



PI<sup>+</sup> v3.2  
TranSight v5.2  
Tax-PI v3.2  
Metro-PI v3.2  
E3+ v3.2

(changes from v3.1/5.1)

### *Major Economic Data Sources*

#### Employment

County	BEA (sector industries; 2001-2022) <sup>1</sup> CBP (detail industries; 2021)
State	BEA (summary industries; 2001-2022) <sup>2</sup> CBP (detail industries; 2021)
National	BEA (summary industries; 2001-2022) <sup>2</sup> CBP (detail industries; 2021) BLS EP (detail industries; 2001-2022 and 2032) <sup>3</sup>

#### Wages

County	BEA (total; 2001-2022) CBP (detail industries; 2021)
State	BEA (summary industries; 2001-2022) CBP (detail industries; 2021)
National	BEA (summary industries; 2001-2022) CBP (detail industries; 2021)

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<sup>1</sup> The BEA Regional Economic Accounts county data series used for v3.2/v5.2 is based on their 11/16/2023 release. The estimates for 2001-2006 are based on the 2002 North American Industry Classification System (NAICS). The estimates for 2007-2010 are based on the 2007 NAICS. The estimates for 2011-2016 are based on the 2012 NAICS. The estimates for 2017 forward are based on the 2017 NAICS.

<sup>2</sup> The BEA Regional Economic Accounts state data series used for v3.2/v5.2 is based on their 09/29/2023 release. The estimates for 2001-2006 are based on the 2002 North American Industry Classification System (NAICS). The estimates for 2007-2010 are based on the 2007 NAICS. The estimates for 2011-2016 are based on the 2012 NAICS. The estimates for 2017 forward are based on the 2017 NAICS.

<sup>3</sup> The BLS Employment Projections (EP) data used for PI<sup>+</sup> v3.2/v5.2 is based on their 09/06/2023 release.

### **Personal Income and Earnings**

County	BEA (components and summary industries; 2001-2022)
State	BEA (components and summary industries; 2001-2022)
National	BEA SPI (components and summary industries; 2001-2022) BLS EP (components; 2001-2022 and 2032) RSQE (components; 2024-2025) <sup>4</sup>

### **Compensation**

County	BEA (components and summary industries; 2001-2022)
State	BEA (components and summary industries; 2001-2022)
National	BEA (components and summary industries; 2001-2022)

### **Commuter Flows**

County to County	BEA (gross flow of earnings by county; 2001-2022) BEA (total number of workers commuting between counties of residence and counties of work; 1990, 2000) BEA (commuting patterns between counties of work and counties of residence by major industry; 2000) ACS (residence county to residence workplace county flows; 2009-2013)
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### **Technology Matrix**

National	BLS (detailed industries; 2001-2022 and 2032)
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### **Detailed Industry Policy Variables**

National	BEA Benchmark 2017 IO Table
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### **Final Demand**

State	BEA (consumption for major categories; 2001-2022)
National	BEA (components; 2001-2023) RSQE (components; 2024-2025) BLS EP (components and industry value added; 2001-2022, 2032)

### **GDP by Industry**

County	BEA GDP by County (21 major categories; 2001-2022)
State	BEA GDP by State (summary industries; 2001-2022)
National	BLS EP (detailed industries; 2001-2022 and 2032)

### **Occupation Matrix**

National	BLS EP (employment by industry and occupation; 2022 and 2032)
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### **Price Deflators**

State	BEA Implicit Price Deflators (aggregate; 2008-2022)
National	BEA Personal Income Price Deflator (aggregate; 2001-2022)
National	BEA Commodity Prices (detailed categories; 2001-2022)
National	BLS EP (detailed industries; 2001-2022 and 2032)

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<sup>4</sup> The 2/16/2024 RSQE Forecast is used for v3.2/v5.2.

## ***Major Demographic Data Sources***

### **Population**

County	BEA (total; 2001-2022)
County	Census (age, sex, race; 2000-2022)

### **Demographic Components of Change**

County	Census (2000-2022)
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### **Labor Force**

County	BLS (total; 2000-2022)
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### **Nativity Rates**

Nation	Census (2001-2100)
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### **Birth Rates**

State	CDC (2001-2020)
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### **Survival Rates**

Nation	Census (2001-2100)
Nation	Congressional Budget Office (2023-2096)

### **Net International Migrants**

Nation	Census (2001-2100)
Nation	Congressional Budget Office (2023-2096)

### **Participation Rates**

Nation	BLS (2001-2032)
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### **Active Military**

Nation	DoD (2001-2022)
County	American Community Survey (2005-2022)

### **Military Dependents**

Nation	DoD (total; 2003-2022)
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### **Prisoners**

County	Census (sex, race, facility; 1990; 2000; 2010;2020)
	Bureau of Justice Statistics (50 largest jail jurisdictions mapped to counties; 2001-2010)
	Bureau of Prisons (facilities mapped to counties; 2005-2022)
	Various state-specific correctional websites

### **College Enrollment**

County	Census (2000; 2010)
	American Community Survey (2005-2022)
State	National Center for Education Statistics (2000-2005)
National	National Center for Education Statistics (2000-2005)

## **Incorporation of BLS 2022-32 Employment Projections**

National projections include the input-output table, employment, output, value-added, labor productivity, and deflators by detailed industry: final demand by component; personal income by component; labor force; and occupations by detailed industry.

