Note on the Z.1 Forecast Re-specifications

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The Federal Reserve has made significant revisions to series in its Financial Accounts of the United States – Z.1 release. As a result, historical data have changed significantly for some of the most important series in the model, including FCS$_US and FCN$_US, which are two NIPA components that get injected directly into the FGDP$ bloodstream, affecting our interest rate, unemployment rate and inflation rate forecasts and touching every series in the model. We took this opportunity to examine certain forecast equations to see if they could be improved. Our criteria for determining if they could be improved was an analysis of the shock properties of the equation, the baseline forecast produced by the equation, the back-testing error of the equation, it's performance relative to an auto-regressive benchmark, and its equation statistics, among other factors. These factors are discussed in depth in the Moody's Analytics U.S. Model Development Standards document. As a result, we re-specified the forecast equations of the following variables:

- FIFNESI$_US
- FCNOTH$_I_US
- FIFNESOT$_US
- FCS$_US
- FIFNESTR$_US
- FCDFHE$_I_US
- FCSREC$_I_US
- FCSTRS$_I_US
- FCDOTH$_I_US
- FZFL155035015Q_US
- FCDREC$_I_US
- FZFL152010005Q_US
- FCDXMVP$_US
- FCBC_US

FIFNESI$_US: We removed the constant term from the forecast equation. Constant terms in differenced log specifications can create unwanted time trends and bias the coefficients of the remaining regressors. We also removed the capacity utilization term, as it lost its statistical significance in the absence of a constant term. We also linked the dependent variable to after-tax corporate profits. Higher corporate profits boost companies' willingness to invest capital. We kept the cost of financing term but split it up into two terms: one for the debt cost of financing and the other for the equity cost of financing. We also added the S&P 500 volatility index as a cyclical term, since companies invest less in times of financial uncertainty.

FCNOTH$_I_US: The only change we made to this equation was replacing the PDL term for real disposable per capita income with a differenced log transformation that takes the 2-period moving average. The rest of the regressors were left unchanged, although new historical data and the altered specification did affect the regressor coefficients.

FIFNESOT$_US: Similar to FIFNESI$_US, we split up the debt and equity share of financing terms and added the S&P 500 volatility index as a cyclical term. We also added after-tax corporate profits as a regressor. It was important for us to have the same framework for modeling investment even though this was the nonresidential other category instead of the industrial equipment category. Companies are affected by the same factors as they make their investment decisions, regardless of what industry they are in. The coefficients are different, however, as these same factors affect investment in each industry differently.

FCS$_US: This is perhaps the most important equation in the model. Real GDP is the most important variable, consumption is the biggest component of real GDP, and service consumption is the biggest component of real consumption. Therefore we wanted to tread very carefully. The two main drivers of the dependent variable are real disposable income per capita and household wealth. Americans spend roughly 95% of the income that they earn. Moreover, the household wealth effect has been extensively documented. Consumers spend more when their wealth increases, and vice versa. We also had a consumer confidence term in the forecast equation.

When including new historical data, however, the statistical significance of this regressor wanes, and it is no longer statistically significant at even the 90% confidence interval. Moreover, the American economy has changed

significantly over the last 50 years. Rampant income inequality has concentrated more income and wealth into the hands of the wealthiest individuals, whose propensity to spend is far less than middle class households. As a result, we experimented with shortened sample ranges for the estimation. In a nod to inequality, the coefficient on the real per capita disposable income fell. Furthermore, the consumer confidence term became insignificant and its sign flipped. As a result, we dropped the term and tested the shorter specification against a longer one in which real spending matters more and so does consumer confidence. Our testing revealed that the shortened sample performed better when the model was back-tested from 2003 to 2019. Therefore, we adopted this change to FCS$_US and used shorter time frames when estimating real consumption components.

FIFNESTR$_US: We removed the constant term from the equation for the same reasons that we did so for FIFNESI$_US. We also split up the debt and equity share of financing terms and added the S&P 500 volatility index as a cyclical term. We also added after tax corporate profits as a regressor, mirroring the other two investment equations that were re-estimated. One differentiating factor is that we use light vehicle sales in this equation, whereas we do not in the prior two. Vehicle sales have a very strong positive correlation with investment in transportation and related equipment because of fleet sales. We wanted our equation to capture this dynamic.

