



User's Guide

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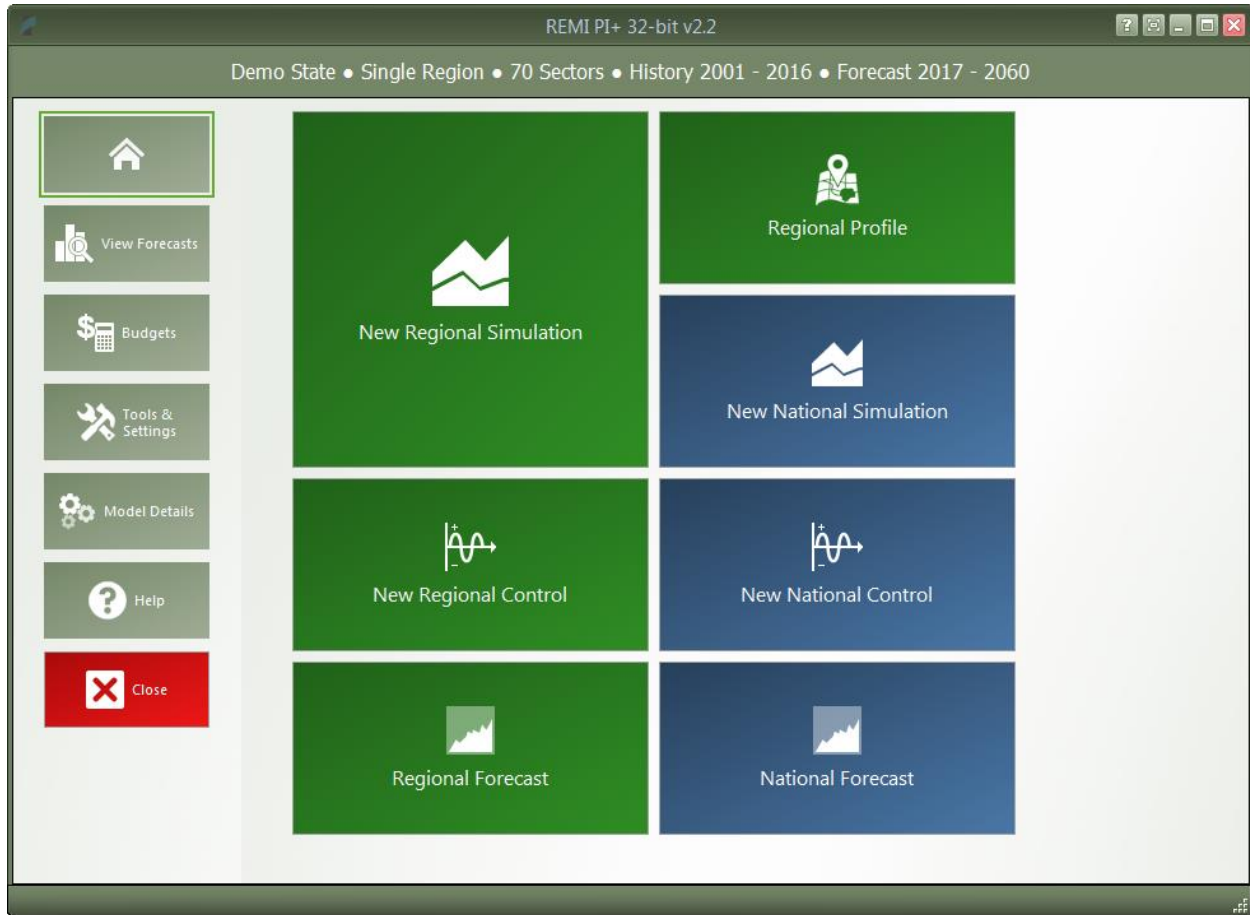
I. Introduction

This user's guide is intended to serve as a broad overview of the software interface of Tax-PI version 2.2. Contained within this document are descriptions and screenshots that map out the overall layout of the application and also highlight some of the specific functionality available in different areas of the product. Given the large number of changes to many parts of Tax-PI in recent version upgrades, including a major restructuring of the forecast file system and a complete redesign of the results, we at REMI hope that this guide will be useful during the process of learning the updated software.

II. Overview of the Tax-PI Home Window

The main Tax-PI application window is the initial jumping off point for all analyses performed with the REMI model. This home window is the central location for creating and managing forecasts and budgets, changing general settings, making customizations, examining detailed information specific to your model regions, and finding in-software support material. There are six major sections to the home window, each accessible via tiles located on the left-hand side of the screen.

Figure 1: Tax-PI Home Window



Home Screen

The first section of the home window, which will be the first thing seen once Tax-PI has finished launching, is the home screen. The home screen's purpose is to provide quick and simple access points for starting your use of the REMI model to simulate policy change. By clicking on the appropriate tile, you are able to start creating any one of the four types of forecasts available in Tax-PI: regional simulations, national simulations, regional controls, and national controls. In some cases, you may be prompted to choose a baseline for your new forecast from the Forecast List. Your new forecast will open in a separate window, called the Forecast Window.

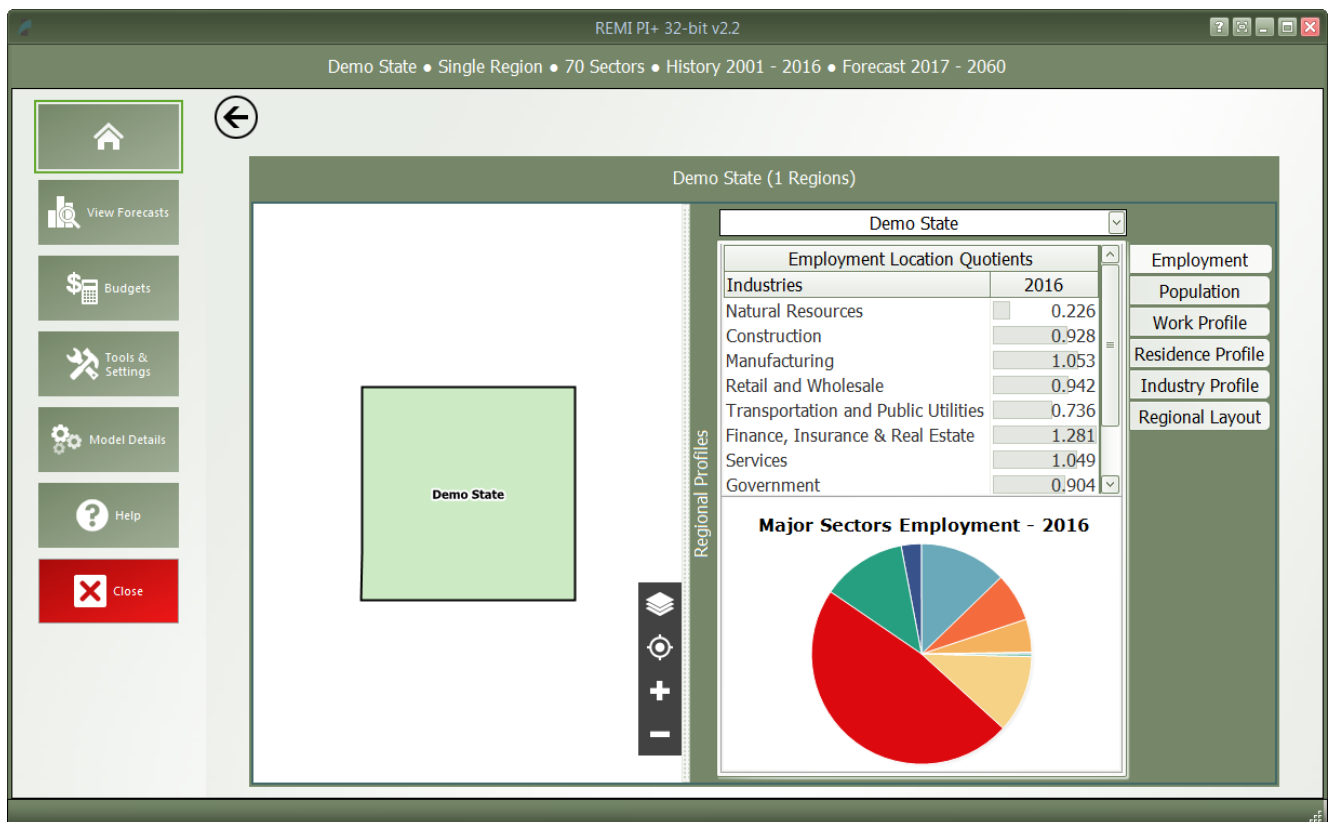
If you are interested in exploring REMI's default control forecasts that form the basis of your model, you can dig directly into the data by clicking on the “Regional Forecast” or “National Forecast” tiles. The selected forecast will be opened in a special Forecast Window that shows only the Results section. Some specific tables, maps, and data visualizations have been specially chosen to display REMI's baseline forecasts and provide informative profiles of the national and regional economies.

Another way of examining baseline data and visualizing differences between your model regions is to visit the Regional Profile tool, also accessed from the home screen by clicking on the “Regional Profile” tile.

Regional Profile

The Regional Profile tool features a combination of a regional map with several tabs of tables and charts describing last-history-year data for major economic and demographic concepts for each region. This tool is useful for learning about the specific economic and demographic characteristics of your model regions. Many of the tables contain location quotients, which make it easy to identify unique regional attributes in comparison to national averages. Additionally, our newly updated map is capable of displaying an internet-based OpenStreetMaps layer using the Map Layers button, which could prove useful for investigating regional geography.

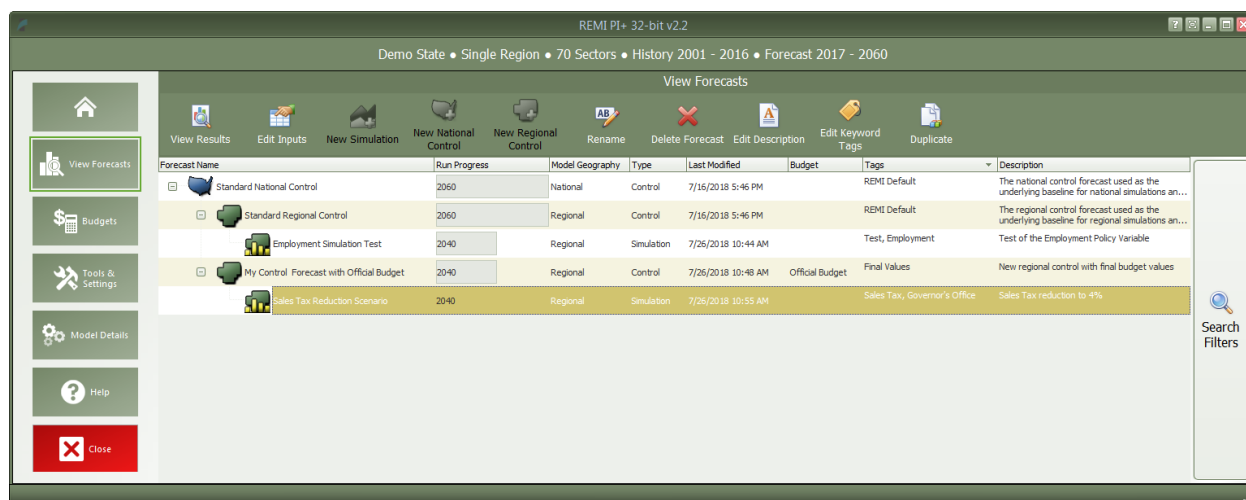
Figure 2: Regional Profile



Forecast List

The Forecast List, accessed by clicking on the “View Forecasts” tile, is the central location for everything to do with forecast management. Unlike in previous versions of Tax-PI, version 2.2 no longer operates in a workbook-based manner. Instead of opening singular workbooks that each may have contained multiple forecasts, we have moved to an approach of always providing visible access to every forecast at the same time on the Forecast List. Forecasts are not opened automatically, so large lists of forecasts will not inherently cause any increased operating overhead for Tax-PI. We hope that this new file management system will result in less file management work for users and fewer instances of forecasts being lost if errors occur.

Figure 3: Forecast List



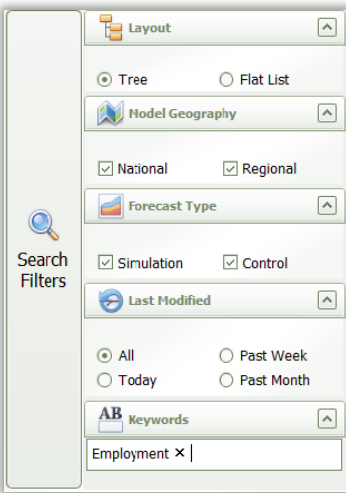
The Forecast List organizes forecasts in a tree structure. Each forecast appears underneath its parent baseline control, with the Standard National and Standard Regional Controls at the top. Selecting a forecast in the list will activate buttons above the list depending on the forecast selected and what options are available to it. For control forecasts, buttons for creating new control or simulation forecasts will become active depending on the type of control forecast selected. All forecasts in the list can be opened for viewing in their respective Forecast Window. Depending on whether a forecast being opened already has been run, the Forecast Window will open to either the Inputs List or the Results section.

Other actions that can be taken for forecasts on the Forecast List are renaming, deleting, adding or editing a description, adding or editing keyword tags, and duplicating. Tags and descriptions are new features that should be useful for organizing your forecasts now that they are all contained in the same place. For further ease of use when the forecast list becomes long, we have added search filters that can quickly hide all forecasts that you are not currently interested in seeing.

Search Filters

Clicking on the righthand “Search Filters” panel on the Forecast List pops open a set of useful options for filtering down the list of known forecasts. There are filters for viewing only national or regional forecasts, for hiding all simulations or all controls, for seeing only forecasts modified within a recent time period, and lastly, an auto-complete search filter for retrieving forecasts with information matching the search terms.

