Learning from Recent Errors

Larry Ozanne
September 16, 2007
The analysis and conclusions in this presentation are my own and should not be interpreted as those of the Congressional Budget Office

Which Errors?

• Residuals in forecasting equation
  – Estimated 1952-2006
  – Residuals for 2004, 2005

• Residuals show:
  – What the equation still cannot explain
  – After it has full information on 2004-05
Forecasting Equation

Dependent Variable: Growth rate of gains

- Explanatory variables:
  - Growth of S&P 500, Dollar volume of trades
  - Growth of housing starts
  - Growth of business cycle indicators
  - Change in US tax rate on gains,
  - Change in dummies for 1986, 1987

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Predicted</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>0.434</td>
<td>0.188</td>
<td>0.246</td>
</tr>
<tr>
<td>2005</td>
<td>0.324</td>
<td>0.109</td>
<td>0.215</td>
</tr>
<tr>
<td>1952-06</td>
<td></td>
<td></td>
<td>0.120</td>
</tr>
</tbody>
</table>
What gains did equation miss?

• Real estate?
• Private equity and hedge funds?
• 2003 tax cut?
• Any suggestions?

California Data May Help

• Gross gains by asset type
  – Stocks
  – Other securities
  – Residential Real Estate
  – Other Real Estate
  – Other Assets
• Annually, 1985 or 1986 to 2006
Ask 3 questions

- Were Gains in CA like gains in US?
- Which assets pushed up gains?
- Which assets stumped CBO equation?
Which Assets Stumped CBO Equation?

- Estimate CBO-type equation for each asset
- Predict dollar gain and error in 2004-05
  - By asset
- Add errors in 2004-05 by asset
- Compute share of total $ error by asset
Simplified CBO Equation

- Dep. Var.: Growth rate of gains
- Explanatory Vars:
  - Growth of S&P 500
  - Growth of housing starts (not S.F.)
  - Growth of personal income
  - Change in federal cap gain tax rate
  - Change in dummy var. for 1986

Simpler equation, similar errors

- Errors similar to CBO eq’s in 2004-05 when simpler eq. fit to
  - US net positive gains
  - CA net positive gains
  - CA gross gains

- So simpler eq errors by asset type probably tell us about errors in CBO eq.
Contributions to Dollar Error 04-05

- Other Assets 49%
- Stocks 35%
- Other real estate 7%
- Residential real estate 6%
- Other securities 3%

Implication & Ideas for Eq

- Better explanatory vars for Other Assets and Stocks are most important.
- What’s in “Other Assets”?  
  – Flow-through from sale of what?
- Did easy credit inflate gains on many assets?
Implications for 2008

• Gains grew *about* 11% in 07
• Eqs probably predict -5% to -10% in 08
  – RMSE of forecasts = 20 percentage points
• Unexplained surge raises risks to forecast
  – If cause of surprise surge is reversing,
    decline could be larger than equation predicts

Background Information
### Forecast Errors (% points)

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Forecast</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>54.4</td>
<td>22.9</td>
<td>31.5</td>
</tr>
<tr>
<td>2005</td>
<td>38.3</td>
<td>12.6</td>
<td>25.7</td>
</tr>
<tr>
<td>1988-06</td>
<td></td>
<td></td>
<td>20.1</td>
</tr>
</tbody>
</table>

### Which explanatory vars work?

- **S&P500** (dollar volume)
  - Stocks, Other Securities, Other Assets
- **Starts** don’t work
- **Personal Income**
  - Residential real estate, but seems big.
- **Tax Rate**
  - Res. Real Estate, but seems big.
Which eqs have higher S.E.?

- Real estate equations
  - Larger variance in dep. var.
  - Explanatory variables less successful

Eqs w/ higher resids 04-05

- Other assets
- Other real estate
Net positive vs. gross gains

• Net pos gains grew faster in 2004
  – Loss offsets must have been falling
• Equation has bigger error explaining growth of net pos than gross in 04
  – Explaining changes in loss offsets on 04 is part of problem
• In other years, equation has bigger errors explaining gross gains. (2000, 2003)
• Understanding loss offsets should help