Sonoma Clean Power

Forecast Discussion
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Overview

• Forecast to 2025, with emphasis on 2020-2021 for:
  • US Gross Domestic Product (GDP), California Gross State Product (GSP), California Personal Income (PI), all in 2012 dollars.
  • California, Sonoma County, Mendocino County Employment
  • Establishments to Small and Large Commercial Meters
  • Occupied Housing Units in Sonoma and Mendocino counties
  • Permits, Sonoma and Mendocino counties
  • Electric Vehicles, California
  • Delinquencies in California (data not available at county level)
  • SCP area when applicable = Sonoma and Mendocino counties less Healdsburg and Ukiah

• Assuming history is a guide, as are the connections of national to state to county economies.
Caveats

• Data paucity and volatility make forecasting in this environment tricky
• April Jobs data likely move the “better” forecast to somewhere between the median and the terrible, think 40% movement along that continuum toward terrible
• Do not expect precision, the key is capturing trend and cycle
US GDP, CA GSP

• These are the core forecasts, assuming that history repeats with some minor differences
• Forecasts are **median, good and terrible**, based on consensus forecasts from professional forecasters
  • NABE, IMF, Goldman, UCLA, DOF
  • Forecasts for remainder of 2020 and for 2021
• We shaped 2022-2025 to be generally slow growth on average
  • 1.5-3% per quarter SAAR for US GDP
  • This implies 2.0% to 4.6% for California GSP
• We assume based on statistical properties that US GDP and CA, Sonoma and Mendocino employment strongly enough related to use US GDP forecast as baseline
Note on Data Frequency

- US GDP and Forecasts are Quarterly
- Employment and Establishments are Monthly
- Permits are Monthly
- Car Sales for US are monthly, but electric car sales data are annual
- Housing units are annual
- Delinquency data are quarterly
- Use of employment seasonal factors to convert quarterly to monthly data for employment estimates from quarterly GDP forecast
### US GDP Forecasts as Baseline (% SAAR)

<table>
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<tr>
<th>Quarter</th>
<th>US Median</th>
<th>US Good</th>
<th>US Terrible</th>
<th>CA Median</th>
<th>CA Good</th>
<th>CA Terrible</th>
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<td>1.7</td>
<td>2.9</td>
<td>4.6</td>
<td>2.6</td>
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Employment

• We used US GDP forecasts to shape CA employment levels
  • Median
  • Good
  • Terrible

• Assume that CA forecast drives Sonoma and Mendocino
  • Use auto-regressive, moving average (ARMA) process to connect quarterly forecasts for US GDP to CA employment levels
  • Labor force changes based on last five years average growth to 2025
  • Unemployment rate implied by ratio of labor force less employment to labor force in each place.
  • Healdsburg and Ukiah backed out of Sonoma County and Mendocino County respectively as a percent of each county’s employment level.
Employment: Sonoma County

Note: Shaded Area Forecast Window
Employment: Mendocino County

Note: Shaded Area Forecast Window
Establishments

- From the Employment Forecasts, the changes in businesses were estimated
- Using Industry Sector data (NAICS-2):
  - Use recent proportions of each sector in each county’s economy
  - Use a “vulnerability” percentage as a way to increase precision on how businesses may be lost or preserved
  - Then map employment forecast to industry-sector level employment
  - Implies a certain number of businesses that remain (the change is the net loss of business) and then gain as employment grows
- Use Sonoma and Mendocino employment levels net of Healdsburg and Ukiah as baseline
- Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages and California Employment Development Department, QCEW
## Vulnerability