Figure 4: Search Filters

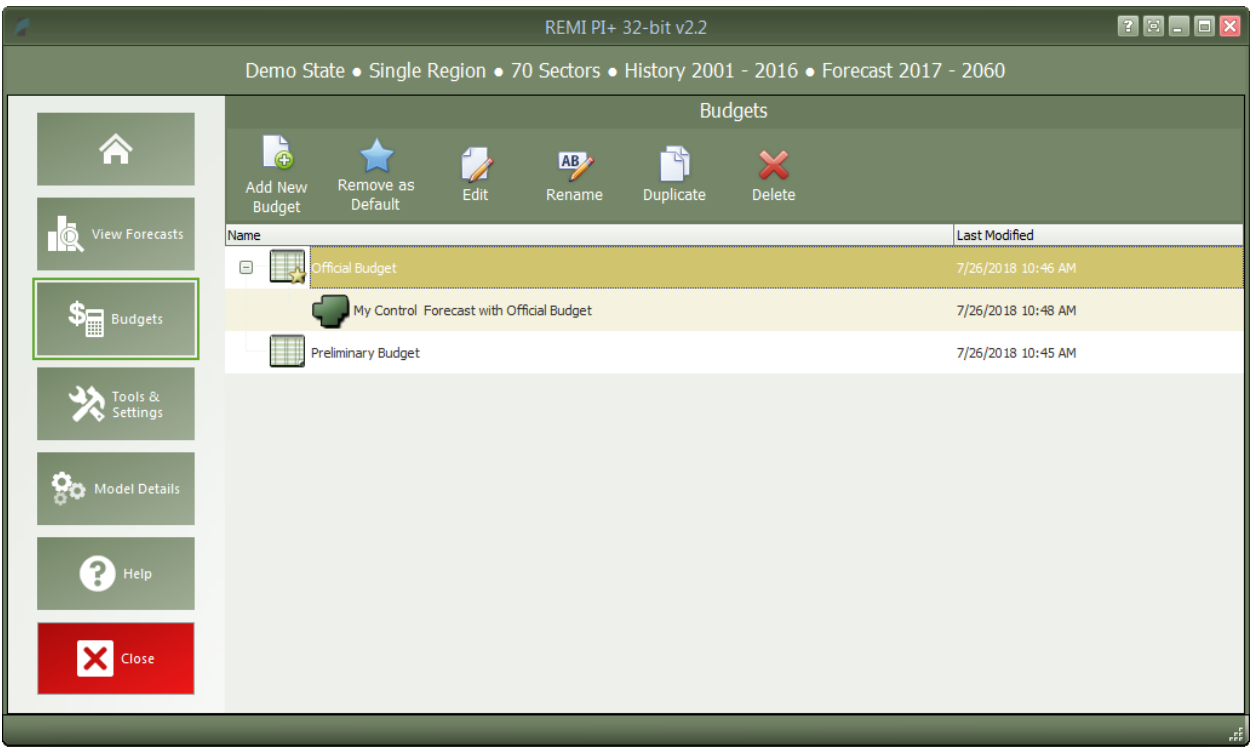


Budget List

The Budgets section provides a list of budgets and provides tools for managing them. Budgets can be created, renamed, duplicated, deleted, or opened for editing from this section. A new regional control must be created with a budget to create a baseline budget forecast, and then simulations built from that control will inherit its budget. If a budget is marked as the default budget then all new regional control forecasts will be automatically set to use that budget. The control forecasts that use a budget are listed below the budget on the list.

A budget can still be modified after it is used to create a control forecast. After saving a modified budget, you will get the option to update the budget in all forecasts that use it. The forecasts will get the newest version of the budget but they will still need to be rerun to update the budget forecast. If the forecasts are not automatically updated with a new budget at this time, each will be marked with a warning indicating that the budget is out-of-date. When the out-of-date forecasts are opened, you can choose to update to the newest version of the budget or you can save the older budget with a new name.

Figure 5: Budget List



Budget Calibration

Clicking on the Edit button or double-clicking on a budget name will open the budget for editing. The budget calibration screen is used to create revenue and expenditure categories and assign properties to those categories for forecasting. It also has options for defining the fiscal year, setting the monetary units, and adjusting balanced budget feedback settings.

Figure 6: Budget Calibration

Budget Calibration - FY2017 Budget

Options

Start of Fiscal Year: July
Units: Nominal \$ (M)

Expenditures Determined By: ☐ Revenues ☒ Demand

Revenues

Display Years: 2015 to 2017

Revenue Name	FY2015	FY2016	FY2017
Income Taxes	0	1546	0
Payroll Taxes	0	1115	0
Corporate Income Taxes	0	584	0
Excise Taxes	0	95	0
Tobacco Products Tax	0	12	0
Federal Grants	0	72	0
Fees	0	219	0

Revenue Details

Tobacco Products Tax

Economic Indicator: Personal Consumption Expenditures

☐ Time Series ☐ Include All

Details	Units	All Years
Motor vehicle fuels, lubricants, and fluids	Percent	0
Fuel oil and other fuels	Percent	0
Pharmaceutical and other medical products	Percent	0
Recreational items	Percent	0
Household supplies	Percent	0
Personal care products	Percent	0
Tobacco	Percent	100
Magazines, newspapers, and stationery	Percent	0
Net expenditures abroad by U.S. residents	Percent	0
Rental of tenant-occupied nonfarm housing	Percent	0
Imputed rental of owner-occupied nonfarm housing	Percent	0
Rental value of farm dwellings	Percent	0
Group housing	Percent	0
Water supply and sanitation	Percent	0
Electricity	Percent	0

Buttons: Add Revenue, Aggregate Revenues, OK, Cancel

Historical or projected budget values can be entered into the revenue and expenditure grids, and each category must be assigned an economic indicator and policy variable. Revenue categories can also be assigned a tax rate, but that is not necessary for budget forecasting.

The economic indicator is a model result that will be used to forecast the growth of the budget category. The entered budget value will be divided by the indicator to calculate an effective rate which will be used with the economic forecast to g. If the indicator has multiple details, then each detail can have a percentage assigned to it to indicate what portion of that detail to include in the indicator calculation. For example, a sales tax might exclude certain items so some details may be less than 100%, and the time series option could allow the tax to be phased in or out over time.

The policy variable assigned to a category links budget changes to economic changes in the model. The variable should represent how the budget category works, for example, a sales tax on consumer goods could be linked to the Consumer Price policy variable.

The Tax Rate associated with a revenue category is optional and only used as a reference when creating a new revenue policy variable. A new tax rate can be entered into the budget calculator which will use the original rate to convert the change into a dollar amount.

Balanced Budget Feedback Settings

After the initial budget forecast is generated, Tax-PI can automatically attempt to balance the budget so the total revenues and expenditures match. It may take several feedback iterations to balance the budget. The number of iterations can be adjusted from a regional control's 'Forecast Options' screen. There are two methods for balancing the budget.

The first method is activated by selecting 'Expenditures Determined by Demand' and clicking the 'Settings' button to set up rules to determine which revenues and expenditures to adjust in the case of a budget surplus or deficit. Tax-PI will add policy variables to perform feedback adjustments to balance the budget.

The balance budget feedback setting screen provides options for handling the gap between revenues and expenditures. The user can decide how much of the gap should be filled by adjustments to revenues and how much should be from adjustment to expenditures. Then, the adjustments can be spread among the revenue and expenditure categories. The spread button will proportionally distribute the changes based on the last entered budget values.

Figure 7: Balanced Budget Feedback Settings

Balanced Budget Feedback

Default Feedback Settings

Surplus Deficit

Decide how to balance the budget when there is a surplus

Spread

Name	Name	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Distribution of	Revenue Share	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Adjustments	Expenditure Share	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%
	Income Taxes	42.438%	42.438%	42.438%	42.438%	42.438%	42.438%	42.438%	42.438%
	Payroll Taxes	30.607%	30.607%	30.607%	30.607%	30.607%	30.607%	30.607%	30.607%
	Corporate Income Taxes	16.031%	16.031%	16.031%	16.031%	16.031%	16.031%	16.031%	16.031%
	Excise Taxes	2.608%	2.608%	2.608%	2.608%	2.608%	2.608%	2.608%	2.608%
Revenues	Tobacco Products Tax	0.329%	0.329%	0.329%	0.329%	0.329%	0.329%	0.329%	0.329%
	Federal Grants	1.976%	1.976%	1.976%	1.976%	1.976%	1.976%	1.976%	1.976%
	Fees	6.012%	6.012%	6.012%	6.012%	6.012%	6.012%	6.012%	6.012%
	Sum of Revenues	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%
	Health and Human Services	10.407%	10.407%	10.407%	10.407%	10.407%	10.407%	10.407%	10.407%
	Transportation	6.160%	6.160%	6.160%	6.160%	6.160%	6.160%	6.160%	6.160%
	Education	25.695%	25.695%	25.695%	25.695%	25.695%	25.695%	25.695%	25.695%
Expenditures	Public Safety	18.225%	18.225%	18.225%	18.225%	18.225%	18.225%	18.225%	18.225%
	Administration and Finance	32.932%	32.932%	32.932%	32.932%	32.932%	32.932%	32.932%	32.932%
	Judiciary	6.582%	6.582%	6.582%	6.582%	6.582%	6.582%	6.582%	6.582%
	Sum of Expenditures	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%

OK Cancel

Alternatively, by selecting the option 'Expenditures Determined by Revenues', each revenue category can be mapped to expenditure categories by clicking on the 'Settings' button. Then, policy variables will be added to the simulation to adjust the expenditure values until they hit the revenue-based targets.

On the budget mapping setting screen, a distribution can be set up from each revenue category to each expenditure category. The spread button will proportionally distribute expenditures based on the last year of entered budget values.

Figure 8: Revenue to Expenditure Mapping

Budget Mapping

Views

☒ Expenditures x Revenues
 ☐ Expenditures x Year
 ☐ Flat View

Year

2017

Spread

Revenue Mapping

Create a mapping from each of the revenue categories to each of the expenditure categories. This mapping will be used to balance the budget when the revenue mapping feedback option is on.

Create a mapping of revenues to expenditures

Expenditures	Revenues					
	Income Taxes	Payroll Taxes	Corporate Income Taxes	Excise Taxes	Tobacco Products Tax	Federal Grants
Health and Human Services	10.407%	10.407%	10.407%	10.407%	10.407%	10.407%
Transportation	6.160%	6.160%	6.160%	6.160%	6.160%	6.160%
Education	25.695%	25.695%	25.695%	25.695%	25.695%	25.695%
Public Safety	18.225%	18.225%	18.225%	18.225%	18.225%	18.225%
Administration and Finance	32.932%	32.932%	32.932%	32.932%	32.932%	32.932%
Judiciary	6.581%	6.581%	6.581%	6.581%	6.581%	6.581%
Sum	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%

OK

Cancel

Tools & Settings

The Tools & Settings section of the main window contains, as the name suggests, several tools and settings that will likely be useful at some point in your use of Tax-PI.

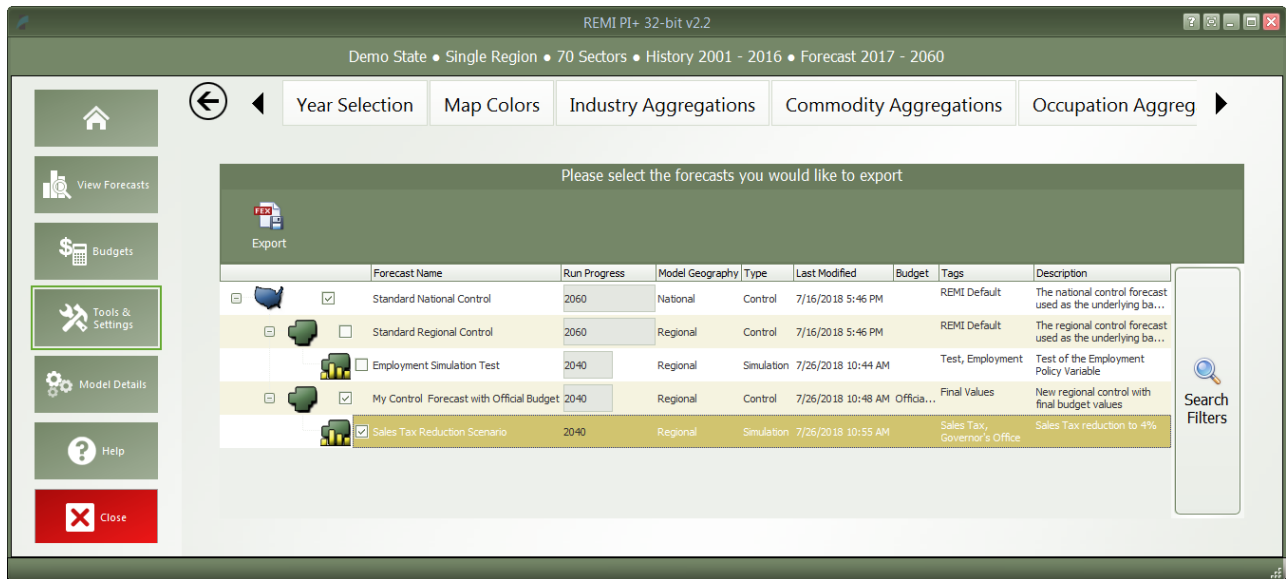
Figure 9: Tools & Settings



Exporting and Importing Forecasts

Perhaps most important among the various tools and settings available on the Tools & Settings screen are the forecast export and import features. Due to our new system of automatically managing forecast files, it is no longer possible to simply pass along a “.RWB” workbook file to other users or to REMI for support because a given installation of Tax-PI will not know about forecasts in files that it did not create itself. The solution to this is our new export and import features. The corresponding tiles are located under the “Tools” heading. The export feature will allow you to select any forecasts you want to share and package them up in a single file that can be imported by another user with the same Tax-PI model. Exported forecasts will be contained within a new “.FEX” file format. When selecting forecasts for export, be aware that any parent control forecasts are required to be exported as well and will be automatically checked off.

Figure 10: Forecast Export



File Cleanup

Another file management feature that has been added with version 2.2 is the forecast backup file. Each time a forecast is saved, a backup file is created as well so that there is something to fall back in case the file is corrupted or lost when it is next used. If you end up with too many backup files in the Workbooks subdirectory of your model folder or if you find that you would like to attempt to access a backup, you can use the File Cleanup feature. The File Cleanup dialog will determine how many forecast files exist that are unknown to Tax-PI as either backups, exports that have yet to be imported, or any other forecast files and allow you to deal with them by either deleting or importing them.

Options

The options menu consists of several non-crucial settings. You can change the Tax-PI color scheme, select an alternative tile navigation design, decide whether exported files should automatically open, allow for Tax-PI to use the Internet to retrieve OpenStreetMaps data, supply a sound file for use as an indicator alert that Tax-PI has finished running a forecast, and select from several alternative industry labelling forms that include NAICS codes.

