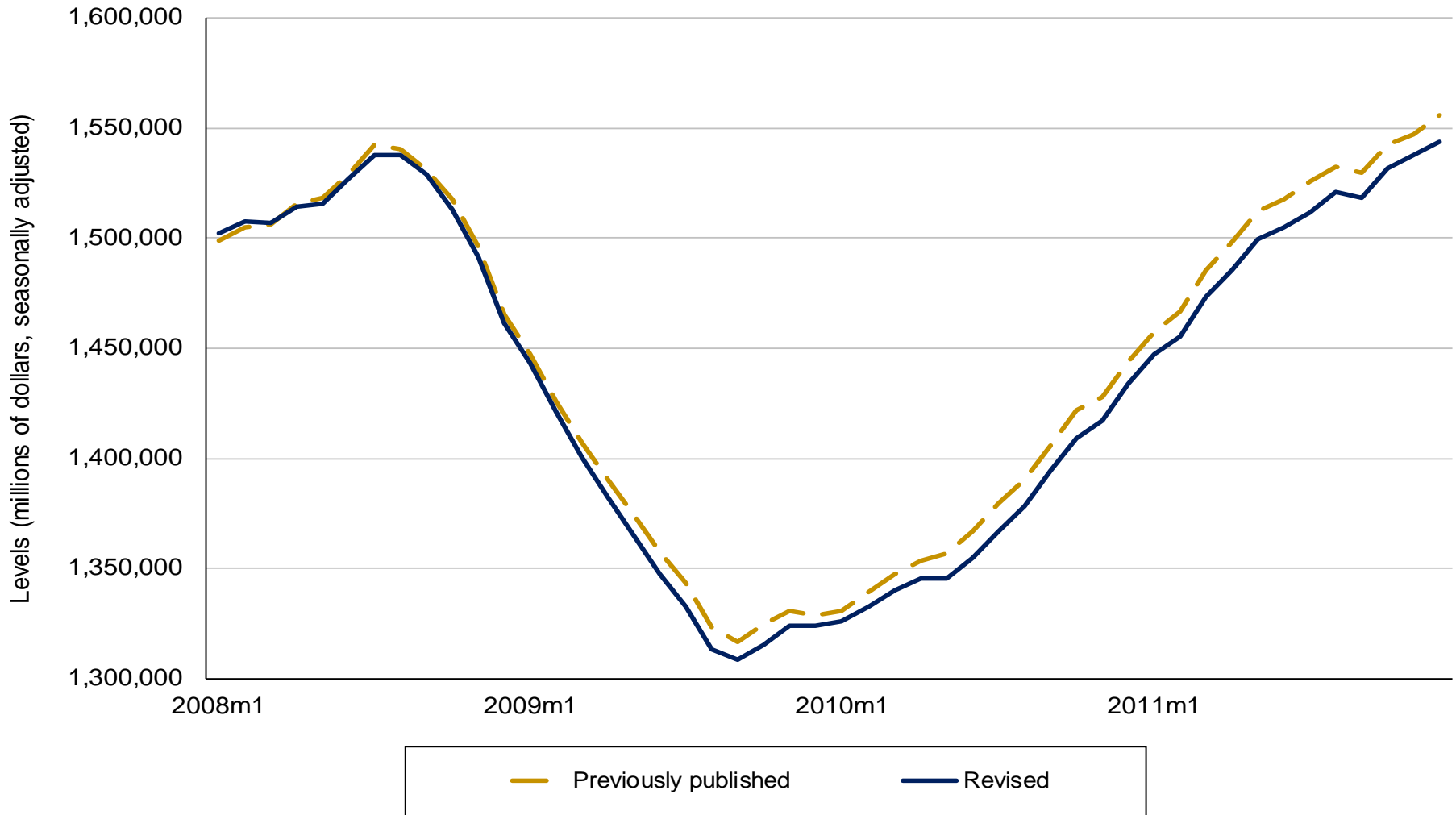
Source: Census Bureau, July 3, 2012

# Retail sales excluding motor vehicles



Source: Census Bureau, March 30, 2012

# Business inventories



Source: Census Bureau, July 20, 2012

# New source data vs. indirect indicators

- For some components of GDP and GDI, direct indicators aren't available
  - State & local government spending
    - Current data on employment and construction
    - Data on other types of spending available from Census Bureau with a 2-year lag
  - Corporate profits
    - Current data on public corporations
    - Comprehensive IRS data available (including private and S corporations) with a 2-year lag
  - IRS data on proprietors' and partnership income with a 2-year lag



