USA Consumption function

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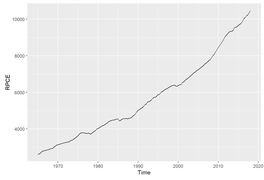
DATA

Table continues below

date	RGDP	RPCE	Rates_and_Yields	Long_Term_GBO
1965-01-01	4362	2614	4.197	4.203
1965-04-01	4417	2643	4.303	4.207
1965-07-01	4515	2689	4.31	4.247
1965-10-01	4619	2764	4.567	4.473
1966-01-01	4732	2805	5.063	4.77
1966-04-01	4748	2812	5.38	4.78

Consumer_Price_Index	Compensation_of_Employees
14.39	352.8
14.49	358.9
14.53	366.2
14.61	377.1
14.74	385.8
14.88	395.9



Transformed data

applying lag and differencing ts

Table continues below

dlnC	Ct-1/Yt-1	dlnY	dRat3	dRR3	dRat2	dRR2
0.01097	NA	0.01256	0.37	0.27	0.1133	0.04333
0.01704	0.5993	0.02199	0.76	0.5633	0.2633	0.2667
0.02773	0.5984	0.02278	1.07	0.5333	0.7533	0.5233
0.01465	0.5954	0.02405	1.167	0.6667	0.8133	0.3067
0.002559	0.5984	0.003409	0.6933	0.2333	0.67	0.37
0.01135	0.5928	0.008433	-0.1833	-0.1967	0.3767	0.2233

dlnP	dW
0.006371	6.1
0.00296	7.3
0.005263	10.9
0.009301	8.667
0.009009	10.13
0.008622	10.27

Estimation

Simple OLS

```
##
## Call:
## lm(formula = dlnC ~ ., data = .)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.010763 -0.002420 -0.000201  0.002259  0.013487
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.305e-02  1.027e-02   6.141 4.28e-09 ***
## Ct-1/Yt-1   -8.804e-02  1.572e-02  -5.601 6.92e-08 ***
## dlnY         4.573e-01  4.464e-02  10.246  < 2e-16 ***
## dRat3       -1.677e-05  4.427e-04  -0.038  0.9698
## dRR3        -7.717e-04  8.277e-04  -0.932  0.3522
## dRat2        4.387e-04  5.052e-04   0.868  0.3862
## dRR2         7.622e-04  1.030e-03   0.740  0.4603
## dlnP        -2.838e-01  4.763e-02  -5.959 1.12e-08 ***
## dW           1.697e-05  7.580e-06   2.119  0.0353 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.004488 on 202 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.5502, Adjusted R-squared:  0.5324
## F-statistic: 30.88 on 8 and 202 DF,  p-value: < 2.2e-16
```

```
##
##  Durbin-Watson test
##
## data:  .
## DW = 2.3261, p-value = 0.9838
## alternative hypothesis: true autocorrelation is greater than 0
```

OLS with autocorrelation

```
##
## Call:
## lm(formula = dlnC ~ ., data = .)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.0109687 -0.0022730 -0.0001549  0.0022478  0.0132781
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.497e-02  1.062e-02   6.115 5.10e-09 ***
## Ct-1/Yt-1   -9.088e-02  1.624e-02  -5.596 7.29e-08 ***
## dlnY         4.534e-01  4.547e-02   9.972  < 2e-16 ***
## dRat3        5.297e-06  4.407e-04   0.012   0.990
## dRR3        -7.447e-04  8.252e-04  -0.902   0.368
## dRat2        4.563e-04  5.023e-04   0.908   0.365
## dRR2         6.949e-04  1.029e-03   0.676   0.500
## dlnP        -2.865e-01  4.843e-02  -5.916 1.44e-08 ***
## dW           1.586e-05  7.554e-06   2.099   0.037 *
## AR(1)       -3.726e-02  7.114e-02  -0.524   0.601
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.00446 on 197 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.536,  Adjusted R-squared:  0.5169
## F-statistic: 25.49 on 9 and 197 DF,  p-value: < 2.2e-16
```

```
##
##  Durbin-Watson test
##
## data:  .
## DW = 2.3178, p-value = 0.9808
## alternative hypothesis: true autocorrelation is greater than 0
```