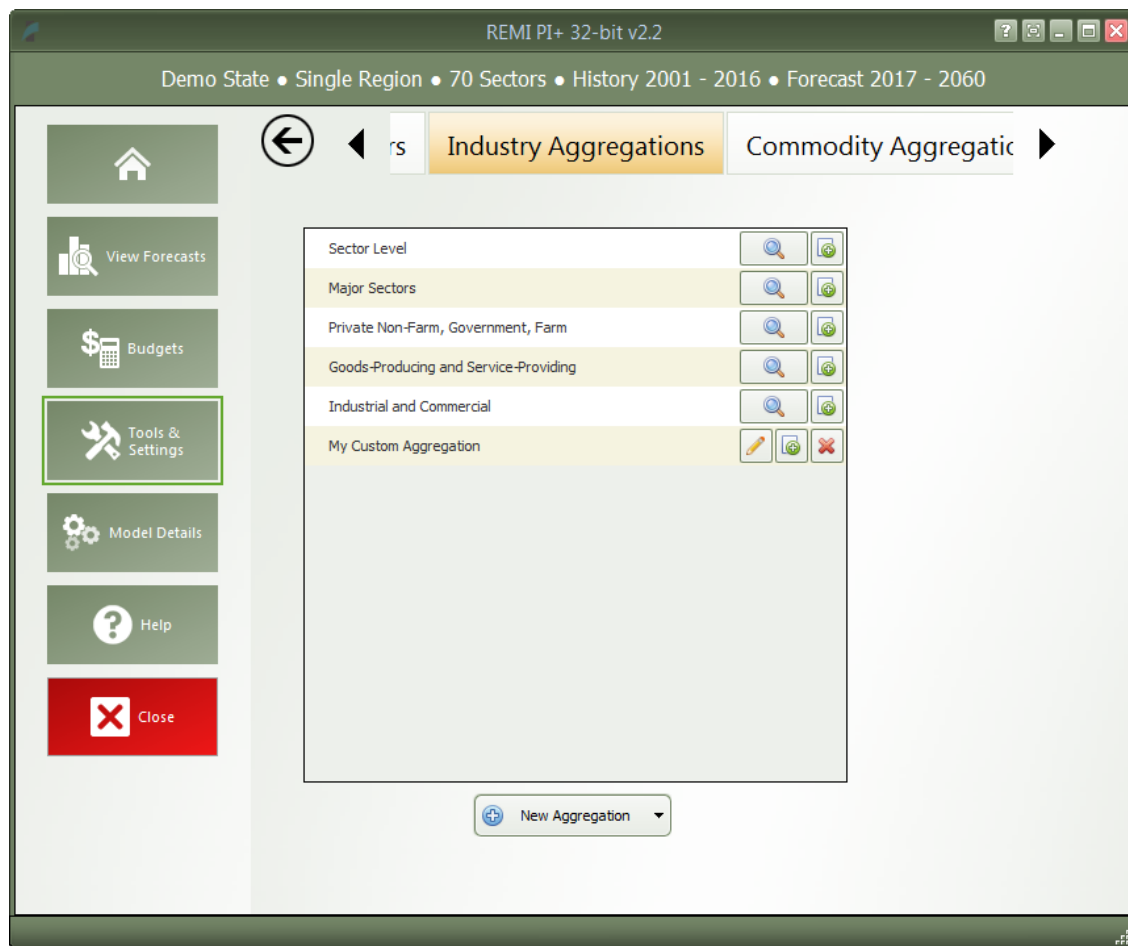
Year Selection

The Year Selection screen is used to build lists of years for use on the results. Saved year lists that you create can later be applied to result visualizations such that only the years included in the list are shown. This feature is useful if you are only interested in viewing certain years of results and would prefer to have a saved list rather than filtering the years shown by visualizations manually.

Aggregation Manager

Aggregations are groupings of details including industries, commodities, occupations, and ages. They are a new feature for version 2.2 and have been thoroughly integrated into the model with respect to both policy variable creation and the results. Aggregations save time when you are interested in only certain details or when you would like to define your own customized structuring of all the details. The Aggregation Manager allows you to create aggregations for each of the five supported detail types, export all of your aggregations to a file, and import aggregations from an exported file. Exporting and importing aggregations may be useful for collaborating with other users, sharing with REMI in a support scenario, or for transferring your aggregations when a new version of Tax-PI is released.

Figure 11: Industry Aggregation Manager



For most of the detail types, you will find some default aggregations built by REMI. You can view these default aggregations to see how they categorize details and also duplicate them if you would like to make a small change. For making a completely new aggregation, click the “New Aggregation” button at the bottom of the aggregation list. Depending on your model and the detail type, you may be prompted to choose what level of detail you would like to use in building the aggregation. For example, a 70-sector

model would be able to create industry aggregations using the default 70 sectors or, optionally, using 23 sectors instead.

Creating a custom aggregation will open the Aggregation Editor. To build an aggregation using the Aggregation Editor, simply create some groups using the “Add Group” button, give them meaningful names, and then drag details from the left-hand list box onto the groups. In long lists of details, it may be useful to use the search box to filter the list. Groups and details can be deleted by selecting them and clicking the “Delete Selection” button, and details can be moved between groups or back to the left-hand list box by dragging. There are additional detail-moving features located in the right-click menu.

Model Details

The fifth section of the Tax-PI Home Window is the Model Details screen. This area contains a variety of detailed data as well as other information like lists of all possible variables, your model region layout, and industry sectors cross-listed with NAICS codes.

Figure 12: Model Details



Model Parameters

The Model Parameters window displays the values of all parameter constants used in REMI's equations for your specific model. The window is arranged so that each model equation has its own tab containing all relevant parameters. Descriptions are provided to explain the significance of each parameter in its equation.

Figure 13: Model Parameters

The screenshot shows the 'Model Parameters' window with a sidebar on the left listing various model components. The 'Consumption' tab is selected. The main area displays parameters for the Consumption Equation, organized into three sections: β in the Consumption Equation, γ in the Consumption Equation, and Regional Effect in the Consumption Equation.

β in the Consumption Equation		
Marginal income elasticities for necessities and luxuries		
Commodity	Necessities	Luxuries
All Commodities	0.61000	1.33846

γ in the Consumption Equation		
Marginal price elasticities for necessities and luxuries		
Commodity	Necessities	Luxuries
All Commodities	-0.66000	-1.65000

Regional Effect in the Consumption Equation	
Adjustment for regional differences in consumption	
Commodity	Demo State
New motor vehicles	0.95374
Net purchases of used motor vehicles	0.84035
Motor vehicle parts and accessories	0.84035
Furniture and furnishings	0.96076
Household appliances	1.08571
Glassware, tableware, and household u...	0.81644
Tools and equipment for house and gar...	0.83963
Video, audio, photographic, and inform...	0.83963
Sporting equipment, supplies, guns, an...	0.83963
Sports and recreational vehicles	0.83963

Help

The final section of the home window is the Help center. Here you will find several useful sources of information that can help answer questions about the Tax-PI software or the underlying REMI model.

Figure 14: Help Center



Software Information

The “About” window displays information about your installation of Tax-PI. It contains version, model, and build ID numbers as well as information that could be useful for a REMI support situation such as information about applied patches and some statistics pertaining to your computer’s memory usage.

Frequently Asked Questions

The FAQ window contains answers to common questions about using Tax-PI. Questions and answers are grouped by topic and provide insight into important REMI model concepts, detail some best-practices for policy variable usage, explain the options available when running a forecast, and give tips for troubleshooting errors.

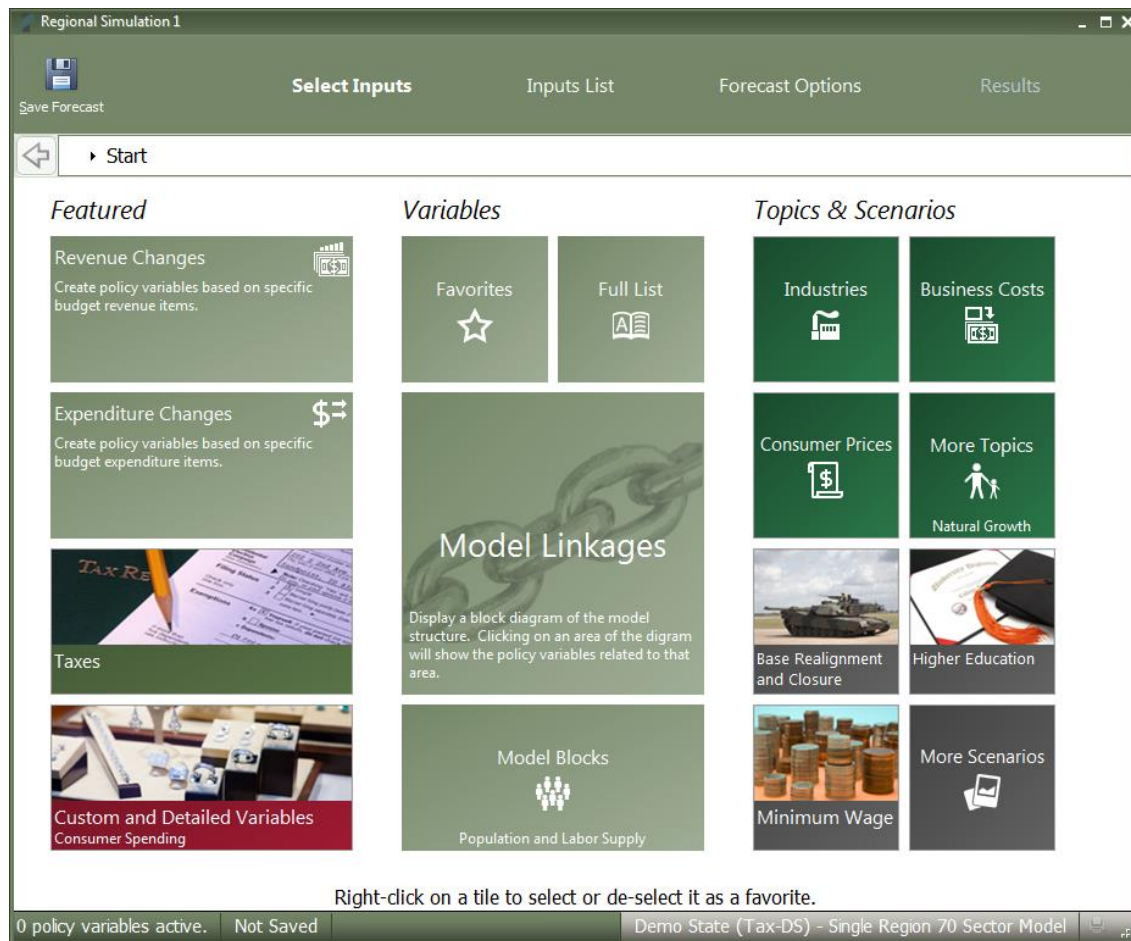
Documentation

The documentation viewer is a built-in PDF viewer that provides easy access to all documentation files that are shipped with your model. From the documentation viewer, you can print as well as easily open our Documentation folder if you’d like to copy or share our documentation files. Specific documentation pieces that are worth noting are the PI+ Changes file, which briefly outlines a history of major changes between PI+ versions, and the PI+ Overview file which provides an in-depth description of data, software, and methodology changes made for the current version. The rest of our documentation focuses on REMI’s model equations, data sources, estimation procedures, and industry and occupation layouts.

III. Overview of Forecast Windows

The process of creating a forecast takes place within a Forecast Window. The three main aspects of working with a forecast: specifying policy variables, running the forecast, and viewing the results, each take place on separate screens of the Forecast Window and are accessed using the navigation links along the window's header panel. At any time, your forecast and its contents such as policy variables and customized result visualizations can be saved using the "Save Forecast" button which is always located at the upper left of the screen on the header panel. Forecast windows are now separate entities from the main application window and thus multiple forecasts can now be open simultaneously, with each accessible via a button on the Windows taskbar.

Figure 15: Forecast Window

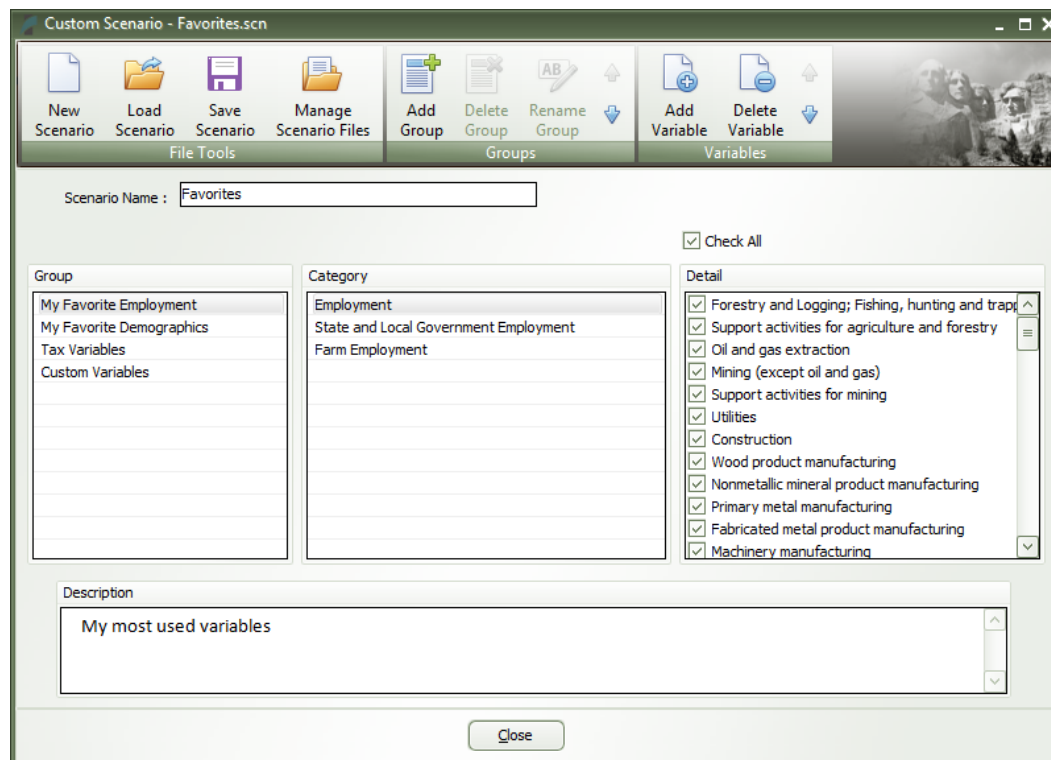


Select Inputs

The first screen that will be visible when creating a new forecast is Select Inputs (shown in Figure 15). This tile-based interface is the jumping off point for choosing what policy variables to add to the forecast. Each tile represents some number of policy variables which will be opened in the Policy Variable Selector, whether it is a single variable like in the case of the Employment tile or a group of related policy variables like with the Business Costs or various Scenario tiles. At the forefront of the input selection screen, the Featured section highlights variables and topics that are likely to be used most often. Alternatively, the Model Linkages and Model Blocks tiles offer ways of accessing policy variables by area of the REMI model structure where they fit in. If you'd prefer to see all variables that are available for your forecast, the Full List tile will open all variables in the Policy Variable Selector.