FCDFHE$_I_US: As for FCS$_US, we shortened the estimation period because we believe that a more recent window is more representative of current consumer dynamics. We also dropped the constant term so as not to introduce a time trend. We kept the other regressors unchanged. The new specification boasts superior performance during back-testing and has strong shock properties.

FCSREC$_I_US: The only change we made was to add a differenced S&P 500 volatility index to introduce more cyclicality into this forecast equation. The estimation range was left unchanged (it was already using only recent data), and the two main regressors remained statistically significant at the 95% confidence interval.

FCSTRS$_I_US: The only change we made to the forecast equation was removing the AR(1) term. That term is used to guard against serial correlation of the error terms. It can also have a profound impact on the coefficients of the other regressors, however. While untransformed historical data for this dependent variable is clearly nonstationary, we transform both the dependent variable and the regressors with a differenced log term. That removes the serial correlation from the error terms. Since the equation doesn't rely on the AR(1) term to generate accurate and stable forecasts, we prioritized the enhanced shock properties that removing the AR(1) term provided.

FCDOTH$_I_US: We also shortened the sample for this equation. We kept the household wealth term as it was and moved to a differenced log moving average specification for the real per capita income term instead of using a polynomial distributed lag. We also added the change in the S&P 500 volatility index, as consumers spend less on durable goods during times of financial uncertainty.

FZFL155035015Q_US: This variable is the real estate assets of households. We keep the main variables unchanged. Those are the number of households times the homeownership rate and the FHFA house price index, and the BEA measure of real private fixed residential assets multiplied by the residential fixed investment deflator. We continue to use differenced log transformations for those variables. We did change the transformation on the one-year-change-in-house-prices variable from a PDL to a differenced log. Doing so strengthens the BEA measure of real private fixed residential assets multiplied by the residential fixed investment deflator term.

FCDREC$_I_US: We removed the constant term in this differenced log specification. We also changed the cyclical term from the change in the unemployment rate to the change in the S&P 500 volatility index for empirical purposes. The rest of the regression remained unchanged.

FZFL152010005Q_US: This variable is broad household assets. Because this includes real estate assets, and households' homes are their principal source of wealth, FZFL155035015Q_US is included in this regression and it is a very powerful predictor. We removed the constant term in this differenced log specification and the AR terms as well, since we conduct differenced log transformations of both the dependent variable and all of the regressors. We also include a measure of consumer durable goods to capture other sources of non-household wealth. The only changes were the removal of the AR terms and the constant term.

FCDXMVP$_US: The consumption and income relationships for durable goods consumption ex-autos were more stable than for services, so the estimation sample on the regression was not shortened. Moreover, cyclical factors are more important for consumer spending on big ticket durable goods. Therefore, we added a differenced unemployment rate variable, which is statistically significant at the 99% confidence interval. We retain the household wealth and real per capita disposable income variables. We also retain the two-year personal lending rate variable. Durable goods spending is far more interest rate sensitive than spending on services. Lastly, we add a consumer confidence term, which is positively correlated with durable goods spending.

FCBC_US: The only change that was made to this forecast equation was that an AR(1) term was added. The equation is specified in log form, which means that the forecast equation approximates the level, not the change, in consumer confidence. Therefore, it is prone to jump offs to the extent that the approximated level differs significantly from the last point of history. To ameliorate this, we introduce the AR(1) term. The rest of the equations remain statistically significant with the correct sign. The fit of this equation is improved, as are its back-testing properties.

