

Computing Supply Table



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- Introduction to the Supply Table
 - Anatomy of supply table; Valuation concepts
- US Process
 - Time Series
 - Benchmark Methods and Challenges
 - Annual Methods and Challenges
- Interpolation and Extrapolation
- Applications
- Conclusions and Future Directions

- Business Register
 - Comprehensive
 - Ensures no double counting
 - Provides sampling frame for Census and surveys.
 - US case: establishment-based.

- Process is guided by the availability of data
 - Benchmark (every five years)
 - Annual
 - Quarterly

Benchmark Sources

Core Data source: Economic Census

- Measures almost the whole universe of establishments with 5 or more employees

Supplemented with data from:

- Business Expense Survey (BES)
- Economic Research Service (ERS)
- Bureau of Transportation Statistics (BTS)
- Census of governments.

Non-employer establishments data supplemented with administrative data.

Annual Sources

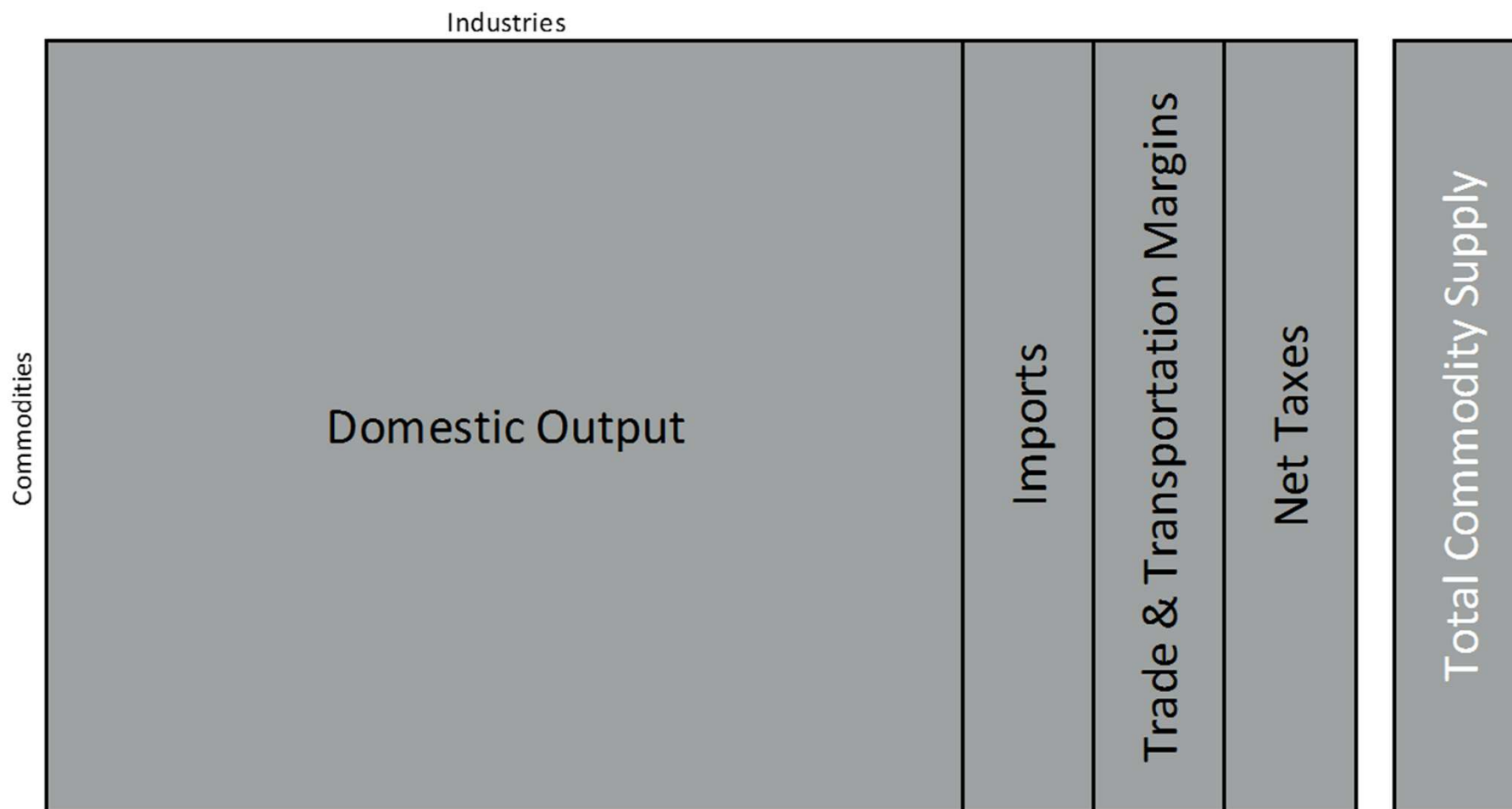
Other Census Bureau programs:

- Annual Surveys; examples:
 - Annual Retail Trade Survey (ARTS)
 - Annual Wholesale Trade Survey (AWTS)
 - Service Annual Survey (SAS)
 - Annual Survey of Manufactures (ASM)
 - Annual Survey of Government Finances (ASGF)
- Value of Construction Put-in-Place (VPIP)
- Business R&D and Innovation Survey (BRDIS)
- Special Tabulations

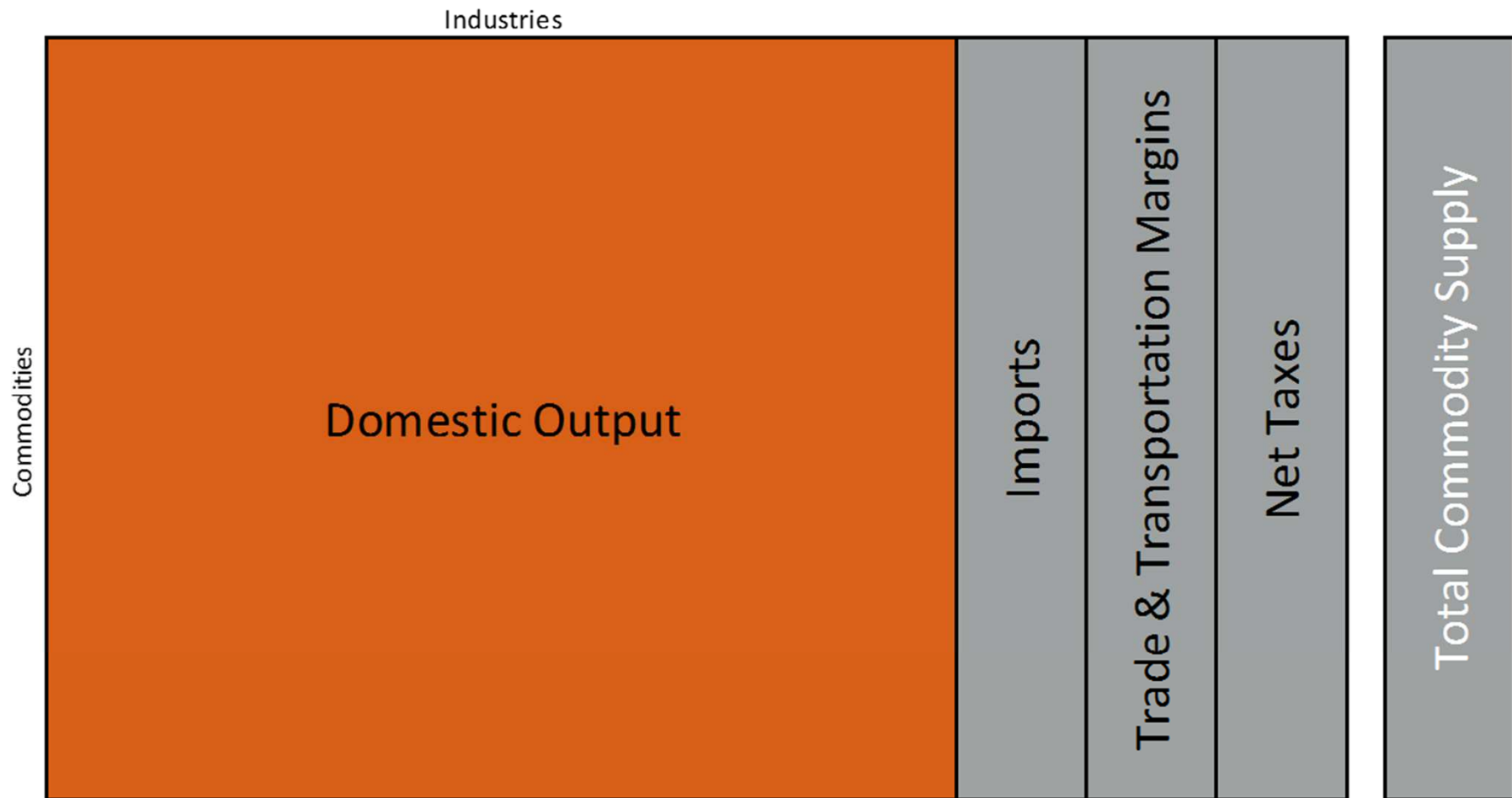
Non Census Bureau programs:

- ERS, BTS

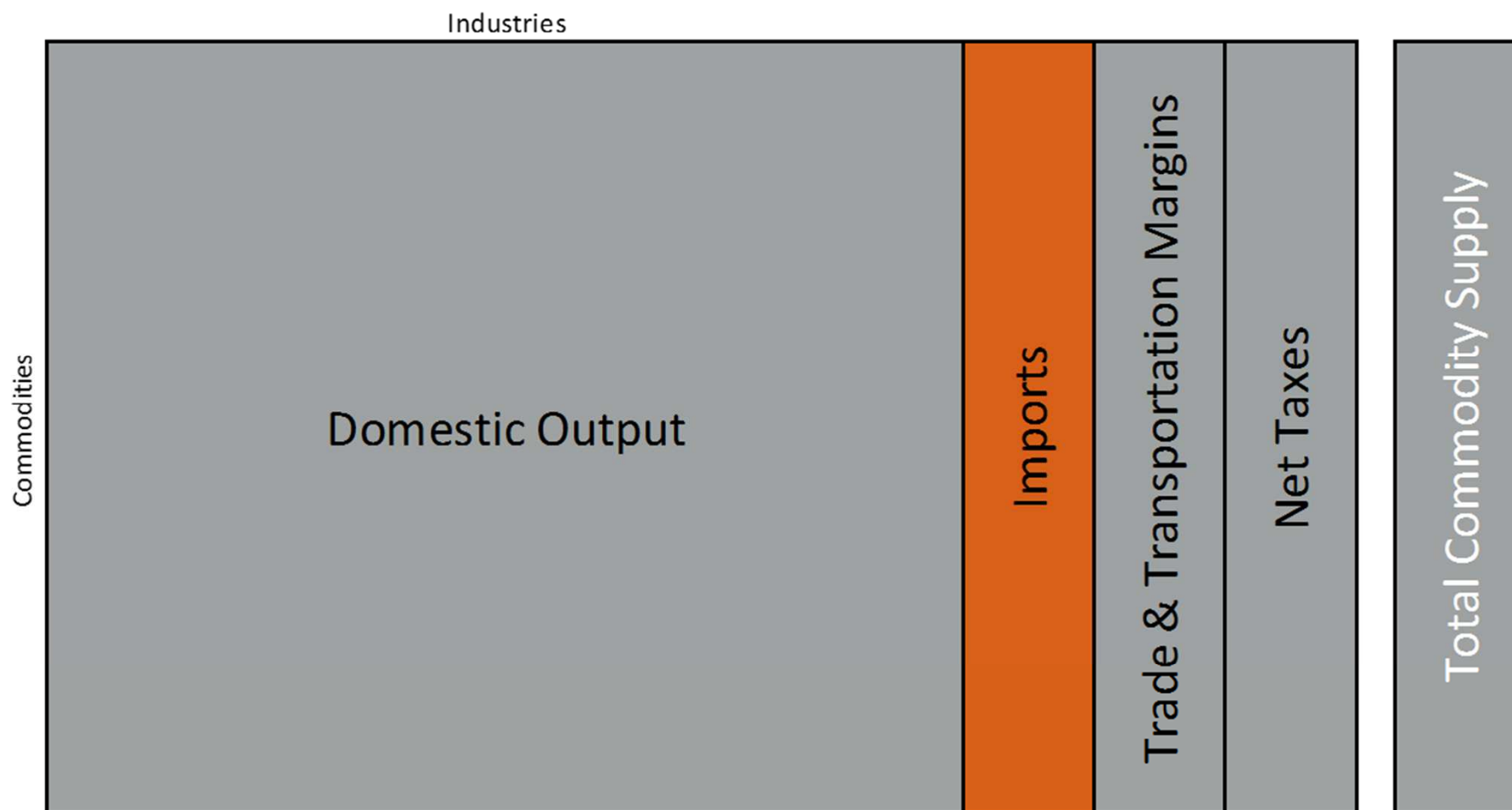
Introduction to the Supply Table



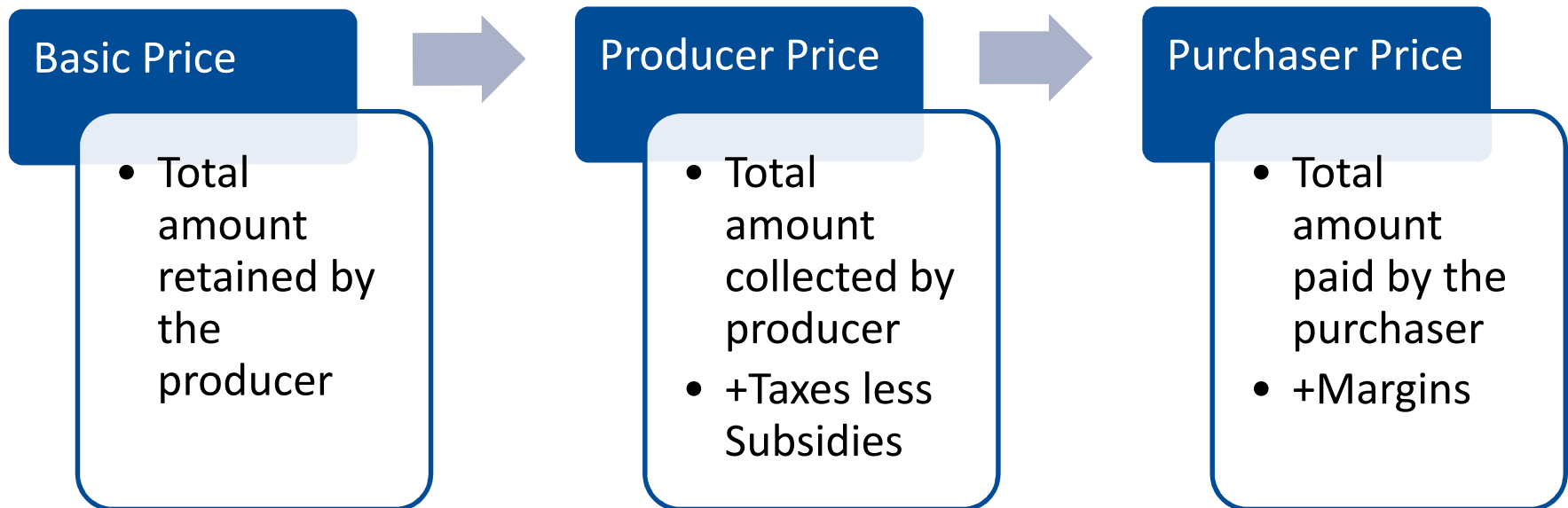
Introduction to the Supply Table



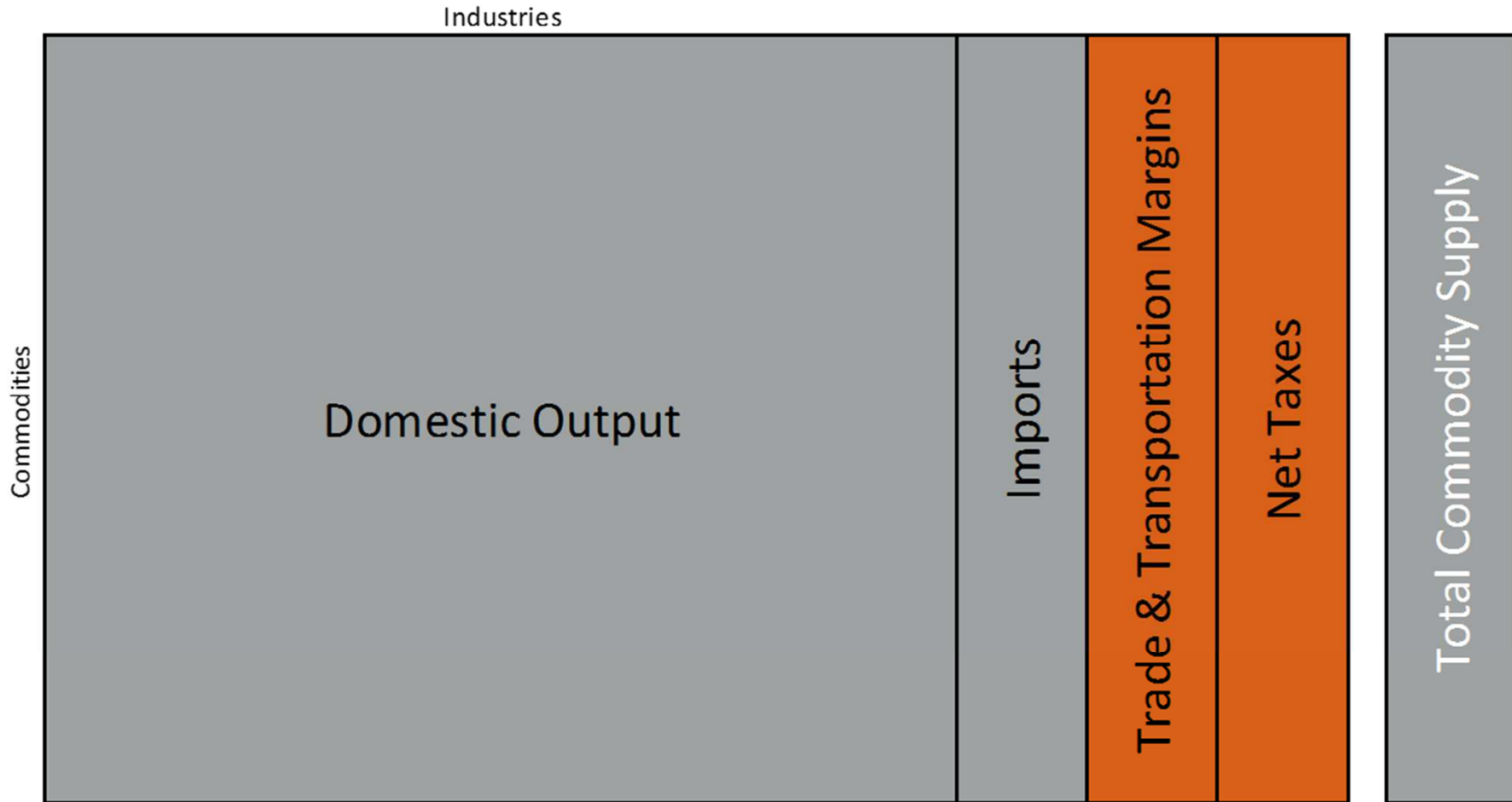
Introduction to the Supply Table



Valuation Concepts



Introduction to the Supply Table



US Methodology – Computing Supply Tables

Make

- Excludes imports, net taxes, margin columns
- Valued either in basic or producer prices

Use

- Relies on make table accounting identities
- Valued either in basic, producer or purchaser prices

Supply

- Missing Link: Margins

Why Time Series SUTs?

