



**(changes from PI<sup>+</sup> v2.0)**

## *Major Economic Data Sources*

### Employment

County	BEA LAPI (sector industries; 2001-2015) <sup>1</sup> CBP (detail industries; 2014)
State	BEA SPI (summary industries; 2001-2015) <sup>2</sup> CBP (detail industries; 2014)
National	BEA SPI (summary industries; 2001-2015) <sup>3</sup> CBP (detail industries; 2014) BLS EP (detail industries; 2001-2014 and 2024) <sup>3</sup>

### Wages

County	BEA LAPI (total; 2001-2015) CBP (detail industries; 2014)
State	BEA SPI (summary industries; 2001-2015) CBP (detail industries; 2014)
National	BEA SPI (summary industries; 2001-2015) CBP (detail industries; 2014)

### Personal Income and Earnings

County	BEA LAPI (components and summary industries; 2001-2015)
State	BEA SPI (components and summary industries; 2001-2015)
National	BEA SPI (components and summary industries; 2001-2015) BLS EP (components; 2001-2014 and 2024) RSQE (components; 2016-2019) <sup>4</sup>

### Compensation

County	BEA LAPI (components and summary industries; 2001-2015)
State	BEA SPI (components and summary industries; 2001-2015)
National	BEA SPI (components and summary industries; 2001-2015)

### Commuter Flows

County to County	BEA (gross flow of earnings by county; 2001-2015)
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<sup>1</sup> The BEA Local Area Personal Income (LAPI) series used for PI<sup>+</sup> v2.1 is based on their 11/17/2016 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 forward are based on the 2012 NAICS.

<sup>2</sup> The BEA State Personal Income (SPI) series used for PI<sup>+</sup> v2.1 is based on their 09/28/2016 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 forward are based on the 2012 NAICS.

<sup>3</sup> The BLS Employment Projections (EP) data used for PI<sup>+</sup> v2.1 is based on their 12/08/2015 release.

<sup>4</sup> The 6 January 2017 forecast from RSQE is used for PI<sup>+</sup> v2.1.

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; 2006-2010)

**Technology Matrix**

National BLS (detail sectors; 2001-2014 and 2024)

**Final Demand**

National BEA (components; 2001-2015)  
 RSQE (components; 2016-2019)  
 BLS EP (components and industry value added; 2001-2014, 2024)

**Occupation Matrix**

National BLS EP (employment by industry and occupation; 2014 and 2024)

***Major Demographic Data Sources***

**Population**

County BEA (total; 2001-2015)  
 County Census (age, sex, race; 2000-2015)

**Demographic Components of Change**

County Census (2000-2015)

**Labor Force**

County BLS (total; 2000-2015)

**Natality Rates**

Nation Census (2001-2100)

**Birth Rates**

State CDC (2001-2015)

**Survival Rates**

Nation Census (2001-2100)

**Net International Migrants**

Nation Census (2001-2100)

**Participation Rates**

Nation BLS (2001-2050)

**Active Military**

Base DoD (total; 2001-2009)  
 Nation DoD (total, sex, race; 2001-2015)

County American Community Survey (2005-2015)

**Military Dependents**

Nation DoD (total; 2001-2005)

**Prisoners**

County Census (sex,race,facility; 1990; 2000; 2010)  
Bureau of Justice Statistics (50 largest jail jurisdictions mapped to counties; 2001-2015)  
Bureau of Prisons (facilities mapped to counties; 2005-2015)  
Various state-specific correctional websites

**College Enrollment**

County Census (2000; 2010)  
American Community Survey (2005-2015)  
State National Center for Education Statistics (2000-2015)  
National National Center for Education Statistics (2000-2015)



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

From the BEA website:

“This year’s revision introduced two major methodological improvements affecting nonfarm proprietors’ income that were discussed in the March, July, and October 2016 issues of the *Survey of Current Business*: (1) improved geocoding and editing of source data from IRS Form 1065 (Partnership Returns) and Schedule C of Form 1040 (Sole Proprietor Returns), and (2) an improved method of allocating national control totals to state and counties. A complete presentation and discussion of the data and revisions will be provided in the December 2016 issue of the *Survey of Current Business*.”

## **Incorporation of BEA Total Personal Consumption Expenditures (PCE) by State Data**

The BEA provides a limited historical time series of PCE data (nominal dollars) by state for 16 major categories of consumption. We now take this data into account when allocating national PCE data to states (via counties) over the historical period.

## **Incorporation of BEA GDP by State Data**

The BEA provides a limited historical time series of GDP data by state for 61 industries. We now take this data into account when allocating national output data to states (via counties) over the historical period.

## **Incorporation of American Community Survey Data**

The ACS provides estimates of active duty armed forces personnel by county. We are now using this data instead of Department of Defense Personnel by Location data to estimate Active Military by county because it reports where military members live instead of where they work. ACS also provides estimates of population living in military group quarters housing. Military Dependent population is now estimated by applying a fixed number of military dependents to each active duty military member living outside of group quarters housing instead of applying a fixed number of dependents to each military member based on their branch of the military.