# Revisions to the 2007–2009 recession

- Revisions were unusually large
  - Early estimates significantly understated the extent of the decline
  - Revisions exposed gaps in data used for early estimates
- Some revisions came quickly as actual data replaced assumptions and indicators were revised
  - 2008Q4 – revised from  $-3.8\%$  (Jan 30, 2009) to  $-6.2\%$  (Feb 27, 2009)
- Other revisions came later with annual revisions
  - In July 2011, 2008Q4 was revised to  $-8.9\%$
  - Total revision from advance to latest (5.1 percentage points) is the largest downward GDP revision on record

# Sources of revisions to 2008Q4 GDP [percentage points]

	Advance	Third Annual (Latest)	Revision
<b>Gross domestic product</b>	<b>-3.8</b>	<b>-8.9</b>	<b>-5.1</b>
Personal consumption	-2.47	-3.53	-1.06
Fixed investment	-3.12	-4.05	-0.93
Change in private inventories	1.32	-1.54	-2.86
Exports	-2.84	-2.97	-0.13
Imports	2.93	2.84	-0.09
Government expenditures	0.38	0.35	-0.03

- Revisions to inventory investment came in 2<sup>nd</sup> estimate (Feb 2009) and in 1<sup>st</sup> & 2<sup>nd</sup> annual revisions (July 2009, 2010)
- Revisions to personal consumption came in 2<sup>nd</sup> estimate (Feb 2009) and in 3<sup>rd</sup> annual revision (July 2011)
- Revisions to fixed investment in 2<sup>nd</sup> annual revision

# Revisions to GDP contraction, 2007Q4–2009Q2

Release date	Cumulative percent change [ <i>not</i> at annual rate]	Cumulative revision
July 2009	-3.7	...
July 2010	-4.1	-0.4
July 2011	-5.1	-1.4
July 2012	-4.7	-1.0

- From first estimate for full contraction period to latest estimate, cumulative contraction in real GDP revised from -3.7 percent to -4.7 percent
- Revisions in July 2011 mostly reflected newly available annual surveys for 2009