If there are certain policy variables that you are likely to frequently use together and they are not already grouped by one of REMI's scenarios, you might consider using the Custom Scenario editor to build your own. This editor, found under the "More Scenarios" tile by clicking "Custom Scenarios", allows for creating multiple groups of policy variables where each variable can also have its list of details filtered down to remove ones that won't be useful. The custom scenario can be given a name, description, and saved using the controls on the editor. Saved custom scenarios are given their own tiles in the "Custom Scenarios" section of the Select Inputs screen.

Figure 16: Custom Scenario Editor



In order to make your most-used policy variables and custom scenarios even more accessible, you can make use of the Favorites section. Right-clicking any tile will save it to your Favorites (indicated with a star), where they can then be dragged into any customized order.

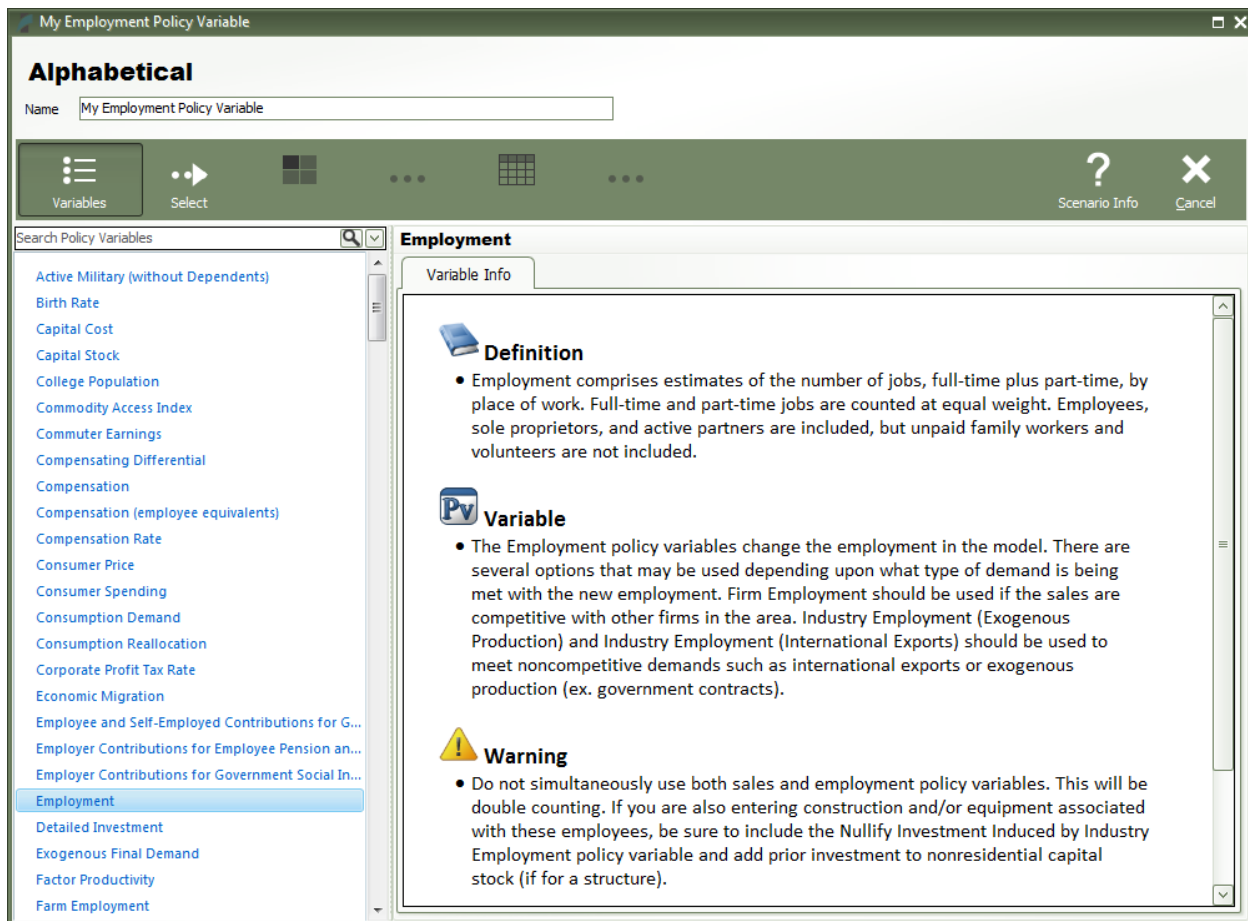
Policy Variable Selector

Clicking on a tile that represents some number of policy variables will open up the Policy Variable Selector window. This window is split into three tabs (“Variables”, “Details”, and “Edit Values”) that each represent a step in the process of defining exactly how your policy variables will enter into the model. At any time, you can name your policy variables using the editor at the top of the window. You can also click the “Scenario Info” button to see a description of the scenario you have open.

The first tab on the Policy Variable Selector contains the variable list. This screen is where an individual policy variable is selected for editing. The contents of the variable list are determined by what group of variables was previously chosen. Only one variable can be selected for editing at a time, but once you finish creating a variable, you can always go back to the variable list tab to start working with another. In cases where you accessed the Policy Variable Selector using a tile that represents just a single variable, this section will be skipped since there is no selection to be made. If the number of available variables is large, it may be helpful to use the search field for filtering the list down by variable name or description.

Clicking a variable in the list will display information about it and its options. In some cases, a diagram may be available that depicts how the selected policy variable interacts with other variables and how it fits into the REMI model. Once you have decided what variable to choose, clicking the “Select” arrow button on the window’s header panel will move the variable to the Details tab to begin editing.

Figure 17: Policy Variable Selector – Variable List Tab



The Details tab is where you specify what the exact form of the policy variable should be. Different variables have different sets of details that must be filled out before the variable can be added to your forecast. Each type of detail information that must be specified will be represented by a tile on the left-hand side of the screen. Clicking one of these tiles will allow you to fill out some information describing your policy variable and can be done in any order. Most policy variables will require you to at least specify the regions it should affect and the unit type of the values. In the specific case of the Employment policy variable, shown below in **Error! Reference source not found.**, option and industry details are also required. Options only exist on some policy variables, they allow for choosing exactly how the variable should interact with other parts of the model. Selecting industry details for the Employment variable depicted below controls what industries will be impacted by the policy variable's changes to employment levels.

Figure 18: Policy Variable Selector – Details Tab (In Progress)

My Employment Policy Variable

Alphabetical

Name:

Variables | Details

Employment

Options
Industry (Exogenous Production)

Industry
Grouped All

Region (1)
Demo State

Units

Industry

- Forestry and Logging; Fishing, hunting and trapping
- Support activities for agriculture and forestry
- Oil and gas extraction
- Mining (except oil and gas)
- Support activities for mining
- Utilities
- Construction
- Wood product manufacturing
- Nonmetallic mineral product manufacturing
- Primary metal manufacturing
- Fabricated metal product manufacturing
- Machinery manufacturing
- Computer and electronic product manufacturing
- Electrical equipment, appliance, and component manufacturing
- Motor vehicles, bodies and trailers, and parts manufacturing
- Other transportation equipment manufacturing
- Furniture and related product manufacturing
- Miscellaneous manufacturing
- Food manufacturing
- Beverage and tobacco product manufacturing
- Textile mills; Textile product mills
- Apparel manufacturing; Leather and allied product manufacturing
- Paper manufacturing
- Printing and related support activities
- Petroleum and coal products manufacturing
- Chemical manufacturing
- Plastics and rubber products manufacturing

☒ Group Industries

Favorites
Industry Aggregation
List
Hierarchy

There are several ways to select specific details from the various types of detail lists, which include regions, industries, commodities, occupations, and ages. The first way is to select them from the simple flat list view. Hold down the Ctrl key to select multiple details one at a time or Shift to select a range of details all at once. If you would like to apply the same policy change to multiple details, it is helpful to check the “Group Industries” or equivalent checkbox below the detail list. This will put all of the details into a single variable rather than creating separate variables for each selected detail.

Another way of selecting details is to use the hierarchical view. Simply click the “Hierarchy” button to the right of the detail list to see a hierarchical tree structure with checkboxes as the selection mechanism. This view is useful for selecting multiple related details all at once. For example, you could check the “Manufacturing” tree item to capture all manufacturing sub-industries. The final way to select details is to click the “Aggregation” button and select a custom or pre-defined aggregation, discussed in the “Aggregation Manager” section. Selecting an aggregation will repopulate the flat and hierarchical detail lists with the aggregated detail groups contained within the chosen aggregation. Similar to the detail grouping checkboxes, creating a variable with an aggregated detail will cause the inputted year values to be spread among the individual regions, industries, commodities, occupations, or ages as it enters the model.

Figure 19: Policy Variable Selector – Details Tab (Completed)

My Employment Policy Variable

Alphabetical

Name:

Variables Details Add to Editor Scenario Info Cancel

Employment

Options
Industry (Exogenous Production)

Industry
Grouped All

Region (1)
Demo State

Units
Percent

Select a Unit Type

☒ Share of Employment

☐ Units

☐ Thousands

Scale

☐ Proportion

☒ Percent

Once the unit type and the rest of the options on the policy variable have been specified, you will be able to click the “Add to Editor” button to move the variable into the value editing spreadsheet. The number of created policy variables will be displayed as a badge on the “Edit Values” button that becomes enabled once at least one variable has been added. One policy variable will be created and added to the spreadsheet for each combination of details specified on the Details tab. If you chose to check any of the grouping check boxes or chose to use aggregations, then all of those grouped details will be combined into one variable, which is depicted below for the industry dimension.

Figure 20: Policy Variable Selector – Value Editor

My Employment Policy Variable

Alphabetical

Name:

Variables Details Edit Values Add to Inputs Calculator Spreader Scenario Info Cancel

Category	Detail	Units	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Employment	Industry (Exogenous Production): Detail...	Percent	5	5	5	5	5	5	5	5	5	5	5	5

Options
Industry (Exogenous Production)

Details
Forestry and Logging; Fishing, hunting and trapping
Support activities for agriculture and forestry
Oil and gas extraction
Mining (except oil and gas)
Support activities for mining
Utilities
Construction
Wood product manufacturing
Nonmetallic mineral product manufacturing
Primary metal manufacturing
Fabricated metal product manufacturing
Machinery manufacturing
Computer and electronic product manufacturing
Electrical equipment, appliance, and component manufacturing
Motor vehicles, bodies and trailers, and parts manufacturing
Other transportation equipment manufacturing
Furniture and related product manufacturing
Miscellaneous manufacturing

The editor will allow you to input values for each policy variable in each year. You can change the region and units by clicking on those cells in the spreadsheet, which contain combo-box editors. The Calculator and Spreader tools located on the top right of the navigation panel are useful for inputting more complicated series of values. If you need to change more options on your variable, you can click the “Redefine Details” button marked with a left-facing arrow. Variables can be deleted using the adjacent button that is marked with an “X”. Once finished, add your variables to the forecast’s Inputs List screen by clicking the final arrow button, “Add to Inputs”. Submitted variables will appear on the Inputs List together in a group with the name specified on the Policy Variable Selector.

Budget Variables

Simulations build off a regional control that contains a budget can use policy variables for each of the revenue and expenditure categories in that budget. If the fiscal year and calendar year do not match, then the policy variable selector will look different. Each year will contain two columns, one for each part of the fiscal year contained in the calendar year. This provides a way to specify the fiscal year for the revenue or expenditure change and also a calendar year for the associated economic policy variable.

Figure 21: Policy Variable Selector – Value Editor for Budget Variables

If a tax rate has been specified for a revenue category, the budget calculator can be used to convert tax rate change into an equivalent dollar amount.

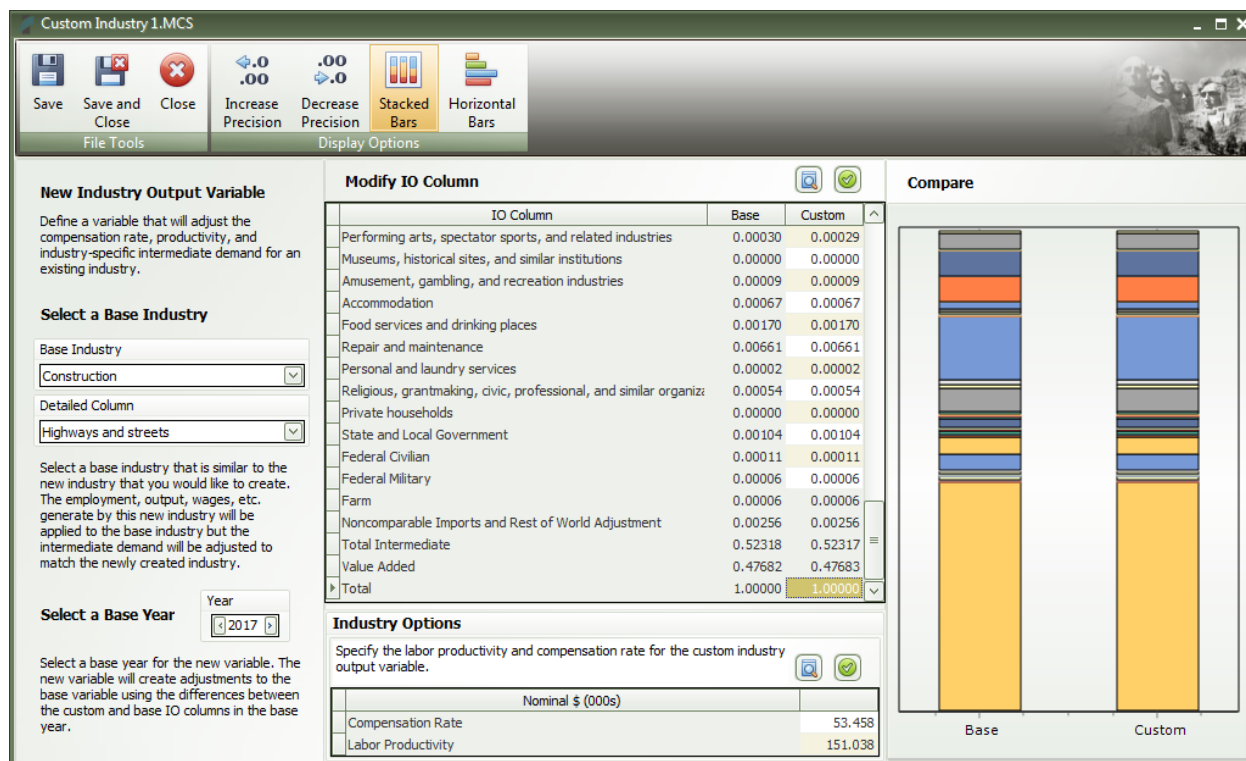
Figure 22: Budget Calculator

Custom Variables

There are a handful of special policy variables, available only to regional simulations, that are known as custom variables. These variables are much more customizable than regular policy variables because they allow for modifications to be made to the input-output (IO) table data that dictates how the variable will affect different parts of the economy within the model. There are custom variables for Industry Output/Sales, Government Spending, Investment Spending, Consumer Spending, Imports, Exports, and Tourism Spending. These variables can be found under the “Custom and Detailed Variables” tile in the Featured section of the Select Inputs screen and also can be added to a custom scenario. Custom variables can be created, edited, and deleted from the Policy Variable Selector’s Details tab once a particular type of custom variable has been selected. Creating a new custom variable opens the Custom Variable Editor,

which looks slightly different and has various options depending on which type of custom variable is being created.