Robust LS

```
##
## Call: rlm(formula = dlnC ~ ., data = .)
## Residuals:
##       Min        1Q    Median        3Q       Max
## -1.019e-02 -2.323e-03 -2.325e-05  2.287e-03  1.410e-02
##
## Coefficients:
##               Value   Std. Error t value
## (Intercept)  0.0547   0.0104     5.2524
## Ct_1_Yt_1   -0.0759   0.0159    -4.7621
## dlnY         0.4845   0.0453    10.7029
## dRat3       -0.0001   0.0004    -0.2025
## dRR3        -0.0000   0.0008    -0.0785
## dRat2        0.0005   0.0005     1.0425
## dRR2         0.0005   0.0010     0.4377
## dlnP        -0.2534   0.0483    -5.2456
## dW           0.0000   0.0000     1.9554
##
## Residual standard error: 0.003452 on 202 degrees of freedom
##   (4 observations deleted due to missingness)
```

```
##
##  Durbin-Watson test
##
## data:  .
## DW = 2.3261, p-value = 0.9838
## alternative hypothesis: true autocorrelation is greater than 0
```

Adding dummy variable (1997 break)

```
##
## Call:
## lm(formula = dlnC ~ ., data = .)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.0107055 -0.0024187 -0.0001994  0.0022516  0.0134852
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.292e-02  1.035e-02   6.093 5.56e-09 ***
## Ct-1/Yt-1   -8.784e-02  1.581e-02  -5.556 8.68e-08 ***
## dlnY         4.574e-01  4.475e-02  10.222  < 2e-16 ***
## dRat3       -1.659e-05  4.434e-04  -0.037   0.9703
## dRR3        -7.737e-04  8.298e-04  -0.932   0.3522
## dRat2        4.368e-04  5.065e-04   0.862   0.3896
## dRR2         7.695e-04  1.034e-03   0.744   0.4576
## dlnP        -2.835e-01  4.781e-02  -5.929 1.31e-08 ***
## dW           1.596e-05  7.632e-06   2.090   0.0378 *
## dummy        6.944e-04  4.550e-03   0.153   0.8789
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.004499 on 201 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.5502, Adjusted R-squared:  0.5301
## F-statistic: 27.32 on 9 and 201 DF,  p-value: < 2.2e-16
```

```
##
##  Durbin-Watson test
##
## data:  .
## DW = 2.3265, p-value = 0.9839
## alternative hypothesis: true autocorrelation is greater than 0
```

OLS 1997 - 2018

```
##
## Call:
## lm(formula = dlnC ~ ., data = .)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.0104623 -0.0020544  0.0002249  0.0017084  0.0099140
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.052e-01  2.149e-02   4.914 5.18e-06 ***
## Ct-1/Yt-1   -1.519e-01  3.185e-02  -4.767 8.96e-06 ***
## dlnY         3.466e-01  7.813e-02   4.436 3.10e-05 ***
## dRat3        1.049e-03  1.099e-03   0.955   0.343
## dRR3         4.415e-04  1.265e-03   0.366   0.715
## dRat2       -5.912e-04  1.441e-03  -0.410   0.683
## dRR2        -3.899e-04  1.375e-03  -0.283   0.778
## dlnP        -7.421e-02  7.759e-02  -0.956   0.342
## dW           1.559e-05  6.383e-06   2.442   0.017 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.003341 on 75 degrees of freedom
##   (3 observations deleted due to missingness)
## Multiple R-squared:  0.5947, Adjusted R-squared:  0.5514
## F-statistic: 13.75 on 8 and 75 DF,  p-value: 4.471e-12
```

Summary of All Models

	(1)	(2)	(3)	(4)	(5)
(Intercept)	0.063	0.065	0.055	0.063	0.105
	(0.010)	(0.011)	(0.010)	(0.010)	(0.021)
Ct-1/Yt-1	−0.088	−0.091		−0.088	
	(0.016)	(0.016)		(0.016)	
dlnY	0.457	0.453	0.485	0.457	0.347
	(0.045)	(0.045)	(0.045)	(0.045)	(0.078)
dRat3	0.000	0.000	0.000	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
dRR3	−0.001	−0.001	−0.001	−0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
dRat2	0.000	0.000	0.001	0.000	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
dRR2	0.001	0.001	0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
dlnP	−0.284	−0.287	−0.253	−0.283	−0.074
	(0.048)	(0.048)	(0.048)	(0.048)	(0.078)
dW	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AR(1)		−0.037			
		(0.071)			
Ct_1_Yt_1			−0.076		−0.152
			(0.016)		(0.032)
dummy				0.001	
				(0.005)	
Num.Obs.	211	207	211	211	84
R2	0.550	0.538		0.550	0.595
R2 Adj.	0.532	0.517		0.530	0.551
AIC	−1671.8	−1641.6	−1670.6	−1669.9	−709.0
BIC	−1638.3	−1605.0	−1637.0	−1633.0	−684.7
Log.Lik.	845.924	831.820	845.278	845.936	364.488
RMSE	0.00	0.00	0.00	0.00	0.00