# Misperceptions about revisions

- BEA's practice of annualizing percent changes exaggerates perceived revisions

## GDP revisions

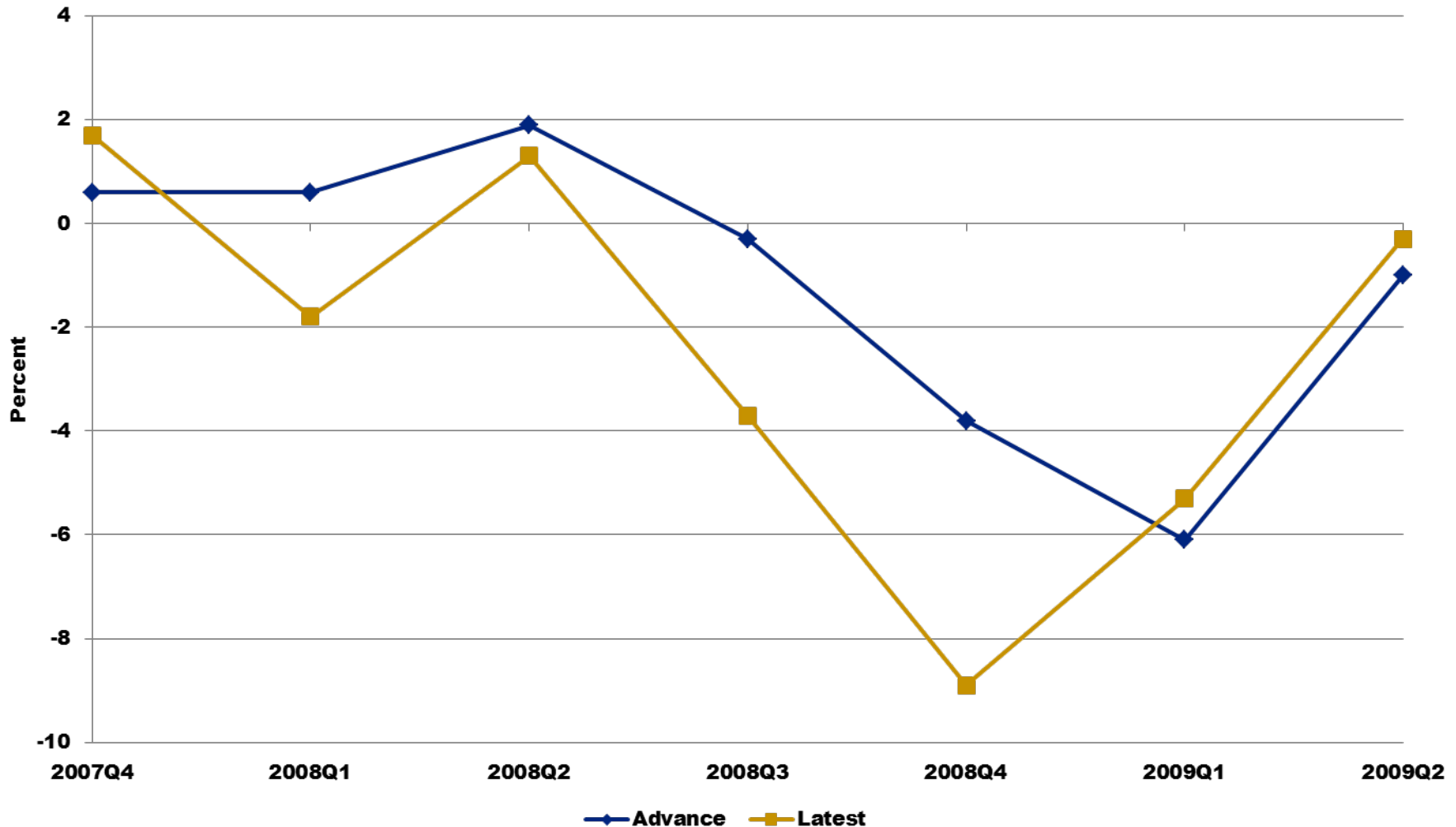
Quarter	Percent change Annual rate			Percent change Quarterly rate		
	Advance	Latest	Revision	Advance	Latest	Revision
2008Q1	0.6	-1.8	-2.4	0.1	-0.4	0.5
2008Q2	1.9	1.3	-0.6	0.5	0.3	-0.2
2008Q3	-0.3	-3.7	-3.4	-0.1	-0.9	-0.8
2008Q4	-3.8	-8.9	-5.1	-1.0	-2.3	-1.3
2009Q1	-6.1	-5.3	+0.8	-1.6	-1.3	+0.3
2009Q2	-1.0	-0.3	+0.7	-0.3	-0.1	+0.2

# Misperceptions about revisions

- Although the sequence of “advance” GDP estimates looks like a time series, it does not represent a series that BEA ever actually published
  - For example, by the time BEA published the advance GDP for 2009Q1, the estimate for 2008Q4 had already been revised from -3.8 percent to -6.3 percent
- Example from *New York Times* blog

