

# 2018 Economic Programs Webinar Series: Webinar #7 – Data Literacy

Exploring Economic Data

Thursday, October 25, 2018

Presenter: John Sperry



# Economic Programs Webinar Series

- Monthly webinars on key topics
- Follow real-life use cases
- Recorded and posted for later reference
- Learn more at <https://www.census.gov/data/training-workshops.html>

## U.S. Census Bureau Presents... The 2018 Economic Programs Webinar Series



Interested in learning about the wide range of economic data and resources you can get from the Census Bureau? If you answered yes, then this webinar series is for you!

You will have the opportunity to learn about the types of data related to different topics and subject areas. Each session will demonstrate the value of our data through real life scenarios and plain language guidance. We will share on how you can access this information and why it's important for you. This webinar series is for anyone looking for data and not sure where to begin. Discover the possibilities. Here are the topics:

TOPIC:	SESSION DATE:
Healthcare	March 15, 2018
Employment	April 17, 2018
Government	May 24, 2018
Construction	June 20, 2018
Professional/Scientific	August 2, 2018
Hidden Gems	September 12, 2018
Data Literacy	October 25, 2018

**SAVE THE DATE:** All webinars are FREE and start 2:00pm ET

No registration required – Log in details will be provided 24-48 hours prior to the event

For more information about the Economic Programs Webinar Series, please contact the Data User Outreach & Education Branch at 800-242-2184 or [ewd.outreach@census.gov](mailto:ewd.outreach@census.gov)

# Today's Webinar

- Define data literacy
- Cover common data user challenges
  - Balancing Three Mission Principles
  - Accounting for Error
  - Classification Systems
  - Valuation of Dollars
  - Seasonally Adjusted v. Non-Seasonally Adjusted Data
- Frame pitfalls with use cases predominately from:
  - *Wholesale Trade across the Indicator, Annual, and Economic Census Program Areas*
  - *International Trade*

## Census Programs Covered Today

Program	Description	Geography	NAICS Industry
Economic Census (EC)	Most comprehensive econ program	U.S., states, counties, metros, places, ZIPs	2- thru 6
Wholesale Trade Indicator (MWTS)	Earliest indicator on wholesale trade sector.	U.S.	42
International Trade	Provides monthly international trade data on goods and services.	U.S., District-level, U.S. states, U.S. ports, trading partner countries	11-thru 512, 910-990

# About the Census Bureau

- The U.S. Census Bureau is the federal government's largest statistical agency.
- We conduct more than 130 censuses and surveys each year, including
  - **The Decennial Census** – the once-a-decade population and housing count of all 50 states and U.S. territories
  - **The American Community Survey** – the ongoing annual survey of the nation's population
  - **The Economic Census** – the official five-year measure of American businesses
- Our mission is to serve as the nation's leading provider of quality data about its people and economy.

Decennial Population  
and Housing Census  
Every 10 years

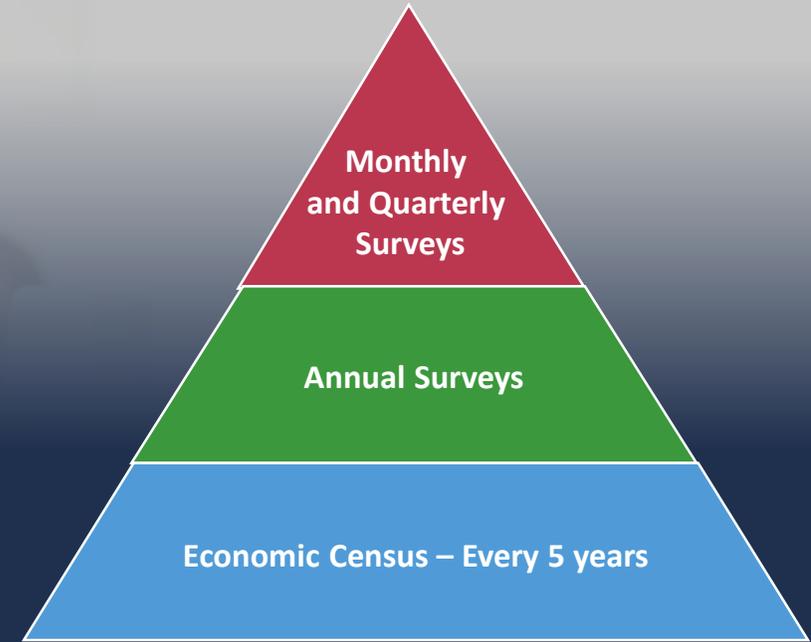
Economic Census  
Every 5 years

Census of Governments  
Every 5 years

American Community Survey  
Annual

Annual Retail Trade  
Annual

Plus more than 130  
demographic and economic  
surveys every year



## Census Economic Surveys

- Census Bureau Economic Surveys are a key source for official statistics companies can use:
  - Monthly and Quarterly are small sample surveys that provide the most **TIMELY** data available
  - Annual surveys have larger samples and provide the most up-to-date **TREND** data available
  - Every 5 years, the Economic Census measures all businesses and provides the most **COMPREHENSIVE** data available
- These surveys set the standard for U.S. economic statistics, and are fueled by the data provided by individual businesses

