Dynamic Impacts of Tax Law Changes

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Road Map

• Differentiate between static and dynamic impacts
• Suggest times when dynamic scoring is appropriate
• Demonstrate complementary relationship between dynamic and static scoring
• Describe dynamic modeling techniques used in Kentucky
• Discuss tax-by-tax results
Regional Economic Models, Inc. (REMI)
(States that use REMI for dynamic modeling)

- Arkansas
- Connecticut
- Florida
- Georgia
- Illinois
- Indiana
- Iowa
- Kentucky
- Maine
- Michigan
- Minnesota
- Missouri
- New York
- Texas
- Vermont
- Wisconsin

The Modern Literature
(Dominated by discussions of the Laffer Curve)

- Hypothesized a relationship between tax rates and tax revenues
- Unclear which tax rate equates to the maximum revenue yield
Focus of Dynamic Analysis

- Baseline revenue forecasts make *ceteris paribus* assumptions about the underlying revenue structure.
- Certain changes to tax law may lead to changes in the underlying baseline economic assumptions.
- Therefore, in order to quantify the effects of violating *ceteris paribus* assumptions, dynamic scoring is used.
- Not grounded in Laffer Curve macro assumptions, as Laffer-type relationships would affect the static estimates (which are inputs to the dynamic model)

Static versus Dynamic Analysis

Economic Assumptions

Revenue Forecast

Policy Change

Static Estimates
- Behavioral Effects
- Assume employment and personal income unchanged

Dynamic Estimates
- Behavioral Effects
- Relax *ceteris paribus* assumptions of economic forecast
Static Estimates Used as Inputs to Dynamic Estimates

- In some cases, the static estimate of a tax change is used as an input into the dynamic estimation
  - Corporate License Tax
  - Individual Income Tax
  - Property Taxes
Example: Individual Income Tax

Individual Income Tax Rate Reduction

Static Revenue Estimate

Baseline Income In Model

Adjustment to Taxes

Percent Reduction In Taxes

REMI Variable

Baseline Taxes In Model

Adjustment for Itemizers

Dynamic Impacts

Federal Deduction

Dynamic Impacts of Individual Income Tax

Percent Reduction In Taxes

Increase in Competitive Position

Increase in Disposable Income

Economic Migration

Increase in Consumer Demand
A More Complicated Example: Corporate License Tax

Repeal Corporate License Tax

Increases internal rate of return on capital

More Investment in Kentucky

Increased Demand for Capital

Complicating Factors
(Shock the cost of investment rather than level of investment)

If we are tempted to assert that money is the drink which stimulates economic activity, we must remind ourselves that there may be several slips between the lip and the cup … Whilst a decline in the rate of interest (or cost of capital) may be expected, ceteris paribus, to increase the volume of investment, this will not happen if the schedule of the marginal efficiency of capital is falling more rapidly than the rate of interest (cost of capital).

John Maynard Keynes
General Theory, pp 173
Parenthesis Added
Corporate License Tax

- Corporate License Tax Rate Reduction
- Static Revenue Estimate ($196.6 mil)

53-Sector Value Added
- Divide Static Estimate Across Industries
- Adjustment to Cost of Capital

Cost of Capital By 53 Sector
- REMI Variable

Dynamic Impacts
Details of License Tax Input
(Spreading $196.6 million static input across industries)

Factor Inputs From Capital$_i$

Value Added$_i$ * Value Added$_i$ ÷ Output$_i$ = Capital Share Of Output$_i$

Normalize to 100%

Industry i’s Share

* Static Estimate $196.6$ mil

REMI Inputs for the cost of capital for 53 sectors

Jobs for Kentucky Tax Plan

- Introduced in the 2004 Regular Session
- Modified slightly and passed the Senate, attached to the Budget Bill (HB 269)
- House wanted to decouple, never taken to a vote
Dynamic Scoring Grid
(Overall Package was revenue neutral over Biennium)

<table>
<thead>
<tr>
<th>Positive Dynamic Effects</th>
<th>Negative Dynamic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeal of the corporate license tax</td>
<td>Alternative minimum calculation for business entities</td>
</tr>
<tr>
<td>Reduce rates on corporate income tax</td>
<td>Adding limited liability companies to corporate income tax base</td>
</tr>
<tr>
<td>Repeal property tax on intangible personal property</td>
<td>Removing new property from rate setting base on real property</td>
</tr>
<tr>
<td>Individual income tax reduction</td>
<td>Raising cigarette taxes</td>
</tr>
<tr>
<td>Enterprise initiative</td>
<td>Taxing other tobacco products</td>
</tr>
<tr>
<td>Sales tax holiday</td>
<td>Telecommunications tax reform</td>
</tr>
<tr>
<td>Tourism advertising initiative</td>
<td>Impose transient room tax</td>
</tr>
</tbody>
</table>

