

Modeling the Potential Impact of a Closure of the Portsmouth Naval Shipyard

This assessment of the potential economic impact of a closure of the Portsmouth Naval Shipyard on New Hampshire under BRAC 2005 was carried out using the Economic and Labor Market Information Bureau's New Hampshire 10-County Econometric Model - a REMI Policy Insight® model¹. Below is an explanation of the economic theory and data behind the REMI model and a description of how this tool is used to model planned or anticipated economic events.

The REMI Model

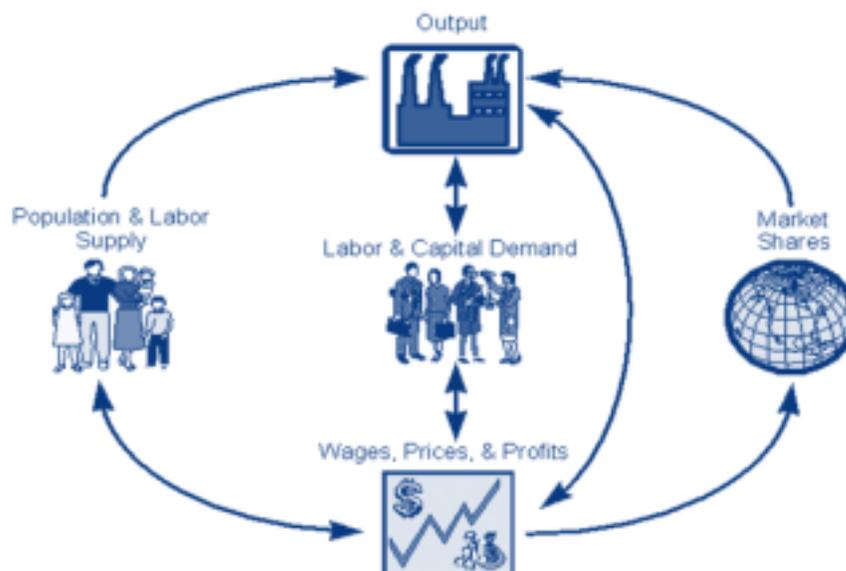
REMI Policy Insight® is a structural model, meaning that it depends on cause-and-effect relationships. The model is based on two key underlying assumptions from mainstream economic theory: households optimize their resources and producers maximize profits. Although the REMI model is a sophisticated mathematical tool, the overall dynamic can be understood by lay people. The tool is often used by economic developers and planners to gauge the potential impact on a regional economy of proposed projects such as

improvements to transportation infrastructure; commercial, industrial and residential development; relocation or expansion of businesses, etc.

In the model, businesses produce goods and services to sell to local firms, investors, governments, and individuals, or sell as exports outside the region. The output is produced using labor, capital, fuel, and intermediate inputs. The demand, per unit of output, for labor, capital, and fuel depends on the relative cost of each input. An increase in the price of any one of these inputs leads to substitution away from that input to other inputs. The supply of labor in the model depends on the size of the population and the share of the population which participates in the labor force. Economic migration affects the population size. People will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labor determines the wage rates (price of labor) in the model. Wage rates, along with other

Figure 2.1 REMI Policy Insight Overview



prices and productivity, determine the cost of doing business for each industry in the model. An increase in the cost of doing business causes either an increase in prices or a cut in profits, depending on the market for the product. In either case, an increase in costs would decrease the share of the local and U.S. market supplied by local firms. This market share, combined with the demand described above, determines the amount of local output. Many other feedbacks are incorporated in the model. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment, and population growth impacts government spending. Figure 2-1 is a pictorial representation of REMI Policy Insight®.

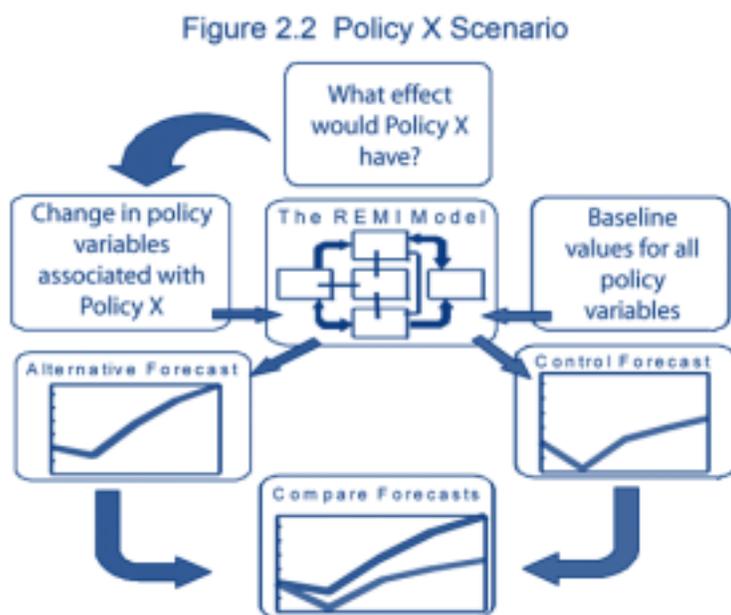
Figure 2-2 shows the policy simulation process for a scenario called Policy X. The effects of a scenario are determined by comparing an alternative forecast to the baseline REMI forecast (control forecast). To create the control forecast for a particular region, REMI uses recent data and thousands of equations

to generate projected economic activity. To show the effects of a given economic event, the assumptions made are translated into *change in policy variables*, representing the direct effects. The model generates the alternative forecast using these alternated policy variables as inputs.

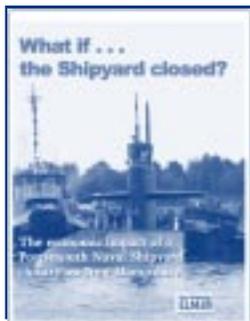
Figure 2-2 Policy X Scenario
 For the Portsmouth Naval Shipyard study, the Policy X is the closure of the Shipyard. The impact is assessed relative to the expected growth in the region's economy assuming no closure and growth as forecasted to 2021² by REMI.

Examples of other policy scenarios simulated using the Economic and Labor Market Information Bureau's New Hampshire 10-County Econometric Model are the *North Country Industrial Development Simulation - Estimated impacts of economic development in the three northern counties of New Hampshire*, and the *Impact of a Potential Coos County Paper Industry Contraction*. The study on the potential closure of the

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Portsmouth Naval Shipyard and the *North Country Industrial Development Simulation* are available on the web at <http://www.nhes.state.nh.us/elmi/specpubs.htm>. The impact study of the paper industry contraction is only available in hard copy. Any of these publications can be requested by contacting ELMI Publications at (603) 228-4124.

REMI studies have been conducted in regional economies all over the United States, on subjects ranging from economic development, transportation, infrastructure, environment, energy and natural resources to state and local

tax changes. Some of these studies are listed at the Regional Economic Models, Inc website at <www.remi.com/support/articles.html>.

If you have any questions about the Portsmouth Naval Shipyard study or any questions related to the use of the REMI Model, please contact Peter S. Bartlett at (603) 228-4122, email pbartlett@nhes.state.nh.us or Annette Nielsen at (603) 229-4427, email anielsen@nhes.state.nh.us.

¹ Product of Regional Economic Models, Inc. of Amherst, MA.

² REMI has the capabilities to forecast to 2050.

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