# Common Economic Data Terms

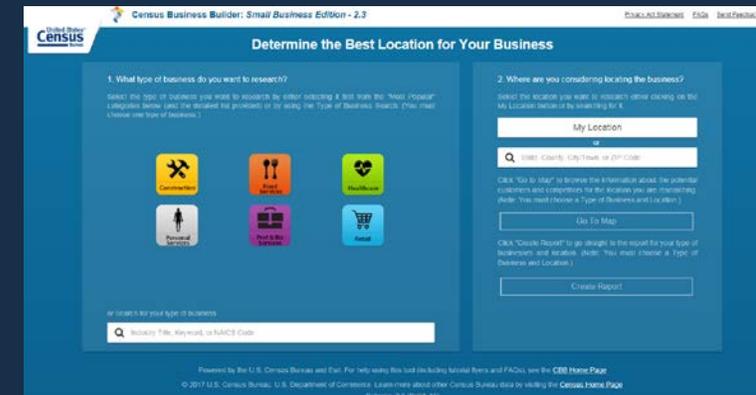
- [NAICS](#) (North American Industry Classification System)
  - Our primary data dimension
- U.S. Code [Title 13 and 26](#)
  - Protects business privacy



# Where can I access today's data?

- American FactFinder
  - Most comprehensive Census database
  - Website: <https://factfinder.census.gov/>
- USA Trade Online
  - International Trade data
  - Website: <https://usatrade.census.gov/>
- Economic Indicator Database
  - Indicator level data
  - Website: <https://www.census.gov/econ/currentdata/>
- Census Business Builder
  - Tool to help users understand the business landscape for a region
  - Website: <https://cbb.census.gov/sbe/#>

## Census Data Tools



**Census Indicator Database  
Webinar: Navigating Census  
Databases:  
[census.gov/econ/webinar](https://www.census.gov/econ/webinar)**

# Data Literacy



- What is it?
  - Defined: Ability to derive meaningful information from data.
- Why is it important?
  - Can help you determine if data is accurate and relevant for your needs.
  - Being informed mitigates misuse of data.
- How do we make a determination on what's relevant?
  - Example: A data user wants international trade data on alcohol.
    - Do we use seasonally adjusted data or not seasonally adjusted data?
    - What classification system to use? NAICS, End-use, Harmonized System?
    - Aggregate alcohol trade or more detailed figures? i.e. beer, wine, liquor.