# Advance versus latest estimates

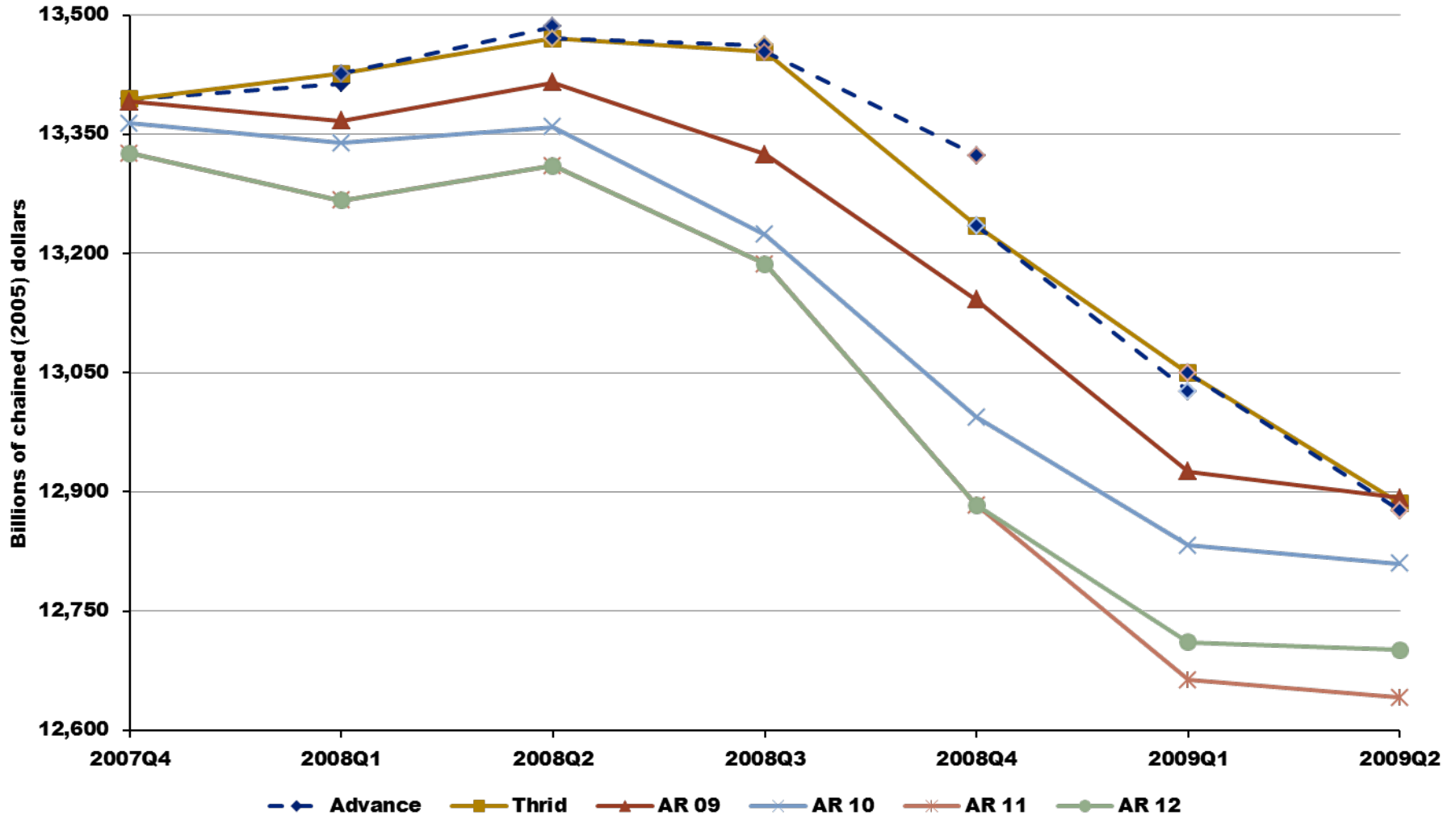
## Percent Change From Preceding Period in Real GDP



# Revisions to published time series

## Real GDP, 2007Q4-2009Q2

**Real GDP, 2007Q4-2009Q2**



# Interaction between revisions and policy

- Analysis to answer the question: If we knew then what we know now, how would policy have been different?
- The importance of timing; revision release dates and formulation of policy
- Timing of advance 2008Q4 GDP estimate doesn't coincide with ARRA legislation
  - ARRA formulated in December 2008
  - Passed House on January 28 (2 days before GDP)
- Estimates for 2008Q3 may have had an effect



