REMI PI+ v2.0
(changes from PI+ v1.7)

Major Economic Data Sources

Employment

County	BEA LAPI (sector industries; 2001-2014)[1]
	CBP (detail industries; 2013)
State	BEA SPI (summary industries; 2001-2014)[2]
	CBP (detail industries; 2013)
National	BEA SPI (summary industries; 2001-2014)[3]
	CBP (detail industries; 2013)
	BLS EP (detail industries; 2001-2014 and 2024)[3]

Wages

County	BEA LAPI (total; 2001-2014)
	CBP (detail industries; 2013)
State	BEA SPI (summary industries; 2001-2014)
	CBP (detail industries; 2013)
National	BEA SPI (summary industries; 2001-2014)
	CBP (detail industries; 2013)

Personal Income and Earnings

County	BEA LAPI (components and summary industries; 2001-2014)
State	BEA SPI (components and summary industries; 2001-2014)
National	BEA SPI (components and summary industries; 2001-2014)
	BLS EP (components; 2001-2014 and 2024)
	RSQE (components; 2015-2018)[4]

Compensation

County	BEA LAPI (components and summary industries; 2001-2014)
State	BEA SPI (components and summary industries; 2001-2014)
National	BEA SPI (components and summary industries; 2001-2014)

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[1] The BEA Local Area Personal Income (LAPI) series used for PI+ v2.0 is based on their 11/19/2015 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.

[2] The BEA State Personal Income (SPI) series used for PI+ v2.0 is based on their 09/30/2015 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.

[3] The BLS Employment Projections (EP) data used for PI+ v2.0 is based on their 12/08/2015 release.

[4] The 17 May 2016 forecast from RSQE is used for PI+ v2.0.

Commuter Flows
    County to County   BEA (gross flow of earnings by county; 2001-2014)
                                         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; 2001-2014)
                                           RSQE (components; 2015-2018)
                                         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; 2001-2014)
    County   Census (age, sex, race; 2000-2014)

Demographic Components of Change
    County   Census (2000-2014)

Labor Force
    County   BLS (total; 2000-2014)

Natality Rates
    Nation   Census (2001-2100)

Birth Rates
    State   CDC (2001-2014)

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; 2001-2014)
County   American Community Survey (2005-2014)

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; 2001-2014)
Bureau of Prisons (facilities mapped to counties; 2005-2014)
Various state-specific correctional websites

College Enrollment
County   Census (2000; 2010)
American Community Survey (2005-2014)
State   National Center for Education Statistics (2000-2014)
National   National Center for Education Statistics (2000-2014)

Introducing REMI 2.0

REMI 2.0, our next generation of REMI models, is dynamic, intuitive, and smart. It is developed using Einstein's principle: "Everything must be made as simple as possible – but not simpler." The new user interface developed specifically for policy variable navigation is based on three Smart Modeling principles:
1. To streamline
2. To enhance flexibility
3. To visualize

Updated Wage/Compensation/Earnings Rate Equations

Two different elasticities were estimated for each equation, the first based on the response to relative employment opportunity, and the second based on the response to occupational employment demand.

See *Estimates of Wage Compensation Earnings Rate Elasticities v2_0.pdf* for detailed documentation.

Updated Residential/Non-Residential Investment Equations

The speed of adjustment (the rate at which the difference between optimal and actual capital stock is filled) was estimated separately for residential and non-residential investment.

See *Estimates of Investment Equations v2_0.pdf* for detailed documentation.

Shortened Historical Time Series

The historical time series has been shortened, and now begins in 2001 instead of 1990. This change was necessary due to the BEA shortening its NAICS time series for state level data – state level data now begins in 1998, while county level data begins in 2001.

New Economic Profile Table

A new Economic Profile table is available as part of Model Details that displays BEA aggregate historical time series data (1969-2014) for the model regions.

09/22/2016

County Changes

Bedford County, VA now includes the independent city of Bedford for all years.
Shannon County, SD has been renamed to Oglala Lakota County.

Industry Definition Changes in BLS Data and IO Tables

Special notice regarding industry reclassifications (Source: http://www.bls.gov/sae/benchmark2014.pdf)

Each first quarter, the QCEW program incorporates updated industry assignments as they improve their classifications of establishments. Usually reclassifications are spread among industries. In 2013, substantial changes were made to two industries in particular: services for the elderly and persons with disabilities and funds, trusts, and other financial vehicles.

Prior to 2013, UI records from several state-funded programs that provide nonmedical, home-based services for the elderly and persons with disabilities were incorrectly classified under the North American Industry Classification System (NAICS) code for private households (NAICS 814110), which is out of scope for the CES program. As of the first quarter 2013, this employment is now coded in services for the elderly and persons with disabilities (NAICS 624120), which is in scope. The introduction of employment due to a coding change would create large, noneconomic breaks in CES time series data. To prevent these breaks and to properly allocate historic employment, CES worked with QCEW microdata and information from the affected states to reconstruct the histories of the affected series. Six states were most affected by the reclassification of data in NAICS 624120: California, Massachusetts, Missouri, Nebraska, Texas, and Washington. Education and health services series in these states, and all of the series that include them, are subject to historical reconstructions.