Figure 23: Custom Variable Editor – Industry Output/Sales



On the left-hand panel of the Custom Variable Editor are variable-specific options and instructions. These options typically involve specifying information about what base data you would like to associate with the custom variable such as the base year, base industry, commodity or government spending category, and so on. The base IO column data resulting from your choices is what you are able to subsequently modify using the central IO Column editor in order to finish specifying the custom variable. Additional customizations are available for certain types of custom variables, such as the options for adjusting compensation rate and labor productivity of custom industries, as shown in

. To aid in constructing your custom IO column, the chart on the right-hand side of the screen, which can be toggled between stacked-bar and horizontal-bar views, helps visualize the differences between the base and custom IO columns. Additionally, using the button marked with a magnifying glass in the IO column editing area, IO column reference data for each forecast year can be viewed as a table or chart and can be auto-filled into the custom column editor. The Custom Industry Output/Sales variable editor also has reference information for national and regional compensation rates and labor productivity. The right-click menu of the custom column editor has an “Apply Remainder” option (except when editing Industry Output/Sales, for which Value Added captures the remainder), which can prove useful as the IO column

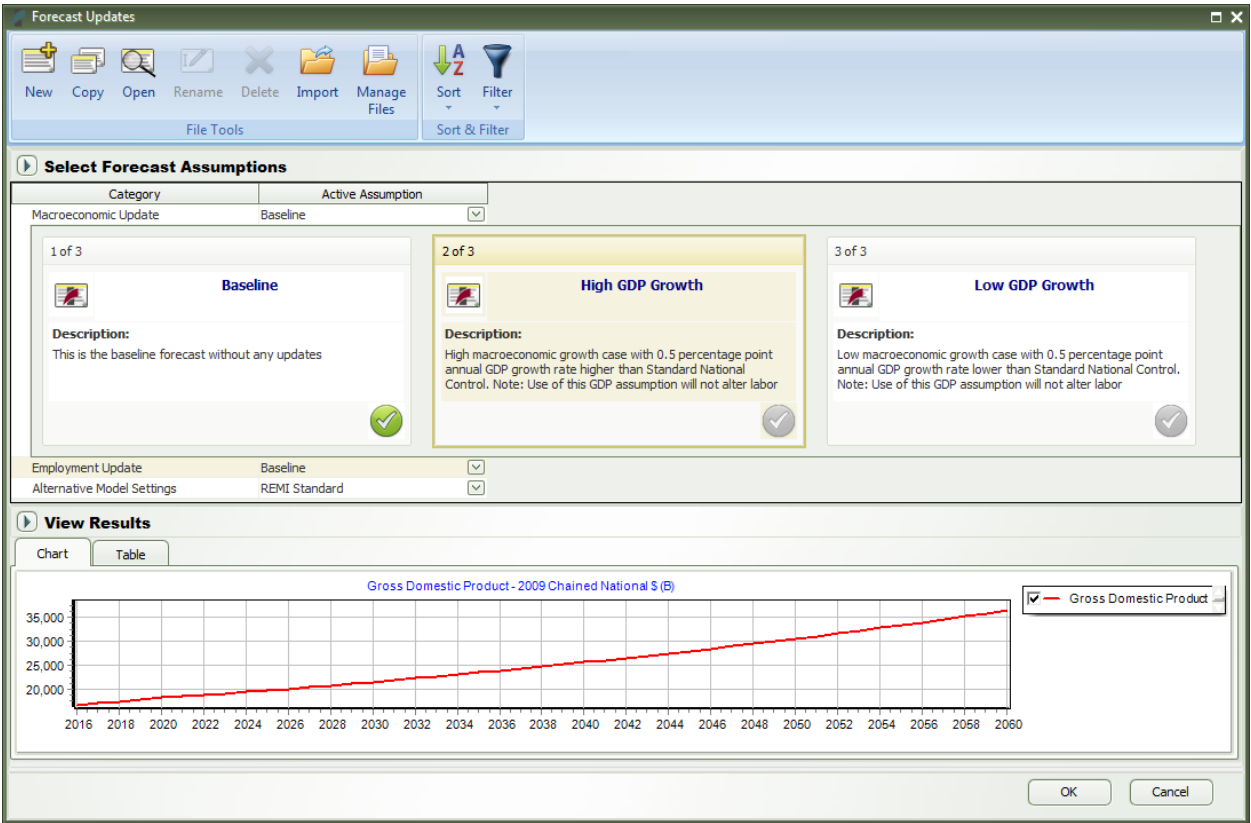
needs to total to one. If there are issues with any of your custom values, the button usually displaying a green checkmark in the corresponding section of the editor will change and instead warn you of the problems with what you have entered.

Once you have finished your custom variable, simply save it and subsequently use it as you would a normal policy variable. Saved custom variables appear in the Details tab of the Policy Variable Selector once you have selected that same category of custom variable. Be aware that custom variable files should not be transferred between versions of Tax-PI because each new release includes an updated IO table. This means that the values you attached to the custom variable will vary from the base data not only in the way that you intended them to, but also due to our updates affecting the base IO table.

Model Assumptions

In addition to directly entering policy variables, a forecast can also be changed from its baseline by another type of input: customized model assumptions. Model assumptions can only be added to control forecasts. There are five categories of model assumptions, some of which are applicable only to regional controls and some only to national controls. All five categories of model assumptions are handled by the Forecast Updates window shown in Figure 24. This window shows all of the available assumption types that can be modified for the current forecast. Each assumption type has at least one default assumption, called either the Baseline or REMI Standard assumption. Some types of assumptions have other pre-defined choices available. Figure 24 shows two such alternative Macroeconomic Update assumptions, representing higher and lower GDP growth scenarios compared to the baseline forecast. The tools menu along the top of the window has buttons for opening each assumption to view its data, copying an assumption for customization, and creating a brand-new assumption to start from scratch. You can also rename and delete assumptions and import assumption files from past versions. To select a non-baseline assumption, whether it is a REMI alternative or custom-made, just click the checkmark button on the assumption’s card. Some types of assumptions will feature a visualization consisting of a chart and table that depict how the selected assumption affects the relevant concept.

Figure 24: Forecast Updates Manager



Employment Update

Employment updates are accessible for national and regional control forecasts and allow for calibration of a forecast to alternative by-industry employment data. You can enter employment values at different industry levels and in different units using the options at the top left of the form. You can also change how you enter values for the region dimension using the region combo-box. Regardless of the options specified, data must be entered for every industry. To check the default employment values for any of these combinations of industry, region, and unit views, open the “Reference” tab. You can also enter a description of your customized employment update in the text field at the bottom of the window.

Figure 25: Employment Update

Employment Update - New Assumption 1

Options

Level: 70 Sectors

Units: Thousands of Employees

Update Employment Values

Enter new employment values for individual industries or for aggregated industries. If aggregated values are entered, they will be spread to individual industries using the baseline employment values for that year. The "Reference" tab can be used to view baseline values, compare the updated values with the baseline values, or view the annual growth rates resulting from the updated values.

Update **Reference**

Employment Sector	Units	2016 REMI	2016	2017	2018	2019	2020	2021
Forestry and Logging; Fishing, hunting and tr	Thousands of Employees	2.475						
Support activities for agriculture and forestry	Thousands of Employees	1.735						
Oil and gas extraction	Thousands of Employees	2.531						
Mining (except oil and gas)	Thousands of Employees	1.845						
Support activities for mining	Thousands of Employees	0.133						
Utilities	Thousands of Employees	9.195						
Construction	Thousands of Employees	155.052						
Wood product manufacturing	Thousands of Employees	2.400						
Nonmetallic mineral product manufacturing	Thousands of Employees	3.656						
Primary metal manufacturing	Thousands of Employees	5.553						
Fabricated metal product manufacturing	Thousands of Employees	43.945						
Machinery manufacturing	Thousands of Employees	18.205						
Computer and electronic product manufacturi	Thousands of Employees	15.901						
Electrical equipment, appliance, and compone	Thousands of Employees	9.929						
Motor vehicles, bodies and trailers, and parts	Thousands of Employees	3.913						
Other transportation equipment manufacturin	Thousands of Employees	43.210						
Furniture and related product manufacturing	Thousands of Employees	4.858						
Miscellaneous manufacturing	Thousands of Employees	17.459						

Description

Add description for this assumption.

Save As Cancel

Population Update

Population updates are available only for regional controls. This type of assumption can be used to adjust regional population levels. Similar to employment updates, options for controlling the level of the details can be found at the top left of the window. Using these options, alternate population values can be entered by race and by gender, or for all races and both genders together. Different age groupings, unit types, and region groupings are also available. Again, reference values can be found on the “Reference” tab and a description can be added for the update.

Figure 26: Population Update

Population Update - New Assumption 1

Options

- ☒ Race
- ☒ Gender
- ☐ Direct Employment Response
- Ages: 101 Age Groups
- Units: Thousands of People
- 0%

Population Update

Population Update is a tool for adjusting the population in the control forecast. The model will try to match the values entered here by adjusting the amenity variable to change the economic migration to reach the desired population level. Then the population will be reallocated using the international migration and retired migration policy variables.

Update **Reference**

Race	Gender	Age	Units	2017	2018	2019	2020	2021	2022	2023	2024
White-NonHispanic	Male	Age 0	Thousands of People								
White-NonHispanic	Male	Age 1	Thousands of People								
White-NonHispanic	Male	Age 2	Thousands of People								
White-NonHispanic	Male	Age 3	Thousands of People								
White-NonHispanic	Male	Age 4	Thousands of People								
White-NonHispanic	Male	Age 5	Thousands of People								
White-NonHispanic	Male	Age 6	Thousands of People								
White-NonHispanic	Male	Age 7	Thousands of People								
White-NonHispanic	Male	Age 8	Thousands of People								
White-NonHispanic	Male	Age 9	Thousands of People								
White-NonHispanic	Male	Age 10	Thousands of People								
White-NonHispanic	Male	Age 11	Thousands of People								
White-NonHispanic	Male	Age 12	Thousands of People								
White-NonHispanic	Male	Age 13	Thousands of People								
White-NonHispanic	Male	Age 14	Thousands of People								

Description

Add description for this assumption.

Save As Cancel

Macroeconomic Update

The Macroeconomic Values Update allows you to calibrate a national forecast to alternative macroeconomic data by component. Using the options, you can enter values based on final demand, personal income, or a combination of final demand and personal income. Changing the level of the GDP type in the combo-box allows you to specify the level of final demand detail you wish to enter. You can also check “Rescale Nominal Values and Price Index” to enter a different inflation assumption, check “Unemployment Rate” to change the national unemployment rate assumption, or check “Labor Productivity Growth” rate to change the average labor productivity growth rate. There is also an “Adjust GDP” tool for automatically applying a percent change to the baseline macroeconomic values. Just like the other update types, you can always check the baseline values on the “Reference” tab and add a description.

Figure 27: Macroeconomic Update

Macroeconomic Update - New Assumption 1

Options

☒ Final Demand Level: 19 Major GDP Components

☐ Income

☐ Rescale Nominal Values and Price Index

☐ Unemployment Rate

☐ Labor Productivity Growth Rate

Apply a percent change to baseline

Adjust GDP 0.00% Apply

Macroeconomic Update

The Macroeconomic Values Update allows you to calibrate the national forecast to alternative macroeconomic data by component. You can enter values based on final demand, personal income, or a combination of final demand and personal income. Changing the GDP type allows you to specify the level of final demand detail you wish to enter. You can also check Rescale Nominal Values and Price Index to enter a different inflation assumption, check Unemployment Rate to change the national unemployment rate assumption, or check Labor Productivity Growth rate to change the average labor productivity growth rate.

Update Reference

Category	Variable Name	Units	2016 REMI	2016	2017	2018	2019
Personal Consumption Expenditures	Motor Vehicles and Parts Consumption	Billions Chained 2009\$	438.500				
	Furnishings and Durable Household Equipmen	Billions Chained 2009\$	384.700				
	Recreations Goods and Vehicles and Other Du	Billions Chained 2009\$	795.000				
	Food and Beverages Purchased for Off-premi	Billions Chained 2009\$	832.400				
	Clothing and Footwear Consumption	Billions Chained 2009\$	378.700				
	Motor Vehicle Fuels, Lubricants, and Fluids Co	Billions Chained 2009\$	267.897				
	Fuel Oil and Other Fuels Consumption	Billions Chained 2009\$	21.103				
	Other Nondurable Goods Consumption	Billions Chained 2009\$	1025.900				
	Services Consumption	Billions Chained 2009\$	7507.298				
	Private Fixed Investment	Residential Private Investment	Billions Chained 2009\$	587.400			
Nonresidential Structures Private Investment		Billions Chained 2009\$	446.400				

Description

Add description for this assumption.

Save As Cancel

National Demographic Assumptions

National Demographic assumptions allow for modifying various demographic aspects of a national forecast. Alternate values can be entered for birth rates, survival rates, international migration, and participation rates. These custom national demographic values must be entered by gender, race, and individual age group. A description of a national demographic assumption can be added using the text field on the top left of the form.

Figure 28: National Demographic Assumption

International Migration - New Assumption 1

Description
Add description for this assumption.

Demographic Assumptions
Enter values into the grid to create a new demographic assumption. This assumption will be added to the assumptions list and can be activated to change the national demographic forecast. Enter a description that can be displayed on the assumption card.

