

Getting Started with



# Welcome

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Welcome to REMI PI<sup>+</sup>. Your program package includes both regional and national data models. The regional data and model have been calibrated to the region(s) that you specify at purchase, and all packages include a Windows<sup>®</sup> point-and-click interface that makes them easy for all levels of computer users.

## What Is REMI PI<sup>+</sup>?

REMI PI<sup>+</sup> combines decades of economic experience with an easy-to-use software interface. The REMI model is a dynamic model that forecasts how changes in the economy and adjustments to those changes will occur on a year-by-year basis. The model is sensitive to a very wide range of policy and project alternatives and to interactions between the regional and national economies. By pointing and clicking, you can answer the toughest “What if...?” questions about federal, state, local, or regional economies.

Founded in 1980, Regional Economic Models, Inc. (REMI) constructs models that reveal the economic and demographic effects of policy initiatives or external events on a local economy. PI<sup>+</sup> model users include national, regional, state, and city governments, as well as universities, nonprofit organizations, public utilities, and private consulting firms.

REMI is dedicated to continuing economic research combined with quality customer service and support.

# System Requirements

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We recommend that your computer system meet the following specifications. PI<sup>+</sup> may run on systems below these minimum specs, but functioning is severely impaired.

- Windows 2000, XP, or Vista (32- or 64-bit)
- 1.4 GHz or faster processor
- 1 GB RAM (2-3 GB for larger models, and for Windows Vista)
- 2 GB of available hard-disk space (10 GB for larger models)
- 1024x768 display

Simulation execution time increases exponentially with the number of regions and industry sectors. Large models (i.e. >25 regions for 23 industries, >12 regions for 70 industries, and >6 regions for 169 industries) benefit greatly from increased memory capacity and processor speed<sup>1</sup>.

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<sup>1</sup> For example, on a computer with a 3 GHz Intel Core 2 Duo processor and 3 GB of RAM, a 3 region model with 70 industries will run a 25 year forecast in 6 seconds, while a 51-area model takes 14 minutes.

# Installation

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**IMPORTANT NOTE:** You must have Windows administrative privileges to install this software.

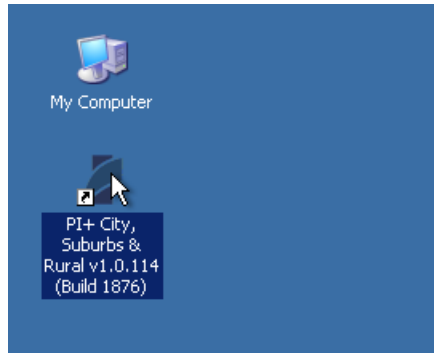
When you are ready to install REMI PI<sup>+</sup>, insert the CD provided into your CD-ROM drive. The InstallShield installation utility should run automatically. If it does not appear, select your CD drive in “My Computer” (XP) or “Computer” (Vista) and double-click “setup” or “setup.exe” to start the installation process. A shortcut to the application will appear on the desktop once the installation is complete.

Contact REMI or your system administrator if you need assistance with installation or operation of the software.

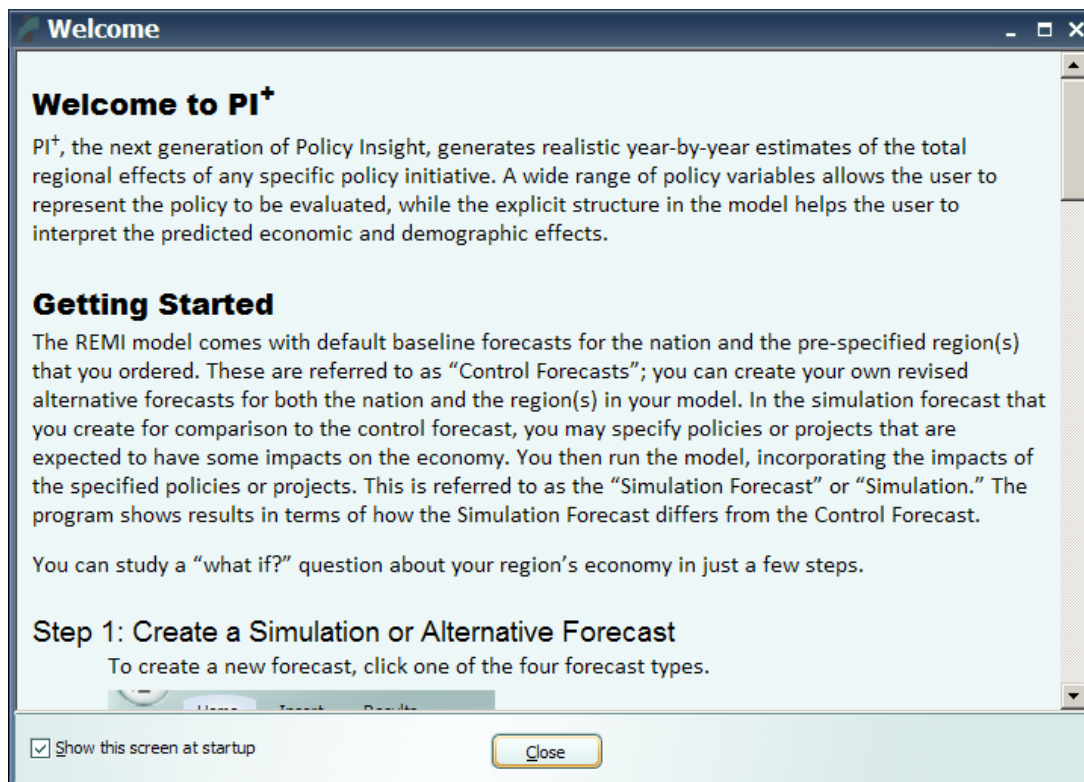
# Running a Simulation

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To start PI<sup>+</sup>, double click on the shortcut appearing on your desktop.

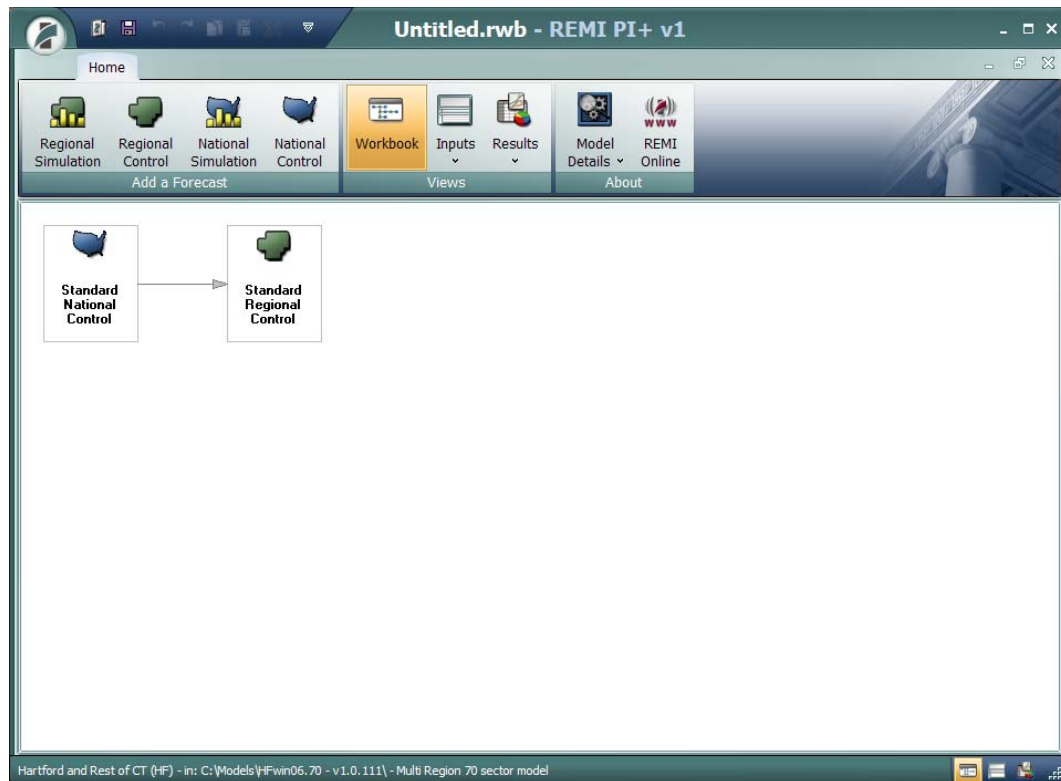


The Welcome screen will display at startup unless you uncheck the box on the lower left hand corner. Use the scroll bar on the right hand side to view the text. When done, click the close button to exit this screen.

