



U.S. Department of Commerce  
Bureau of Economic Analysis



# **Integrating and Accelerating BEA's Industry Accounts**

**Presentation for the CRIW  
Pre-Conference on Architecture  
for the National Accounts**

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# Outline

- BEA's vision for integrating the accounts
- Methodologies for integration
- Steps for integration
- Products

# BEA Accounts

## Three approaches to estimate GDP

### 1. Expenditures approach:

$$\text{GDP} = C + I + G + (X - M)$$

### 2. Income approach:

$$\begin{aligned} \text{GDP} = & \text{Compensation of employees} \\ & + \text{property-type income} \\ & + \text{indirect business taxes} \end{aligned}$$

### 3. Production approach:

$$\text{GDP} = \text{Gross output} - \text{intermediate inputs}$$

# BEA's Vision for Integrating the Accounts

- Long-term: Full Integration (2008-2010)
  - Integration of all industry accounts and integration of industry accounts with the national income and product accounts (NIPA's)
  - Provide a third approach to measure GDP
- Short-term: Partial Integration (2004-2007)
  - Integration of the Annual I-O and GDP-by-industry accounts

# Value Added Estimates Depend on Quality of Data

## I-O accounts

- Value added =  
Gross output -  
intermediate inputs
- Quality of gross output is high, but overall quality of intermediate inputs is not.

## GDP-by-industry accounts

- Value added =  
Compensation of  
employees + property type  
income + IBT
- Quality depends on source data; property type income is most troublesome

# Partial Integration: Four Steps to Integrate Industry Accounts

- Develop 1997 “Prime” benchmark table
- Develop time series of gross output and value added by industry
- Apply I-O framework to develop time series of annual I-O accounts
- Develop real (inflation adjusted) measures

# Step 1: Develop 1997 “Prime” Benchmark I-O Table

- Incorporate results of 2003 NIPA revisions
- Options for setting best levels of value added
  - Use results “as is” from the 1997 Benchmark I-O accounts
  - Use results “as is” from the GDP-by-industry accounts
  - Straight average of results from the 1997 Benchmark I-O and GDP-by-industry accounts
  - Incorporate the best estimates from both sets of accounts

# Merging Information for Setting Value-Added Levels

## Benchmark Value Added

**GDP-by-Industry Value Added**

Poor Benchmark data / good GDP-by-industry data e.g., Transportation/Warehousing	Good Benchmark data / good GDP-by-industry data e.g., Health care
Poor Benchmark data / poor GDP-by-industry data e.g., Construction	Good Benchmark data / poor GDP-by-industry data e.g., Mining

# Evaluation Criteria: (1)

## Benchmark I-O Accounts

- Percent intermediate inputs by industry covered by Census Bureau
- Share of an industry's data provided by Census Bureau
- Share of industry estimates added to balance the I-O table