Gender	Race	Age	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Male	White-NonHispanic	Age 0	0	0	0	0	0	0	0	0	0	0
		Age 1	0	0	0	0	0	0	0	0	0	0
		Age 2	0	0	0	0	0	0	0	0	0	0
		Age 3	0	0	0	0	0	0	0	0	0	0
		Age 4	0	0	0	0	0	0	0	0	0	0
		Age 5	0	0	0	0	0	0	0	0	0	0
		Age 6	0	0	0	0	0	0	0	0	0	0
		Age 7	0	0	0	0	0	0	0	0	0	0
		Age 8	0	0	0	0	0	0	0	0	0	0
		Age 9	0	0	0	0	0	0	0	0	0	0
		Age 10	0	0	0	0	0	0	0	0	0	0
		Age 11	0	0	0	0	0	0	0	0	0	0
		Age 12	0	0	0	0	0	0	0	0	0	0
		Age 13	0	0	0	0	0	0	0	0	0	0
		Age 14	0	0	0	0	0	0	0	0	0	0
		Age 15	0	0	0	0	0	0	0	0	0	0
		Age 16	0	0	0	0	0	0	0	0	0	0

Save As Cancel

Alternative Model Settings

Different pieces of the REMI model's structure are linked together in certain ways as our best means of approximating of how the real economy generally works. In some cases, you may find that the model would better match a particular real-world scenario if some of these connections behaved differently or were removed altogether. Using the Alternative Model Settings, you can do just that by changing certain settings that control various interacting parts of the model. Depending if you are creating a national or regional control, there are different settings that are available. Certain pre-defined alternative sets of settings exist that REMI has found to be useful in the past. When making your own custom alternate model settings, simply toggle any of the on-off switches to enable or disable that particular model response. A few settings are actually parameters to model equations that can be modified. Each of these

has an alternative set of values that can be viewed and selected for substitution. The default housing price and land price coefficients can also be substituted for custom values. Any setting that has been changed from the REMI default value will be highlighted for easy differentiation. Information buttons containing setting descriptions are present next to every setting.

Figure 29: Alternative Model Settings

Alternative Model Settings - New

Output and Demand

- ☒ Investment Response to Capital Stock
- ☐ Alternative Investment Response to the Level of Activity
- ☒ Commodity Access Index Response to Intermediate Inputs Access
- ☒ Government Spending Response to GDP
- ☒ Property Income Response to Population
- ☒ Local Consumption Response to Income and Prices
- ☒ Transfer Payment Response to Population
- ☒ Government Spending Response to Population
- ☐ Alternative Commuter Response (Fixed Shares)

Compensation, Prices, and Costs

- ☒ Compensation Response to Labor Market Conditions
- ☒ Housing Price Response to Population and Income

Labor and Capital Demand

- ☒ Labor Intensity Response to Relative Factor Costs
- ☒ Labor Access Index Response to Industry and Occupation Access

Population and Labor Supply

- ☒ Economic Migration Response to Expected Income
- ☒ Participation Rate Response to Expected Income

Market Shares

- ☒ Exports To Rest Of World Response To Production Costs

Parameters

- Housing Price Coefficients**
 - ☒ Standard
 - ☐ Alternative
 - ☐ Custom
- Compensation Equation Coefficients**
 - ☒ Standard
 - ☐ Alternative
- Demand Price Elasticities**
 - ☒ Standard
 - ☐ Alternative
- Nonresidential Land Price Coefficients**
 - ☒ Standard
 - ☐ Alternative
 - ☐ Custom
- Migration Speed of Adjustment**
 - ☒ Standard
 - ☐ Alternative

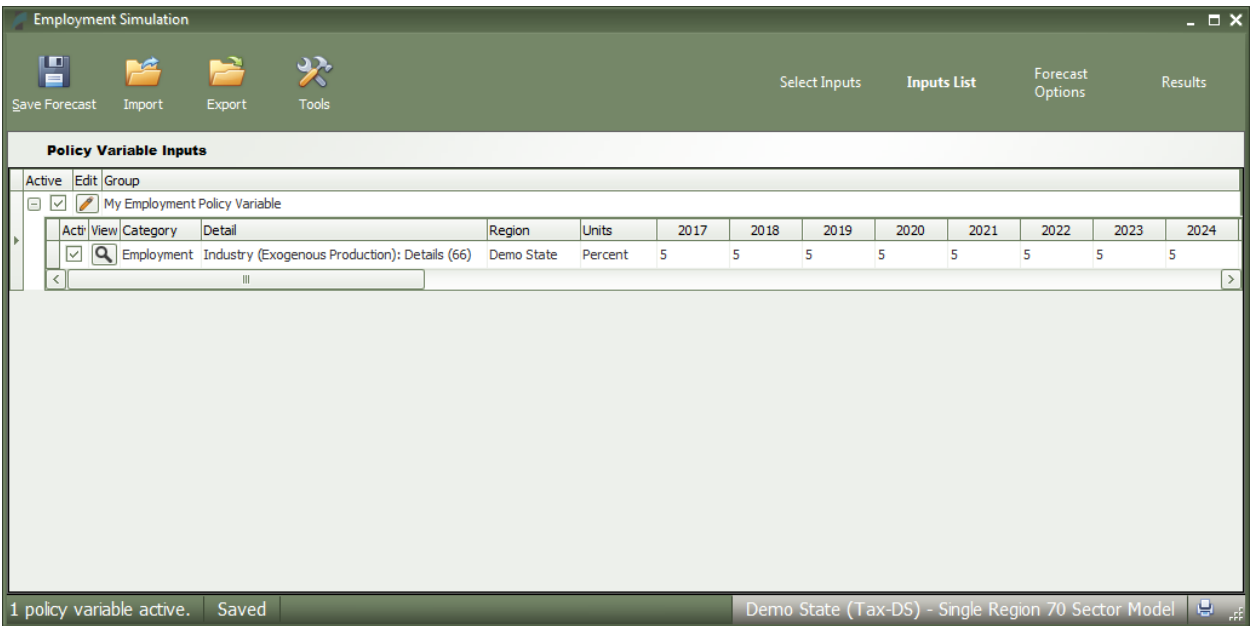
Highlighted if Different from REMI's Defaults

OK Cancel

Inputs List

The Inputs List is a screen that displays the policy variable groups and contained policy variables that will be included as inputs to the model as it runs. Expand any group to see the variables inside. Unchecking a check box in the “Active” column of the list will exclude the corresponding variable or variable group from the forecast run. Another feature of the Inputs List is the ability to inspect the converted versions of a given policy variable. While there are many different ways to specify any particular policy variable, only one format can actually be used by the model, so conversion is necessary. Clicking on the magnifying glass icon on a policy variable in the Inputs List will open this converted variable window. The “Tools” button stationed on the header of the Inputs List provides some useful functionality for selecting, merging, and deleting groups of policy variables from the list. Finally, any model assumptions that have been added to the forecast will also be displayed on this screen alongside a button for quickly editing them.

Figure 30: Inputs List

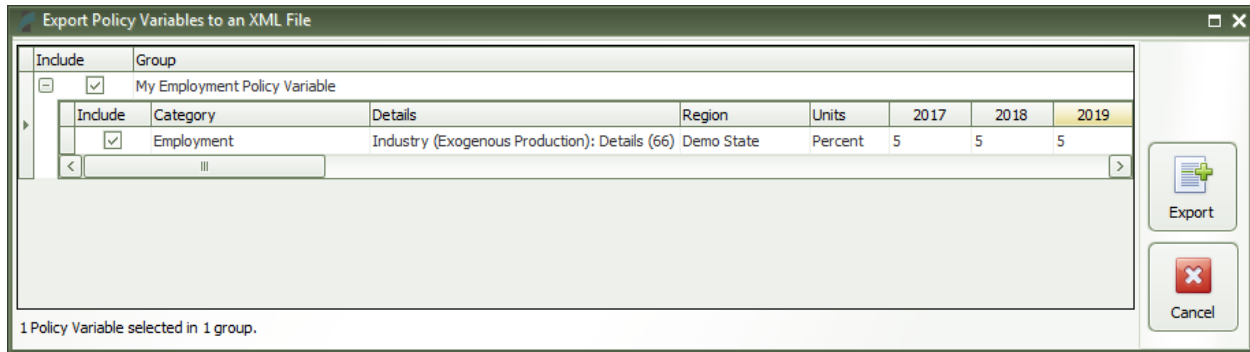


The policy variable import and export buttons are also located on the inputs list. Clicking the “Export” button will open the Export Center, which provides functionality for selecting which of the existing policy variables should be exported. Likewise, clicking the “Import” button launches a file selection dialog, which, once completed, opens the Import Center. The Import Center offers similar selection functionality to the Export Center, but also has additional options for merging, duplicating, and clearing values from variables found in the export file.

Policy Variable Export and Import Centers

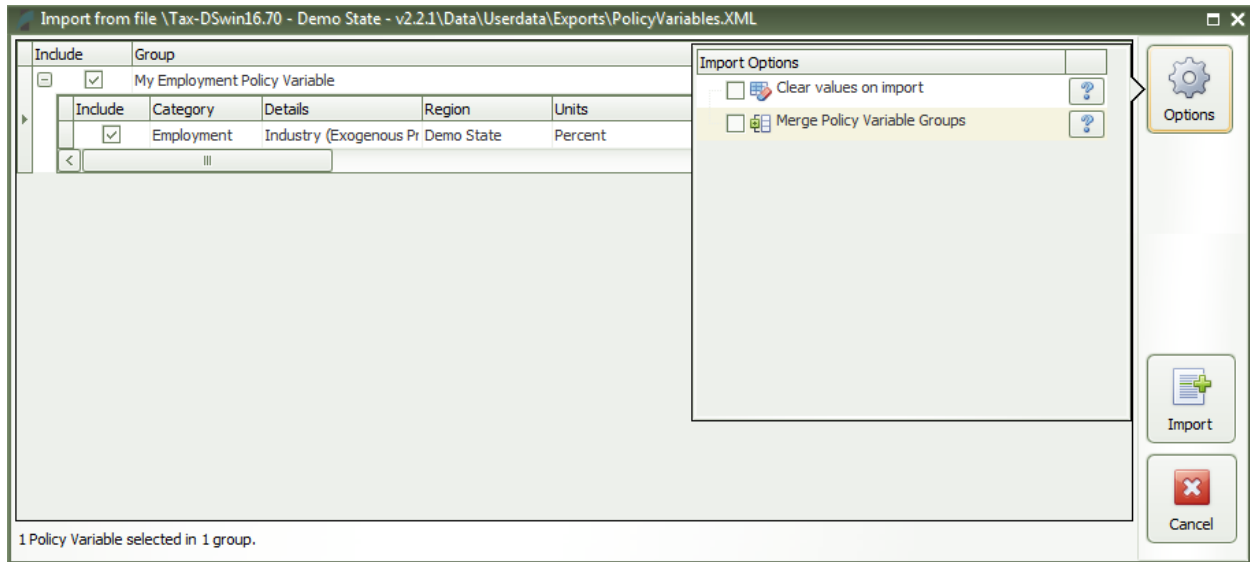
The Export and Import Centers are similar windows that provide a method for deciding which policy variables contained in the present forecast should be exported to a file or imported from a file, respectively. Simply check or uncheck checkboxes in the “Include” column to include or exclude variables.

Figure 31: Export Center



Our current policy variable export files use the flexible XML format to store the wide variety of options that can be associated with all of our different types of policy variables. Unfortunately, XML files are not easily manipulated by hand or by third-party software. As such, when working with large numbers of variables for repeated forecast runs, we recommend creating one or more templates using the PV Selector and the policy variable group merging tool and exporting them. A template would then be a large policy variable group containing all of your required variables in the correct order and with the desired options to match the format of your values. Each use of a template then just becomes a task of opening the variable group in the PV Selector and pasting in values, rather than attempting to replicate the complex structure of the policy variables in our export files, which would be highly error-prone.

Figure 32: Import Center

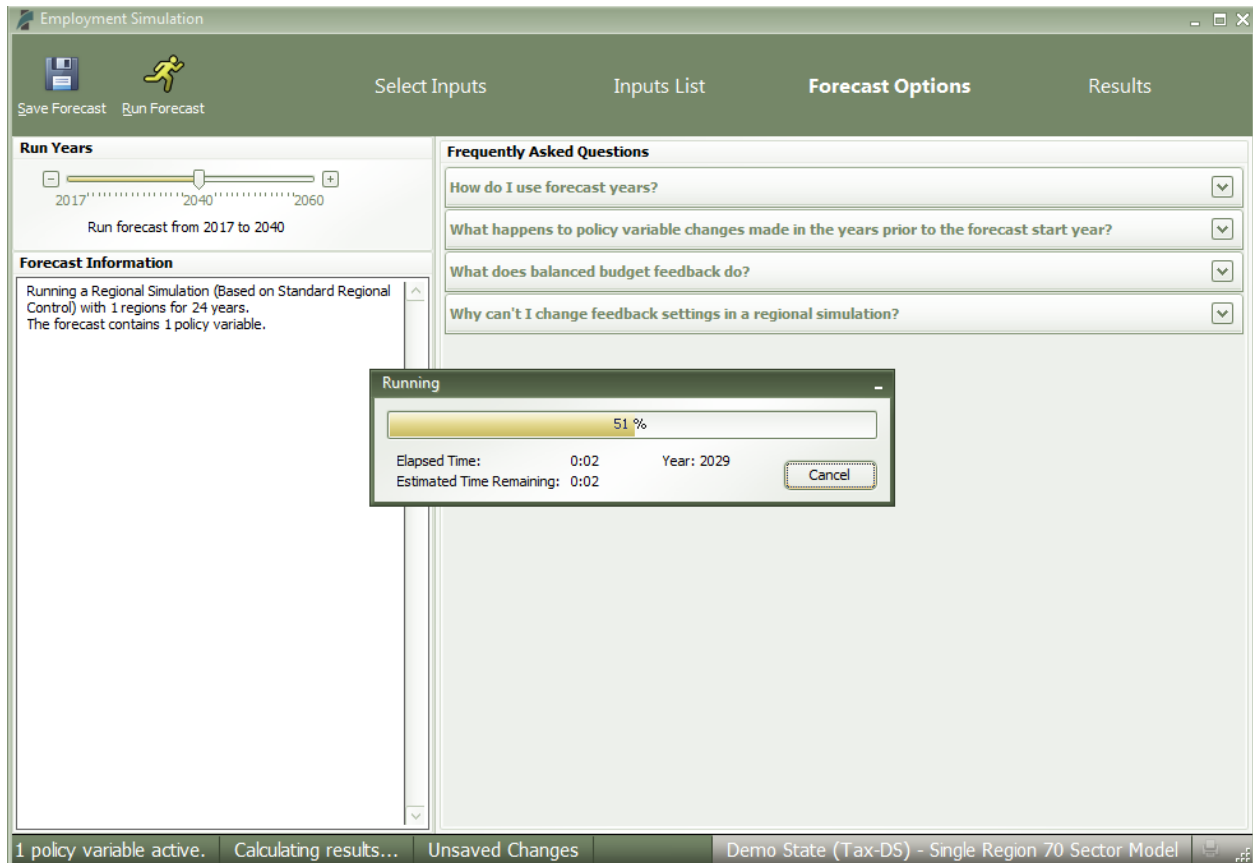


Importing with the Import Center follows roughly the same process as exporting, but with more options. There are options for merging policy variable groups, clearing the values out of the variables, and duplicating variables across all or some of your model regions. In addition to the most straightforward form of importing: from an exported XML policy variable file, you can also import policy variables from a REMI workbook file and from several legacy import file formats. Use caution with legacy formats, as your old variables may not perfectly map to new variables.