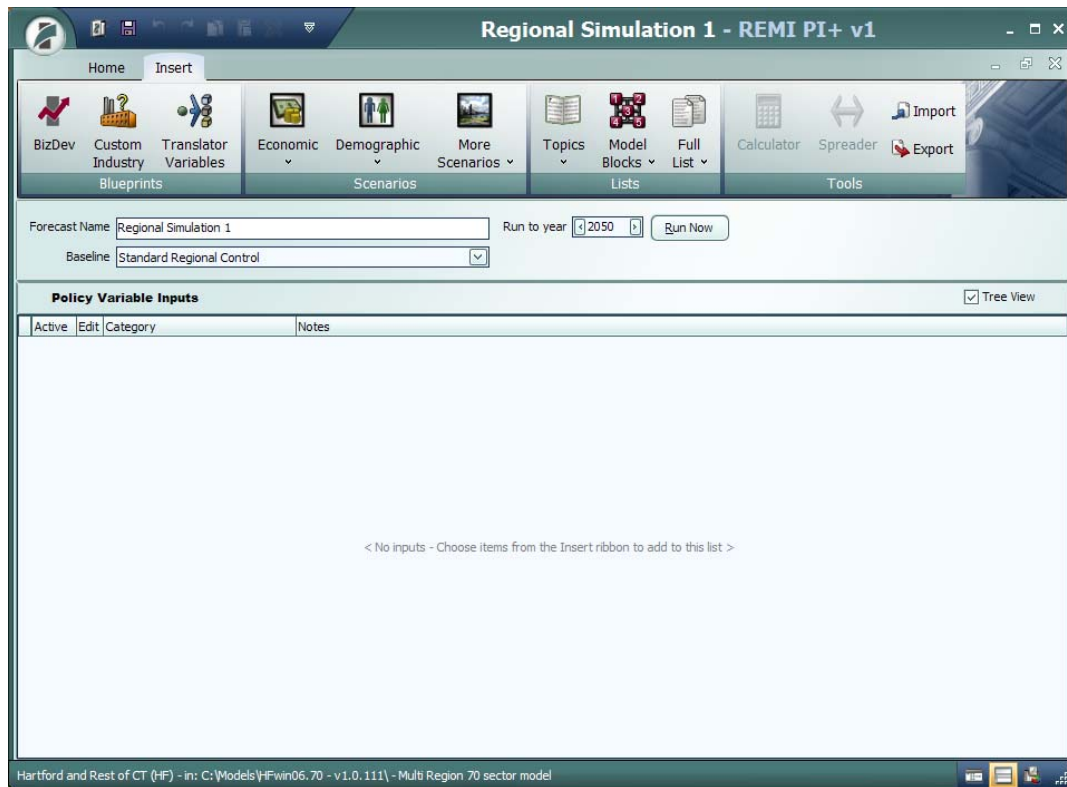


Now you will be viewing the Home tab. Note the default name of the workbook located on the header when you first open PI<sup>+</sup> is Untitled.rwb. You will have the opportunity to rename this document when you save a new forecast. The name of the specific model is located on the

status bar at the bottom of the window. The ribbon displays three groups, Add a Forecast, Views, and About. The Workbook view is the default, and contains the Standard National Control and Standard Regional Control upon first starting. The Inputs view is empty until running additional forecasts, and the Results view gives you the option of displaying the history and forecast of any controls or simulations stored in the workbook. The About group provides access to Model Details such as the national input output table, and to the REMI website, where additional information and documentation may be found.

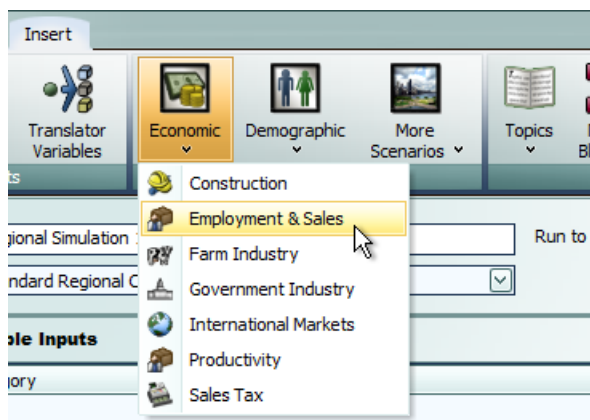


To start a new simulation, click on the Regional Simulation button. The Insert tab now appears.



The Insert tab organizes policy variables into three logical groups, with the most structured approach in the Blueprints group, a more moderately structured approach in the Scenario group, and the least structured approach in the Lists group. Tools are available to assist with filling in values for previously selected policy variables (Calculator and Spreader) and Importing/Exporting policy variables to or from other applications.

In order to model an Economic Scenario, such as a plant shutdown, click on the Economic button, and select Employment & Sales.



The Selector and Editor grids appear. Give the scenario a meaningful name, such as “XYZ Job Losses.” Read the scenario description for helpful information and hints applicable to the selection.

**New Employment and Sales Scenario - REMI PI+ v1**

Home Insert

BizDev Custom Industry Translator Variables Economic Demographic More Scenarios Topics Model Blocks Full List Calculator Spreader Import Export

Blueprints Scenarios Lists Tools

**Employment and Sales Scenario**

Name: XYZ Job Losses

**Scenario Description**  
Employment and Sales are equivalent concepts in the model (labor productivity is used to convert between them). Therefore it is important to never enter employment and sales together in order to represent the same economic activity, otherwise you...

**Selector**

Group	Category	Detail	Region	Units
Firm Behavior			Hartford County	
Industry Behavior			Rest of Connecticut	

Insert Into Editor

**Editor**

Category	Detail	Region	Units	ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
< No Policy Variables selected. Please select from the variable list, then click "Insert into Editor," >														

Add to Inputs List Cancel

Hartford and Rest of CT (HF) - in: C:\Models\HFwin06.70 - v1.0.111\ - Multi Region 70 sector model

In the Selector grid, choose from applicable groups, in this case, Firm Behavior or Industry Behavior. A description of each appears in the information box. If you know that XYZ is a manufacturing company, but you are not sure whether or how much it supplies the local region, choose Firm Behavior.

In the Category box, choose Firm Employment, since for this simulation we only know the number of direct jobs being lost. This selects the specific policy variable to be changed. Read the information box for additional notes regarding the policy variable.



**New Employment and Sales Scenario - REMI PI+ v1**

Home Insert

BizDev Custom Translator Economic Demographic More Topics Model Full Calculator Spreader Import  
Blueprints Variables Scenarios Lists Tools Export

**Employment and Sales Scenario**

Name: XYZ Job Losses

Notes for Firm Employment (number)  
Do not simultaneously use both sales and employment policy variables. This will be double counting. If you are also entering construction and/or equipment associated with these employees, be sure to include the Nullify Investment Induced by Industry

**Selector**

Group	Category	Detail	Region	Units
Firm Behavior	Firm Employment (number)	Forestry and logging; Fishing, hunting and trapping	Hartford County	Units
Industry Behavior	Firm Sales (amount)	Agriculture and forestry support activities	Rest of Connecticut	Thousands
		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		

Insert Into Editor

**Editor**

Category	Detail	Region	Units	ID	2007	2008	2009	2010	2011	2012	2013	2014	2015
< No Policy Variables selected. Please select from the variable list, then click "Insert into Editor." >													

Add to Inputs List Cancel

Hartford and Rest of CT (HF) - in: C:\Models\Fwin06.70 - v1.0.111 - Multi Region 70 sector model

In the Detail box, select the industry that XYZ is classified as. In this example, assume it is Machinery manufacturing. In the Region box, select the region where the plant is located, which is Hartford County. In the Units box, select the appropriate units matching your inputs, in this case Units (number of individual jobs). When ready, click the Insert Into Editor button.

**New Employment and Sales Scenario - REMI PI+ v1**

Home Insert

BizDev Custom Translator Economic Demographic More Topics Model Full Calculator Spreader Import  
Blueprints Industry Variables Scenarios Lists Tools

**Employment and Sales Scenario**

Name: XYZ Job Losses

Notes for Firm Employment (number)  
Do not simultaneously use both sales and employment policy variables. This will be double counting. If you are also entering construction and/or equipment associated with these employees, be sure to include the Nullify Investment Induced by Industry

**Selector**

Group	Category	Detail	Region	Units
Firm Behavior	Firm Employment (number)	Oil and gas extraction	Hartford County	Units
Industry Behavior	Firm Sales (amount)	Mining (except oil and gas)	Rest of Connecticut	Thousands
		Support activities for mining		
		Utilities		
		Construction		
		Wood product manufacturing		
		Nonmetallic mineral product manuf		
		Primary metal manufacturing		
		Fabricated metal product manufac		
		Machinery manufacturing		
		Computer and electronic product m		
		Electrical equipment and appliance		

Insert Into Editor

**Editor**

Category	Detail	Region	Units	ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Firm Employment (number)	Machinery manufacturing	Hartford County	Units	3612	0	0	0	0	0	0	0	0	0	0

Add to Inputs List Cancel

Hartford and Rest of CT (HF) - in: C:\Models\FWin06.70 - v1.0.111 - Multi Region 70 sector model

The Editor grid now displays the policy variable selected. Enter job losses, with a negative value, by year. Since the value will be constant throughout the forecast period to reflect permanent job losses, the calculator may be used to automatically fill in the values for all years. To do this, highlight the range of cells, in this case 2009-2050, and click on the Calculator button on the Tools group of the ribbon. Enter the value to be filled in each year, in this case 675 (for a job loss of 675 employees). Then click OK.

