Seasonally Adjusting Liquid Deposits for COVID-19 challenges

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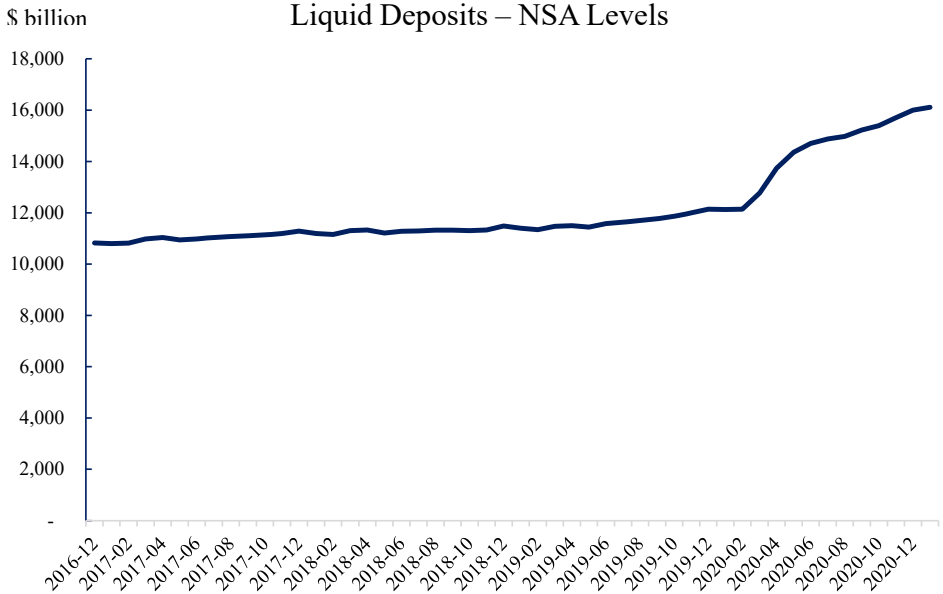
The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff or the Board of Governors.

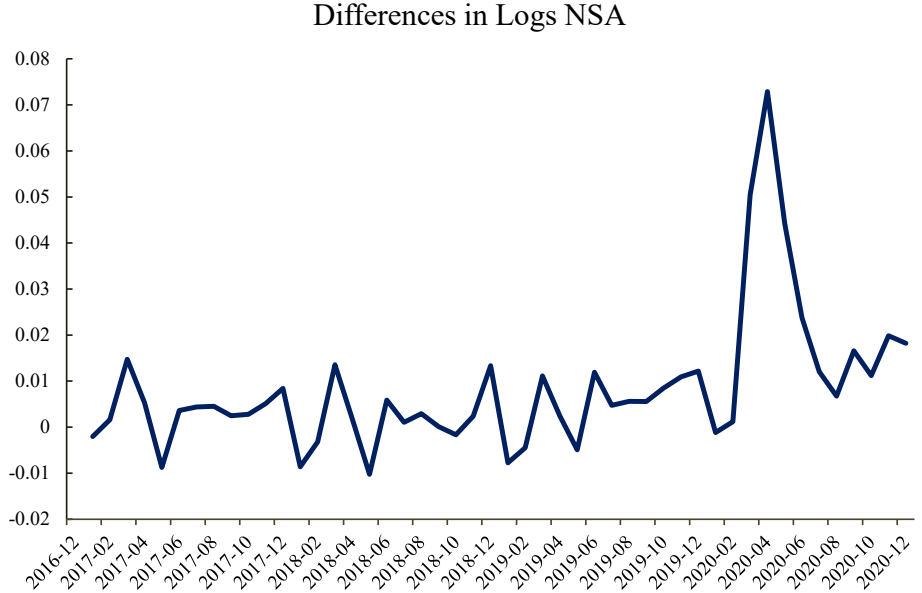
Background

- Not seasonally adjusted (NSA) and seasonally adjusted (SA) monthly data on the U.S. monetary aggregates are published on the on the H.6 Statistical Release.
- The largest component of the monetary aggregates, liquid deposits, comprises savings and checking accounts.
- Total liquid deposits were heavily affected by the pandemic, but there were also substantial shifts among its disaggregated components.

The Problem



Source: Board of Governors



Causes

- Elevated precautionary demand for liquid assets coupled with fiscal stimulus upended normal seasonal patterns of the liquid deposit series. Some examples of the above include:
  - Depositing of credit line draw proceeds by corporates
  - Depositing of Paycheck Protection Program loan proceeds by small businesses
  - Economic impact payments (from fiscal stimulus)
  - Delay of the annual tax due date from April to July

Solution

- Model used in prior years revealed consecutive ‘level shift’ outliers in March, April, and May 2020
- Decided to implement ramp regression variable from February 2020 – May 2020

Effectiveness of the Solution

- Introduction of ramp feature improves overall fit (reduced BIC).
- Similar standard deviation of monthly growth rates.
- Checked modified model for monthly or quarterly correlations.