From the BLS:

“Projected employment growth is driven by labor force growth, which in turn is constrained by population growth. Total population is projected to grow slightly slower than previous decades, at 0.7 percent annually over the projections period, although population growth is concentrated among individuals aged 75 and over because of the aging of the baby-boom generation. Because older age groups have lower labor force participation rates than prime age workers, overall labor force participation rates are projected to decline. Despite all these constraints, real Gross Domestic Product (GDP) is expected to grow 1.9 percent over the 2022-32 decade, remaining largely consistent with the growth over the 2002-12 and 2012-22 periods.”

## **Updates to Local Area Personal Income**

From the BEA website:

“The estimates for 2022 incorporate the results of BEA’s comprehensive update of personal income by county and metropolitan area that was also released today. The annual estimates of personal income by county and metropolitan area from 1979 to 2021 were revised. These updates incorporate new and revised source data that are more complete and more detailed than previously available, the results of the September 28, 2023, comprehensive update of the National Economic Accounts, and the results of the September 29, 2023, comprehensive update of state personal income.”

## **Updates to GDP by County**

From the BEA website:

“The estimates for 2022 incorporate the results of BEA’s comprehensive update of GDP by county and metropolitan area that was also released today. The annual estimates of GDP by county and metropolitan area from 2017 to 2021 were revised. These updates incorporate new and revised source data that are more complete and more detailed than previously available as well as the results of the comprehensive updates of BEA’s National Economic Accounts, Industry Economic Accounts, and annual GDP by state accounts that were published earlier.”

## **Updated Personal Consumption Expenditures by State**

From the BEA website:

“The estimates for 2022 incorporate the results of BEA's comprehensive update of PCE by state that was also released today. The annual estimates of PCE by state for 1997 to 2021 were revised. The update incorporates new and revised source data that are more complete and more detailed than previously available: the results of the September 28, 2023, comprehensive update of the National Income and Product Accounts and the September 29, 2023, comprehensive update of state personal income statistics.”

## **Shifted Real Dollar Basis from Chained (2012) to Chained (2017)**

Output and price measures from the BEA Industry Economic Accounts now use 2017 as the reference year; previously, the reference year was 2012. The real dollar year in the model has switched switch from 2012 to 2017.

## **New Industry Definitions**

The BLS redefined the industries reported in the historical and projected input-output tables. These data are now based on the 2022 North American Industry Classification System (NAICS) instead of the 2017 version and so several industry names and codes in the model may have also changed slightly.

Due to the changes in the BLS Industry Sectoring Plan, REMI has revised the industry definitions for the 160 sector models.

Two industries:

*Beverage manufacturing*

*Tobacco manufacturing*

have been combined into the single industry:

*Beverage and tobacco manufacturing*

And one industry:

*Retail trade*

has been separated into two:

*Retail Trade (excluding motor vehicles and parts dealers)*

*Motor vehicles and parts dealers*

## **Detailed Industry and Detailed Investment (Translator) Policy Variables**

The detailed industry and detailed investment policy variables have been updated to reflect the new BEA 2017 Benchmark IO table.

### **Detailed industries**

Four detailed industries:

*Household cooking appliance manufacturing*

*Household refrigerator and home freezer manufacturing*

*Household laundry equipment manufacturing*

*Other major household appliance manufacturing*

were replaced by a single detailed industry:

*Major household appliance manufacturing*

Several detailed industries also had minor name changes.

### **Detailed investment**

Two detailed equipment categories:

*Electro-medical equipment*

*Medical instruments*  
were replaced by the single category:  
*Medical Equipment*

These three detail intellectual property products were eliminated:

*Private investment in Software*  
*Private investment in Research and Development*  
*Private investment in Entertainment, Literary, and Artistic Originals*

### **Updated Method for Estimating Output**

REMI Methodology for estimating output by county and sector in the history was adjusted to provide a more consistent time-series.

### **Demographic Data**

For the following datasets, the estimates are based on the 2010 Census and were created without incorporation or consideration of the 2020 Census results. The estimates add births to, subtract deaths from, and add net migration to the enumerated resident population from the 2010 Census.

Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2020

National Population Estimates by Age, Sex, Race, and Hispanic Origin for the United States: April 1, 2010 to July 1, 2020

Annual County Resident Population Estimates by Age, Sex, Race, and Hispanic Origin: April 1, 2010 to July 1, 2020

For the following datasets, the estimates are developed from a base that integrates the 2020 Census, Vintage 2020 estimates, and 2020 Demographic Analysis estimates. The estimates add births to, subtract deaths from, and add net migration to the April 1, 2020 estimates base. Race and Hispanic origin data in the Vintage 2022 estimates do not currently reflect the results of the 2020 Census.

National Population Estimates by Age, Sex, Race, and Hispanic Origin for the United States: April 1, 2020 to July 1, 2022

Annual County Resident Population Estimates by Age, Sex, Race, and Hispanic Origin: April 1, 2020 to July 1, 2022

Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2020 to July 1, 2022

The population totals displayed in the model come from the BEA dataset Personal Income by Major Component and Earnings by NAICS Industry. For 2010 through the first quarter of 2020, BEA produced intercensal annual state population statistics for 2010 to 2019 and quarterly statistics for the second quarter of 2010 through the first quarter of 2020 that are tied to the

Census Bureau decennial counts for 2010 and 2020. Census will release official intercensal population data in 2024.

### **Incorporated Census 2023 National Population Projections Assumptions**

The Census released new birth rate and survival rate projections which were incorporated into the REMI forecast.

From the census website:

The 2023 National Population Projections for the United States are the first set of projections to incorporate the results of the 2020 Census. Prior series based on the 2010 Census were released in 2012, 2014 and 2017.

### **Connecticut Census Data**

The Census Bureau adopted the nine planning regions in Connecticut as county-equivalents for purposes of collecting, tabulating, and disseminating statistical data instead of the eight counties which ceased to function as governmental and administrative units in 1960. The 2022 population estimates and the components of demographic change were reported using the new county-equivalents. The data released by BEA used the old county definitions, so REMI converted the Census data from the nine county-equivalents back to eight counties.

### **Change to Calculation of Induced Employment and Output Results**

The calculation of the 'Induced Employment' was changed to include the old 'Induced Employment' result and the old 'Dynamic Employment' result so 'Induced Employment' will now include all changes in Employment from the baseline that were not the result of 'Direct Employment' or 'Indirect Employment' changes. The 'Dynamic Employment Multiplier' was eliminated because it was calculated using 'Dynamic Employment', and the 'Type II Employment' multiplier is changed because it is calculated using 'Induced Employment' which has changed.

Old result categories and definitions:

*Direct Employment* - The total employment that is being directly added to the simulation through either industry sales or industry employment policy variables.

*Indirect Employment* - The total Employment needed to satisfy the change in Intermediate Demand caused by the change in Direct Employment. The Output supplied by the Direct Employment demands Intermediate Inputs and some of those inputs will be supplied locally. The Employment needed to generate the locally supplied Output is the Direct Employment.

*Induced Employment* - The total Employment generated by the change in Consumption as a result of the change in income associated with Direct and Indirect Employment. The income associated with the Direct Employment and Indirect Employment will change the Local Consumption Demand. Some of that Demand is satisfied with local Output and the employment needed to generate that Output is the Induced Employment.

*Induced Employment* - The Employment generated by the dynamic model effects associated with the Direct, Indirect, and Induced Employment changes. It is calculated as the total change in Employment minus the Direct, Indirect, and Induced Employment.

*Type I Employment Multiplier* - The multiplier is the ratio of total Direct plus Indirect Employment created to Direct Employment added.

*Type II Employment Multiplier* - The multiplier is the ratio of total Direct, Indirect, and Local Consumption Demand Employment created to Direct Employment added.

*Dynamic Employment Multiplier* - The multiplier is the ratio of total Employment created to Direct Employment added.

New result categories and definitions:

*Direct Employment* - The total employment that is being directly added to the simulation through either industry sales or industry employment policy variables.

*Indirect Employment* - The total Employment needed to satisfy the change in Intermediate Demand caused by the change in Direct Employment. The Output supplied by the Direct Employment demands Intermediate Inputs and some of those inputs will be supplied locally. The Employment needed to generate the locally supplied Output is the Direct Employment.

*Induced Employment* - The change in the total Employment less the Direct Employment and Indirect Employment.

*Type I Employment Multiplier* - The multiplier is the ratio of total Direct plus Indirect Employment created to Direct Employment added.

*Type II Employment Multiplier* - The multiplier is the ratio of total Employment created to Direct Employment added.

The calculations of the 'Induced Output' and 'Type II Output Multiplier' results have corresponding changes and the 'Dynamic Output Multiplier' was eliminated.

### **Incorporated Additional CBO Projections Data**

Ten-Year projections from the Congressional Budget Office's detailed *Spending Projections, by Budget Account* were used to better calibrate Transfer Payments projections categories in the national model.