**Row Calculation**

Fill Range % Change ± Value Linear Exponential Anticipation Annualize

Fill the selected range with a single value

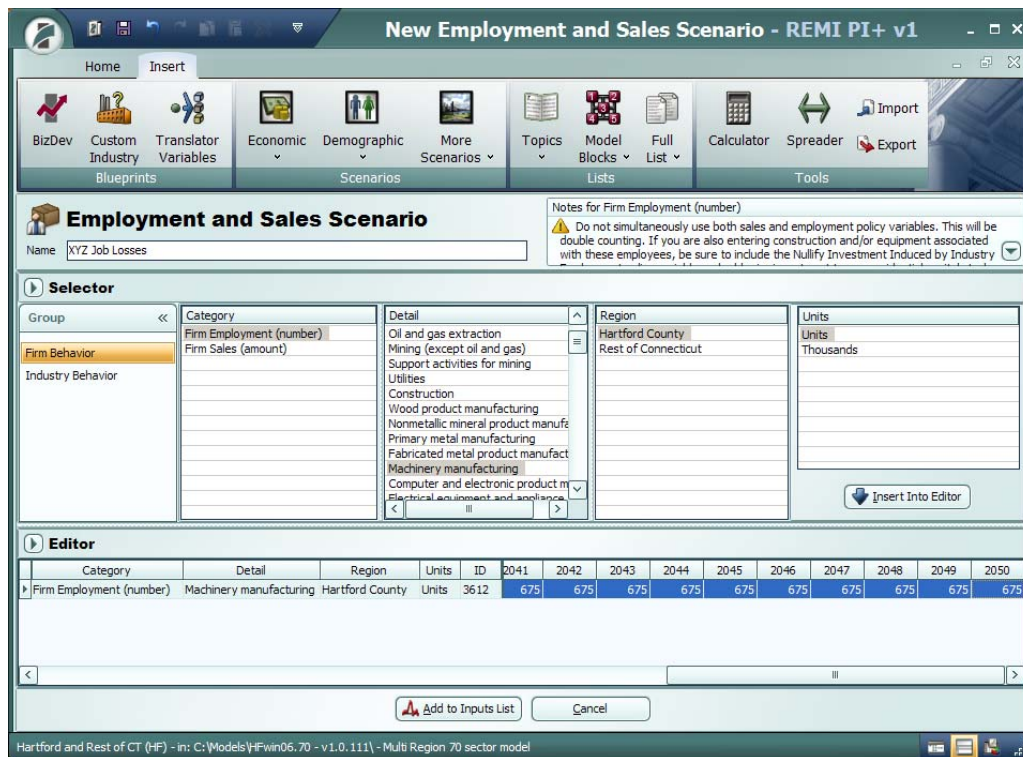
Value: 675

Start Year: 2007 End Year: 2050

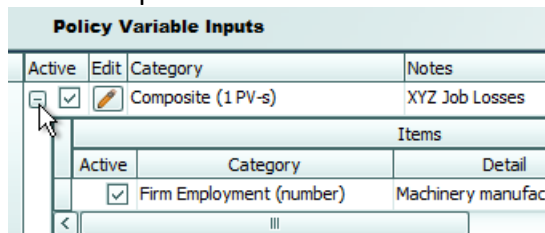
OK Cancel

☐ Automatically show calculator

The Editor grid is now filled with a time series of the value entered. If this is the only desired policy variable change (perhaps because it is the only input information available), click the button at the bottom of the screen, Add to Inputs List.



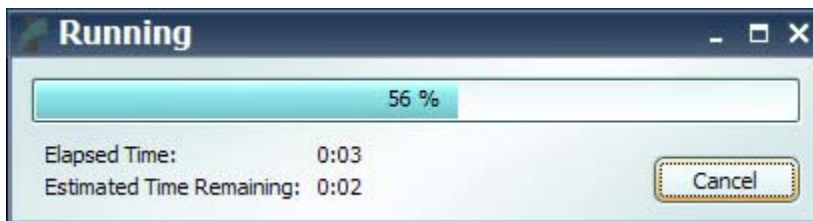
The Policy Variable Inputs view now displays, listing the policy variable category just created. Click the open button to see the details.



In this example, only one policy variable is listed. If multiple variables had been selected, then would also be listed here. Note that no changes to either policy variables or values may be made here, except to make them inactive or active by unchecking/checking the box ☐ ☒ . Only active variables will be included when the simulation is run. To go back and edit policy variables or their values, click on the edit button , which will take you back to the Selector/Editor grid. It is a good idea to give the forecast a meaningful name, such as XYZ Plant Shutdown. You may also determine the appropriate baseline which the simulation will be compared to (the Standard Regional Control is the default and only option unless the user has created other alternatives). Also, determine the length of the forecast to be run (2026 is the default, which represents a 20 year time horizon; the maximum year is 2050). When ready to run the simulation, click the Run Now button.



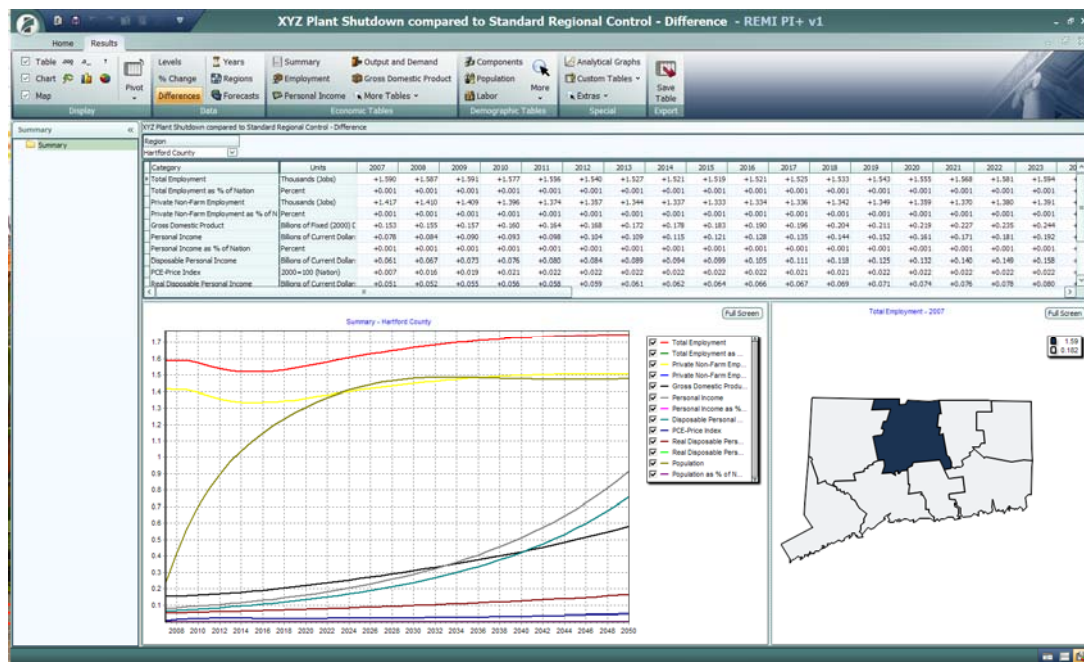
A status bar displays stating the elapsed time and estimated time remaining. Models with a small number of regions will run in only a few seconds on a fairly fast computer.



When the forecast has completed running, the Results tab appears. It is helpful at this time to maximize the application display so it fills your monitor screen, if you have not already done so.



The default view shows Summary concepts displayed as both a table and a line chart. The Display group on the far left of the ribbon also provides a map view for multi-region models. One, two, or all three views may be activated at a time.



The Display group also has buttons for adjusting decimal precision, chart type, and allows pivoting of the data to rearrange the layout of the grid.

The Data group provides buttons for viewing the data as levels, percent change, or differences. It also allows the Years, Regions, and Forecasts viewed to be adjusted.

The Economic Tables group presents all of the model's economic variables in organized tables. The Demographic Tables group presents all of the model's demographic concepts into organized tables.

The Special group includes Analytical Graphs, which are useful for tracing cause and effect relationships for specific model equations, Custom Tables, which allows you to edit and create tables according to your own needs, and access to several Extras, such as DevSight.

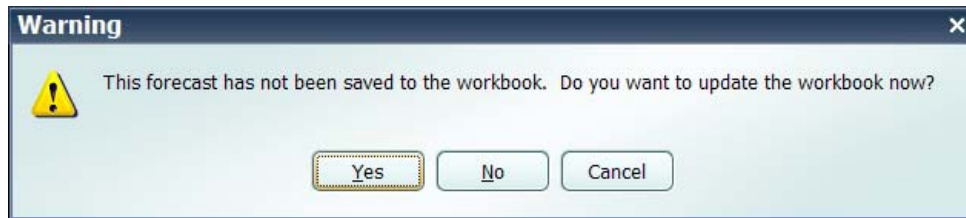
The Export group allows you to save a table to another format for easy import into other applications, such as a spreadsheet.

When done viewing the simulation results, close the Results tab window by clicking on lower X in the upper right hand corner.

