Outline

- Sources of analysis
- Current events: Stimulus package (ARRA)
- Budget implications of fiscal policy
- Full employment budget balance
Non-partisan and Partisan Analyses

• The CBO is the Congress’s nonpartisan economic/budget analytical arm

• Other agencies include General Accountability Office (GAO) and Congressional Research Service (CRS)

• Mirrors the Executive Branch’s Office of Management and Budget (OMB) and Council of Economic Advisers (CEA) in White House

• Always think about who’s writing what you read
Did the Stimulus “Work”

• What does “work” mean?
• We’ll interpret “work” to mean increase aggregate demand, output, employment
• One has to be careful about over what period one talks about “working”
• Uncertainty pervades all these analyses (real world vs. textbook)
Estimates of the Impact of ARRA

Table 7. Estimates of the Effects of the ARRA on GDP Growth

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CEA: Projection Approach</td>
<td>+2.6</td>
<td>+2.8</td>
<td>+2.7</td>
</tr>
<tr>
<td>CEA: Model Approach</td>
<td>+2.8</td>
<td>+3.9</td>
<td>+1.8</td>
</tr>
<tr>
<td>CBO: Low</td>
<td>+2.4a</td>
<td>+2.4a</td>
<td>+1.2</td>
</tr>
<tr>
<td>CBO: High</td>
<td>+6.5a</td>
<td>+6.5a</td>
<td>+3.1</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>+2.2</td>
<td>+3.3</td>
<td>+2.0</td>
</tr>
<tr>
<td>IHS/Global Insight</td>
<td>+2.1</td>
<td>+2.5</td>
<td>+2.2</td>
</tr>
<tr>
<td>James Glassman, J.P. Morgan Chase</td>
<td>+4.5</td>
<td>+2.2</td>
<td>+3.1</td>
</tr>
<tr>
<td>Macroeconomic Advisers</td>
<td>+2.1</td>
<td>+2.0</td>
<td>+1.5</td>
</tr>
<tr>
<td>Mark Zandi, Moody's Economy.com</td>
<td>+2.8</td>
<td>+3.2</td>
<td>+2.0</td>
</tr>
</tbody>
</table>

Percentage Points, Annual Rate

Sources: See text for details.

Note: a. Second- and third-quarter effects show the average for these quarters.
How Did They Estimate This Effect?

- Use the multiplier model we have learned
- Figure out how much tax payments have been reduced, how much transfers have increased
- Figure out how much government spending on goods and services
- Apply multipliers, then add up effects, compare to GDP
- Annualize to get growth rates
- Caveat: Have to account for time dimension (impact takes time)
## Quantities (Cumulative)

Table 2. Fiscal Stimulus by Functional Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Q1 (March(^a))</th>
<th>Q2 (June(^b))</th>
<th>Q3 (September(^c))</th>
<th>Q4 (December(^d))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Tax Cuts</td>
<td>2.3</td>
<td>28.7</td>
<td>42.8</td>
<td>56.3</td>
</tr>
<tr>
<td>AMT Relief</td>
<td>0.0</td>
<td>7.2</td>
<td>12.7</td>
<td>15.9</td>
</tr>
<tr>
<td>Business Tax Incentives</td>
<td>0.1</td>
<td>13.1</td>
<td>24.0</td>
<td>33.3</td>
</tr>
<tr>
<td>State Fiscal Relief</td>
<td>8.5</td>
<td>28.2</td>
<td>43.8</td>
<td>59.3</td>
</tr>
<tr>
<td>Aid to Directly Impacted Individuals</td>
<td>0.0</td>
<td>9.8</td>
<td>32.1</td>
<td>57.5</td>
</tr>
<tr>
<td>Government Investment Outlays</td>
<td>0.0</td>
<td>6.1</td>
<td>23.6</td>
<td>41.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11.0</strong></td>
<td><strong>93.1</strong></td>
<td><strong>178.9</strong></td>
<td><strong>263.3</strong></td>
</tr>
<tr>
<td><strong>Change in Total (from the End of the Previous Quarter)</strong></td>
<td><strong>11.0</strong></td>
<td><strong>82.1</strong></td>
<td><strong>85.8</strong></td>
<td><strong>84.4</strong></td>
</tr>
</tbody>
</table>

