Building Indexes of Economic Activity

from

Intuit Online Payroll

Intuit QuickBooks Online

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Origins

PayCycle – founded 1999, acquired by Intuit, June, 2009
- does payroll, online, for tiny companies
- user needs no accountant, no book keeper
- log on, enter SS#, name, hours, hourly rate, or salary, overtime, commissions, etc
- software computes amount due Federal govt, state govt, net to employee, cuts checks, does payroll bookkeeping

as of December, 2008, Paycycle’s engineers and marketing people thought they could “see the recession” in their data, wanted an index of small biz employment
Features

- modal customer has 4 employees
- 65% are hourly workers
- most recent data includes > 80,000 firms (out of 4.7 million firms with < 50 ees)
- does both W-2 and 1099 records (97% are W-2)
- all employers are firms, not establishments of bigger firms
- data are over-represented in California (23%), Florida, Texas, New York
- profound seasonality just like other employment data
Strengths

- records support transactions, so data are very clean
- records created in real time when ees are paid
- service is online, roll-upable by Intuit
- firm record has a zip code
- we can measure
  employment
  compensation
  hours worked
  hourly rate
  % full time
  new hire rate
Wish For: industry (no knowledge at present)

Strategy

“Same-stores” 1 to 19 ees, > 4 months of history

> 1 and < 19 ees in prior period and current

> 20 ees in prior, < 19 (including 0) in current (fell in)

0 in prior period, > 0 (including > 20) in current (zoomed through)

Who is not in?

- > 20 in both prior and current
- = 0 in both prior and current
rebenchmarking underway, still under construction
QuickBooks Online

- accounting software
- millions of desktop copies, 150,000 users online
- new customers assign themselves to industry
- geography (zip code)
- ONLY source of *monthly* data on small business revenues, expenses, payables, receivables, ... (similar to IRS SoI, but monthly, not annual)
Features

- Low attrition rates (far below BEA small business survival rates, not typical)
- Average income well above sole proprietors in Statistics of income, even by industry
- Heavy in California, Florida, Texas, etc.
- Somewhat timely (but not like payroll data)
- Good industry breakouts (good list, rolls up to high-level categories in SoI), and zip codes
- More typos than Online Payroll data
- Average customer smaller over time
Strategy

- Build model trained on past data, by industry, to forecast what revenues will be when complete
- Winsorize at 2% and 98%
- regress average monthly revenues by cohort on dummies for cohort date age
- take date dummies, seasonally adjust, and calculate trend
Typical data by cohort -- professional services
Note

- abrupt decline in 2008q4
- newer cohorts have lower revenues and income
- strong seasonality in income, coming from expenses (dip in December)
cohorts for construction
Note

- Decline starting in 2005
- Lower revenue and income for newer cohorts
- Strong seasonality, lowest revenues in January, lowest income in December
The story
Two recessions

- one starts in 2006 with collapse of construction
- another in 2008q4 with bank panic
- health sails through both, but has falling revenues starting 2011
Are updates boring?

NO! Revenue index update

<table>
<thead>
<tr>
<th>sector</th>
<th>change April to May, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>0.51%</td>
</tr>
<tr>
<td>Real estate and rental and leasing</td>
<td>0.10%</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>-0.01%</td>
</tr>
<tr>
<td>Professional, scientific, and technical services</td>
<td>-0.03%</td>
</tr>
<tr>
<td>All</td>
<td>-0.12%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>-0.16%</td>
</tr>
<tr>
<td>Accommodation, food, drinking</td>
<td>-0.32%</td>
</tr>
<tr>
<td>Other services</td>
<td>-0.78%</td>
</tr>
</tbody>
</table>
The revenue index a la Sufi and Mian – did revenues decline more in the counties that had bigger property value booms and busts?