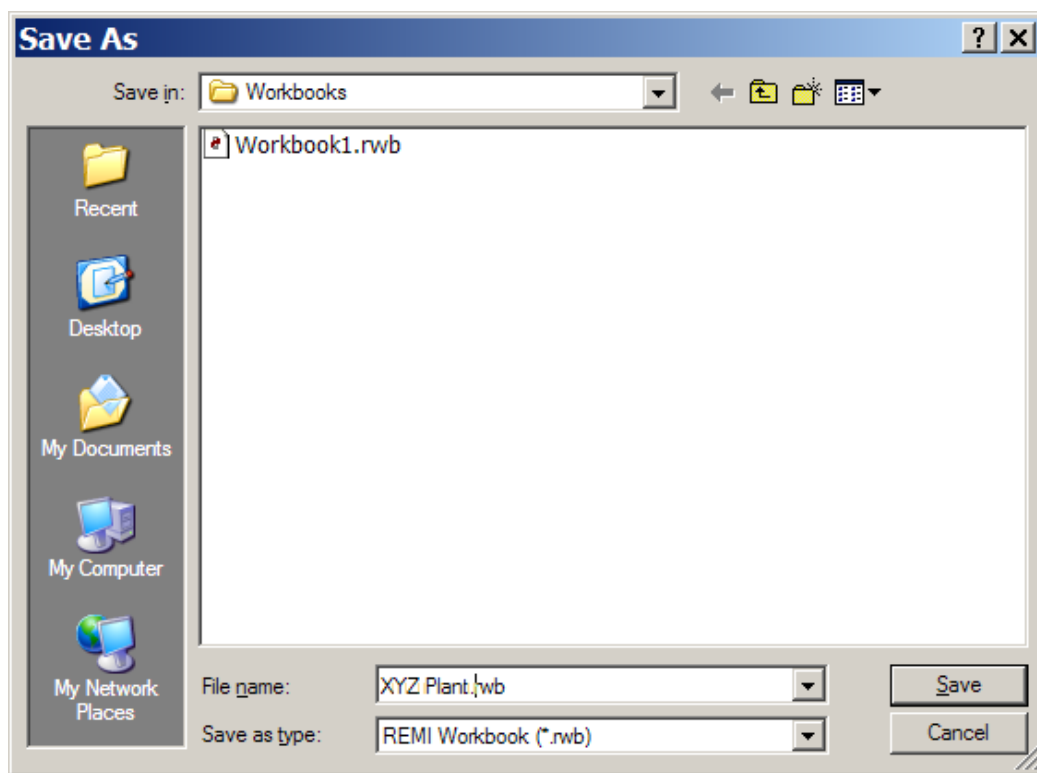




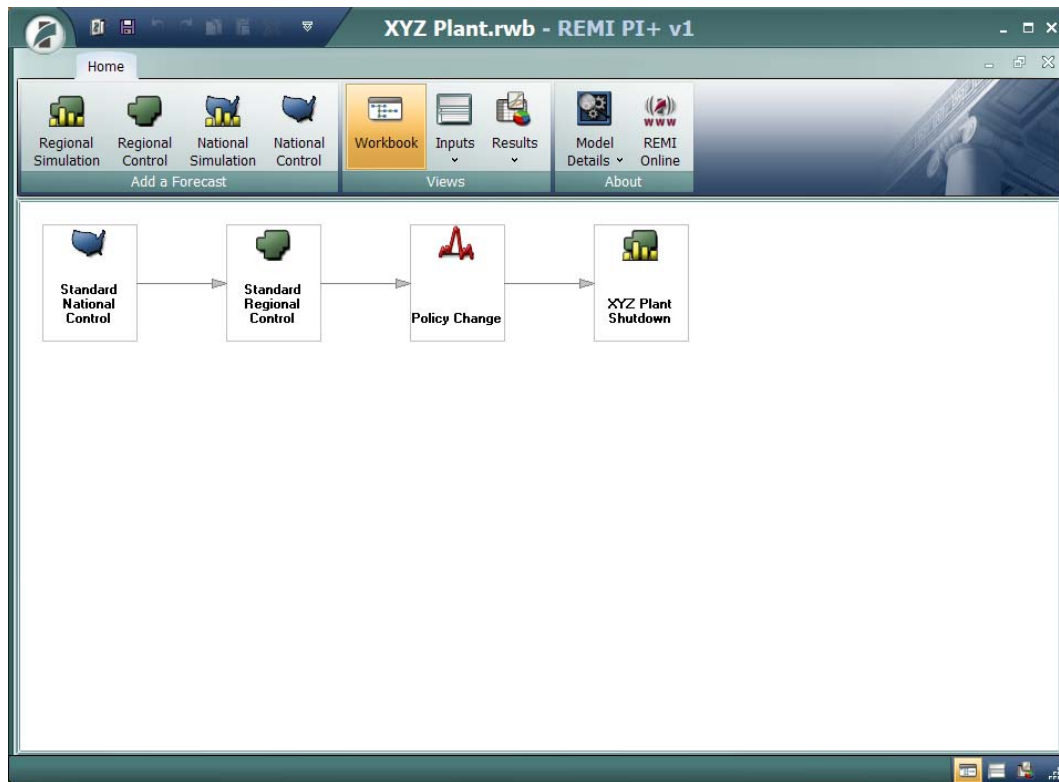
Then close the Insert tab window by clicking again on the lower X in the upper right hand corner. You will be prompted to save the forecast to the workbook. Click Yes.



Then you will be prompted to give the workbook a name, such as XYZ Plant. Then click the Save button.



Your Workbook view will now display the XYZ Plant Shutdown simulation.



To reexamine the policy variable inputs, simply double click on the Policy Change box of the flow chart. To reexamine the simulation results, double click on the XYZ Plant Shutdown box.

Likewise, the Standard Regional Control and Standard National Control data may be viewed by double clicking on those respective boxes.

To close the application, click on the top X in the upper right hand corner.



New Consumer Taxes Topic - REMIPi+ v1

Home | **Insert**

BizDev

Custom Industry

Translator Variables

Economic

Demographic

More Scenarios

Topics

Model Blocks

Full List

Calculator

Spreader

Import

Export

Blueprints

Scenarios

Tools

**Consumer Taxes Topic**

Government Spending (amount)

The Government Spending (amount) policy variable converts the change in State and Local Government Spending entered into Industry Demand using the Technical Coefficients Matrix. This variable should be used to increase or decrease general

Name

**Selector**

Category

- Consumer Spending (amount)
- Government Spending (amount)**
- State Government Spending (amount)
- Local Government Spending (amount)
- Government Spending including Non-Pecunia...
- Personal Taxes (amount)
- Consumer Price (amount)

Detail

- Total

Units

- 2000 Chained National \$ (Units)
- 2000 Chained National \$ (000s)
- 2000 Chained National \$ (M)
- 2000 Chained National \$ (B)
- 2008 Chained National \$ (Units)
- 2008 Chained National \$ (000s)
- 2008 Chained National \$ (M)
- 2008 Chained National \$ (B)

Insert Into Editor

**Editor**

Category	Detail	Units	ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Government Spending (amount)	Total	2008 Chained National ...	94	0	0	0	100	100	100	100	100	100	100	100

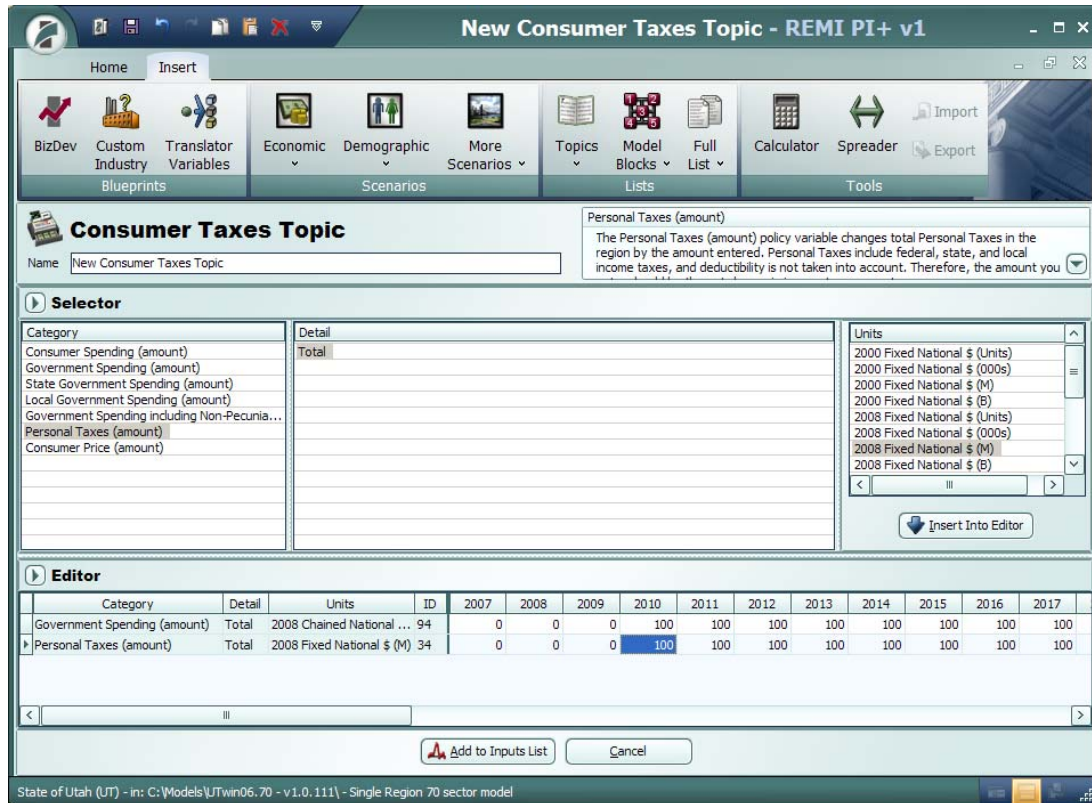
Add to Inputs List

Cancel

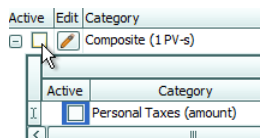
State of Utah (UT) - in: C:\Models\UTwin06.70 - v1.0.111 - Single Region 70 sector model



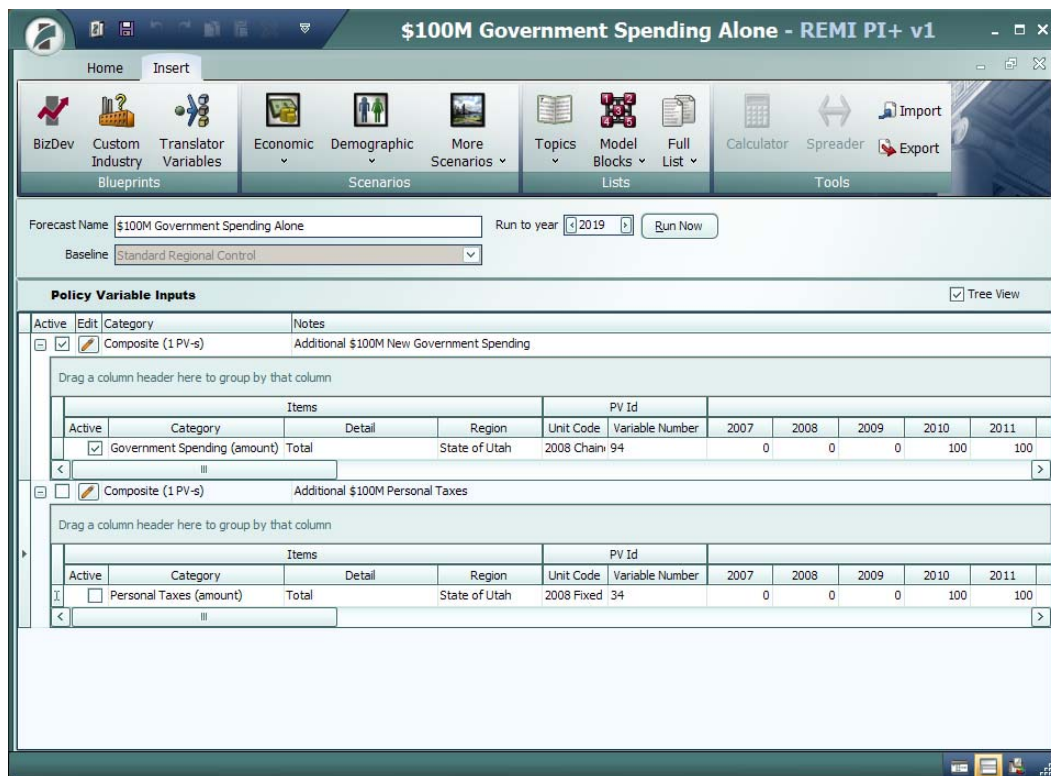
Step 2: To add the second policy variable, click on Personal Taxes (amount), choose the equivalent units used previously (2008 Fixed National \$ (M)), Insert into Editor, and enter a value of 100 for the same years (2009-2019). Then Add to Inputs List.