## **New IO Table Category**

The BLS Input Output tables used in the REMI model include two non-industry categories called “Noncomparable Imports” and “Rest of World Adjustment”. In previous versions of the model we have aggregated these categories into a regular industry in order to maintain a balanced table, but this method resulted in some unusual inter-industry and final demand relationships. For v2.1 we have defined a new IO category called “Noncomparable Imports and Rest of World Adjustment” that properly accounts for the entire IO structure without impacting other industries.

### **Updated Economic Migration Equation**

The response to relative employment opportunity and the real relative compensation rate for the economic migration equation were re-estimated based on a more recent historical time series of data.

See *Economic Migration Equation Estimation v2\_1.pdf* for detailed documentation.

### **Updated Endogenous Labor Force Participation Rate Response**

The response to relative employment opportunity and the real relative compensation rate for the labor force participation rate equations were re-estimated (by gender, age, and ethnicity) based on a more recent historical time series of data.

See *Estimated Labor Force Participation Rates Elasticities v2\_1.pdf* for detailed information.

### **New Land Price Equation for Nonresidential Cost of Capital**

Previously, the Relative Housing Price equation was used to represent both Residential (Housing) and Nonresidential (Land) costs in the model. This meant that changes to nonresidential property values were driven by real disposable income and population (the same as changes to residential property values). A new, separate equation has been added for determining the cost of capital that has the same form as the housing price equation but uses GDP instead of real disposable income and jobs instead of population, as these seem to be better indicators of changes to nonresidential property prices.

### **Proper Aggregation of Inter-regional Government and Farm Trade**

When aggregating regions, the government and farm industries now properly net inter-regional imports and exports, instead of doing a straight aggregation. Self Supply and the RPC are also properly recalculated for the sum of regions.

### **New and Modified Policy Variables**

- Real Estate Price, with an option for Residential (Housing) and/or Nonresidential (Land) (replaces previous Housing and Land Price policy variable)
- The Consumption Reallocation policy variable is now included as an option on the Consumer Spending policy variables.
- The Federal Military Employment policy variable now has an option to designate whether they are “Active” or “Nonactive”. Only Active Military will directly affect military population.
- The Capital Stock policy variable now includes options for both Actual and Optimal.
- The Employment and Output policy variables now include options for Nullifying Induced Intermediate Inputs and/or Induced Investment.

## **Software Enhancements**

- The Model Parameters display has been updated.
- The Alternative Model display for model calibration has been redesigned so that users have a better understanding of which options can be turned on/off, which have default/alternative behavior, and what they mean.
- Policy variables listed in the PV editor grid may now be moved up or down (reordered) by selecting an entire row or multiple rows and pressing Ctrl+Up Arrow or Ctrl+Down Arrow or by dragging and dropping.
- Multiple groups of policy variables may now be combined into one group.
- Group Regions is now an option during policy variable selection. Users may enter a single value and have it automatically spread across designated or all model regions.
- New Policy Variable Export Center allows users to have more control over the exporting of policy variables, based on the same design as the Policy Variable Import Center.
- New Policy Variable Templates make it easier for users to create policy variables in a spreadsheet and paste them into the software.
- Documents available for display from the Documentation viewer may now be printed or saved to a disk.
- New Results Table Export Center allows users to have more control over exporting of results, including placing tables on multiple sheets in a workbook.
- The design for Year Selection and Region Groups Preferences was improved.

## **New Labor Supply Closure Option for SRUS and MRUS Models**

Single and multi-region US models (models with regions that explicitly cover the entire US) now have an additional Closure Option available called “Labor Supply”. This option is appropriate to use when running an alternative national or regional control or simulation where the labor supply for the nation has been directly shocked (for example, directly increasing or reducing population or participation rates) as it adjusts the employment forecast so it tracks changes in the labor force forecast. This is necessary because at the national level there is no constraint on employment growth relative to what the available labor can support. Without using this closure option, it is possible to have employment unreasonably grow beyond the size of the labor force.

## **Unit Conversion for Nominal Results**

Unit conversion for categories reported in nominal dollars was disabled in v2.0 because of a discrepancy between reported and converted values for some personal income concepts. For example, Real Disposable Personal Income was calculated within the model as Disposable Personal Income / PCE with both values coming from the same forecast. However, when the results were converted and displayed within PI<sup>r</sup>, the units were converted using values from the Standard Control. This sometimes led to a discrepancy in values between the variable labeled Real Disposable Personal Income, and the variable Disposable Personal Income converted from nominal to real dollars. Nominal dollar unit conversion has been reinstated for v2.1 and users

now have the option of choosing whether to convert results using prices from the same forecast or from the baseline forecast.