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)
GDP Growth (SAAR), 09Q1,Q2

Figure 3. Contributions to Real GDP Growth

Percentage points

<table>
<thead>
<tr>
<th>Component</th>
<th>2009:Q1</th>
<th>2009:Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Consumption Expenditures</td>
<td>0.44</td>
<td>-0.69</td>
</tr>
<tr>
<td>Nonresidential Fixed Investment</td>
<td>-5.29</td>
<td>1.15</td>
</tr>
<tr>
<td>Other Fixed Investment</td>
<td>-1.33</td>
<td>-1.33</td>
</tr>
<tr>
<td>Inventory Investment</td>
<td>-2.36</td>
<td>1.39</td>
</tr>
<tr>
<td>State and Local Gov’t Spending</td>
<td>-0.19</td>
<td>0.44</td>
</tr>
<tr>
<td>Federal Gov’t Spending</td>
<td>-0.33</td>
<td>0.82</td>
</tr>
<tr>
<td>Net Exports</td>
<td>2.64</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Source: Department of Commerce (Bureau of Economic Analysis).
Note: Bars sum to quarterly change in GDP growth (-6.4% in Q1; -1.0% in Q2).
Estimates of the Impact of ARRA

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

<table>
<thead>
<tr>
<th>Source</th>
<th>2009:Q2</th>
<th>2009:Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEA: Projection Approach</td>
<td>+2.3</td>
<td>+2.7</td>
</tr>
<tr>
<td>CEA: Model Approach</td>
<td>+3.1</td>
<td>+3.6</td>
</tr>
<tr>
<td>CBO: Low</td>
<td>+1.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>+1.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>CBO: High</td>
<td>+5.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>+5.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>+2.2</td>
<td>+3.3</td>
</tr>
<tr>
<td>IHS/Global Insight</td>
<td>+2.3</td>
<td>+2.3</td>
</tr>
<tr>
<td>James Glassman, J.P. Morgan Chase</td>
<td>+3.0</td>
<td>+4.0</td>
</tr>
<tr>
<td>Macroeconomic Advisers</td>
<td>+2.1</td>
<td>+1.9</td>
</tr>
<tr>
<td>Mark Zandi, Moody's Economy.com</td>
<td>+2.8</td>
<td>+3.6</td>
</tr>
<tr>
<td>NABE Survey</td>
<td>+0.5</td>
<td>+0.8&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Sources: See text for details.
b. Approximate. NABE reports that about 1/3 of respondents expect the Recovery Act to add less than 0.5 percentage points to growth in the second half of 2009, and slightly over half expect it to add between 0.5 and 1.5 points; the remainder presumably expect it to add more than 1.5 points.
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>March&lt;sup&gt;a&lt;/sup&gt;</th>
<th>June&lt;sup&gt;b&lt;/sup&gt;</th>
<th>August&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Tax Cuts</td>
<td>2.3</td>
<td>29.3</td>
<td>40.0</td>
</tr>
<tr>
<td>AMT Relief</td>
<td>0.0</td>
<td>7.6</td>
<td>8.8</td>
</tr>
<tr>
<td>Business Tax Incentives</td>
<td>0.1</td>
<td>14.4</td>
<td>17.2</td>
</tr>
<tr>
<td>State Fiscal Relief</td>
<td>8.5</td>
<td>28.2</td>
<td>38.4</td>
</tr>
<tr>
<td>Aid to Directly Impacted Individuals</td>
<td>0.8</td>
<td>14.4</td>
<td>30.6</td>
</tr>
<tr>
<td>Government Investment Outlays</td>
<td>0.0</td>
<td>5.9</td>
<td>16.5</td>
</tr>
<tr>
<td><strong>Total&lt;sup&gt;d&lt;/sup&gt;</strong></td>
<td><strong>11.8</strong></td>
<td><strong>99.8</strong></td>
<td><strong>151.4</strong></td>
</tr>
</tbody>
</table>

**Sources:** Recovery.gov; CEA calculations; Updated simulations from the Department of the Treasury (Office of Tax Analysis) based on the Mid-Session Review.

**Notes:**
- a. Data on outlays and obligations are for March 27.
- b. Data on outlays and obligations are for June 26.
- c. Data on outlays and obligations are for August 28.
- d. Items may not add to total due to rounding.
Apply Multipliers

IMPACT MULTIPLIERS (within the quarter)

- Tax cuts: $29.3 bn × 0
- AMT relief: $7.6 bn × 0
- Bus. Tax incentives: $14.4 bn × 0
- State fiscal relief: $28.2 bn × 0.5
- Aid to directly impacted: $14.4 bn × 1
- Govt. investment outlays: $5.9 bn × 1

= (29.3 × 0) + (7.6 × 0) + (14.4 × 0) + (28.2 × 0.5) + (14.4 × 1) + (5.9 × 1)

= $34.4 bn
Deflate, calculate q/q impact

- GDP deflator in 2009Q2: 109.671 \approx 110
- $34.4 \text{ bn}/1.10 = \underline{32.27} \text{ Ch.2005}$
- 2009Q2 real GDP SAAR: 12892.5 \text{ Ch.2005}$
- 2009Q2 real GDP: \frac{12892.5}{4} = 3232.1
- Impact 2009Q2: \frac{32.27}{3232.1} = 0.00998
- Annualize impact: \left(1.00998\right)^4 = 1.04
- Impact on growth: (1.04-1) \times 100\% = 4 \text{ ppts}

(correction highlighted red)
Comparisons, Complications

- Impact of 4 ppts vs. CEA 3.1 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?
## Quantities (Cumulative)

### Table 2. Fiscal Stimulus by Functional Category

<table>
<thead>
<tr>
<th></th>
<th>Through the end of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>March(^a)</td>
</tr>
<tr>
<td></td>
<td>Billions of Dollars</td>
</tr>
<tr>
<td>Individual Tax Cuts</td>
<td>2.3</td>
</tr>
<tr>
<td>AMT Relief</td>
<td>0.0</td>
</tr>
<tr>
<td>Business Tax Incentives</td>
<td>0.1</td>
</tr>
<tr>
<td>State Fiscal Relief</td>
<td>8.5</td>
</tr>
<tr>
<td>Aid to Directly Impacted Individuals</td>
<td>0.8</td>
</tr>
<tr>
<td>Government Investment Outlays</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total(^d)</strong></td>
<td><strong>11.8</strong></td>
</tr>
</tbody>
</table>

Sources: Recovery.gov; CEA calculations; Updated simulations from the Department of the Treasury (Office of Tax Analysis) based on the Mid-Session Review.

Notes:  
\(^a\) Data on outlays and obligations are for March 27.  
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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)

\[ A_0 \equiv (a_0 - bTA_0 + IN_o + GO_o + g_o) \]
\[ \Delta A = (\Delta a - b\Delta TA + \Delta IN + \Delta GO + \Delta g) \]

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 \( t=0 \)

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

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

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

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

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

\[
\Delta Y / \Delta GO = \alpha[1 - b] = 1 \quad \text{for balanced budget multiplier}
\]
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

Cyclically Adjusted Budget Balance

Budget balance

Projections (9/1/09)