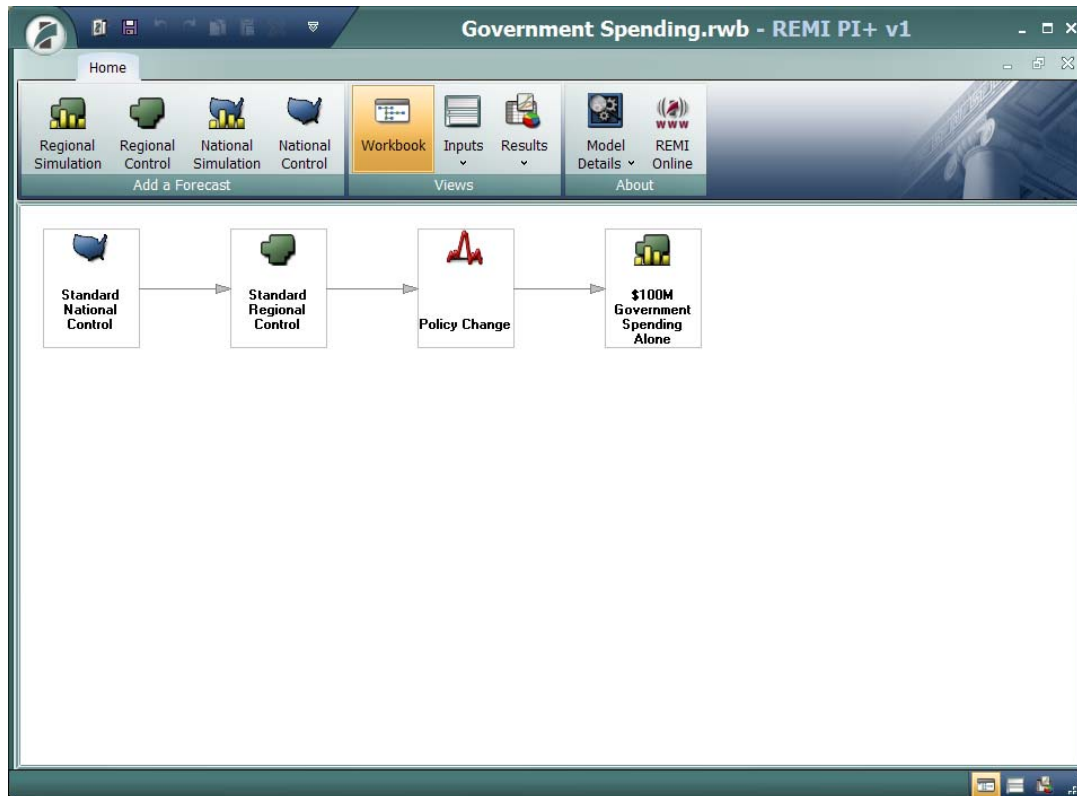
Step 3: The Policy Variable Inputs View shows both policy variables. For the first simulation, we want to run one alone, so deactivate the Personal Taxes policy variable by unchecking the active box.




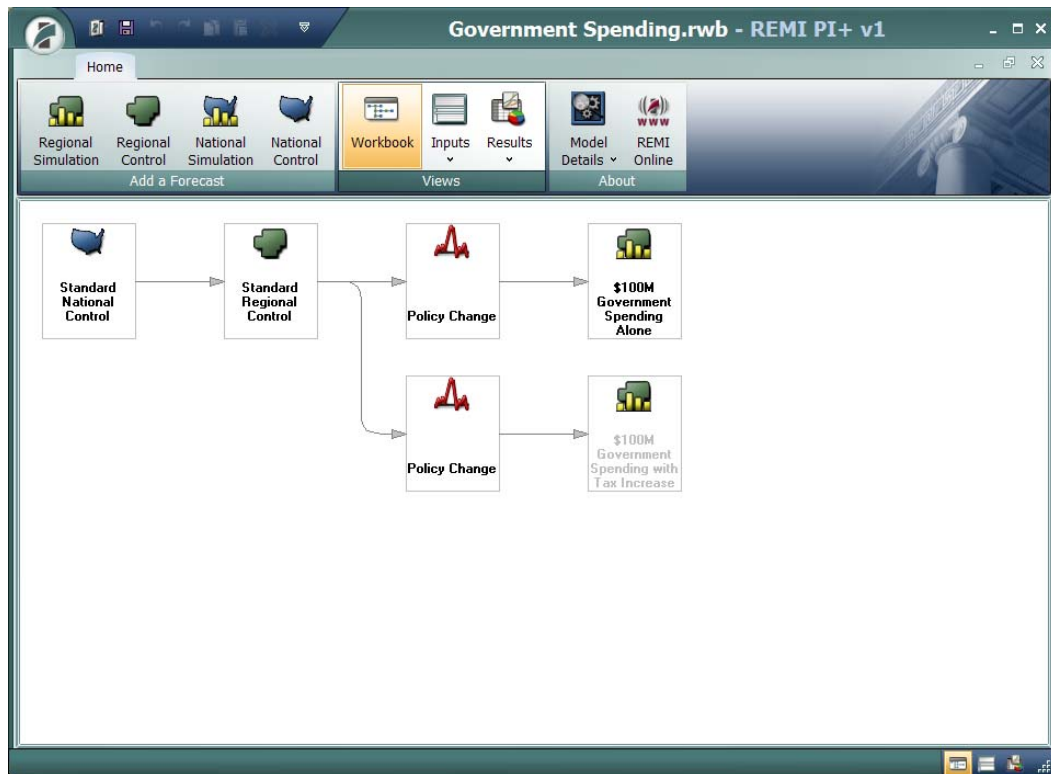
Name the forecast, in this case, \$100M Government Spending Alone, and set the run to year to 2019, since we are only interested in a 10 year time horizon. Then click Run Now.



Step 4: Close and save this forecast to a new workbook. The Workbook view now shows the saved simulation.

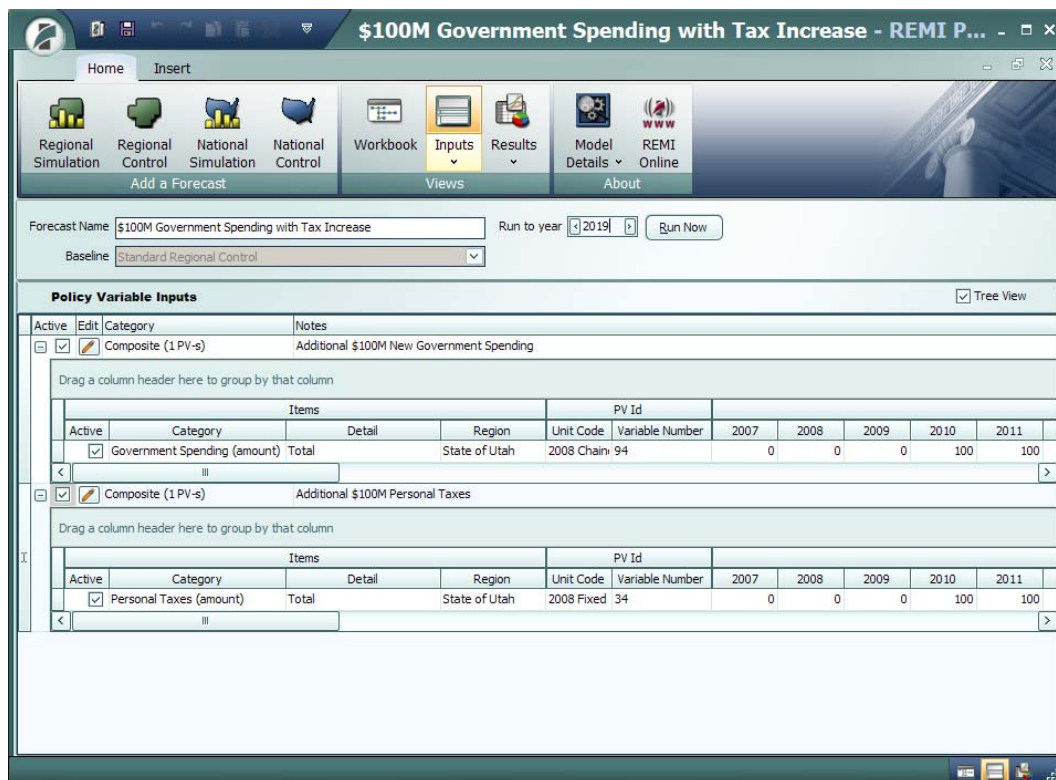


To copy the policy variables already selected to a new simulation, click on the Policy Change box, and then go to the Quick Access Tool Bar in the upper left hand corner of the application and click on the paste button . Give the simulation a meaningful name, in this case, \$100M Government Spending with Tax Increase, and click OK. A new forecast branch is now visible. The new forecast name is currently ghosted because the forecast has not yet been run.