New equation specifications

Dependent Variable: DLOG(FIFNESI$_US)
Method: Least Squares
Date: 10/01/19 Time: 11:03
Sample (adjusted): 1990Q1 2019Q2
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(FZ_US(-1)-FZTAX_US(-1),5))	0.235617	0.096173	2.449936	0.0158
D(FDEBT_US(-1)*FRBAAC_US(-1))	-0.018865	0.013464	-1.401137	0.1639
DLOG(@MOVAV(FEQUITY_US(-1)*FSP500Q_US(-1),4))	0.253209	0.064516	3.924770	0.0001
D(@MOVAV(FSPVOL_US(-1),2))	-0.013774	0.009584	-1.437203	0.1534

R-squared	0.262332	Mean dependent var	0.004185
Adjusted R-squared	0.242919	S.D. dependent var	0.030260
S.E. of regression	0.026329	Akaike info criterion	-4.402966
Sum squared resid	0.079028	Schwarz criterion	-4.309044
Log likelihood	263.7750	Hannan-Quinn criter.	-4.364831
Durbin-Watson stat	1.625072		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCNOTH$_I_US/FPOP_US)
Method: Least Squares
Date: 10/01/19 Time: 13:04
Sample (adjusted): 1990Q1 2017Q2
Included observations: 110 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLBR_US)	-0.005981	0.002823	-2.118968	0.0364
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.186927	0.059505	3.141377	0.0022
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	0.577843	0.118822	4.863087	0.0000

R-squared	0.238751	Mean dependent var	0.004982
Adjusted R-squared	0.224522	S.D. dependent var	0.008410
S.E. of regression	0.007406	Akaike info criterion	-6.946225
Sum squared resid	0.005868	Schwarz criterion	-6.872576
Log likelihood	385.0424	Hannan-Quinn criter.	-6.916352
Durbin-Watson stat	2.206514		

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Dependent Variable: DLOG(FIFNESOT$_US)
Method: Least Squares
Date: 09/30/19 Time: 17:36
Sample (adjusted): 1990Q1 2019Q2
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(FZ_US(-1)-FZTAX_US(-1),5))	0.318471	0.102164	3.117250	0.0023
D(@MOVAV(FDEBT_US(-1)*FRBAAC_US(-1),2))	-0.029672	0.018421	-1.610823	0.1100
DLOG(@MOVAV(FEQUITY_US(-1)*FSP500Q_US(-1),4))	0.243211	0.069953	3.476767	0.0007
D(FSPVOL_US)	-0.018756	0.006016	-3.117397	0.0023

R-squared	0.272061	Mean dependent var	0.005988
Adjusted R-squared	0.252905	S.D. dependent var	0.032336
S.E. of regression	0.027949	Akaike info criterion	-4.283545
Sum squared resid	0.089052	Schwarz criterion	-4.189623
Log likelihood	256.7291	Hannan-Quinn criter.	-4.245410
Durbin-Watson stat	1.743816		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCS$_US/FPOP_US)
Method: Least Squares
Date: 10/05/19 Time: 22:36
Sample (adjusted): 1995Q1 2019Q1
Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWFA$_US+FNWRE$_US)/FPOP_US),4))	0.114490	0.021143	5.415065	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),4))	0.471532	0.053189	8.865247	0.0000

R-squared	0.426212	Mean dependent var	0.003219
Adjusted R-squared	0.420172	S.D. dependent var	0.003381
S.E. of regression	0.002575	Akaike info criterion	-9.065762
Sum squared resid	0.000630	Schwarz criterion	-9.012675
Log likelihood	441.6895	Hannan-Quinn criter.	-9.044296
Durbin-Watson stat	1.381125		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
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Dependent Variable: DLOG(FIFNESTR$_US)
Method: Least Squares
Date: 10/01/19 Time: 18:00
Sample (adjusted): 1990Q1 2019Q2
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FRVEHL_US)	0.611015	0.106600	5.731870	0.0000

DLOG(@MOVAV(FZ_US(-1)-FZTAX_US(-1),5))	0.449730	0.228370	1.969299	0.0514
D(@MOVAV(FDEBT_US(-1)*FRBAAC_US(-1),6))	-0.120839	0.081045	-1.491013	0.1387
DLOG(@MOVAV(FEQUITY_US(-1)*FSP500Q_US(-1),4))	0.361447	0.148303	2.437218	0.0164
D(@MOVAV(FSPVOL_US(-1),2))	-0.104513	0.020869	-5.008012	0.0000