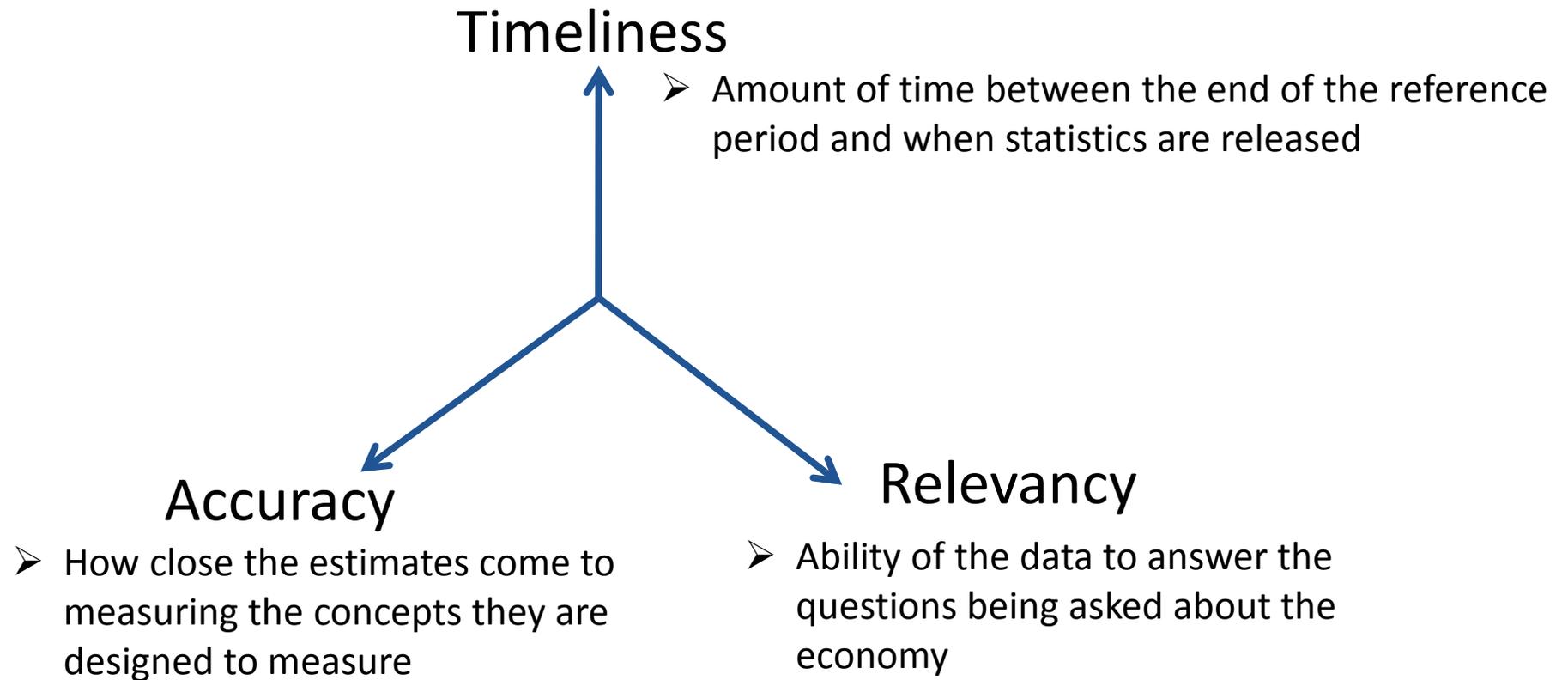
# Common Data User Pitfalls

- Balancing Three Mission Principles
- Accounting for Error
- Classification Systems
- Valuation of Dollars
- Seasonally Adjusted v. Not Seasonally Adjusted Data

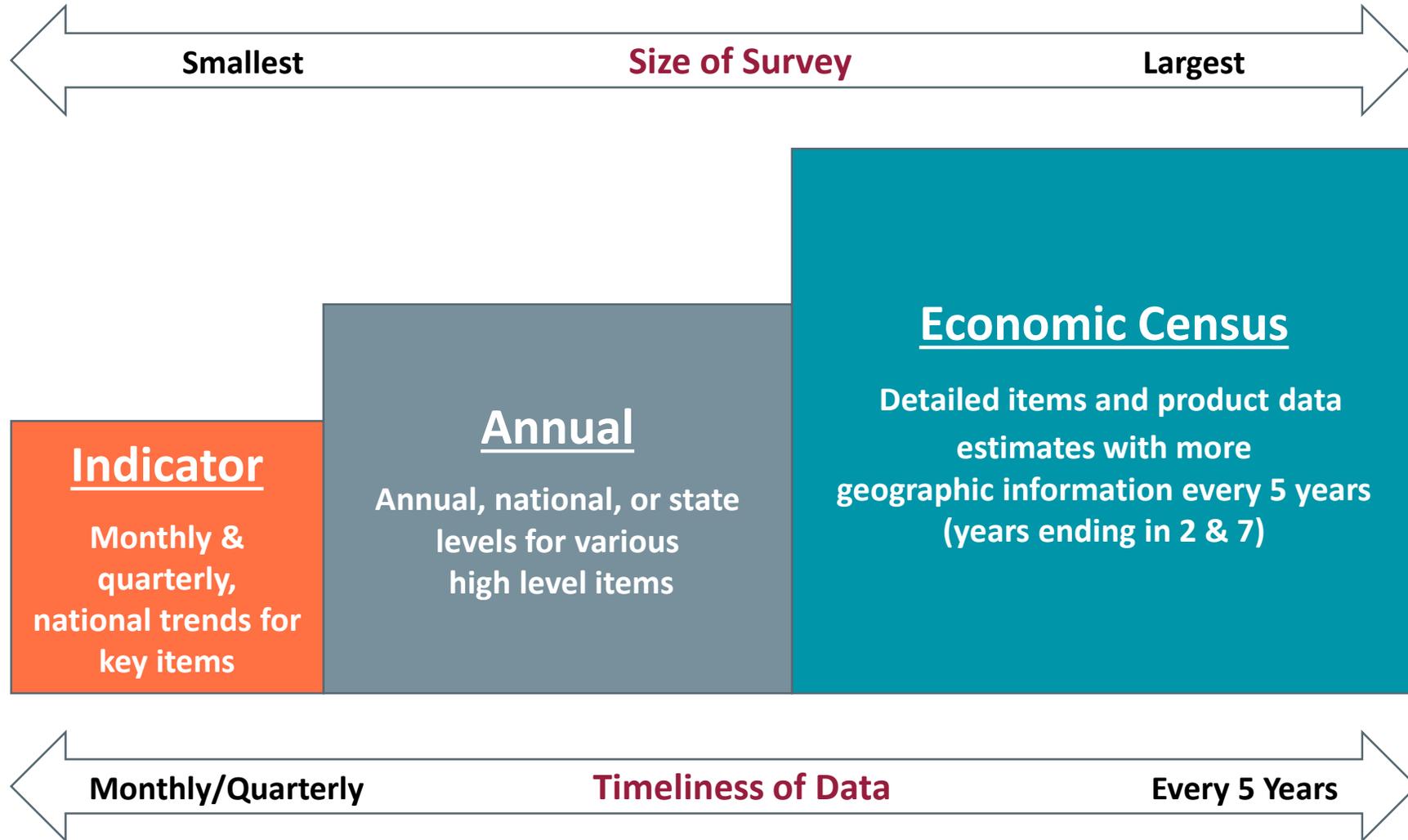


# Common Pitfalls: Balancing Three Mission Principles

Relevancy, Timeliness and Accuracy



# Common Pitfalls: Relevancy, Timeliness, & Accuracy



# Economic Indicators

[census.gov/economic-indicators](https://census.gov/economic-indicators)