- To provide up-to-date information on the changing structure of the economy
 - Key for policy making purposes; e.g., impact analysis, understanding global value chains and globalization
- Framework for producing inflation-adjusted value added statistics, which leads to other extensions
 - E.g., GDP by state statistics, integrated productivity statistics
- BEA's time series consists of a series of Benchmark tables and Annual tables.

Benchmark Tables

- About Every 5 years
 - Most recent is 2007 Benchmark
- Based mostly on economic census data
 - But supplemented with administrative and other data
- Detailed industry and commodity level (389 industries) for publication
- “Working Level” for Benchmark about 900 industries and 5,000 products
- Fully Integrated with Annual time series

Establishment Data

Why “establishment” data?

- Better aligns production and inputs.
- Minimizes changes due to business classification changes.
- Harder data collection problem.
 - Sole proprietorships are straight forward
 - Types of corporate organization presents certain challenges

Domestic Output is calculated in one of two ways for the benchmark:

- Levels are provided from the source data that shows the value of commodities produced by industry
- Within manufacturing: distribution of Industry shipments are bi-proportionally balanced to total industry shipments and product shipments

Imports Methodology

- Imports source data are provided at domestic port value with includes Foreign port value, insurance, freight and import duties
- In the supply table import duties need to be removed from the imports column and included in Net Taxes
- Source data collected at 10 digit level (HS-6 plus extensions)

US Process – Benchmark Imports

[hts code example]

0901.21.0010

What these numbers mean

09

Chapter

Coffee, Tea, Mate And Spices

0901

Heading

*Coffee, Whether Or Not Roasted Or
Decaffeinated; Coffee Husks And Skins;
Coffee Substitutes Containing Coffee*

0901.21

Sub Heading

(HS code)

Coffee, Roasted, Not Decaffeinated

0901.21.00

Subheading

(Determines Duty)

No Distinction

0901.21.0010

Statistical Suffix

(Further Definition and Makeup)

*Coffee, Roasted,
Not Decaffeinated,
Certified Organic*

- Trade Margins

- Trade margin output data is collected by kind of business.
 - $\text{Margin output} = \text{Sales} - \text{Cost of Goods Sold} - \text{Inventory Change} - \text{Taxes}$
 - $\text{Margin rate} = \text{margin output} / \text{sales}$
- This margin output needs to be distributed to products
 - In addition to overall sales, data on sales by product is also collected .
 - 1st Pass: Assume a margin rate for each product based on most appropriate kind of business (MAKB) concept
- 1st Pass establishes rough proportions and levels; discrepancies between margin totals and estimated product margins are then balanced.

Example:

- As a first pass, we will impute a margin rate for shoes in department stores based on the margin rate for shoe stores (the MAKB)
- We will repeat this process for every product line sale, assignment a MAKB margin rate
- This leaves a set of product margins inconsistent with the overall margin for each kind of business
- These margin inconsistencies are balanced away, so that A) margin rates are equalized by product line and B) margin totals for each kind of business are correct

- Transportation Margins Sources

- The primary source data for Air and Water Transportation is the Commodity Flow Survey produced by Census and available on a benchmark basis
 - Gives “Ton-Miles” of 40 commodities
 - much less detail than our items so we create buckets
 - Assumption that cost of transportation based on distance and weight of item being moved as no revenue estimates are available by commodity
- The primary source data for Truck Transportation is the Services Annual Survey also produced by Census
 - Gives a revenue estimate, but only breaks out into 10 commodities
- Rail Transportation is based on Annual Data provided by the Association of American Railroads and is a revenue estimate broken-out to 300 distinct commodities
- Pipe Transportation only consists of two items: Petroleum and Natural Gas and both have simple margin rates on one.

- **Transportation Margins Estimation**

- Take initial estimate and apply handling multiplier to compensate for variances in cost based on difficulty or value of the item being moved
- These levels are then attributed to groups of commodities. For some types of transportation (rail), these are rather detailed groups of commodities. For other types of transportation (truck), these are less detailed groups of commodities.
- For very aggregate groupings of commodities, the detail commodity composition that is published can depend on the balancing of the use table.