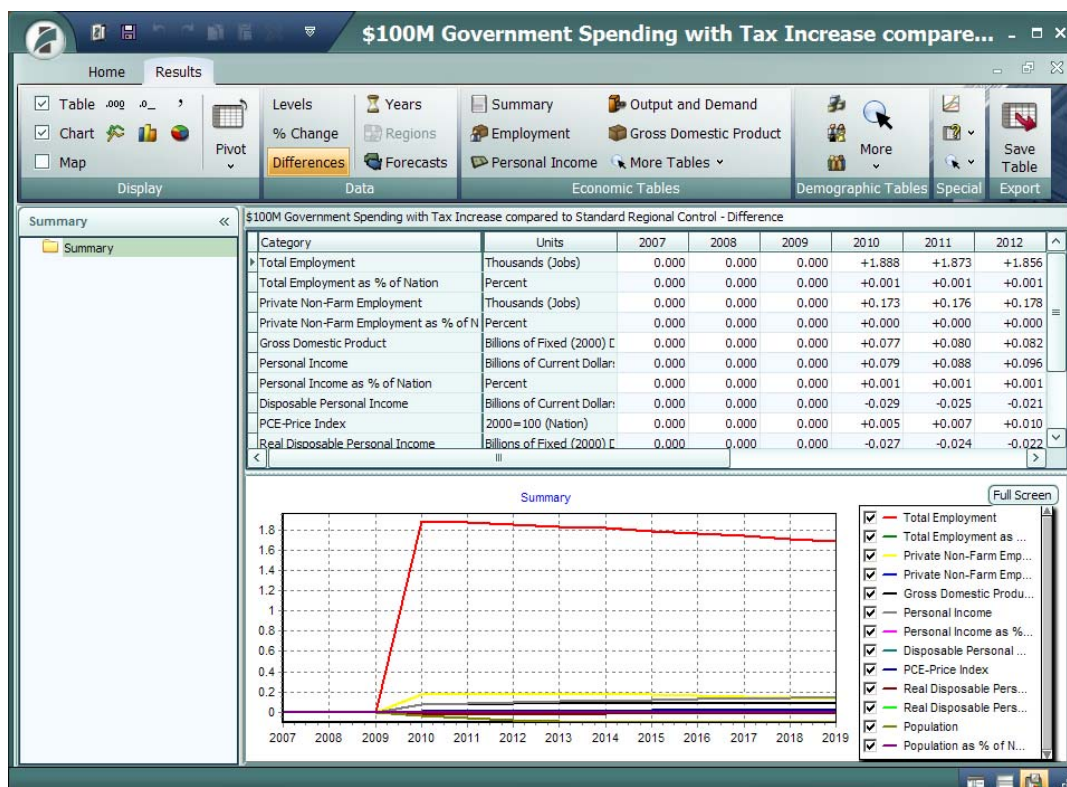


Step 5: Double click on the Policy Change box in order to access the Policy Variable Inputs window. Since an exact copy of the policy changes from the first simulation was made, the Additional \$100M Personal Taxes policy variable is still inactive. To active this variable, click on the check box. Change the run to year to 2019, and click Run Now.

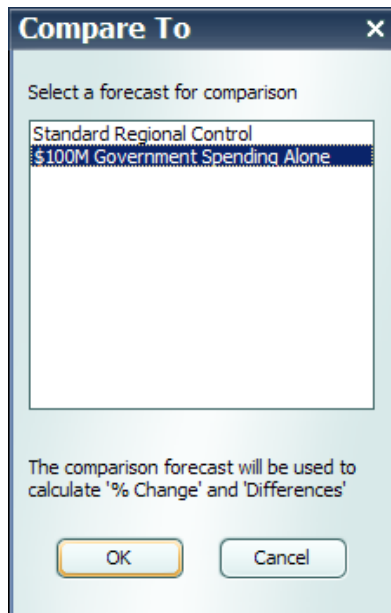




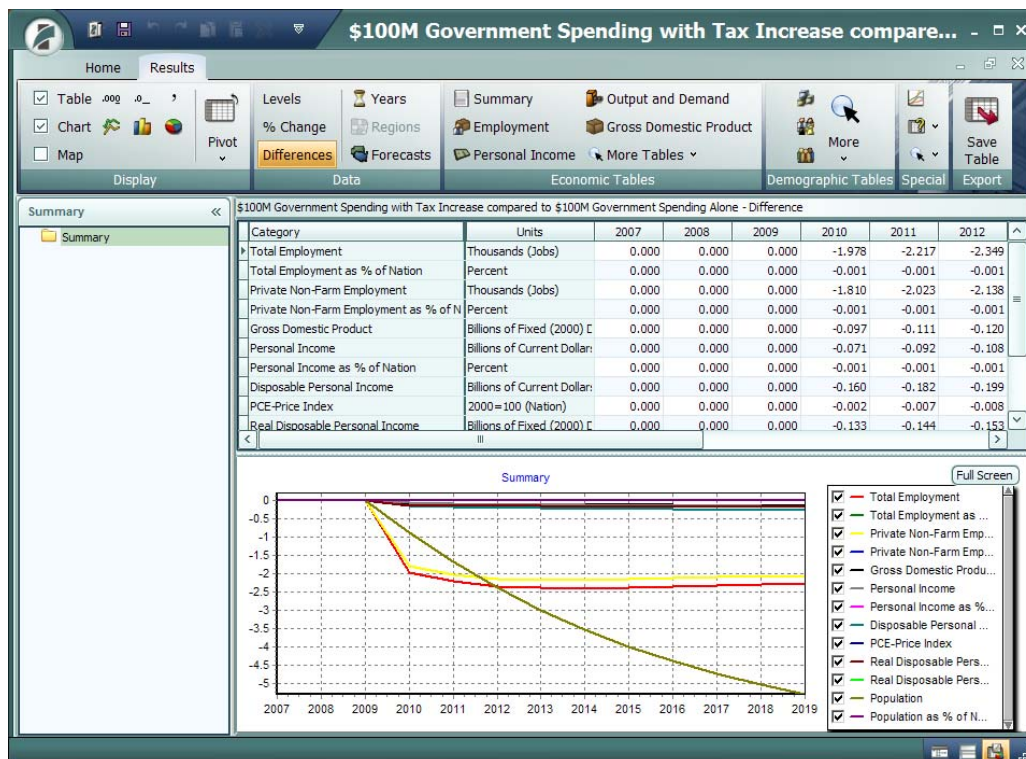
The results now displayed are net for both the additional \$100M of new government spending, and the additional \$100M of new personal taxes.



Step 6: You are now ready to analyze the results. To see the effect of just the increase in personal taxes, click on the Forecast button on the Data group of the Results tab ribbon, and select the \$100M Government Spending Alone forecast for comparison. Click OK.



The Results now reflect just the additional taxes, which leads to a loss of jobs.

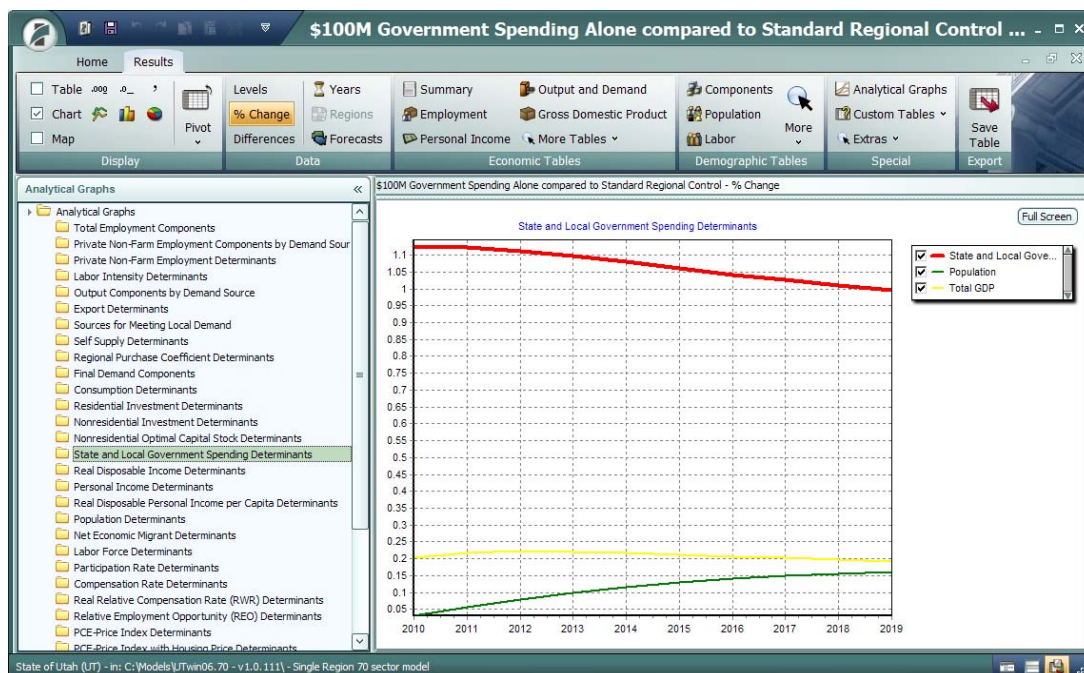


So by going through the policy variable selection process just once, you have been able to generate results for three different simulations, government spending alone, government spending combined with additional personal taxes, and personal taxes alone. Each policy variable generates a change in many of the endogenous variables of the model and it is important to be able to understand how the final results of a simulation are influenced by the specific policy variables that are used. By seeing the effects of each policy variable change, you will be better able to explain the final result when all of the variables are combined.