Initial Approach

- $100 million increments of each tax
  - Reduce Individual Income Tax
  - Reduce Corporate License
  - Increase Cigarette Excise
- Each tax was modeled separately in the model
- Relative magnitudes hint that excise taxes have smaller dynamic losses
Dynamic Grid
(First full year of implementation)

Personal Income, Millions

Corporate: $83
Individual: $69
Excise: -$42

Dynamic Grid
(First Full Year of Implementation)

Employment Effects

Corporate: 2,000
Individual: 1,520
Excise: -766
Tree-Top Results

<table>
<thead>
<tr>
<th>Year</th>
<th>Baseline Job Growth</th>
<th>Job Growth with Impacts</th>
<th>Net Dynamic Impact</th>
<th>% of Baseline Job Growth</th>
<th>Revenue Impact ($ mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>34,747</td>
<td>39,091</td>
<td>4,344</td>
<td>12.5%</td>
<td>$7.1</td>
</tr>
<tr>
<td>2006</td>
<td>29,747</td>
<td>37,020</td>
<td>7,273</td>
<td>24.4%</td>
<td>$13.8</td>
</tr>
<tr>
<td>2007</td>
<td>31,256</td>
<td>38,985</td>
<td>7,729</td>
<td>24.7%</td>
<td>$16.1</td>
</tr>
<tr>
<td>2008</td>
<td>28,426</td>
<td>36,446</td>
<td>8,021</td>
<td>28.2%</td>
<td>$18.1</td>
</tr>
</tbody>
</table>

Back-End Model
(Turning Dynamic Impacts into Jobs and Revenue)

• For Employment, direct output of REMI
  – Since no jobs were used as inputs, all new jobs are indirect
  – Employment by sector

• For Revenues, multiple approaches
  – Quick and dirty percentage of personal income
  – More detailed tax estimates were also done
  – Population induced expenditures?
Top-View Revenue Impact

- Modernization package was scored statically for budgetary purposes
- Revenues depicted have isolated the dynamic impacts

Top-View Jobs Impact

- REMI model was used to compute dynamic employment impacts
- Used conservative assumptions
- The figures reflect net new jobs, demonstrating that the stimulative effect of the tax plan more than swamps any counterbalancing employment effects
Distribution of Jobs

<table>
<thead>
<tr>
<th>Employment Sector</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durables</td>
<td>163</td>
<td>298</td>
<td>341</td>
<td>369</td>
</tr>
<tr>
<td>Non-Durables</td>
<td>15</td>
<td>88</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>Total Manufacturing</td>
<td>178</td>
<td>386</td>
<td>465</td>
<td>518</td>
</tr>
<tr>
<td>Mining</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Construction</td>
<td>617</td>
<td>1,780</td>
<td>1,728</td>
<td>1,667</td>
</tr>
<tr>
<td>Trans&amp;Pub Util</td>
<td>24</td>
<td>64</td>
<td>72</td>
<td>74</td>
</tr>
<tr>
<td>Fin&amp;Ins&amp;Real Est</td>
<td>240</td>
<td>419</td>
<td>510</td>
<td>579</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>141</td>
<td>610</td>
<td>793</td>
<td>873</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>99</td>
<td>198</td>
<td>229</td>
<td>246</td>
</tr>
<tr>
<td>Services</td>
<td>2,038</td>
<td>2,739</td>
<td>2,863</td>
<td>2,941</td>
</tr>
<tr>
<td>Agri&amp;For&amp;Fish Serv</td>
<td>26</td>
<td>53</td>
<td>64</td>
<td>71</td>
</tr>
<tr>
<td>Total Non-Manufacturing</td>
<td>3,187</td>
<td>5,928</td>
<td>6,262</td>
<td>6,458</td>
</tr>
<tr>
<td>Total Government</td>
<td>4</td>
<td>44</td>
<td>82</td>
<td>118</td>
</tr>
<tr>
<td>Total Employment</td>
<td>3,369</td>
<td>6,359</td>
<td>6,810</td>
<td>7,094</td>
</tr>
</tbody>
</table>

Summary of Modeling Strategy
(Turning Static Impacts into Dynamic Inputs)

- Avoid using fiscal elements in the REMI model
- Preferable to use REMI policy variables that affect underlying economic behavior embodied in the tax law changes
- No handbook or standard procedure for modeling dynamic changes due to tax policy – Multiple approaches were used
Conclusions

• Dynamic Analysis is a useful tool for estimating the impact of changes in the tax code.
• Results are often relatively modest compared with expectations.
• Dynamic Scoring is a valid analytical approach when used properly and with conservative assumptions.

Questions ?