Alaska’s Non-Petroleum Corporate Income Tax: Trends in Collections by Sector and Revised Forecast Model

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PURPOSE

• To examine trends in Alaska’s non-petroleum corporate income tax; and
• To present our revised corporate income tax forecast model.

Note: Corporate Income Tax = CIT
Outline

• Findings
• Background
• Sector Collections
• Methodology
• CIT Forecast Model
• Conclusion

FINDINGS

• Historical CIT Collections
• Mining CIT Collections
• New CIT Forecast Model
Historical CIT Collections

Mining & CIT Collections

Fiscal Year

Collections ($ Millions)

2002 2003 2004 2005 2006 2007

Historical CIT Collections

Mining
Non-mining

Fiscal Year

Collections ($ Millions)
New CIT Model

• Separate models for mining and other collections
• Previously forecast with one aggregate model
• Mining now 40% of CIT collections

BACKGROUND

• CIT Overview
• Current CIT Forecasts
• State Budget Context
• History of CIT Forecast Methods
CIT Overview

- 2 corporate income taxes: Petroleum CIT and general (all other) CIT
- This presentation focuses on non-petroleum CIT
- Based on federal taxable income with certain Alaska modifications
- Equal 3-factor apportionment: Property, Payroll, Sales
- Graduated rates; max 9.4% rate for income over $90,000

Current CIT Forecasts

![Chart showing CIT collections from 2003 to 2017]
History of CIT Forecast Methods

- 2005 & Prior: Judgment - No model
- 2005: New Blood: Based on CBO federal collections forecast
- 2006: Aggregate statistical model
- 2007: Performed sector analysis and developed a new statistical model
- Getting more sophisticated

SECTOR COLLECTIONS

- CIT Collections by Sector
- CIT Growth Rates by Sector
- Focus on Mining Sector
CIT Collections by Sector

Change in Collections and Average Annual Growth Rates, 2002-2007

CIT from Mining Sector

Average Annual Increase: 327%
METHODOLOGY

- CIT Collections Data
- Sector Definitions
- Comparison to NAICS

CIT Collections Data

- Source: Department of Revenue Accounting System
- Collections consist of:
  - Estimated Payments
  - Payments with Returns
  - Audits and Compliance
  - Tax Refunds
Sector Definitions

- Two differences from NAICS:

  1) Sectors based on primary Alaska operations
  2) Important sectors not aligned with NAICS constructed using parts of NAICS sectors

“Custom” Sectors

- Constructed using portions of NAICS sectors:
  - **Fisheries** (agriculture and manufacturing)
  - **Oil Services** (mining, transportation and professional services)
  - **Tourism** (transportation, real estate & rental, administrative services and accommodation & food services)
CIT FORECAST MODEL

- Current Forecast Model
- Modeling Mining Separately
- New Model: Mining
- New Model: Other Sectors
- Prior Model Comparison
- Forecast Accuracy Comparison

Current CIT Forecast Model

<table>
<thead>
<tr>
<th>Dependent Variable: Quarterly Estimated Payments, $ Million</th>
<th>Method: Least Squares</th>
<th>Sample: 1990Q1 to 2007Q1 (69 observations)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.8</td>
<td>-1.0</td>
<td>33%</td>
</tr>
<tr>
<td>US Corporate Profits, $ Billion</td>
<td>19.2</td>
<td>5.3</td>
<td>0%</td>
</tr>
<tr>
<td>Alaska ANS Crude Oil Price, $</td>
<td>0.2</td>
<td>2.9</td>
<td>0%</td>
</tr>
<tr>
<td>Explanatory Variable - Q2</td>
<td>-6.0</td>
<td>-4.5</td>
<td>0%</td>
</tr>
<tr>
<td>Explanatory Variable - Q3</td>
<td>-3.5</td>
<td>-2.6</td>
<td>1%</td>
</tr>
<tr>
<td>Explanatory Variable - Accellerated Depreciation</td>
<td>-11.9</td>
<td>-7.1</td>
<td>0%</td>
</tr>
</tbody>
</table>