### B. Using Analytical Graphs to Understand Results

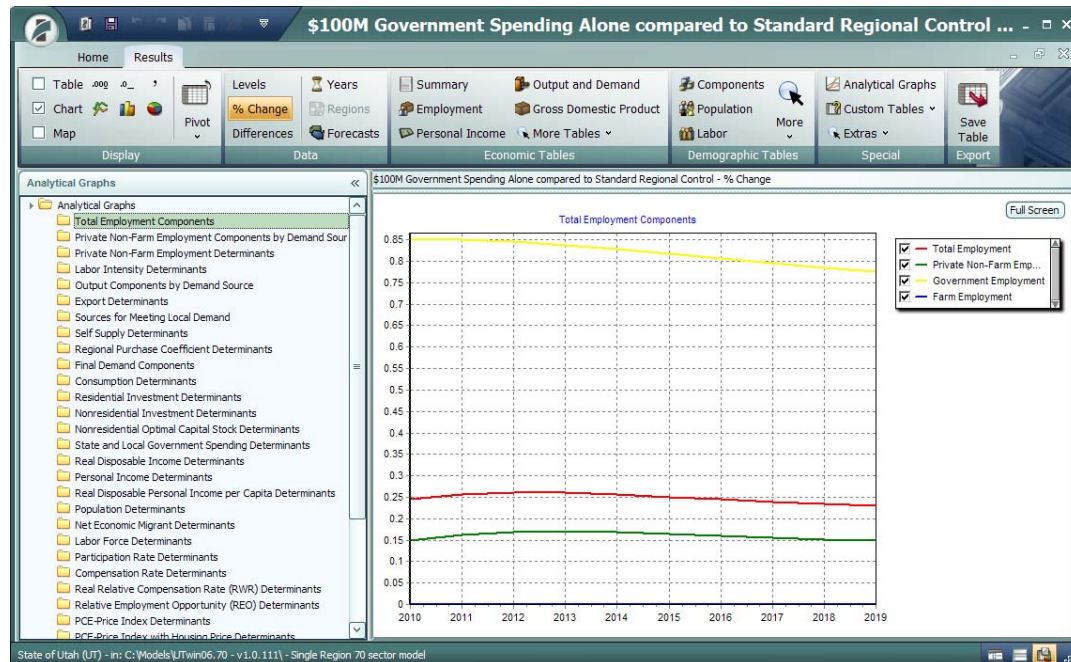
Analytical Graphs are organized to illustrate the main determinants of key variables of the model. By stepping through the graphs, you can quickly see the percent change in a key variable as well as that variable's main determinants, allowing you to isolate the primary cause and effects of the simulation changes.

Looking at the \$100M Government Spending Alone simulation (compared to the Standard Regional Control), the State and Local Government Spending Determinants chart illustrates the total percent change to State and Local Government Spending, which is a combination of both the direct \$100M input as well as the indirect effect of a slightly higher population and economy (measured in Total GDP).



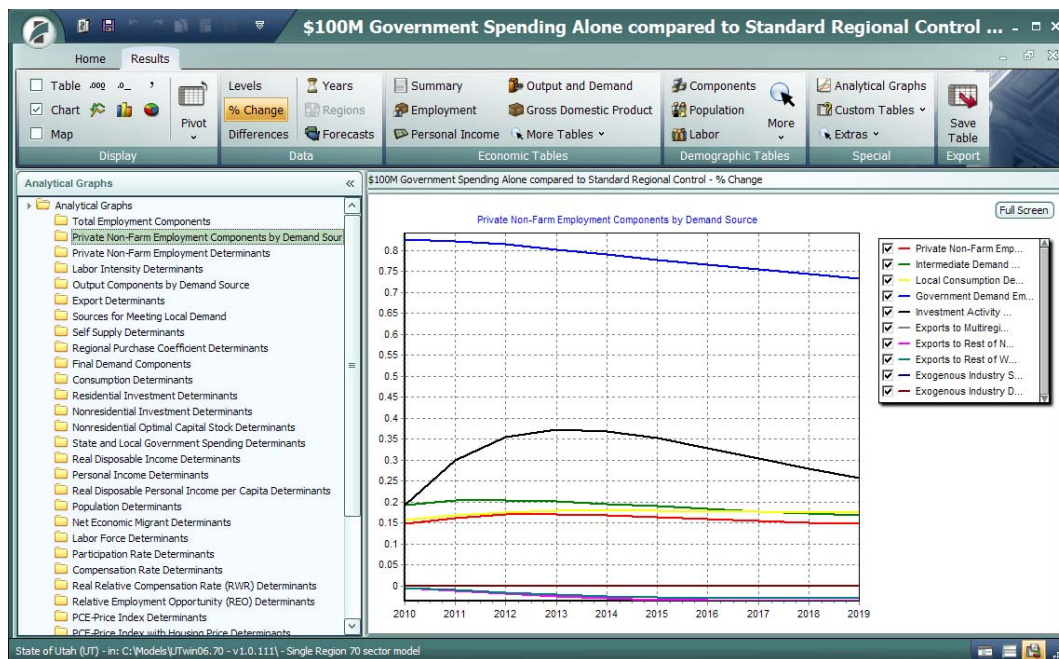
The effect on employment can be explained by viewing the Total Employment Components chart. A change in government employment leads the way, which is logical since the direct input was additional government spending, most of which, on average, is used to support

employment. The change in Private Non-Farm Employment is the indirect effect of the additional government spending.

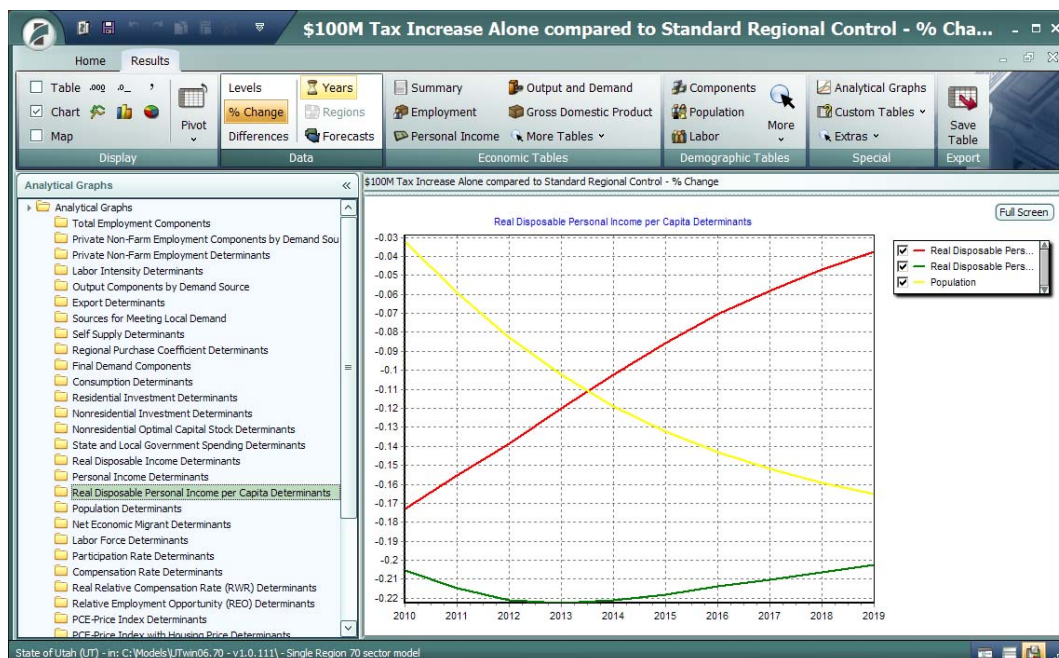


To better understand the change in Private Non-Farm Employment, you can look at the Private Non-Farm Employment Components by Demand Source chart, which shows the percent change in employment by type of demand. Consumption and Intermediate Demand are typically the largest components of demand, so these changes track the most closely to the overall change in Private Non-Farm Employment. The additional government spending led to an increase in consumption primarily due to the spending of compensation earned by the new government employees. The intermediate demand increased due to additional demand by consumers as well as direct spending of the government on supplies, etc.