- Provide monthly and quarterly data that are **timely, reliable**, and offer comprehensive measures of the U.S. economy.
- Fewer Data Items are collected than for annual surveys and the Economic Census.
- Smaller sample size than annual surveys and the Economic Census.
- Generally speaking, collected at the company or company reporting unit level
- National level statistics

# Annual Surveys

[census.gov/econ](https://census.gov/econ)

- Fewer Data Items are collected than on the Economic Census
- Collected at the company level or establishment level
- Provides national or state level statistics
- Provides Year-to-Year Comparisons

# Economic Census

[census.gov/EconomicCensus](https://census.gov/EconomicCensus)

- Conducted once every five (5) years ending in 2 and 7
- Profiles the U.S. economy from the national to the local level
- Collects data from the business establishments of companies
- **Most detailed** information on the structure of the economy

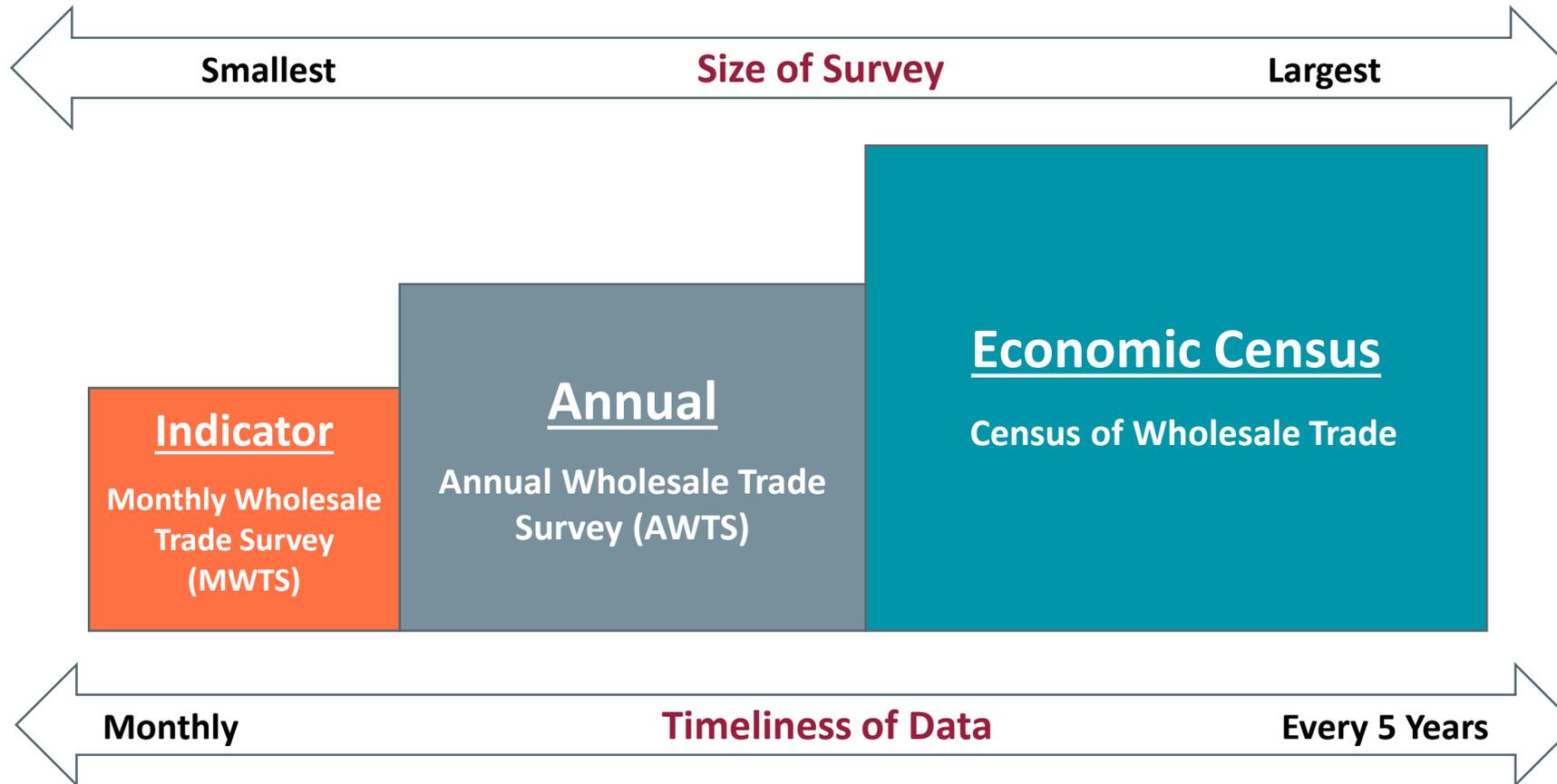
# Economic Census

[census.gov/EconomicCensus](https://census.gov/EconomicCensus)