R-squared	0.515249	Mean dependent var	0.009562
Adjusted R-squared	0.498089	S.D. dependent var	0.082556
S.E. of regression	0.058487	Akaike info criterion	-2.798570
Sum squared resid	0.386544	Schwarz criterion	-2.681168
Log likelihood	170.1156	Hannan-Quinn criter.	-2.750901
Durbin-Watson stat	1.736588		

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Dependent Variable: DLOG(FCDFHE$_I_US/FPOP_US)
Method: Least Squares
Date: 10/04/19 Time: 15:10
Sample (adjusted): 1969Q1 2019Q1
Included observations: 201 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLBR_US)	-0.011740	0.003058	-3.839430	0.0002
DLOG(@MOVAV((FHN1_US+FHX1_US),4))	0.136350	0.030039	4.539114	0.0000
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.473915	0.082315	5.757312	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	0.565960	0.138097	4.098284	0.0001

R-squared	0.480306	Mean dependent var	0.007215
Adjusted R-squared	0.472392	S.D. dependent var	0.017251
S.E. of regression	0.012530	Akaike info criterion	-5.901621
Sum squared resid	0.030931	Schwarz criterion	-5.835884
Log likelihood	597.1129	Hannan-Quinn criter.	-5.875021
Durbin-Watson stat	1.870109		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCSREC$_I_US/FPOP_US)
Method: Least Squares
Date: 10/05/19 Time: 23:00
Sample (adjusted): 1995Q1 2019Q1
Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),4))	0.199359	0.066609	2.992972	0.0035
DLOG(@MOVAV(FYPDPI$Q_US/FPOP_US,4))	0.430264	0.167103	2.574843	0.0116
D(FSPVOL_US)	-0.000895	0.001724	-0.519427	0.6047

R-squared	0.130463	Mean dependent var	0.003656
Adjusted R-squared	0.111963	S.D. dependent var	0.008562

S.E. of regression	0.008068	Akaike info criterion	-6.771288
Sum squared resid	0.006119	Schwarz criterion	-6.691658
Log likelihood	331.4075	Hannan-Quinn criter.	-6.739089
Durbin-Watson stat	1.683942		

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Dependent Variable: DLOG(FCSTRS$_I_US/FPOP_US)
Method: Least Squares
Date: 10/02/19 Time: 11:33
Sample (adjusted): 1995Q1 2016Q4
Included observations: 88 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLBR_US)	-0.009226	0.004312	-2.139523	0.0353
DLOG(@MOVAV(((FNWFA$_US+FNWRE$_US)/FPOP_US),2))	0.200039	0.081602	2.451395	0.0163
DLOG(@MOVAV(((FYPDPI$Q_US+FOCF$_US)/FPOP_US),4))	0.333578	0.127918	2.607753	0.0108

R-squared	0.448321	Mean dependent var	0.002966
Adjusted R-squared	0.435340	S.D. dependent var	0.011910
S.E. of regression	0.008949	Akaike info criterion	-6.560994
Sum squared resid	0.006808	Schwarz criterion	-6.476540
Log likelihood	291.6837	Hannan-Quinn criter.	-6.526970
Durbin-Watson stat	1.561936		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDOTH$_I_US/FPOP_US)
Method: Least Squares
Date: 10/04/19 Time: 15:20
Sample (adjusted): 1995Q1 2019Q1
Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FSPVOL_US)	-0.003228	0.002920	-1.105756	0.2717
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.564030	0.098841	5.706450	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	0.953380	0.222089	4.292793	0.0000

R-squared	0.302246	Mean dependent var	0.010057
Adjusted R-squared	0.287400	S.D. dependent var	0.016022
S.E. of regression	0.013525	Akaike info criterion	-5.738139
Sum squared resid	0.017195	Schwarz criterion	-5.658509
Log likelihood	281.2998	Hannan-Quinn criter.	-5.705941
Durbin-Watson stat	1.752643		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FZFL155035015Q_US)
Method: Least Squares
Date: 10/05/19 Time: 13:26