# Evaluation Criteria: (2)

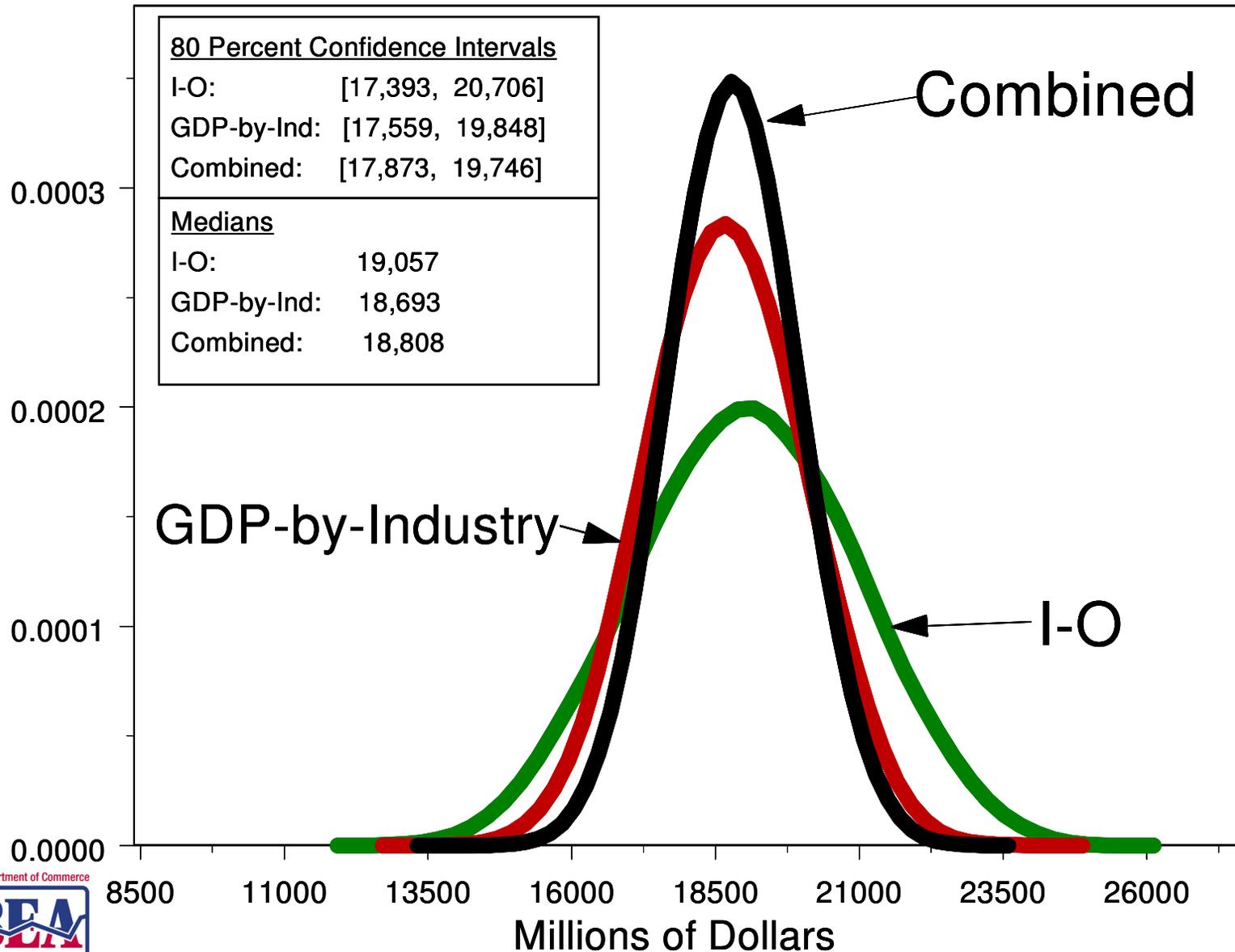
## GDP by Industry Accounts

- Quality of establishment-based components of GDI
  - Company-establishment adjustments
- Stability of implied I-O ratio
- Consistency between IRS-based and Census-based source data

# Merging Information from I-O & GDP by Industry Accounts

- Based on our criteria:
  - Develop expected ranges of the I-O and GDP by industry measures of value added for each industry
  - Combine the two distributions to get the “best” estimate of value added

# Paper Manufacturing: Probability Distribution of Other Value Added from Combined Information



# Step 2: Time Series of Gross Output and Value Added by Industry

- Benchmark gross output and value added to 1997 Prime benchmark I-O table
- Extrapolate gross output by industry using data from Census Bureau
- Develop time series value added by industry from 1997 prime level, using either gross output extrapolators or GDI extrapolators

## **Step 3: Develop Time-series of Balanced Annual I-O Accounts**

- Prepare annual I-O tables, given initial estimates of gross output, value added, and final demand
- Balance annual tables to establish consistency between gross output and value added by industry, GDP by industry, and I-O relationships

# Input-Output Use Table

		INDUSTRIES										FINAL USES (GDP)							TOTAL COMMODIT OUTPUT
		Agricultur	Mining	Construct on	Manufact ing	Transport: tion	Trade	Financc	Service	Other	Total Intermediat Use	PCE	PFI	CBI	X	M	GOV'	GDP	
C O M M O D I T I E S	Agriculture																		
	Minerals																		
	Construction																		
	Manufacturing																		
	Transportation																		
	Trade																		
	Finance																		
	Services																		
	Other																		
	Noncomparabl imports																		
	Total Intermediate inputs																		
V A L U E A D D E D	COMP																		
	IBT																		
	Other value added																		
	Total																		
TOTAL INDUSTRY OUTPUT																			

# Step 4: Develop Real Measures

- Apply double deflation procedure to time series of balanced annual I-O tables
- Real GDP growth based on expenditures approach consistent with real GDP growth based on double deflation procedure

# Products

- **Spring 2004:**
  - Integrated annual I-O and GDP-by-industry accounts
  - Accelerated annual I-O accounts
- **2007:**
  - 2002 benchmark I-O accounts
- **2008:**
  - Move to full integration from 2002 benchmark I-O accounts