Forecast Options

Running a forecast takes place on the Forecast Options screen. Once you have finalized your policy variable inputs, you should make some final decisions about how the forecast should run. Depending on the type of forecast, some different options will be available including closure options and iteration settings. Regardless of the forecast, there will be frequently asked questions and answers about the available run options right on this screen. In a regional control forecast, you can select a budget and set the feedback iteration options. The “Run Years” selector shows what years the forecast will run for. Not all forecast years up to 2060 will be available in all cases. If your forecast has a parent baseline control, only the years for which that control has run will be available. Once you have chosen your options, settings, and run years, simply click the “Run Forecast” button and the model will begin calculating results, as indicated by the pop-up run progress window.

Figure 33: Forecast Options

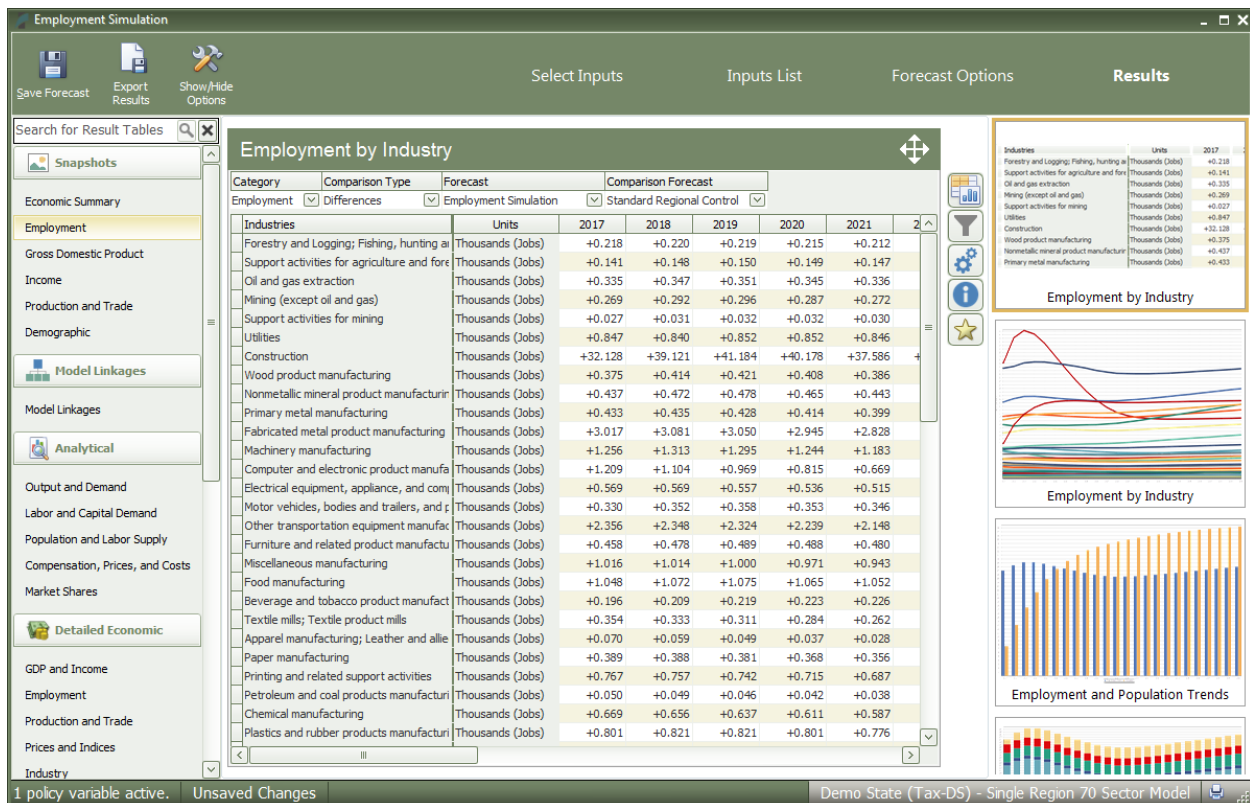


Results

Completely redesigned for version 2.2, the Results section of Tax-PI contains all of the results of the forecast run that were produced by the REMI model. Result data are displayed in tables, maps, and a wide variety of chart-types. The main navigation menu, on the left side of the window, provides a means for accessing all of the different categories of result visualizations that have been created by REMI. These groupings put results together by concept and help to break up the huge amount of data into more manageable sections.

There are five layouts that are used for arranging visualizations among the different categorized sections of the Results screen. The first, which is visible in Figure 34, is the gallery layout mode. In gallery mode, one visualization takes up the majority of the space on the screen and the remaining visualizations belonging to the same group are previewed on a scrolling list of tiles on the right-hand side of the screen. This tile list can be dragged with the mouse, scrolled by mouse wheel, and scrolled by hovering your mouse near the top or bottom visualization and clicking on the arrow buttons that appear. Clicking on any preview tile will slide that visualization into the central, focused view.

Figure 34: Results – Gallery Mode



The next three visualization layout types each look quite different, but all function in very similar ways.

The Model Linkages view, shown in Figure 35, consists of an interactive diagram that depicts the various links that interconnect different parts of the economy in the REMI model. Any of the outer or inner blocks of the diagram, when clicked, will bring forward a group of related results tables.

Other result categories use tile and list layout modes. These two organizational modes simply contain a list of concepts, hierarchically structured in the case of list mode, where each concept has its own tile or list item that links to the corresponding result table. Examples of these two modes are displayed in Figure 36 and Figure 37.

Model Linkages, tile mode, and list mode share similar functionality once you have selected a concept for viewing of its results. Depicted in Figure 38, you can see that the selected result table is shown by itself as part of a tabbed view. The tab bar along the top of the visualization area allows for quickly switching to view any of the other tables included in the same model block, tile group, or list section. The tab bar can be scrolled left and right using the respective on-screen arrow buttons. To go back to the starting view, use the back button on the top left.

Figure 35: Results – Model Linkages

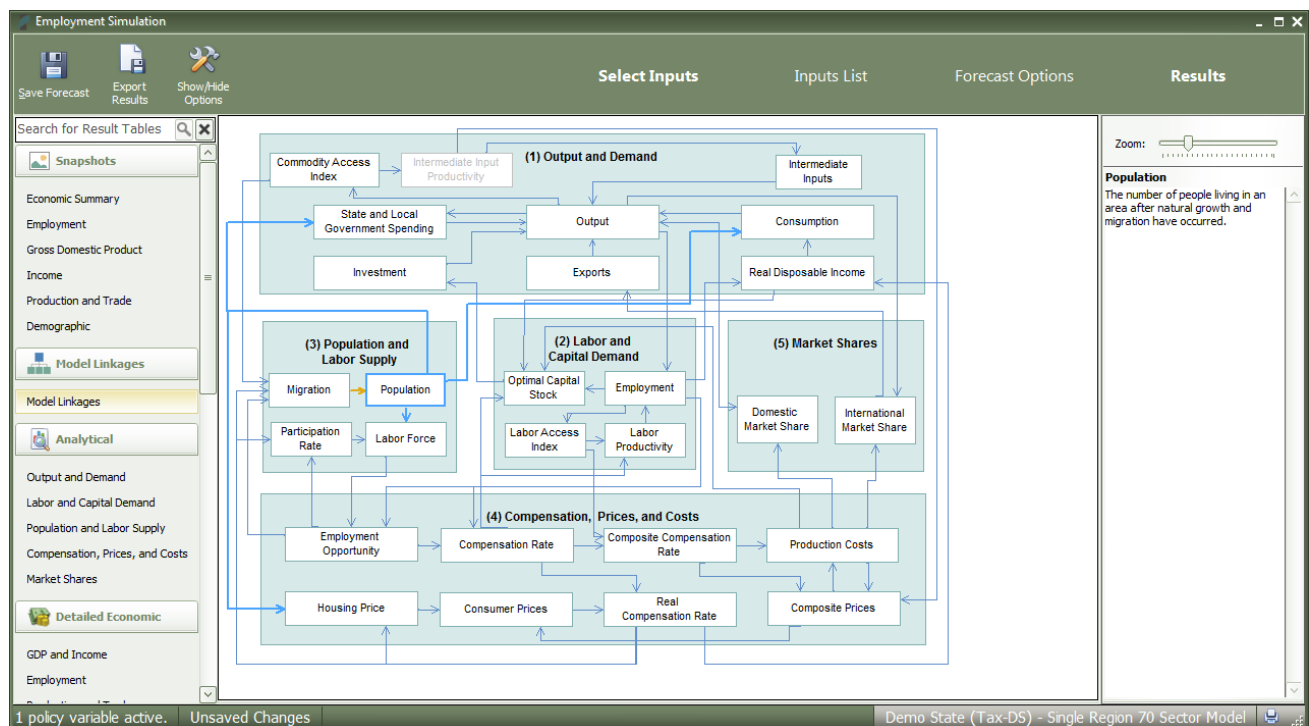


Figure 36: Results – Tile Mode

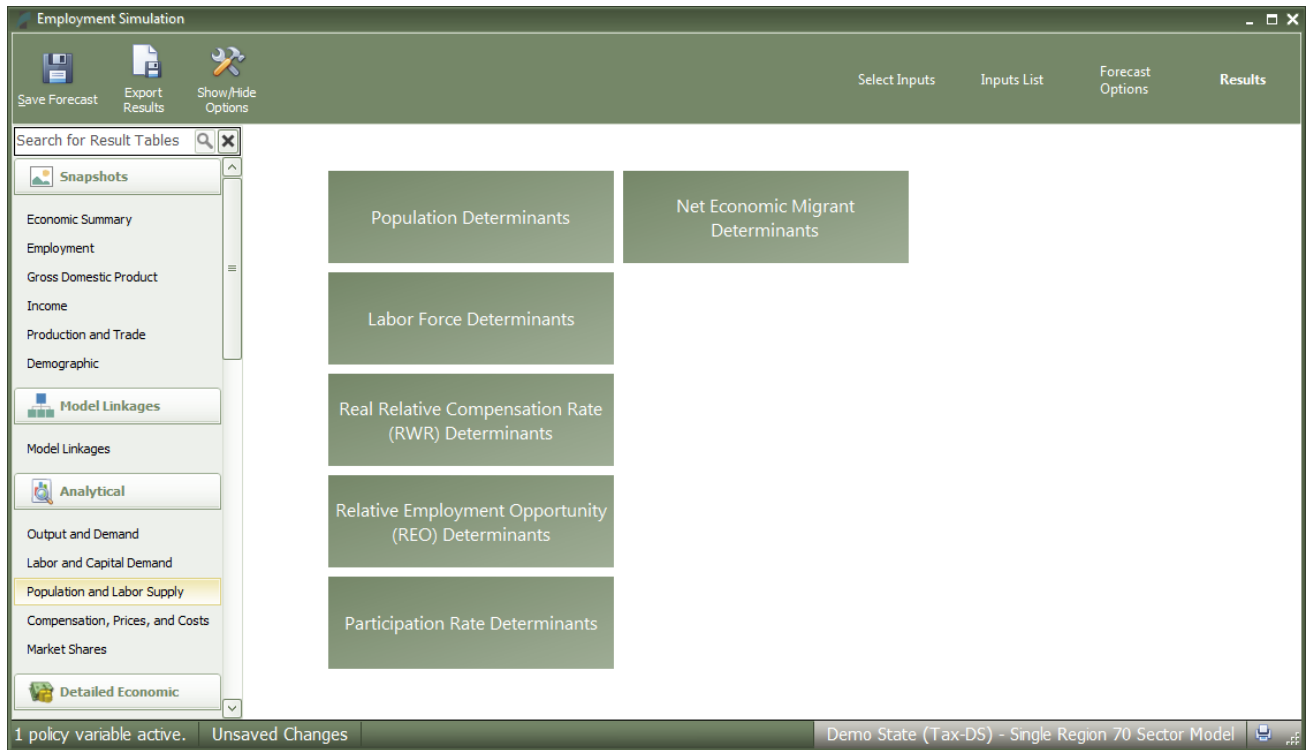
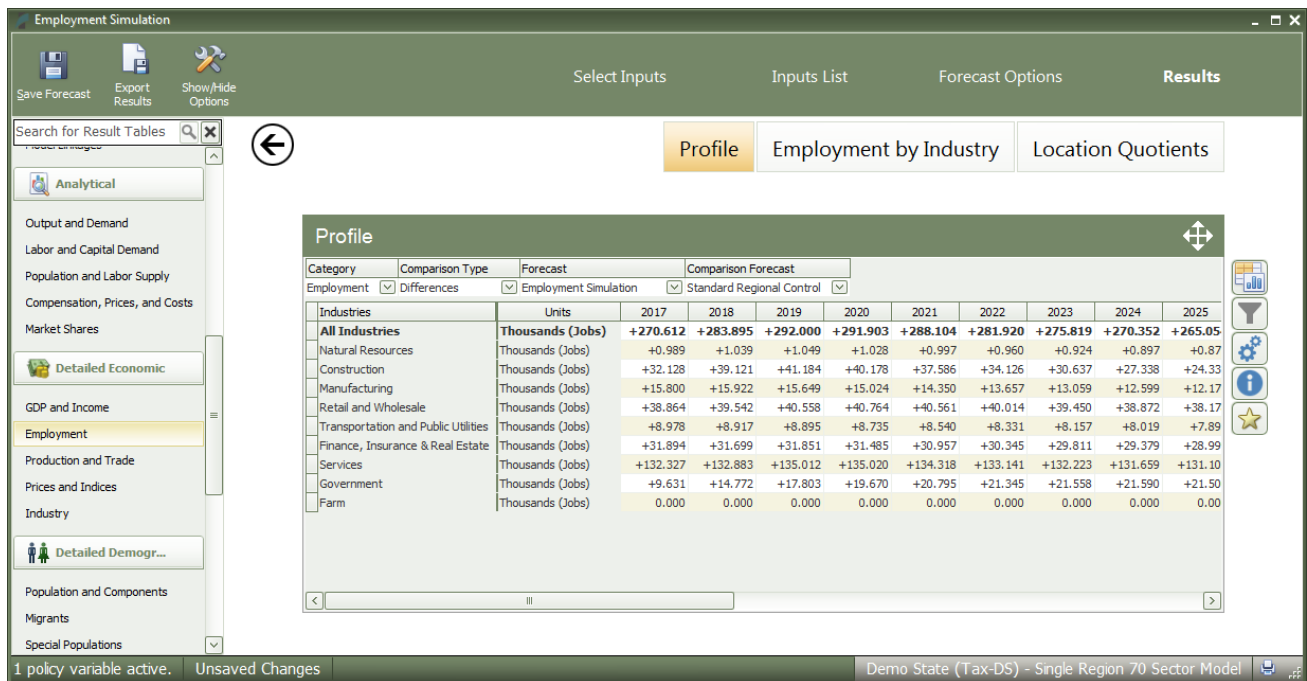