# Basic revision patterns: Frequency patterns for revisions

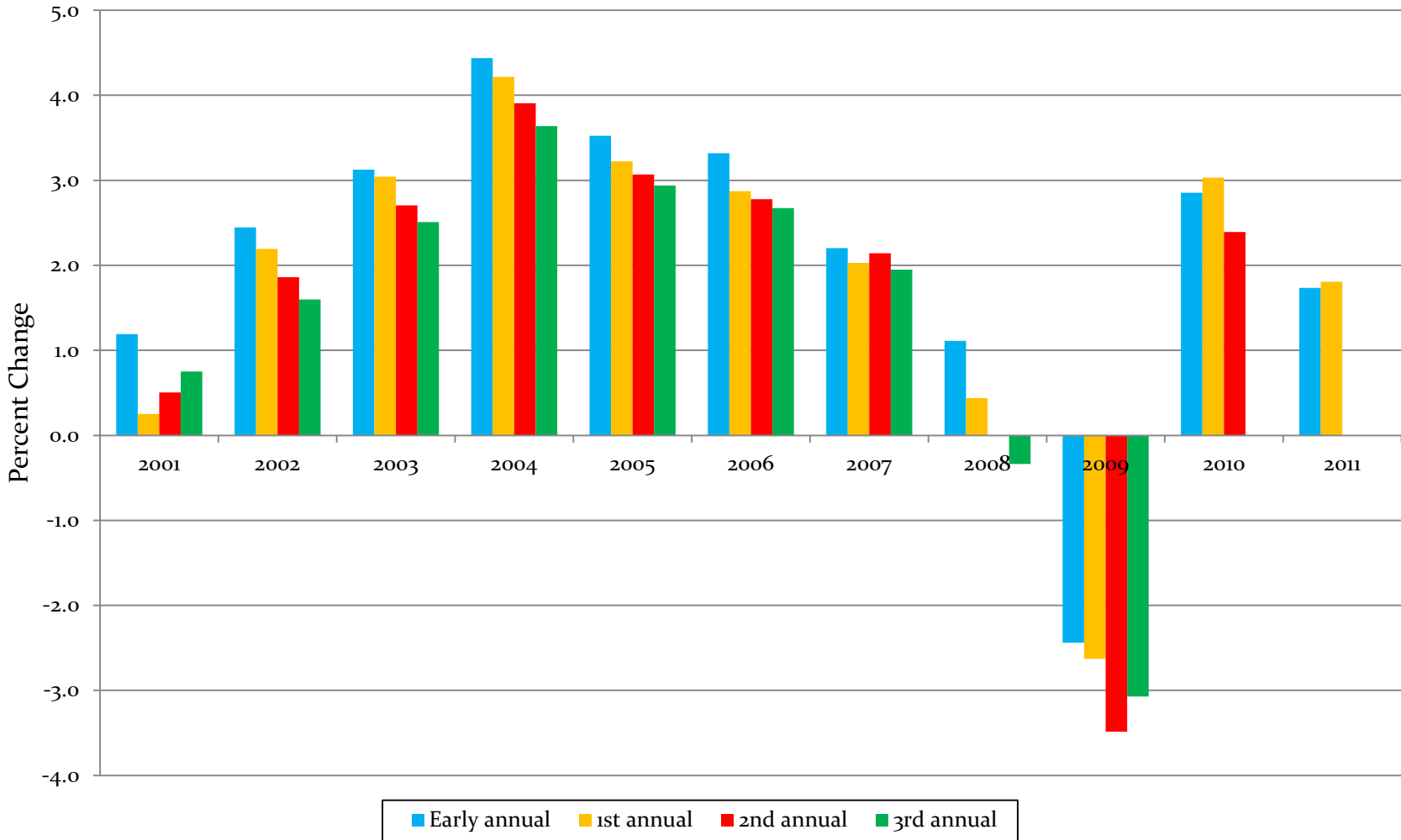
- The three current quarterly vintages of estimates of GDP successfully indicated the following:
  - The direction of change in GDP 97 percent of the time
  - The acceleration or deceleration of growth 72 percent of the time
  - The relative magnitude of growth—whether it was above, near, or below trend more than 80 percent of the time (near is within one standard deviation of the mean growth)
  - The cyclical peaks before 5 of the 6 recessions between 1969 and 2006
  - The cyclical troughs of 4 of the 6 recessions
  - Revisions in both current-dollar and real GDP and their major components are roughly similar to each other over the 1983-2009 time period

# Average revisions to current quarterly estimates of GDP, 1983-2008 [percentage points]

	Mean Revision		Mean Absolute Revision	
	Current-dollar	Real	Current-dollar	Real
<b>Advance</b>	0.31	0.21	1.16	1.31
<b>Second</b>	0.13	0.10	1.06	1.29
<b>Third</b>	0.14	0.12	1.06	1.32

# Systematic Trends?

Vintage Estimates of Real GDP



# Looking at the income side

- Conceptually equivalent measure of aggregate economic activity
- Differences arise from different data sources
- Source data flow not equivalent
  - There is no advance estimate of GDI
  - Second estimates exist for 3 out of 4 quarters for this vintage

# Average Revisions to Current Quarterly Estimates of GDI, 1983-2009 [percentage points]

	Mean Revision	Mean Absolute Revision
<b>Second/1/</b>	-0.01	1.28
<b>Third</b>	0.02	1.24
<b>Fourth/2/</b>	-0.16	1.43

/1/ Beginning with 1995, there are no second estimates for the fourth quarters of years.

/2/ These estimates have been published only from 2002:Q1.

