Agenda

- State Policy Objectives
- About REMI
- About Tax-PI
- Uses in State Policy Analysis
- Model Demonstration
State Policy Objectives

- State and local governments have a dual objective:
  - Well-being of residents
  - Management of the budget and fiscal considerations

- Thus, policy decisions need to take into account both socioeconomic and fiscal effects
REMI’s 39-year history of rigorous academic research and software development has led to the development of the industry standard in macroeconomic research methodology:

- **Input-Output**: Close analysis of inter-industry relationships
- **General Equilibrium**: Estimate of long-run stability of the economy allows for analysis of policy decisions
- **Econometrics**: Advanced statistical analyses underpinning the model
- **Economic Geography**: Effects of geographic concentration of labor and industry

Integrated REMI economic modeling approach
About Tax-PI

**Tax-PI** is the only commercially available dynamic macroeconomic and fiscal impact analysis tool. Tax-PI allows users to understand the deep linkages and relationship between a budget and its economic foundation.

Tax-PI is uniquely customizable to your state:

- User-defined revenue and expenditure categories
- Automatic budget-balancer: demand- or revenue-driven
- Accommodates state’s economic, demographic, fiscal projections
About Tax-PI

Tax-PI Model Structure Overview

- Tax Policy Change
- Dynamic Economic Impacts
- Fiscal and Economic Impact Results
  - Employment
  - GDP
  - Personal Income
  - Population

- Revenue Impacts
- Expenditure Requirements Impacts
- Government Offset

PV (Government Spending with or without Non-Pecuniary Amenity Aspects)
About Tax-PI

User Calibration
- State Expenditures
- State Revenues

Build Simulation
- Economic development
- Tax policy

Dynamic Results
- Demographic
- Economic
- Fiscal
Uses in State Policy Analysis

- Dynamic tax analysis
  - Arkansas fiscal notes
- Fiscal impacts of non-tax policy
  - Amazon HQ2
- Fiscal resiliency
  - Wyoming tax structure
Dynamic Scoring Analysis of Tax Proposals

- Arkansas Bureau of Legislative Research

- Several different tax proposals analyzed

- Tax proposals with largest static impact were income tax rate reductions
Proposal & Methodology

- Personal Income Tax Proposal
  - Reduce top marginal rate from 6.9% to 6%
  - Static fiscal impact of $180 million

- Methodology
  - Modeled as changes to disposable income
  - Modeled as changes to business production costs
    - Businesses can lower labor costs without hurting employees’ disposable income
## Disposable Income Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Individuals</td>
<td>1,108</td>
<td>1,972</td>
<td>2,637</td>
<td>3,107</td>
<td>3,417</td>
<td>2,448</td>
</tr>
<tr>
<td>Total Employment</td>
<td>Individuals</td>
<td>1,440</td>
<td>1,671</td>
<td>1,713</td>
<td>1,631</td>
<td>1,507</td>
<td>1,593</td>
</tr>
<tr>
<td>Gross State Product (Value-Added)</td>
<td>Nominal Millions</td>
<td>$103.8</td>
<td>$124.4</td>
<td>$131.9</td>
<td>$130.5</td>
<td>$125.0</td>
<td>$123.1</td>
</tr>
<tr>
<td>Output (Industry Sales)</td>
<td>Nominal Millions</td>
<td>$172.1</td>
<td>$205.6</td>
<td>$217.0</td>
<td>$213.6</td>
<td>$203.5</td>
<td>$202.4</td>
</tr>
<tr>
<td>Disposable Personal Income</td>
<td>Nominal Millions</td>
<td>$250.4</td>
<td>$273.9</td>
<td>$288.0</td>
<td>$294.9</td>
<td>$296.4</td>
<td>$280.7</td>
</tr>
<tr>
<td>Government Revenue</td>
<td>Nominal Millions</td>
<td>-$171.6</td>
<td>-$170.3</td>
<td>-$169.4</td>
<td>-$169.0</td>
<td>-$168.8</td>
<td>-$169.8</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>Nominal Millions</td>
<td>$2.1</td>
<td>$3.8</td>
<td>$5.2</td>
<td>$6.3</td>
<td>$7.0</td>
<td>$4.9</td>
</tr>
</tbody>
</table>
# Production Cost Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>Individuals</td>
<td>727</td>
<td>1,456</td>
<td>2,145</td>
<td>2,755</td>
<td>3,266</td>
<td>2,070</td>
</tr>
<tr>
<td><strong>Total Employment</strong></td>
<td>Individuals</td>
<td>1,364</td>
<td>1,919</td>
<td>2,279</td>
<td>2,480</td>
<td>2,580</td>
<td>2,124</td>
</tr>
<tr>
<td><strong>Gross State Product</strong></td>
<td>Nominal Millions</td>
<td>$91.2</td>
<td>$134.8</td>
<td>$166.9</td>
<td>$189.6</td>
<td>$205.1</td>
<td>$157.5</td>
</tr>
<tr>
<td>(Value-Added)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>Nominal Millions</td>
<td>$158.0</td>
<td>$234.6</td>
<td>$290.7</td>
<td>$330.0</td>
<td>$356.8</td>
<td>$274.0</td>
</tr>
<tr>
<td>(Industry Sales)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Disposable Personal Income</strong></td>
<td>Nominal Millions</td>
<td>$58.0</td>
<td>$91.8</td>
<td>$119.8</td>
<td>$142.4</td>
<td>$159.4</td>
<td>$114.3</td>
</tr>
<tr>
<td><strong>Government Revenue</strong></td>
<td>Nominal Millions</td>
<td>-$175.5</td>
<td>-$173.5</td>
<td>-$171.8</td>
<td>-$170.5</td>
<td>-$169.4</td>
<td>-$172.2</td>
</tr>
<tr>
<td><strong>Government Expenditure</strong></td>
<td>Nominal Millions</td>
<td>$1.5</td>
<td>$3.1</td>
<td>$4.7</td>
<td>$6.2</td>
<td>$7.6</td>
<td>$4.6</td>
</tr>
</tbody>
</table>
Fiscal Impact Analysis