- **Industry Series (National)**
  - Mining, Construction, Manufacturing
  - Retail, Wholesale, Services
- **Geographic Area (Sub-national)**
  - State, Metropolitan
  - County, Zip code
- **Subject and Summary Series**
  - Product Lines
  - Establishment and Firm size
  - Miscellaneous Subjects
- **Data from Economic Census provide framework for measures**
  - Calculation of Gross Domestic Product
  - Calculation of National Income and Product Accounts
- **Most recent published Economic Census is from 2012**

# Common Pitfalls: Three Mission Principles

Case: Wholesale Trade, NAICS 42



# Comparison of Wholesale Trade Surveys

Relevancy, Timeliness, & Accuracy Case: Wholesale Trade, NAICS 42

	Monthly Wholesale Trade Survey (MWTS)	Annual Wholesale Trade Survey (AWTS)	Economic Census (Census of Wholesale Trade)
<b>Sample Size</b>	4,200 Companies	8,000 Companies	419,000+ establishments of 310,000+ companies
<b>Sample Revision</b>	Every 5 years	Every 5 years	N/A
<b>Items Collected</b>	Sales, Inventories	Sales, Inventories, Purchases, Operating Expenses, inventories held outside the U.S., Commissions, Sales on Own Account, Gross Selling Value, E-Commerce	Sales, Annual and first quarter payroll, Employment, Inventories, Operating Expenses, Kind of Business, Type of operation, Class of Customer, Method of Selling, Product lines, Shipping and handling, Special Inquiries
<b>Data Products</b>	Monthly Wholesale Trade Survey (MWTS)	Annual Wholesale Trade Report, E-Stats	Census of Wholesale Trade Advance Report, Industry Series, Geographic Area, Product Lines, Establishment & Firm size, Miscellaneous Subjects
<b>Release Date</b>	6 weeks after the reference period	14 months after the reference period	2012 Economic Census released on a flow basis starting 1 year after the reference period
<b>Benchmark Products</b>	This report presents the results of the benchmarking operation that revises monthly sales and inventories estimates based on the Annual Wholesale Trade Survey. Estimates are both seasonally adjusted and unadjusted.	AWTS estimates were revised to reflect benchmarking to final results of the 2012 Economic Census	None
<b>Data Coverage</b>	Does <b>NOT</b> include NAICS 4251: Wholesale Electronic Markets Agents and Brokers. Does <b>NOT</b> include MSBO's (Manufacturer's Sales Branches and Offices).	Includes NAICS 4251: Wholesale Electronic Markets Agents and Brokers and MSBO's (Manufacturer's Sales Branches and Offices).	Includes NAICS 4251: Wholesale Electronic Markets Agents and Brokers and MSBO's (Manufacturer's Sales Branches and Offices).

# Common Pitfalls: Accounting for Error

- What is sampling error?
  - Defined: The difference between the estimate and the result that would be obtained from a complete census conducted under the same survey conditions
- Why is this important?
  - Not accounting for sampling error can possibly lead to incorrect interpretations.
    - Example: Seasonally Adjusted June 2018 Wholesale Indicator sales estimate was down 0.1% ( $\pm 0.4\%$ ) from May. Given the sampling error represented by the margin of error, the change in the value of sales could range from -0.5% to +0.3% - so the change in sales could also possibly be zero; meaning sales could be unchanged – or up.
- Are there different kinds of error?
  - Sampling error
  - Non-sampling error: Measurement, Coverage, Non-response

# Accounting for Error

Error	Error Type	Defined
<b>Sampling Error</b>	<b>Sampling</b>	The sampling error of an estimate based on a sample survey is the difference between the estimate and the result that would be obtained from a complete census conducted under the same survey conditions. This error occurs because characteristics differ among sampling units in the population and only a subset of the population is measured in a sample survey.
<b>Measurement Error</b>	<b>Non-Sampling</b>	Difference between the true value of the measurement and the value obtained during the measurement process
<b>Coverage Error</b>	<b>Non-Sampling</b>	Includes both undercoverage and overcoverage, is the error in an estimate that results from (1) failure to include all units belonging to the target population or failure to include specified units in the conduct of the survey (undercoverage), and (2) inclusion of some units erroneously either because of a defective frame or because of inclusion of unspecified units or inclusion of specified units more than once in the actual survey (overcoverage).
<b>Non-response Error</b>	<b>Non-Sampling</b>	Overall error observed in estimates caused by differences between respondents and nonrespondents