Sources: Agency Financial and Activity Reports to the Office of Management and Budget; simulations from the Department of the Treasury (Office of Tax Analysis) based on the FY2011 budget.
Apply Multipliers

IMPACT MULTIPLIERS (within the quarter)

• Tax cuts: $28.7 bn × 0
• AMT relief: $7.2 bn × 0
• Bus. Tax incentives: $13.1 bn × 0
• State fiscal relief: $28.2 bn × 0.5
• Aid to directly impacted: $9.8 bn × 1
• Govt. investment outlays: $6.1 bn × 1

= (28.7 ×0)+(7.2×0)+(13.1×0)+(28.2×0.5)+(9.8×1)+(6.1×1)

= $30.0 bn
Deflate, calculate q/q impact

- GDP deflator in 2009Q2: $109.671 \approx 110$
- $30.0 \text{bn}/1.10 = 27.35 \text{ Ch.2005}$
- 2009Q2 real GDP SAAR: $12905.08 \text{ Ch.2005}$
- 2009Q2 real GDP: $12905.08/4 = 3226.3$
- Impact 2009Q2: $27.35/3226.3 = 0.00848$
- Annualize impact: $(1.00848)^4 = 1.034$
- Impact on growth: $(1.034-1) \times 100\% = 3.4 \text{ ppts}$
Comparisons, Complications

- Impact of 3.4 ppts vs. CEA 2.8 ppts.
- Impact vs. dynamic multipliers
- In our math, we assume everything happens with “a period”
- In reality, impact is different from cumulative long run
- In 2009Q3, some of the tax cuts in 2009Q2 will have an impact: how much?
Budget Implications of Fiscal Policy

• What happens if (lump sum) taxes are increased?
• Does the budget surplus increase dollar-for-dollar with tax increases?
• Can the budget balance improve with tax cuts?
A (Lump Sum) Tax Increase

\[ BuS \equiv T - G \]

\[ T = TA_0 + tY \]

\[ BuS = (TA_0 + tY) - GO_0 \]

\[ \Delta BuS = \Delta TA + t\Delta Y - \Delta GO \]

\[ Y_0 = \bar{\alpha}A_0 \]

\[ \Delta Y = \bar{\alpha}\Delta A \]
Tax Increase (cont’d)

\[ A_0 \equiv (a_0 - bTA_0 + IN_0 + GO_0 + g_0) \]
\[ \Delta A = (\Delta a - b\Delta TA + \Delta IN + \Delta GO + \Delta g) \]

here

\[ \Delta A = -b\Delta TA \Rightarrow \Delta Y = \bar{\alpha}(-b\Delta TA) \]
\[ \Delta BuS = \Delta TA + t\Delta Y - \Delta GO \]
\[ \Delta BuS = \Delta TA + t(-\bar{\alpha}b\Delta TA) \]

\[ \Delta BuS = \Delta TA(1 - \bar{\alpha}bt) \Rightarrow \frac{\Delta BuS}{\Delta TA} = (1 - \bar{\alpha}bt) < 1 \]
Balanced Budget Multiplier

• Suppose one needs to keep budget balanced.
• Assume t=0

\[
Y_0 = \alpha [a_0 - b(TA_0) + IN_0 + GO_o + g_0]
\]

\[
\Delta Y = \alpha [\Delta a_0 - b\Delta TA + \Delta IN + \Delta GO + \Delta g]
\]

\[
\Delta Y = \alpha [-b\Delta TA + \Delta GO] \quad \Delta TA = \Delta GO
\]

\[
\implies \Delta Y = \alpha [-b\Delta GO + \Delta GO]
\]

\[
\Delta Y = \alpha [1-b]\Delta GO
\]

\[
\frac{\Delta Y}{\Delta GO} = \alpha [1-b] = 1 \quad \text{for balanced budget multiplier}
\]
Full Employment Budget Balance

Budget Balance

\[ BuS \equiv T - G \]
\[ T = TA_0 + tY \]
\[ BuS = (TA_0 + tY) - GO_0 \]

Full-Employment Budget Balance

\[ BuS^* \equiv T^* - G \]
\[ T^* = TA_0 + tY^* \]
\[ BuS = (TA_0 + tY^*) - GO_0 \]
Full Employment and Actual BuS