- Fiscal impacts of non-tax policy
  - E.g., economic development incentives
- Contracted with Empire State Development to analyze economic, fiscal impacts of Amazon HQ2 in NYS
  - Impacts quoted by NYS Gov. Cuomo, NYC Mayor de Blasio in press release
- Used data on anticipated construction spending, employment, compensation, incentives
## Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>2019</th>
<th>2023</th>
<th>2027</th>
<th>2031</th>
<th>2043</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Employment</strong></td>
<td>Individuals (Jobs)</td>
<td>2,766</td>
<td>38,526</td>
<td>66,658</td>
<td>88,499</td>
<td>107,183</td>
</tr>
<tr>
<td><strong>Total Tax Revenues</strong></td>
<td>Millions of 2019 Dollars</td>
<td>10.8</td>
<td>194.6</td>
<td>408.3</td>
<td>599.9</td>
<td>969.6</td>
</tr>
<tr>
<td><strong>Total Incentives + Grants</strong></td>
<td>Millions of 2019 Dollars</td>
<td>45.8</td>
<td>141.6</td>
<td>185.5</td>
<td>33.7</td>
<td>0</td>
</tr>
</tbody>
</table>
Fiscal Resiliency

The reduction of potential budget deficits in the face of an unforeseen event

- Resilient to:
  - National Recessions
    - Reductions in output and stock market declines may alter regional positions
      - E.G. DC housing prices fell less than CA during the national recession.
  - Specific Revenue Shocks
    - Industry: Vulnerable to industry shifts
      - E.g. Houston is dependent on oil production/refining
    - Customer: Vulnerable to change in outlays
      - E.g. D.C. metro is reliant on federal contracting
    - Specific Tax
      - E.g. California is reliant on capital gains tax
Common methods to prepare for shocks:

- Leverage periods of economic growth by building budgetary reserves
- Decrease reliance on volatile revenue sources
Fiscal Resiliency

- Decrease Reliance on Volatile Revenue Sources
  - Severance Taxes on Oil and Mineral Resources along with Corporate Taxes are the most volatile sources of state revenue
  - State budget volatility varies greatly (Pew Trusts)
    - Highest Volatility – Alaska, Wyoming, and North Dakota
    - Lowest Volatility – South Dakota, Kentucky, and Maryland

What happens in Wyoming if there is a negative production shock to oil prices?
Diversifying tax revenue via the introduction of a Personal Income Tax*

Methodology

- $334M increased revenue from new PIT
  - Levied on Personal Income minus transfer payments
- $334M decreased revenue from severance taxes
  - Oil & gas extraction
Fiscal Resiliency

Resilience Analysis

Total Revenues

- Total Revenues
- Differences

Budget Disaster Scenario

Budget Resilience Scenario

Total Maximum Loss Potential
$0.912 Billion

Actual Loss in Resilience Scenario
$0.680 Billion

Avoided Loss Due to Resilience Measures
$0.232 Billion

Resilience Loss Reduction Potential
25.41%