In a similar reclassification, employment was largely removed from NAICS 525: funds, trusts and other financial vehicles. QCEW staff determined that, because establishments in this classification are legal entities with very little employment, they should be reclassified according to each establishment's primary economic activity. When necessary, series were historically reconstructed to prevent the appearance of economic changes when the underlying cause was noneconomic. The effects of this reclassification were much smaller than those seen with NAICS 624120 and limited to states and areas with detailed level financial services series. Nearly all affected employment remained within the financial services sector, affecting mostly series containing NAICS 522, 523, and 524 but leaving aggregate series largely unaltered.

New Investment Category

Intellectual Property Products has been separated from Equipment to become the fourth fixed investment category.

Changes to College Population Estimates

The estimates of total college population by state are now based on the single-year estimates from the American Community Survey (B14004) instead of using the estimates of Total Fall Enrollment in Degree-Granting Institutions from the Digest of Education Statistics produced by the National Center for Education Statistics. The NCES estimates included only degree-granting institutions participating in Title IV programs and the estimates were not based on the place of residence of students. The ACS estimates are based on survey data and includes people who responded that they were in college or graduate school, by place of residence. The state totals are divided to counties using the single-year and five-year county estimates from ACS. The age-structure of the population was also considered when making estimates of incoming and outgoing college population for counties that exhibited a 'spike' of college-aged population.

Changes to Military Population Estimates

The estimates of total active military population by county are now based on the single-year estimates from the American Community Survey of population in the Armed Forces by state, and those estimates are divided to the county level using single-year and five-year estimates from the ACS. This replaces military personnel by installation data that is reported by the Department of Defense. Some military installations are very large and are near to or cross county boundaries, and this makes it difficult to determine the place of residence of military personnel. The ACS estimates are based on survey data and they are reported by place of residence.

Interface Redesign for Simulation Inputs

The interface for selecting simulation inputs has undergone major changes to help users more efficiently navigate through the numerous input options. The previous interface design featured the policy variable inputs list as a focal point. It contained the simulation options and various model assumptions and policy variables could be added by selecting from a menu of options on the ribbon. The new design separates the inputs selection, the inputs list, and the simulation options.

A tile-based interface organizes the tools for changing model assumptions and for opening scenarios to create policy variables. This interface design makes the various simulation input options more visible to the user. The policy variables are organized by several different manners to accommodate the different ways that users may think about simulating scenarios. Right-clicking on a tile will mark it as a 'Favorite', and it will show up under the 'Favorites' tile. The favorite tiles can be rearranged by the user.

The Inputs List shows all of the selected inputs. The grid has been redesigned to improve the performance when handling very large lists of policy variables. The buttons for importing and exporting policy variables have been moved from the ribbon to a more prominent spot on the Inputs list. The variables on the list can be inspected by clicking on the magnifying glass next to their name. This will show a more detailed description of the policy variable including all

selected details and options that were used to create the policy variable as well as converting the user selected policy variable to model variables. The user can see how grouped policy variables are disaggregated and how custom variables are translated. The 'Convert Variable' option on the right-click menu will replace the selected variable with the converted variables on the inputs list. Clicking on the 'Detail' section of the grid will also provide a detailed description of the policy variable's options.

A new Forecast Options form contains the forecast settings, closure options (if applicable), and 'Run Forecast' button which were previously on the Inputs List, along with Iteration Settings which were on the 'Alternative Model Settings' dialog for control forecasts. It also contains a summary of the forecast and some frequently asked questions related to the Forecast Options.

New Policy Variable Selector

The policy variables have been redesigned so there are fewer variables with more options, making them easier to find in a long list. The new user interface will make it easier to specify variable changes, help guide users to understand variable options, and provide more space to add additional tools.

A search option has been added that can be used to filter the list of policy variables contained within a scenario. It can filter the list by searching for matches in the variable names or in their detail names.

Detailed variable information is displayed for each policy variable category to help users select an appropriate variable. This may include definitions, usage instructions, warnings, examples, detail options, and diagrams showing how the variables will affect the model.

The 'Scenario Info' button provides additional information that may help a user select appropriate policy variables to model a particular scenario.

Contextual help has been added for variable options.

There is a hierarchical view of industry, commodity, occupation, and age cohort details available to allow for easier input of values at a more aggregate level.

Many policy variables have a 'Group' option that will allow users to create a single policy variable that will automatically be spread to multiple details.

A 'Redefine' option has been added to the inputs grid to allow the user to edit the variable details more quickly.

New Policy Variables

Custom Investment Expenditure

Custom Consumer Expenditure
Custom Government Expenditure
Custom Tourism Expenditure
Custom Industry option added for Government and Farm
Custom Imports
Custom Exports
Consumption Demand
Government Demand
Investment Demand
Gas Tax
Sales Tax
Property Tax
Consumer Price with option for changing the price elasticity

Modified Policy Variables

There are several variables that are now available as shares that were previously only available as amounts, and vice versa.