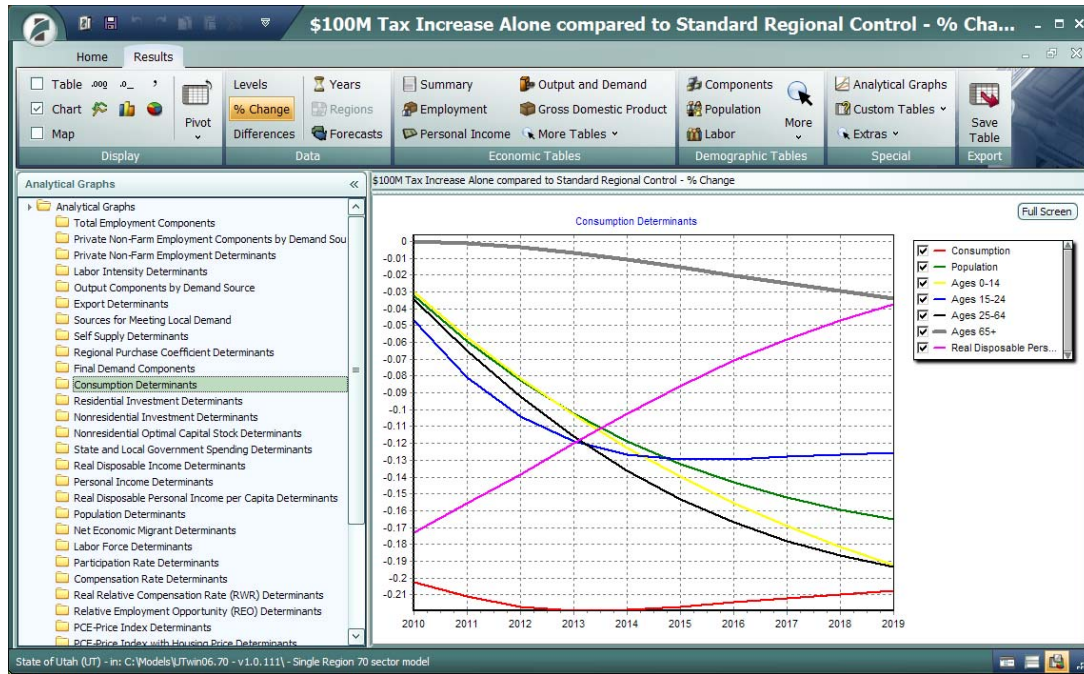




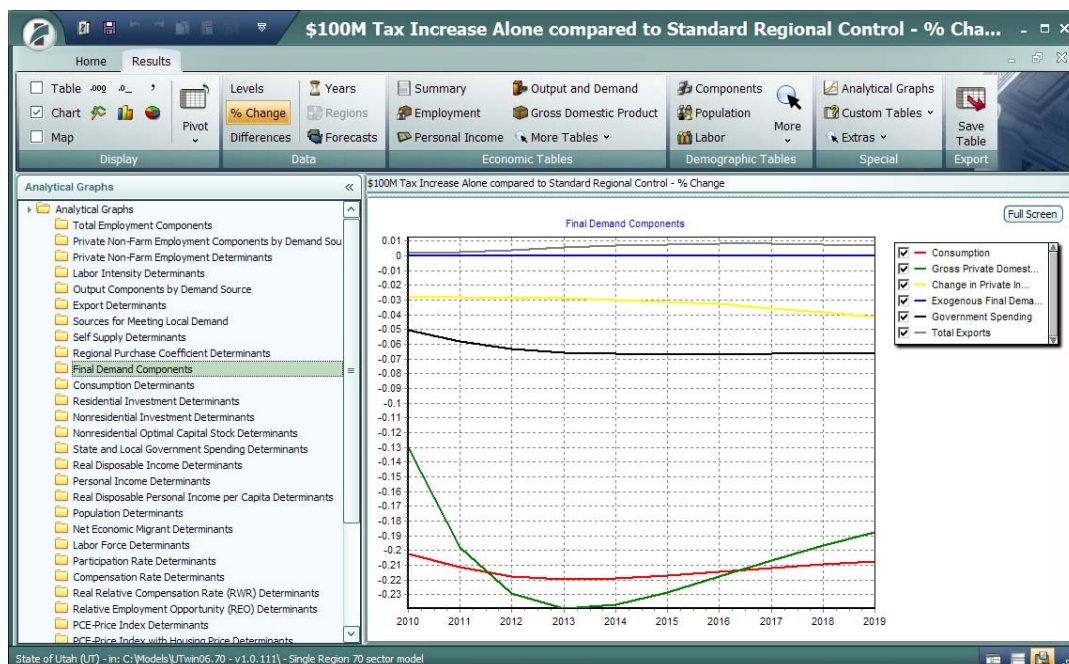
Looking at the \$100M Tax Increase Alone simulation (compared to the Standard Regional Control), the Real Disposable Personal Income per Capita Determinants chart illustrates the total percent change to Real Disposable Income, as well as the percent change in Real Disposable Income per Capita, which is also affected by the percent change in Population. Increasing personal taxes leads to additional outward flow of economic migrants (due to the increased cost of living in the area), which lowers the overall population, mitigating the percent change in Real Disposable Income per Capita compared to the percent change in Real Disposable Income.



The Consumption Determinants chart shows the percent change in Consumption, as well as the primary causes for this, Population (by age cohort) and Real Disposable Income per Capita. A smaller population and less income per person result in less consumption.

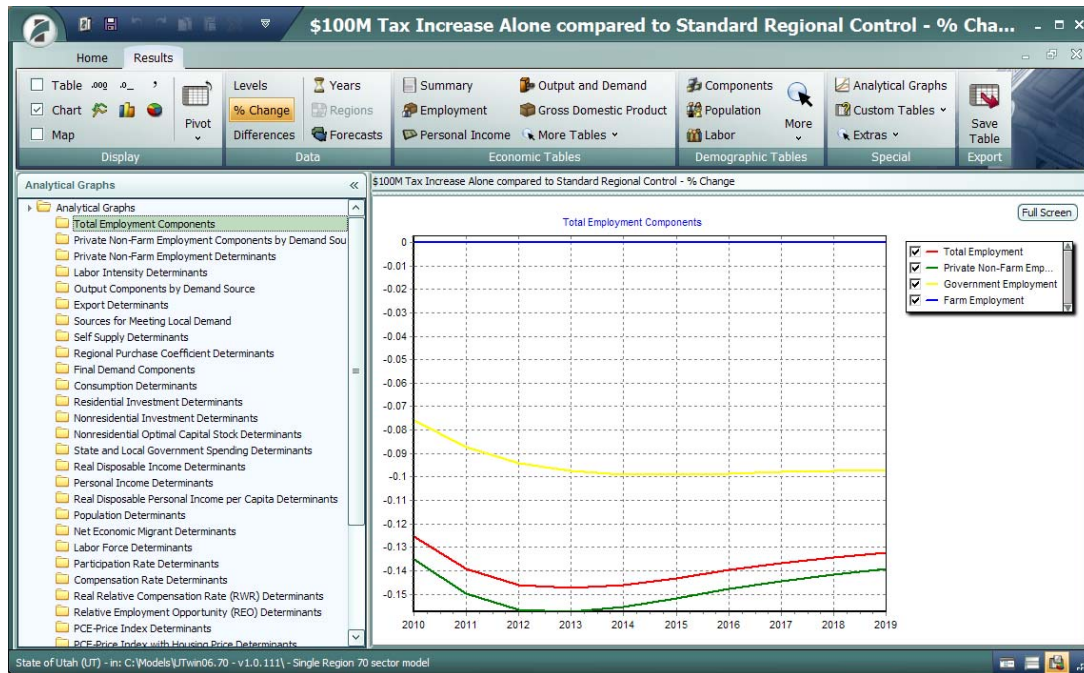


The Final Demand Components chart shows the percent change in major components of GDP. The overall negative effect on the economy (driven by less consumption) leads to less fixed investment over time, due to a smaller optimal capital stock.

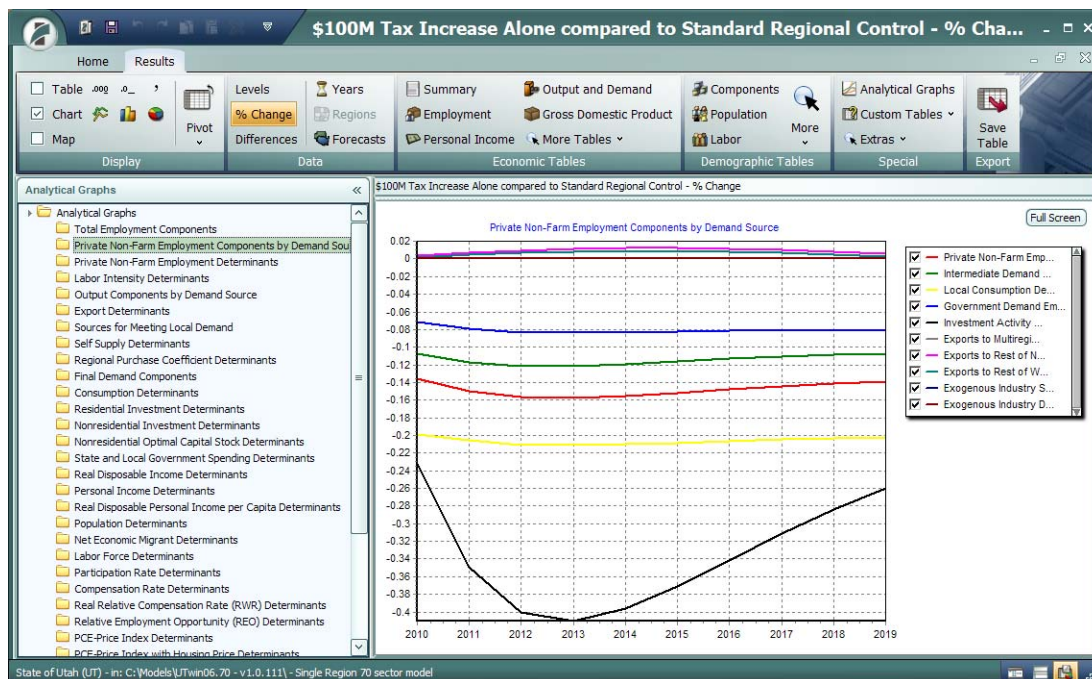




The effect on employment can be explained by viewing the Total Employment Components chart. Private Non-Farm Employment shows the largest decrease in terms of percent change.



The overall loss of jobs is primarily explained by the decrease in demand for Consumption, Investment, and Intermediate goods.



# Getting Additional Help

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Help is available in the following forms:

- REMI Technical Support
- REMI's Web site, [www.remi.com](http://www.remi.com)

## **Contacting REMI Technical Support**

You may contact REMI Technical Support at 413-549-1169. Be sure to be sitting near your computer so a REMI support person can help you with your problem.

## **REMI's Web Site**

REMI's Web site, [www.remi.com](http://www.remi.com), contains a Frequently Asked Questions (FAQ) page, a glossary of terms, and extensive product documentation. There is also a listing of upcoming REMI conferences. You can also ask a question of REMI staff by sending an e-mail to [info@remi.com](mailto:info@remi.com).