Sample (adjusted): 1980Q2 2019Q1
Included observations: 156 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FHHOLDQ_US*FHOWNRQ_US*FHOFHOPIQ_US)	0.684721	0.093340	7.335742	0.0000
DLOG(FHOFHOPIQ_US(-1)/FHOFHOPIQ_US(-5))	0.483052	0.089428	5.401595	0.0000
DLOG(FPDIIFR_US(-1)*FGFAFAPR$Q_US(-1))	0.526782	0.101218	5.204428	0.0000

R-squared	0.659729	Mean dependent var	0.014595
Adjusted R-squared	0.655281	S.D. dependent var	0.016358
S.E. of regression	0.009604	Akaike info criterion	-6.434159
Sum squared resid	0.014113	Schwarz criterion	-6.375508
Log likelihood	504.8644	Hannan-Quinn criter.	-6.410337
Durbin-Watson stat	0.689515		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDREC$_I_US/FPOP_US)
Method: Least Squares
Date: 10/05/19 Time: 13:04
Sample (adjusted): 1995Q2 2019Q1
Included observations: 96 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FSPVOL_US)	-0.003489	0.003948	-0.883949	0.3790
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.887960	0.133556	6.648600	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	1.885426	0.301883	6.245552	0.0000

R-squared	-0.021179	Mean dependent var	0.023083
Adjusted R-squared	-0.043139	S.D. dependent var	0.017892
S.E. of regression	0.018274	Akaike info criterion	-5.135905
Sum squared resid	0.031057	Schwarz criterion	-5.055770
Log likelihood	249.5235	Hannan-Quinn criter.	-5.103513
Durbin-Watson stat	1.107708		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FZFL152010005Q_US)
Method: Least Squares
Date: 10/02/19 Time: 12:20
Sample (adjusted): 1960Q1 2018Q4
Included observations: 236 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FZFL155035015Q_US)	0.777614	0.010491	74.12547	0.0000
DLOG(FGFACD$Q_US)	0.267753	0.018621	14.37944	0.0000

R-squared	0.970748	Mean dependent var	0.016581
Adjusted R-squared	0.970623	S.D. dependent var	0.012742

S.E. of regression	0.002184	Akaike info criterion	-9.406926
Sum squared resid	0.001116	Schwarz criterion	-9.377572
Log likelihood	1112.017	Hannan-Quinn criter.	-9.395093
Durbin-Watson stat	0.145578		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
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Dependent Variable: DLOG(FCDXMVP$_US/FPOP_US)
Method: Least Squares
Date: 10/01/19 Time: 18:28
Sample (adjusted): 1972Q3 2017Q2
Included observations: 180 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLBR_US)	-0.013121	0.003737	-3.510865	0.0006
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.624649	0.097903	6.380313	0.0000
DLOG(FYPDPI$Q_US/FPOP_US)	0.355525	0.123785	2.872113	0.0046
D(FRPERB_US)	-0.013919	0.003742	-3.719512	0.0003
DLOG(FCBC_US)	0.011961	0.009731	1.229230	0.2206

R-squared	0.297549	Mean dependent var	0.010457
Adjusted R-squared	0.281493	S.D. dependent var	0.017853
S.E. of regression	0.015133	Akaike info criterion	-5.516454
Sum squared resid	0.040078	Schwarz criterion	-5.427760
Log likelihood	501.4808	Hannan-Quinn criter.	-5.480492
Durbin-Watson stat	1.754607		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: LOG(FCBC_US)
Method: ARMA Generalized Least Squares (Gauss-Newton)
Date: 10/04/19 Time: 14:46
Sample: 1987Q1 2019Q1
Included observations: 129
Convergence achieved after 7 iterations
Coefficient covariance computed using outer product of gradients
d.f. adjustment for standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.575543	0.026025	175.8112	0.0000
@PCY(@MOVAV(FCPIUE_US,8))	-0.003673	0.002680	-1.370280	0.1731
@MOVAV(FLBR_US-FNAIRU_US,4)	-0.175672	0.016527	-10.62914	0.0000
D(FLBR_US)	-0.224240	0.049392	-4.540037	0.0000
DLOG(@MOVAV(FNWFA$_US/FPOP_US,4))	5.476744	1.552525	3.527636	0.0006
DLOG(@MOVAV(FNWRE$_US/FPOP_US,8))	2.284897	1.096250	2.084284	0.0392
AR(1)	0.547206	0.078644	6.958048	0.0000