- Net Taxes

- The Taxes section of the Supply table includes taxes on products, inclusive of excise and sales taxes. Also included are import duties and subsidies distributed by-product
- The addition of taxes and duties and removal of subsidies completes the transformation from basic to purchaser prices
- The primary source data providers for sales taxes are the Census Bureau State Government Tax Collection Survey and Local Government Finance Survey
 - Sales Tax rates are estimated on a benchmark basis by using total sales relative to tax revenues collected by establishment as reported by the economic census and census of governments and held constant in non-benchmark periods
- Excise taxes are estimated using Treasury data from the office of Tax Analysis, Alcohol and Tobacco Tax and Trade Bureau, and the Statistics of Income

Annual Accounts

- Published with a ten month lag from reference
 - Most recent year available is 2014
 - 2015 will be available in early November 2016
- Based mostly on Census economic survey data
 - But widely supplemented with administrative and other data
- Newly Expanded Industry and commodity level (71 industries to about 120) for publication
- “Working Level” same as for Benchmark ~ 900 industries and 5,000 products
- Fully integrated with Benchmark and NIPAs

Integrated Benchmark and Annual Accounts

- 2014 comprehensive revision marked the first time that the Industry Economic Accounts and National Income and Product Accounts were fully consistent with one another across time.
 - Benchmark Accounts establish both levels and commodity composition of GDP final use categories
 - Now include a time series dimension that previously did not exist
 - Revisions overtime to Benchmark tables
 - Expanded final uses for fixed investment in intellectual property products (i.e., R&D and entertainment originals)

Annually, Domestic Output is calculated in one of three ways :

- Best level data are loaded and used directly
- A distribution of Industry shipments are bi-proportionally balanced to total industry shipments and product shipments
- Levels serve as indicators to interpolate between benchmarks and extrapolate after
 - Extrapolation is typically best percent change

- On an Annual Basis,
 - Imports...
 - Margin rates are held constant relative to the benchmark and therefore margin “pots” and initial margin levels are best changed where new annual data is not available and reset when it is.
 - Sales Tax rates are held fixed in a non-benchmark year and levels are estimated as the tax rate proportion of the commodity output it is being applied to.
 - Excise tax levels are available on an annual basis and are applied to appropriate items, consistent across the timeseries, and ensuring that the aggregated estimates hit top line controls published by the NIPAs.