Figure 37: Results – List Mode



Figure 38: Results – Tabbed View

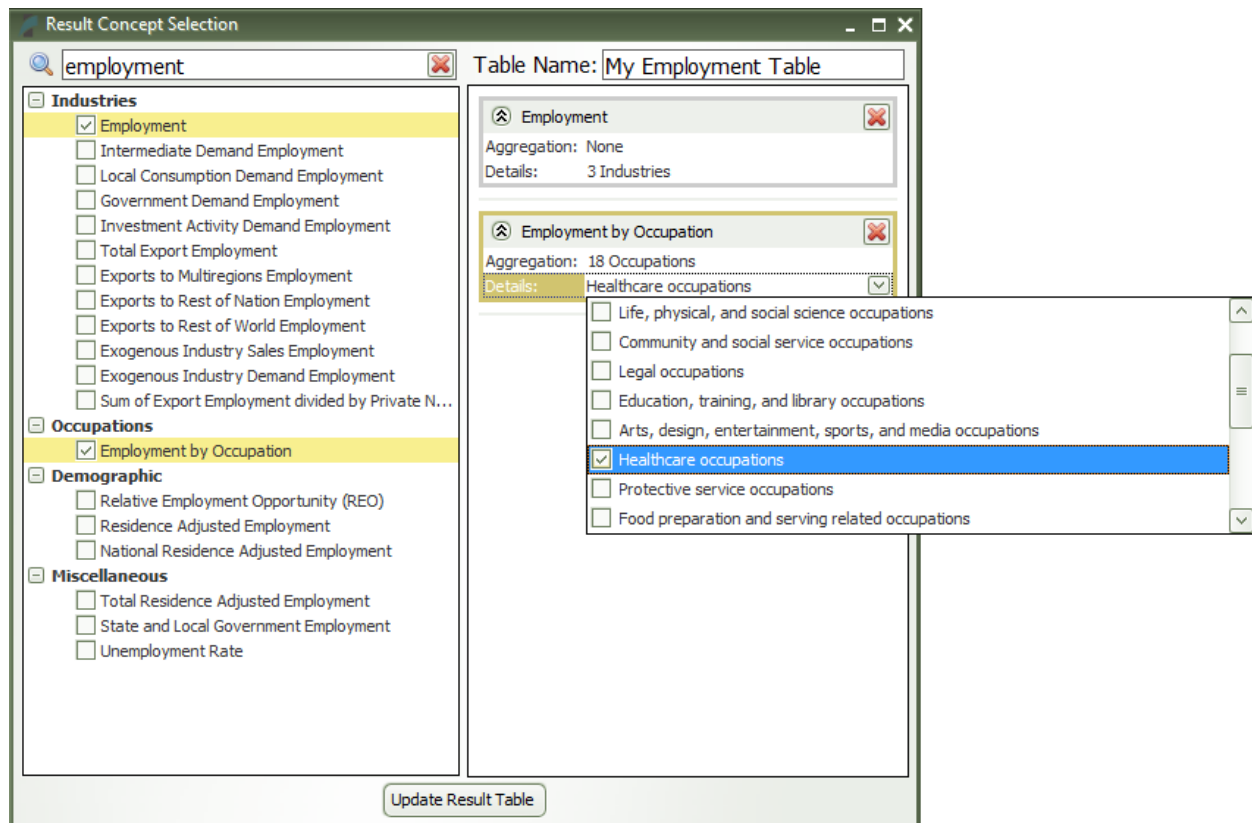


Favorites

The fifth and final layout used on the results screen is row mode that is used on the customizable Favorites section of the results. The Favorites section is intended to allow users to build their own preferred tables, charts, and maps and arrange them however they would like. Favorites are saved and can be viewed for every forecast that you run. To add a new favorite group, scroll down on the main navigation menu until you see the Favorites section and the “[Add a New Favorite]” menu item. Selecting this item will prompt for a name to be assigned to the new group and, afterwards, a table creation tool will launch.

The table creator features a full list of every result concept available to the current type of forecast, sorted by detail category. Use the search bar to filter down the long list. Selected concepts will be displayed in the list on the right for ease of keeping track of what has been selected, removing any no-longer-wanted concepts, and lastly, for specifying further information about selected concepts in certain situations. More information will be required when multiple concepts are chosen to be added to a table and they do not all have the same detail category, for example if one variable has industry details and another has age, race, and gender details. In this case, the resulting visualization will need to display values for each concept and a fixed individual detail, like Employment – Construction rather than general Employment with a combo-box filter for switching the industry. Each selected detail can come from an aggregation, if desired, and ultimately will be added to the finished table as separate line item.

Figure 39: Result Table Creator

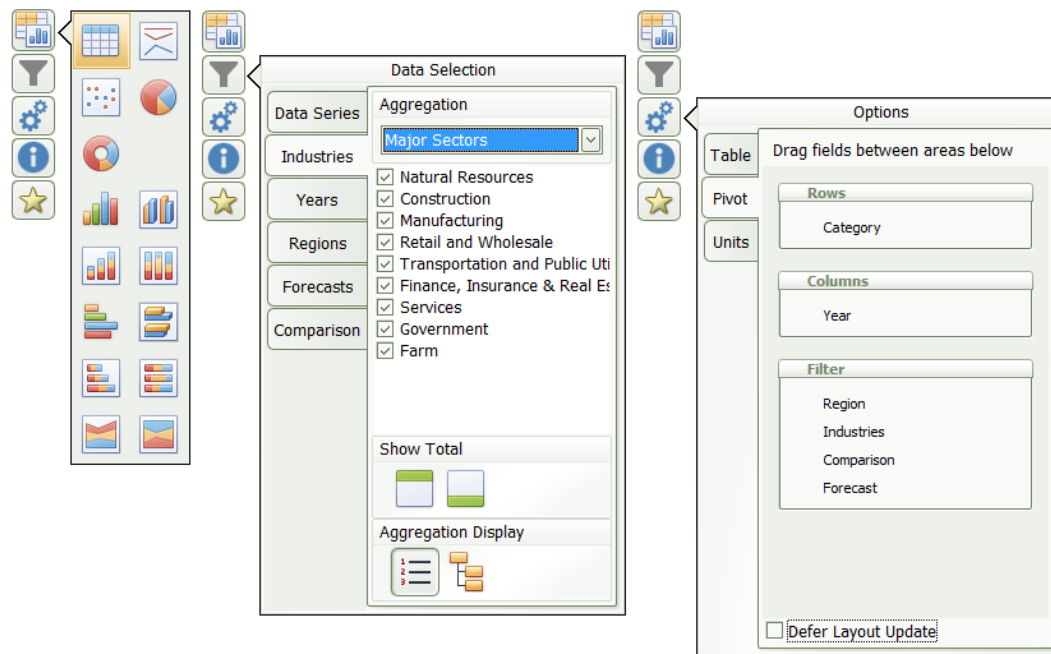


Favorite visualizations have a button on their title header panel that will let you re-open the table creator to adjust their contained data. There are several more options for Favorites that are described in the section below in the context of the many options available for interacting with visualizations.

Interacting with Visualizations

As you navigate the results and click around on visualizations, you will notice that a group of five buttons consistently appears to the right of the most recently selected data visualization. These buttons provide important ways of interacting with the selected visualization. The first three buttons each open pop-up menus that respectively allow for changing the chart-type, modifying the included data, and updating the visualization's settings. The fourth button opens a pop-up text field containing a description of the result concepts currently included in the visualization and the fifth adds a copy of the selected visualization to the Favorites.

Figure 40: Data Visualization Interaction Buttons and Menus



The chart-type menu lets you switch a visualization between showing a table, map, or fourteen different types of charts. Once you have selected a chart-type option, another menu will open that lets you choose between each of the different ways your data could fit into the new type of chart, with visual previews of each of the available configurations.

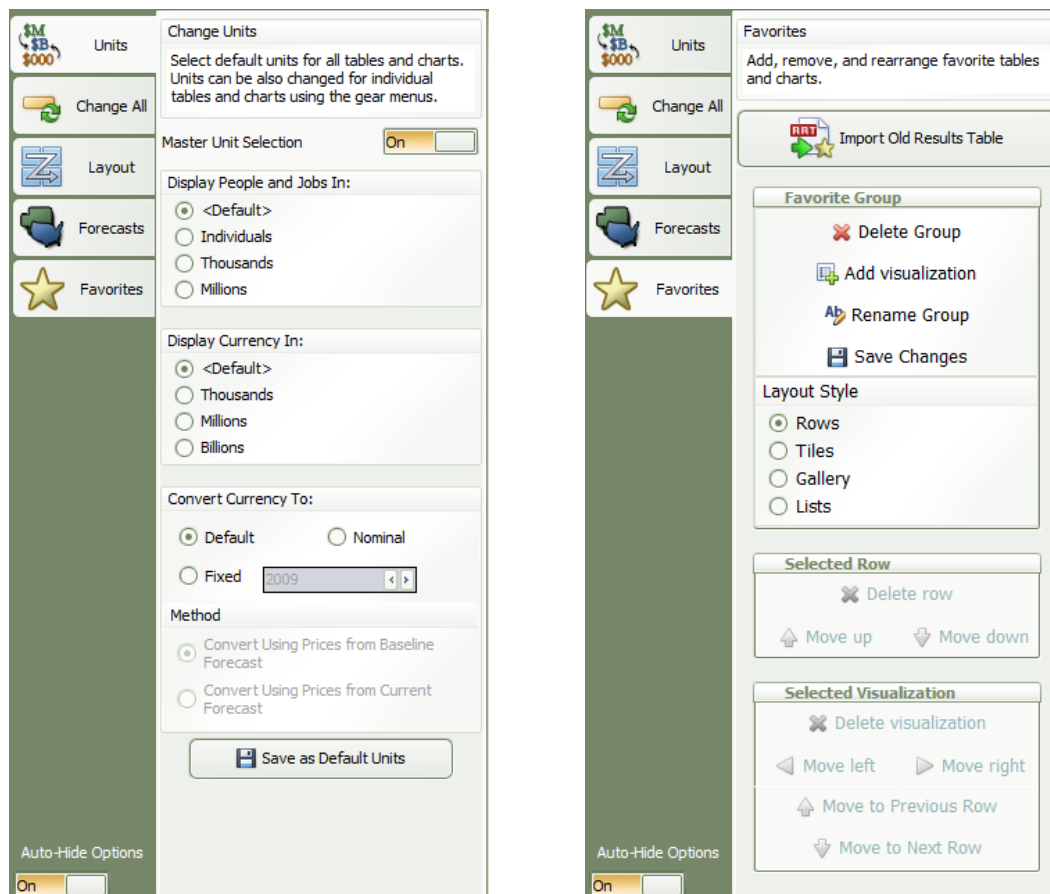
If you want to change what data is being shown on a visualization, look in the data selection menu accessed using the second button from the top with the filter icon. This menu has several tabs that each focus on a separate aspect of the data included in the visualization. In the data series tab, you can toggle whether any of the included data series are visible in the chart, remove them altogether, and add new data series using the result table creator. On the other tabs, which vary depending on what details are associated with the data series being displayed, you can change what details are being shown. You can choose to hide or show each region, year, comparison forecast, comparison method, and other detail. There are also options for changing the aggregation level of the displayed details, adding totals, and introducing hierarchy to the layout of the result table in order to see values for multiple aggregation levels at the same time.

The options menu, shown furthest to the right in Figure 40, has a few more options for modifying the current visualization. For certain chart-types you can choose to enable sorting, pick alternate color schemes, and change the decimal precision of listed values. You can also change the displayed units and use the pivoting tool to restructure the chart entirely by dragging different dimensions of the result data into the different pivot-able destinations afforded by the chart-type. For example, in the pivot menu shown above, industries are currently being displayed down the rows of a table, years along the columns, and the remaining detail types in the filter combo-boxes. This can be altered in any way by dragging these data dimensions between

the different groups, although putting too many dimensions onto the rows or columns of a table or either of the two axes on a chart might cause the visualization to take a very long time to finish updating.

There are several other ways of interacting with and modifying visualizations outside of the main visualization buttons. Master region selection, which is located at the top of the window on the header panel, should be turned on when you would like to have all visualizations display a certain region or aggregated region group. Another useful feature is the full-screen button. This button can be found on the top right corner of any visualization's title area and will toggle full-screen mode for that visualization.

Figure 41: Results Options – Units and Favorites



Even more options can be found by clicking the “Show/Hide Options” button on the header panel. This button will expand or collapse a pop-out options menu originating from the right-hand side of the screen. This global options menu has functionality for changing some settings on all visualizations simultaneously as well as controls for managing Favorites. Shown above in Figure 41, the first tab contains master unit selection, which is analogous to master region selection but for unit types. If you would like to change the units that are used by visualizations by default, you can make those changes and save them here. The second tab of the global options menu has master year selection and master value-precision selection. The third tab

contains a list of your forecasts. Here you can choose to select additional forecasts, aside from the forecast whose results are being viewed and its parent control(s), to show up in the comparison forecast drop-down menu on each visualization. The final tab, focused on Favorites, has quite a few useful features. First is result importing, with this button you can attempt to import result tables from past versions into your Favorites. The remaining features manage your existing Favorites groups and the contained visualizations. You can rename and delete groups, add and remove visualizations from groups, switch the layout style of a group, and move visualizations or rows of visualizations around within a group. Depending on your preferences, you might find it useful to change the state of the “Auto-Hide Options” toggle switch located on the bottom left of the options panel. By default, clicking outside of the options panel will automatically close it, making for easy one-time changes. However, when you are making repeated use of the options you may want to disable that functionality.

Exporting Results

In order to export forecast results from Tax-PI, you will need to locate the “Export Results” button on the navigation header bar, between the save and options buttons. This button launches the “Data Export Center”, which is the home for all result exporting. The interface of the export center has options for deciding what content should be exported, as well as the export file format, and some additional settings. When exporting multiple visualizations to an Excel Workbook, visualizations are each placed on a separate spreadsheet tab.

Figure 42: Result Export