	Liquid Deposits (prev. year spec)	Liquid Deposits (incl. ramp)
BIC	1085	1041
Normal Residuals?	no (p=0.002)	no (p=0.04)
Std. Dev. of Monthly Growth (SAAR, pct)	0.924	0.927

Monthly growth ~ dummy variables for each month

```
> summary(month.model)

Call:
lm(formula = mo_per_growth ~ factor(month), data = test)

Residuals:
    Min      1Q  Median      3Q     Max
-1.1551 -0.4256 -0.1147  0.1371  5.9726

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)      0.53617    0.31739   1.689   0.0941 .
factor(month)2   0.15969    0.43750   0.365   0.7158
factor(month)3   0.33594    0.43750   0.768   0.4443
factor(month)4   0.65594    0.43750   1.499   0.1367
factor(month)5   0.58046    0.43750   1.327   0.1874
factor(month)6   0.22360    0.43750   0.511   0.6103
factor(month)7   0.21369    0.43750   0.488   0.6262
factor(month)8   0.20577    0.43750   0.470   0.6391
factor(month)9   0.09553    0.43750   0.218   0.8276
factor(month)10  0.12183    0.43750   0.278   0.7812
factor(month)11  0.02381    0.43750   0.054   0.9567
factor(month)12  0.26020    0.43750   0.595   0.5533
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9522 on 107 degrees of freedom
Multiple R-squared:  0.04343,   Adjusted R-squared:  -0.0549
F-statistic: 0.4417 on 11 and 107 DF,  p-value: 0.9336
```
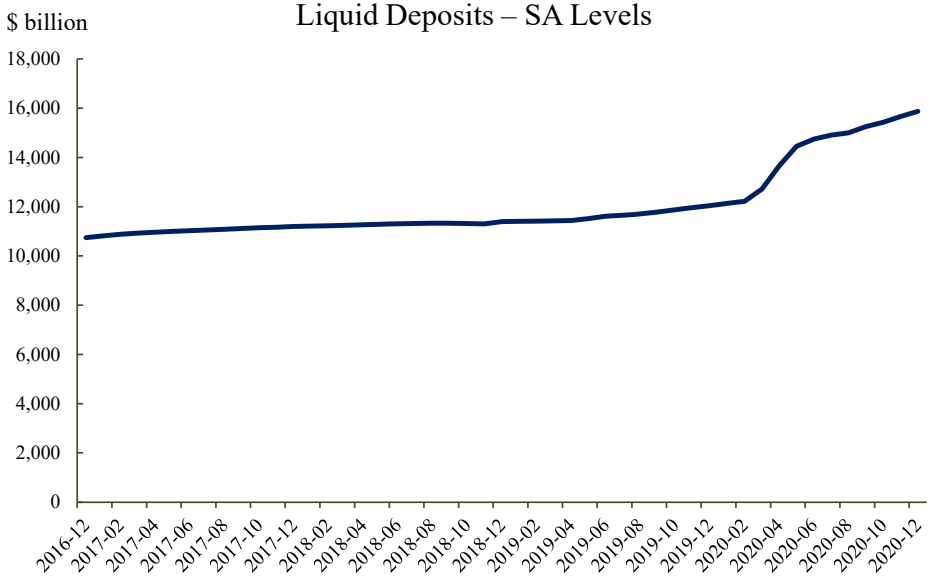
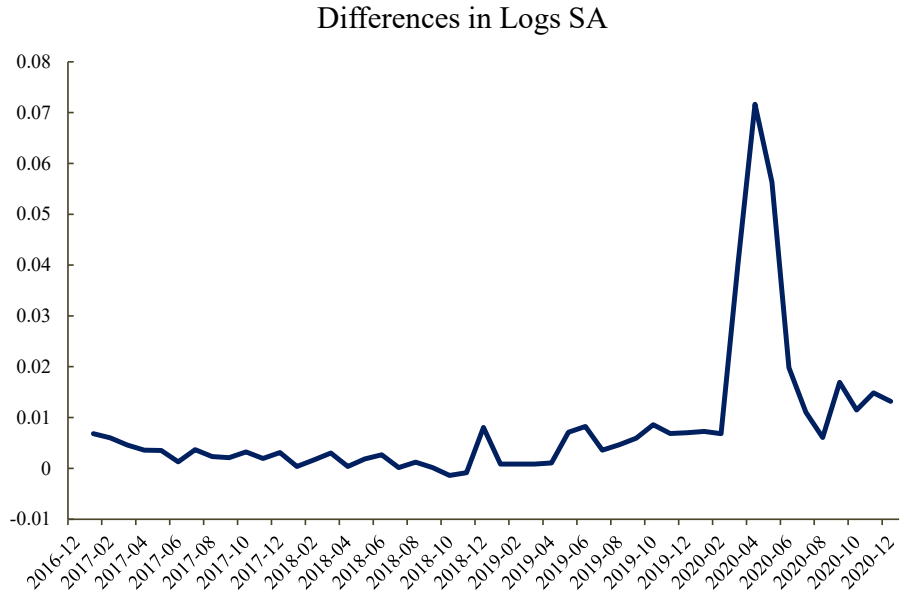

Monthly growth ~ dummy variables for each quarter

```
> summary(quarter.model)

Call:
lm(formula = mo_per_growth ~ factor(quarter), data = test)

Residuals:
    Min      1Q  Median      3Q     Max
-0.9858 -0.4560 -0.1549  0.1064  6.1419

Coefficients:
                  Estimate Std. Error t value  Pr(>|t|)
(Intercept)       0.7070751  0.1722797   4.104 0.0000761 ***
factor(quarter)2  0.3157585  0.2416014   1.307     0.194
factor(quarter)3  0.0007598  0.2416014   0.003     0.997
factor(quarter)4 -0.0356253  0.2416014  -0.147     0.883
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9278 on 115 degrees of freedom
Multiple R-squared:  0.02398,   Adjusted R-squared:  -0.001476
F-statistic: 0.942 on 3 and 115 DF,  p-value: 0.4228
```

Final Results





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