# Accounting for Error

## Case Study: Census Bureau Examples

Error Type	Error Type	Defined	Census Example
<b>Sampling Error</b>	<b>Sampling</b>	The sampling error of an estimate based on a sample survey is the difference between the estimate and the result that would be obtained from a complete census conducted under the same survey conditions. This error occurs because characteristics differ among sampling units in the population and only a subset of the population is measured in a sample survey.	Margin of error, standard error, coefficient of variation, confidence intervals.
<b>Measurement Error</b>	<b>Non-Sampling</b>	Difference between the true value of the measurement and the value obtained during the measurement process	A survey wants data reported to nearest dollar. Survey respondent reports data including cents or in thousands because that's how their accounting is completed.
<b>Coverage Error</b>	<b>Non-Sampling</b>	Includes both undercoverage and overcoverage, is the error in an estimate that results from (1) failure to include all units belonging to the target population or failure to include specified units in the conduct of the survey (undercoverage), and (2) inclusion of some units erroneously either because of a defective frame or because of inclusion of unspecified units or inclusion of specified units more than once in the actual survey (overcoverage).	A wholesale trade survey wants to cover all of wholesale trade, but the sampling frame isn't accurate as companies go out of business and start up operations.
<b>Non-response Error</b>	<b>Non-Sampling</b>	Overall error observed in estimates caused by differences between respondents and nonrespondents	Data are imputed for unit nonresponse, item nonresponse, and for reported data that fail edits. Imputed data are based on responses from similar-sized units classified in the same industry, but non-respondents have different characteristics than respondents.

# Common Pitfalls: Classification Systems

- Most economic data published by Census is in the North American Industry Classification System (NAICS)
- Product classification under the North American Product Classification System (NAPCS)
- Some program areas, like International Trade, publish data under multiple classification systems.
  - NAICS
  - Harmonized System (HS)
  - End-Use
  - Standard International Trade Classification (SITC)

# Multiple Classification Systems

## Case Study: International Trade

System	Source	Purpose	Potential Reason to Use	Example Code
Harmonized System (HS)	Exports based on Schedule B <a href="https://census.gov/foreign-trade/schedules/b/">census.gov/foreign-trade/schedules/b/</a>  Imports based on Harmonized Tariff Schedule (HTS) <a href="https://hts.usitc.gov">hts.usitc.gov</a>	Product level data classification.	Most detailed commodity specific level of data.	HS Code: 0701905055 Red Skin Variety Potatoes, Fresh or Chilled, not elsewhere specified or included
North American Industry Classification System (NAICS)	Standard Issued by Office of Management and Budget, but delegated, developed, and managed by the U.S. Census Bureau	Correlate with U.S. domestic manufacturing data	Aggregate industry level data provides broader view. Data comparable with other program areas at Census.	NAICS Code: 111211 Potatoes
End-use	Bureau of Economic Analysis	Principal use of the merchandise	If analysis is based on principal use of good instead of physical characteristics.	End-use Code: 00130 Vegetables (Import) 00330 Vegetables (Export)
Standard International Trade Classification (SITC)	United Nations	U.N. International Standard	To compare other countries trade data using U.N. statistical standards.	SITC Code 0541: Potatoes, fresh or chilled (not including sweet potatoes)

# Classification Systems

## Case Study: Wholesale Trade

Wholesale NAICS Industry Official Title	NAICS Code Listed on Wholesale Indicator Press Release	Examples of What's Included
Grocery and related product merchant wholesalers, NAICS 4244	<b>Groceries</b>	<b>Fresh Fruit</b> , Frozen Food, Dairy Products, Poultry, Confectionery, Seafood, Meat
Farm product raw material merchant wholesalers, 4245	Farm Products	Grain, Corn, Cotton, Soybeans, Animal Feed
Miscellaneous nondurable goods merchant wholesalers, 4249	Misc. Nondurable	<b>Farm Supplies</b> , <b>Fertilizer</b> , Books, Periodicals, Newspapers, Flowers, Nursery Stock, Tobacco, Paint