# Revisions to Real GDP and Real GDI in 2008:IV

[percentage points]

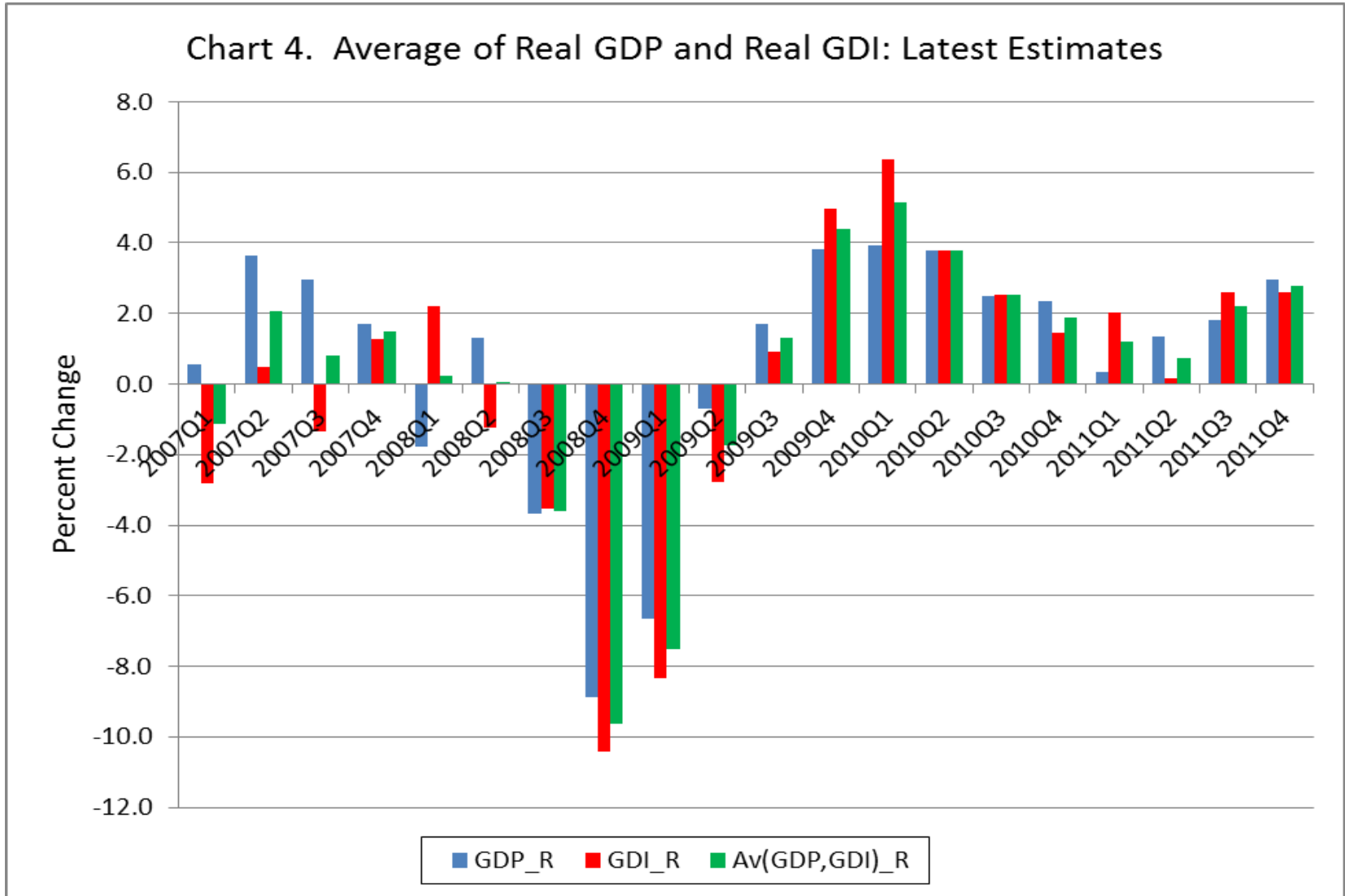
Vintage	Change from Previous Quarter		Revision From Advance Estimate	
	Real GDP	Real GDI	Real GDP	Real GDI
<b>Advance/1/</b>	-3.8	(-4.3)	- - - - -	- - - - -
<b>Second/1/</b>	-6.2	(-6.5)	-2.4	-2.2
<b>Third</b>	-6.3	-7.5	-2.5	-3.2
<b>First annual</b>	-5.4	-7.3	-1.6	-3.0
<b>Second annual</b>	-6.8	-6.9	-3.0	-2.6
<b>Third annual (latest)</b>	-8.9	-9.8	-5.1	-5.5

/1/ Advance and second GDI estimated from GDP by holding the 2008:III statistical discrepancy constant into 2008:IV.

# Recent discussion about which is “better”

- Both GDP and GDI provide information about economic activity
- A simple average of the two was used in BEA articles in the SCB

# Average of real GDP and real GDI





# Average of real GDP and real GDI