<table>
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<th>NAICS-2 Code</th>
<th>Vulnerable (%)</th>
<th>Industry Sector</th>
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<tbody>
<tr>
<td>11</td>
<td>30</td>
<td>Agriculture, Forestry, Fishing and Hunting</td>
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<tr>
<td>21</td>
<td>30</td>
<td>Mining</td>
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<tr>
<td>22</td>
<td>30</td>
<td>Utilities</td>
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<td>23</td>
<td>50</td>
<td>Construction</td>
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<td>31-33</td>
<td>50</td>
<td>Manufacturing</td>
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<tr>
<td>42</td>
<td>40</td>
<td>Wholesale Trade</td>
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<td>44-45</td>
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<td>Retail Trade</td>
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<tr>
<td>48-49</td>
<td>35</td>
<td>Transportation and Warehousing</td>
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<td>51</td>
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<td>Information</td>
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<td>52</td>
<td>30</td>
<td>Finance and Insurance</td>
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<td>53</td>
<td>50</td>
<td>Real Estate and Rental and Leasing</td>
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<td>54</td>
<td>40</td>
<td>Professional, Scientific, and Technical Services</td>
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<tr>
<td>55</td>
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<td>Management of Companies and Enterprises</td>
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<tr>
<td>56</td>
<td>60</td>
<td>Admin, Support, and Waste Services</td>
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<tr>
<td>61</td>
<td>60</td>
<td>Educational Services</td>
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<tr>
<td>62</td>
<td>20</td>
<td>Health Care and Social Assistance</td>
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<tr>
<td>71</td>
<td>70</td>
<td>Arts, Entertainment, and Recreation</td>
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<tr>
<td>72</td>
<td>70</td>
<td>Accommodation and Food Services</td>
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<tr>
<td>81</td>
<td>50</td>
<td>Other Services (except Public Administration)</td>
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<tr>
<td>92</td>
<td>35</td>
<td>Public Administration</td>
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<tr>
<td>99</td>
<td>40</td>
<td>Other</td>
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</table>
Small and Large Commercial Meters

- Use of NAICS in meters data to imply what industry sectors more likely to have small versus large commercial users.
- Use of SCP invoice data from 2019 as baseline for initial estimate of small versus large and then evolution from there.
- Small users likely more vulnerable regardless of “vulnerability” otherwise.
  - Shock more complete in the small category.
  - Also the quickest to grow again as establishments return with jobs growth.
Forecast: Large Comm Meters

Note: Shaded Area Forecast Window
Forecast: Small Comm Meters

Note: Shaded Area Forecast Window
Occupied Housing Units

- Only a “median” forecast: long-term economic trends inside current demographic forecasts
- Past bi-annual data (CA DOF does two estimates, calendar year and then fiscal year) as foundation
- Use of population forecasts for Sonoma and Mendocino counties to 2030 by CA DOF
- Maintain percentage of occupied housing units in Healdsburg and Ukiah of respective county totals
- Hold people per household the same, as this parameter changes slowly
- Occupied housing units then a function of population growth (or devolution) using people per household to 2025
- Sonoma and Mendocino counties both slowly losing population
- Source: California Department of Finance (CA DOF)
Permits

- Housing permits follow employment forecasts
  - Data show 12-month run rate
- Assume developers are going to use macroeconomic conditions and forecast to continue to pull permits
- Does not account for any additional natural disasters
- Assumes that solar is put on all new permits pulled after Jan 1, 2020
- Use of county unincorporated area data to add solar installs that are permitted by not tied to a housing unit
  - Assume 9.5% of permits are for non-new residential solar
- Permits growth assumed to change housing stock more slowly than permits growth (more permits pulled than new houses due to tear-downs and timing plus re-build activity)
- Sources: Census Bureau and County of Sonoma
Permits, 12-month Run Rate

SCP Area Forecasts: Permits

Note: Shaded Area Forecast Window
Electric Vehicles

• Use of unemployment rate to estimate car sales
  • Inversely related, ARMA process to estimate
• More reliable data is US, with California as a percentage of total car sales
• Electric car sales (plug-in) annual figure for CA, approximately 2 percent of overall car sales and rising
• 12 month run rate is how data are reported
• Assume plug-in sales in Sonoma and Mendocino counties follow overall CA sales
  • People from all over will access plug-in sites + overnight plug in at home
• Sources: US Department of Transportation, Bureau of Transportation Statistics, US Department of Energy, Alternative Fuels Data Center
Vehicle Sales US, Millions of Units, 12-month Run Rate

Note: Shaded Area Forecast Window
EV Sales CA, Thousands of Units, 12-month Run Rate

Note: Shaded Area Forecast Window
Delinquencies

- **Quarterly data for CA**
- Assume Sonoma and Mendocino counties follow CA averages
- Unemployment rate best macro variable connected to these data
- ARMA model again used for this, evolution of delinquencies connected to job loss or not
- Perhaps an indicator of delinquent billing
- Main Source = NY Federal Reserve, [Household Debt and Credit Report](#)
% Transition to 30 Days or more on Household Debt, Quarterly

% of 30 Days or more

Note: Shaded Area Forecast Window
Thanks!
Questions?
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@bobby7007