Interpolation and Extrapolation

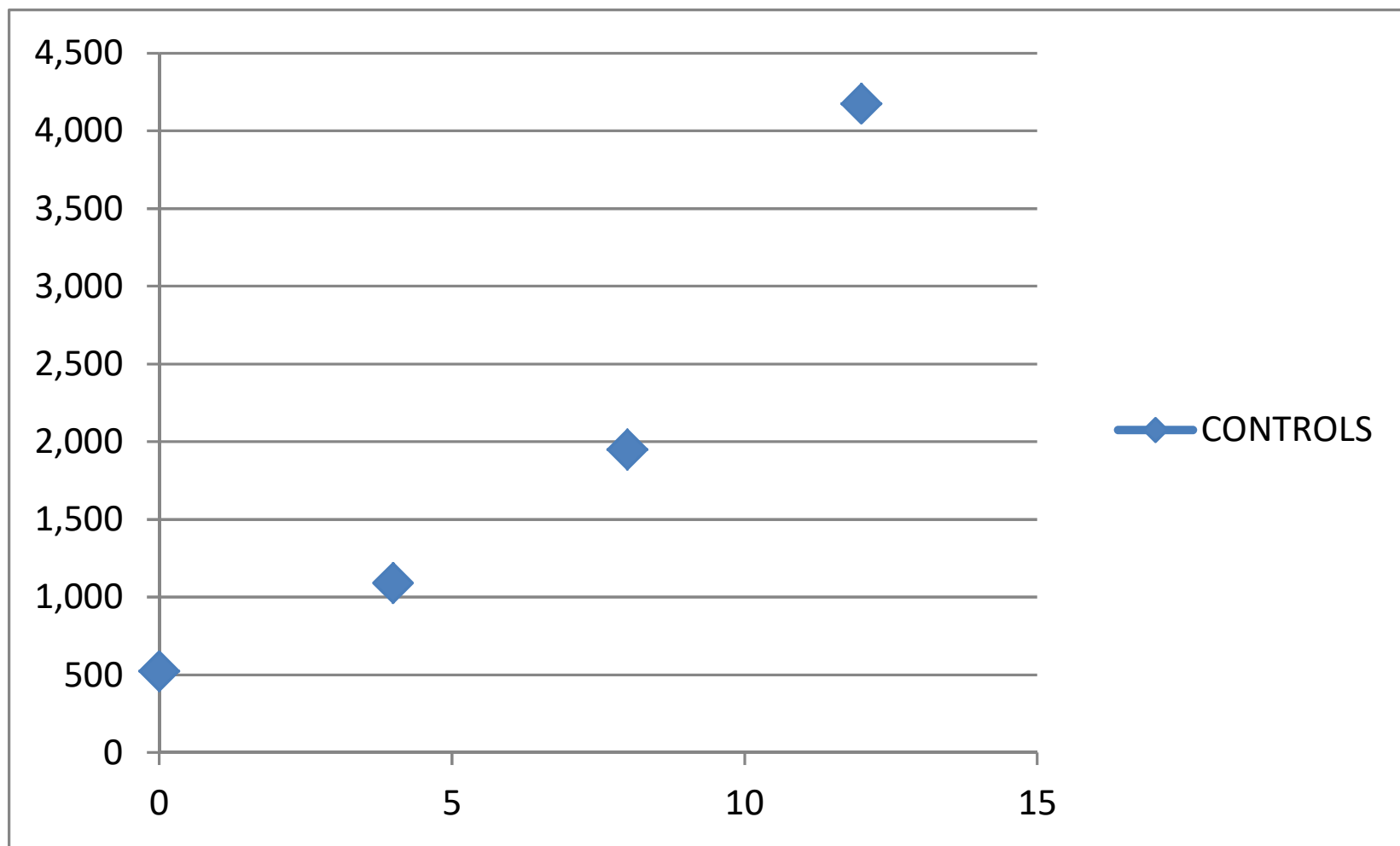


- Annual SUTs are interpolated between benchmarks and extrapolated after benchmarks
- Why interpolate?
 - Brings into account benchmark structures from more than one period
 - Time series more useful for the User community interested in understanding structural changes over time

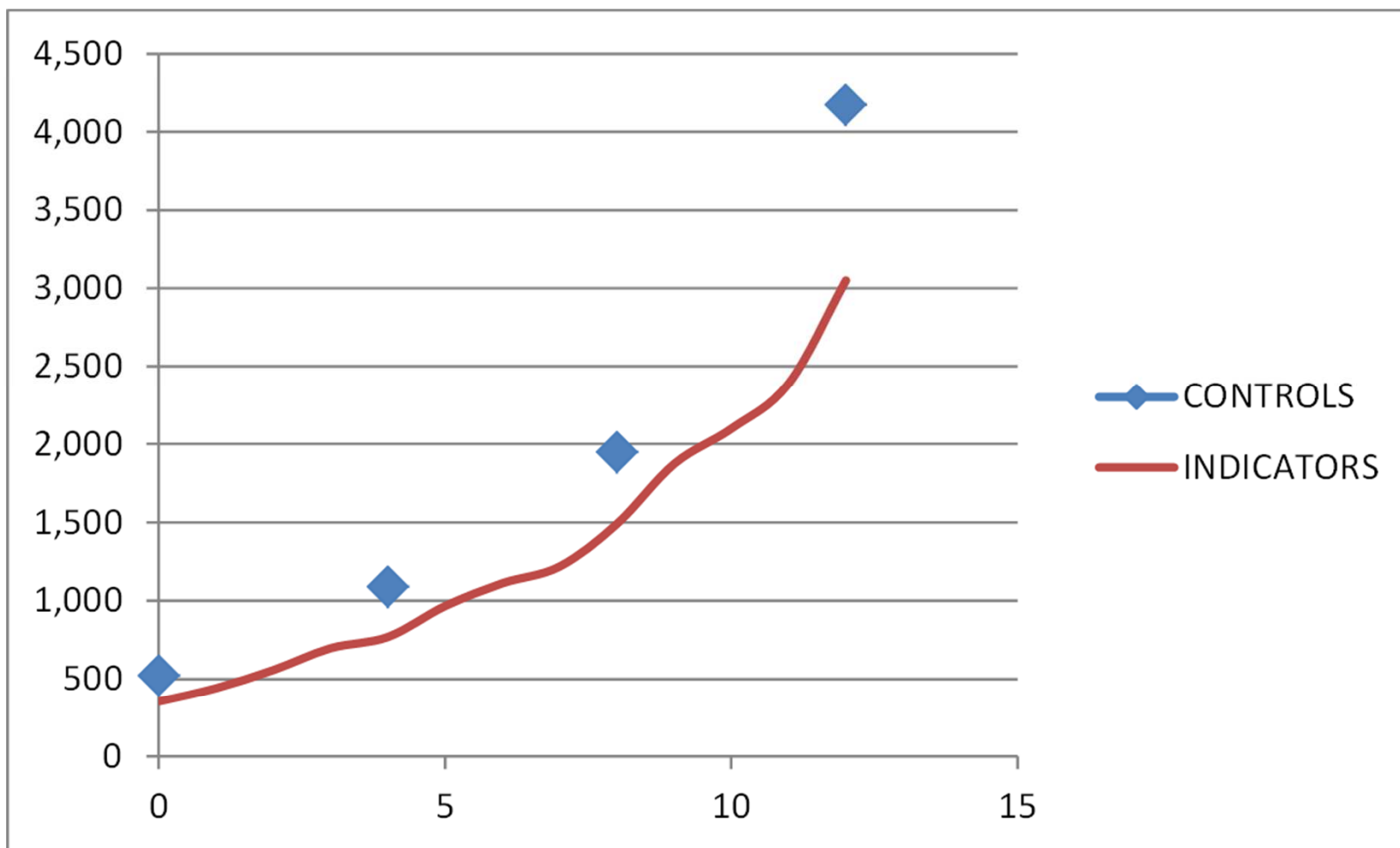
Interpolation Methodology

- Denton proportional first difference method
 - Purpose is to preserve the proportional period-to-period change in the final higher frequency annual estimates, subject to the benchmark constraint
- Series that are interpolated
 - Gross output by product
 - Intermediate inputs by broad category of energy, materials, and services
 - Commodity composition of final demand
 - Gross operating surplus by industry