# Classification Systems

## Case Study: Cross-Sector Analysis – Petroleum

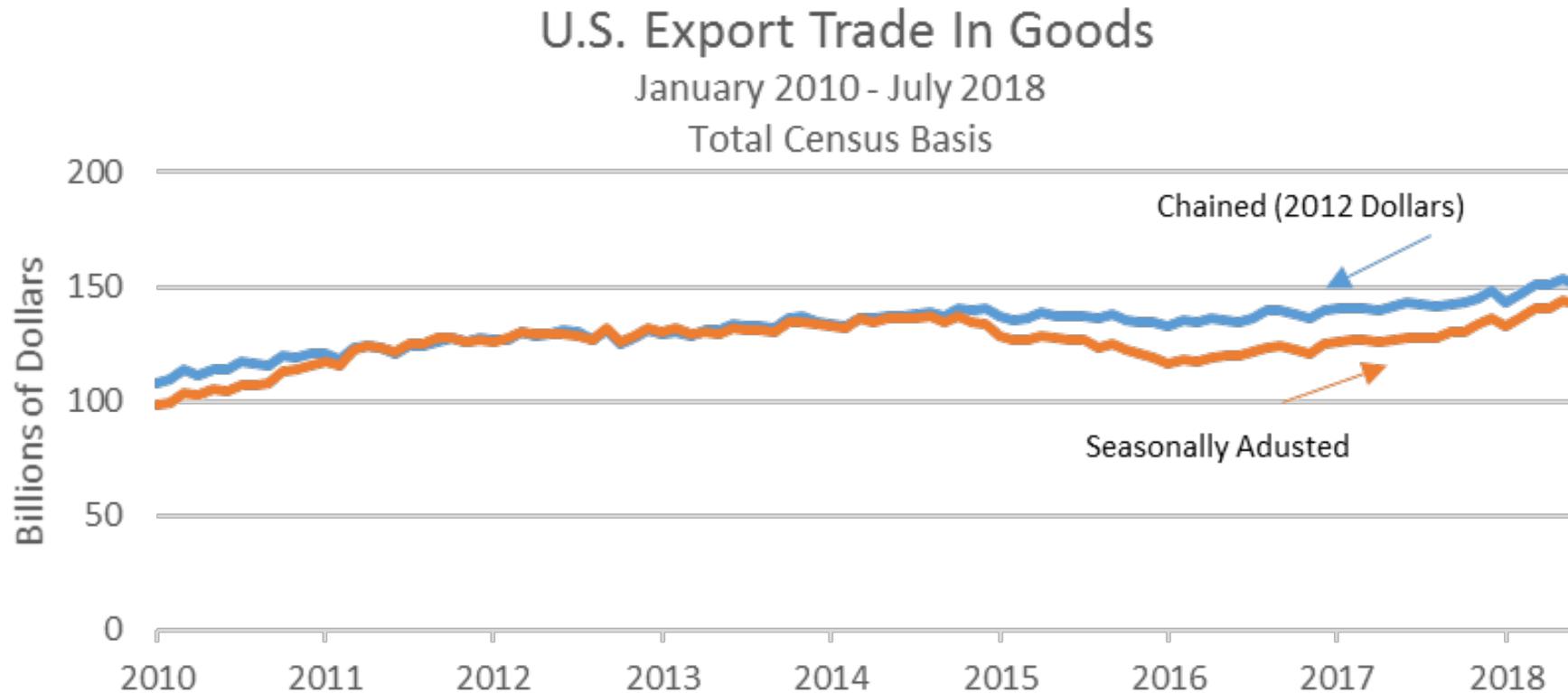
NAICS Sector	Examples of What's Included
Retail: NAICS 447 Gasoline Stations	Gasoline Stations, <b>Gasoline Stations with Convenience Stores</b> , Other Gasoline Stations
International Trade: NAICS 21111 & 324110 Oil, Gas, and Petroleum Refinery Products	Crude Oil, Gasoline, and other Petroleum refinery products
Manufacturing: NAICS 324110 Petroleum Refineries	Establishments primarily engaged in refining crude petroleum into refined petroleum.
Wholesale: 4247 Petroleum and Petroleum Products	Petroleum Bulk Stations and Terminals, Petroleum and Petroleum Product Merchant Wholesalers (except Bulk Stations and Terminals)

# Common Pitfalls: Valuation of Dollars

- Nominal
  - A value reflecting the current price of merchandise, it does not include adjustments to reflect factors such as seasonality or inflation
    - Example: Non-seasonally adjusted data
- Real
  - A constant dollar or real dollar refers to dollars adjusted for inflation/deflation and includes adjustments to reflect seasonality.
    - Example: International Trade Indicator (FT-900) release Exhibits 10 & 11. Data are adjusted for seasonal variation on a real, or chained-dollar, basis (2012 reference year).

# Valuation of Dollars

## Case Study: International Trade



Sources: U.S. Census Bureau, International Trade Statistics  
Data as of September 17, 2018

# Common Pitfalls: Seasonal Adjustment

- **Seasonal Adjustment (S.A.)** –is the process of estimating and removing seasonal effects from a time series in order to better reveal certain nonseasonal features. Can account for trading days, seasonality, moving holidays.
  - Calculated using Census Bureau’s X-13 ARIMA-SEATS program using the X-11 filter based adjustment procedure ([www.census.gov/srd/www/x13as/](http://www.census.gov/srd/www/x13as/))
  - Example: A July drop in automobile production as factories retool for new models.
- **Not Seasonally Adjusted (N.S.A.)** – the survey estimate before seasonal adjustment

# Seasonal Adjustment

Type	Defined	Coverage	Why a Data User May Prefer
Seasonally Adjusted	The process of estimating and removing seasonal effects from a time series in order to better reveal certain nonseasonal features	Seasonally Adjusted data may adjust for but not all of the following: <ul style="list-style-type: none"> <li>• Trading Days</li> <li>• Seasonality</li> <li>• Moving Holidays</li> </ul>	<ul style="list-style-type: none"> <li>• When viewing percentage changes or underlying trends.</li> <li>• Desire data that is smoother due to accounting for adjustments.</li> </ul>
Non-Seasonally Adjusted Data	The survey estimate before seasonal adjustment	N/A	<ul style="list-style-type: none"> <li>• Viewing data over longer periods of time time, i.e. yearly totals.</li> <li>• If a longer time series is available.</li> <li>• More comparative across different surveys.</li> </ul>

# Seasonally & Non-Seasonally Adjusted

## Case Study: Wholesale Alcohol Sales



Source: U.S. Census Bureau, Monthly Wholesale Trade Indicator  
Data as of September 18, 2018

# Data Literacy: Lessons

- Read the methodology behind the statistics.
- Worried about falling into a pitfall? Call or email us! We are here to help. If you have questions – don't hesitate to reach out to your friendly Census analyst.
  - We can help clarify what the data represents, and the direction (up or down) data is moving.
  - We can not analyze the data. I.e. There is more trade in electronics because of a new cell phone release.