Regression Statistics:
- R-squared: 0.79
- Adjusted R-squared: 0.77
- Durbin-Watson stat: 1.16
Modeling Mining Separately

• Mining is biggest sector (40% of total collections)

• Regression statistics improve

<table>
<thead>
<tr>
<th>Sectors Included in Dependent Variable</th>
<th>Probability (1 minus P Value)</th>
<th>Regression Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NIPA Corporate Profits</td>
<td>ANS Crude Oil Price</td>
</tr>
<tr>
<td>All Industries</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>With sectors withheld:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Mining</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Oil Services</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Retail</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Transportation</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Wholesale</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

New Mining CIT Model

Dependent Variable: Quarterly Mining Est Payments, $ Million
Method: Least Squares
Sample: 1990Q4 to 2007Q1 (66 observations)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-11.2</td>
<td>-10.7</td>
<td>0%</td>
</tr>
<tr>
<td>US Corporate Profits, $ Billion</td>
<td>3.2</td>
<td>2.0</td>
<td>5%</td>
</tr>
<tr>
<td>1-yr avg Zinc Price, $ / lb</td>
<td>17.0</td>
<td>9.3</td>
<td>0%</td>
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<tr>
<td>Explanatory Variable - Q2</td>
<td>-0.2</td>
<td>-0.3</td>
<td>79%</td>
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<tr>
<td>Explanatory Variable - Q3</td>
<td>-0.5</td>
<td>-0.7</td>
<td>51%</td>
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<tr>
<td>Explanatory Variable - Accellerated Depreciation</td>
<td>-0.9</td>
<td>-0.8</td>
<td>45%</td>
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</table>

Regression Statistics:
R-squared: 0.80
Adjusted R-squared: 0.78
Durbin-Watson stat: 1.51
New Other Sectors CIT Model

Dependent Variable: Quarterly Non-mining Est Payments, $ Million
Method: Least Squares
Sample: 1990Q4 to 2007Q1 (66 observations)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>5.6</td>
<td>5.5</td>
<td>0%</td>
</tr>
<tr>
<td>US Corporate Profits, $ Billion</td>
<td>11.6</td>
<td>5.9</td>
<td>0%</td>
</tr>
<tr>
<td>Alaska ANS Crude Oil Price, $</td>
<td>0.1</td>
<td>1.9</td>
<td>7%</td>
</tr>
<tr>
<td>Explanatory Variable - Q2</td>
<td>-5.2</td>
<td>-7.2</td>
<td>0%</td>
</tr>
<tr>
<td>Explanatory Variable - Q3</td>
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<td>-3.5</td>
<td>0%</td>
</tr>
<tr>
<td>Explanatory Variable -</td>
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<td></td>
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<tr>
<td>Accelerated Depreciation</td>
<td>-4.8</td>
<td>-5.4</td>
<td>0%</td>
</tr>
</tbody>
</table>

Regression Statistics:
- R-squared: 0.80
- Adjusted R-squared: 0.79
- Durbin-Watson stat: 1.77

Comparison to Prior Model

Forecast Collections ($ million)

- Official spring 2007 forecast
- Current model, re-estimated (unofficial)
- New models (unofficial)
Forecast Accuracy Comparison

- Current and new models back-tested
- Performance Q1 2000 – Q1 2007:
  - Current Model: 23% avg. error
  - New Models: 15% avg. error
- Out-of-sample Q2 2006 – Q1 2007:
  - Current Model: 37% avg. error
  - New Models: 23% avg. error

Conclusions & Future Research

- Dramatic Growth in CIT Revenue
- Mining Sector Now Most Important
- New Models have Improved Accuracy

- Revisit Models with More Data
- Consider Additional Sector Models
- What Would Indicate a Return to Historical Collections?
Questions / Comments

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