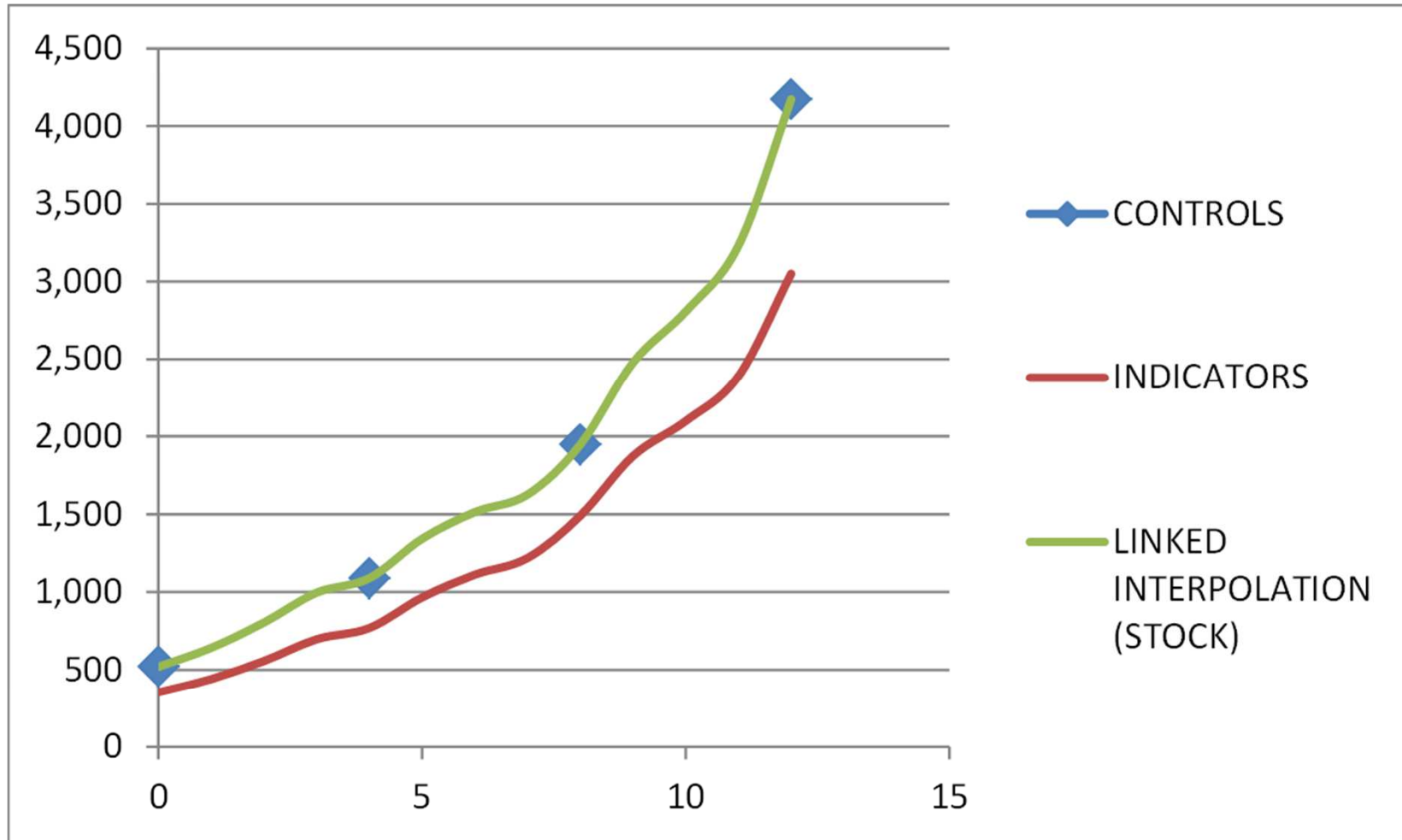
Interpolation and Extrapolation



Interpolation and Extrapolation



Interpolation and Extrapolation



- Strong interest in User community for up-to-date SUTs for impact analysis, projections
- Annual Accounts provide infrastructure to a number of extensions:
 - Inflation-adjusted GDP by industry
 - GDP by state and metropolitan area
 - Integrated statistics on sources of growth
 - Extended SUTs and global value chain analysis

- Time series important for understanding changing structure in the economy and for developing extensions
 - Most important extension at BEA for GDP by industry statistics
- What to Anticipate in November and in Future estimates
 - SUTS replace Make-Use as featured IO Product
 - ISIC and CPC based tables for international comparisons and global value chain analysis
 - Expanded annual publication level for value added and related statistics from 71 industries to about 120
 - Annual gross output currently exists for 402 industries

Conclusion and Future Directions

Proposed Annual Underlying Detail