# Economic Census Your Response Matters



# About the Economic Census

- The U.S. Census Bureau measures the nation's population once every 10 years. It also measures U.S. businesses every 5 years with the Economic Census
- The next Economic Census is underway. Companies report their 2017 year-end numbers. The due date was June 12<sup>th</sup>, but there is still time for companies to respond.
- Response is required by law
- Responses are confidential. Company data is used for statistical purposes only. The Census Bureau is required by law to keep your information private and secure
- Response is required online. This reduces the time needed for completion, improves accuracy, and provides significant cost savings for taxpayers
- Results from the Economic Census are free and available to guide business decisions and policy-making

# Information Required

The Economic Census asks for the following information by location

- Employer Identification Number
- Physical location
- Primary business activity
- Sales, receipts, or revenue
- Employment and payroll
- Industry-specific questions



# Economic Census Response

- Program launched in May 2018
  - Official letters mailed with web address and unique company code to access online survey
  - Response to the 2017 Economic Census was due on June 12<sup>th</sup>. Businesses who have not yet responded are now receiving past due notices with instructions on how to comply and get assistance. Response is required by law.
- Respondents were instructed to set up online account on secure website to complete survey
  - New requirement for Census Bureau economic surveys
  - Similar to other online accounts with email username, password, security questions
- Key changes include
  - Online response requirement, new reporting instrument for businesses with multiple locations, change in data collection timeframe
- Help is available online and via telephone
- Information and resources are available at [www.census.gov/EconomicCensus](http://www.census.gov/EconomicCensus)



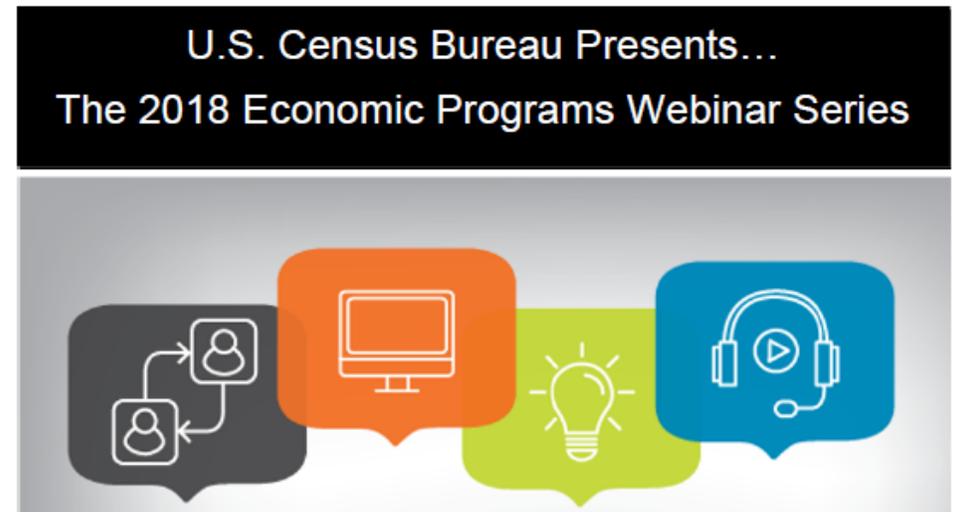
# Economic Programs Webinar Series

- New Webinar Series Coming Spring 2019.

- We are fielding ideas

- Learn more at:

<https://www.census.gov/data/training-workshops.html>



Interested in learning about the wide range of economic data and resources you can get from the Census Bureau? If you answered yes, then this webinar series is for you!

You will have the opportunity to learn about the types of data related to different topics and subject areas. Each session will demonstrate the value of our data through real life scenarios and plain language guidance. We will share on how you can access this information and why it's important for you. This webinar series is for anyone looking for data and not sure where to begin. Discover the possibilities. Here are the topics:

TOPIC:	SESSION DATE:
Healthcare	March 15, 2018
Employment	April 17, 2018
Government	May 24, 2018
Construction	June 20, 2018
Professional/Scientific	August 2, 2018
Hidden Gems	September 12, 2018
Data Literacy	October 25, 2018

**SAVE THE DATE:** All webinars are FREE and start 2:00pm ET

No registration required – Log in details will be provided 24-48 hours prior to the event

For more information about the Economic Programs Webinar Series, please contact the Data User Outreach & Education Branch at 800-242-2184 or [ewd.outreach@census.gov](mailto:ewd.outreach@census.gov)

# Q & A and Thank You!

Contact Me At:

[john.w.sperry@census.gov](mailto:john.w.sperry@census.gov)

**301-763-0258**

Or [ewd.outreach@census.gov](mailto:ewd.outreach@census.gov)

**800-242-2184**