There were many policy variables that covered the same concepts but had slightly different options or usages. These have been replaced by single variables with more options. For example, there is now no need for 'All Industry', 'All Commodity', 'All Age', or 'All Race' types of options. The user is able to select all details or multiple details and group them together to create a single variable. The user entered policy variable automatically spreads into multiple policy variables and the user is able to see how that variable was spread.

Gross Earnings Inflow and Gross Earnings Outflow policy variables are merged into Gross Earnings.

Dividends, Interest, and Rent policy variables are merged into Property Income.

State Government Spending and Local Government Spending policy variables are merged into State and Local Government Spending, available with the 'Amenity' option.

The Personal Taxes policy variable now directly affects a region's commuter share (similar to a price change).

The Fuel Cost policy variables now convert from an amount to a percent change unit based on the region's industry fuel weights.

New Policy Variable Search Field

There is a new Search field located at the top of the policy variable list. Start typing a key word, such as "emp", and the list will be filtered to include only the policy variables that contain "emp"

in their name. This new feature works best with the full policy variable list (select the tile labeled "Full List" from the Variables group).

New Industry Search Field

The new Search All Industries feature, located under the Industries topic, eases searching through all 160 REMI industries. Start typing part of an industry name or NAICS code and every matching industry within your model's available sectors will be returned as a link to an industry-specific policy variable selector. Industry matches are each displayed in a separate, intuitive hierarchy along with their aggregated sectors. This way, even industries not available in your model can provide useful information about which less-specific, available industry is the best fit to use instead.

New Policy Variable Import Utility

Importing from a workbook directly (including from a previous v1.7 model) or importing from a file is now more intelligent. The importer recognizes if the imported policy variables are compatible with the model and variables are imported more accurately, including region recognition.

Users can preview the policy variables before importing them so they can decide which variables to include in the import and so they can view and address error messages.

Certain modifications can be made to the policy variables before they are imported, including changing regions, clearing values, or shifting values from one year to another.

Policy variables can be imported directly from compatible workbook files, and users can browse though workbook simulations to find policy variables.

A new .xml file format has been introduced for importing and exporting policy variable which can better handle the complexity of different policy variables and include more information and reduce importing errors.

User Preferences

From the Preferences menu on the File tab there are new options for customizing the model. There are several pre-defined color themes including single hue and multi-hue options for changing the map display and there is a new dialog for defining custom result regions.

The Options dialog has been moved from 'Tools' to 'Preferences' on the File tab.

The application window size settings are now saved when the application is closed.

New Macroeconomic Values Options

When using the Macroeconomic Values feature to create alternative national control forecasts, users now have the option of simultaneously using Employment Update, so that both final demand and industry employment values may be specified.

If industry employment is not specified, a new "Labor Productivity Growth Rate" option is now available for use in adjusting the total employment in the forecast.

Improved File Association for REMI Workbooks

With the release of v2.0 our product will also install along with it an application that will look through installed REMI products on the computer and open the associated model when a REMI Workbook file (.rwb) is double-clicked or **Open** is chosen from the right-click menu. This will help eliminate problems opening REMI Workbooks created by older versions of the model. The user will no longer have to find the model that will correctly open a workbook.

New "Export All" Option for Occupation by Industry Results

When viewing the Employment by Occupation and Industry results, users now have the option of exporting the complete table all at once. To do so, first right click the mouse somewhere on the grid, then left click and select "Export All" from the menu. The complete data set (all occupations, industries, years, and regions) will be saved to an Excel® workbook file.

New Forecast Log

The forecast log can be accessed from the results display. The log contains information about when the run started, how long it took to complete, which years were run, and what errors may have occurred during the run.

Status Bar

The status bar at the bottom of the application now displays the number of active policy variables and the save state of the forecast.

Custom Variable Editor

A new custom variable editor replaces the old custom industry editor. It can be used to create new custom variables for Industry Output/Sales, Government Spending, Investment Spending, Consumer Spending, Imports, Exports, and Tourism Spending.

Custom variables can be created, edited, and deleted from within the custom variable scenario.

Input-Output column reference data can be viewed and used to auto-fill the custom I-O column.

The Custom Industry Output/Sales variable editor has reference information for national and regional compensation rates and labor productivity.

The base variable's I-O column and the custom variable's I-O column are displayed in a graph for comparison.

Custom Industry Output/Sales variable are no longer region-specific.

Scenario Creator

A ribbon has been added to the Scenario Creator for modifying scenarios. A rich text editor can now be used to enter scenario descriptions.

Help Button

The 'Welcome' popup window has been replaced by the application help button. It provides a walk-through of the model interface.

FAQS

A new FAQS (Frequently Asked Questions) display is available as part of Model Details.

Documentation

All applicable model documentation are now available as part of Model Details.