R-squared	0.913527	Mean dependent var	4.509024
Adjusted R-squared	0.909274	S.D. dependent var	0.309672
S.E. of regression	0.093275	Akaike info criterion	-1.851030
Sum squared resid	1.061432	Schwarz criterion	-1.695847

Log likelihood	126.3915	Hannan-Quinn criter.	-1.787976
F-statistic	214.8081	Durbin-Watson stat	2.043803
Prob(F-statistic)	0.000000		

Inverted AR Roots	.55

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Previous equation specifications

Dependent Variable: DLOG(FIFNESI$_US)
Method: Least Squares
Date: 08/01/13 Time: 14:05
Sample: 1990Q3 2013Q1
Included observations: 91

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.153628	0.066830	-2.298795	0.0240
@MOVAV(((FDEBT_US*FRBAAC_US*(1-FTAXFC_US/100)+FEQUITY_US*(FRGT10Y_US+FERP_US))),40)	-0.003100	0.002802	-1.106223	0.2718
DLOG(FPDIIFNESI_US(-1)/FECIBPGDMFQ_US(-1))	-0.262427	0.324337	-0.809119	0.4207
DLOG(@MOVAV(FTWDBRD$_US,12))	-1.203762	0.502466	-2.395708	0.0188
@MOVAV(FCUMF_US,4)	0.002127	0.001021	2.082348	0.0403
DLOG(FC$_US)	2.138190	0.670163	3.190552	0.0020

R-squared	0.198695	Mean dependent var	0.003868
Adjusted R-squared	0.151560	S.D. dependent var	0.032303
S.E. of regression	0.029755	Akaike info criterion	-4.127981
Sum squared resid	0.075255	Schwarz criterion	-3.962430
Log likelihood	193.8231	Hannan-Quinn criter.	-4.061191
F-statistic	4.215401	Durbin-Watson stat	1.956219
Prob(F-statistic)	0.001800		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCNOTH$_I_US/FPOP_US)
Method: Least Squares
Date: 08/22/13 Time: 10:02
Sample: 1995Q3 2013Q1
Included observations: 71

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.095228	0.048724	1.954446	0.0548
D(FLBR_US)	-0.003300	0.003366	-0.980389	0.3304
PDL01	0.302505	0.053030	5.704418	0.0000
PDL02	0.000210	0.072503	0.002899	0.9977

R-squared	0.233698	Mean dependent var	0.005719
Adjusted R-squared	0.199386	S.D. dependent var	0.008397
S.E. of regression	0.007513	Akaike info criterion	-6.889545
Sum squared resid	0.003782	Schwarz criterion	-6.762070

Log likelihood	248.5788	Hannan-Quinn criter.	-6.838852
Durbin-Watson stat	2.518879		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FIFNESOT$_US/FPOP_US)
Method: Least Squares
Date: 03/26/15 Time: 17:41
Sample (adjusted): 1985Q1 2014Q2
Included observations: 118 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
@MOVAV(((FDEBT_US*FRBAAC_US*(1-FTAXFC_US/100)+FEQUITY_US*(FRGT10Y_US+FERP_US)))/FPOP_US,4)	-0.315847	0.095000	-3.324696	0.0012
DLOG(FPDIIFNESOT_US(-1)/FPDIGDP_US(-1))	-0.520040	0.275698	-1.886272	0.0618
@MOVAV((FZ_US-FZTAX_US)/FPOP_US,4)	0.001231	0.000913	1.348452	0.1802
DLOG(FGDP$_US(-1)/FPOP_US(-1))	2.796232	0.404214	6.917711	0.0000

R-squared	0.379601	Mean dependent var	0.003415
Adjusted R-squared	0.363275	S.D. dependent var	0.030126
S.E. of regression	0.024039	Akaike info criterion	-4.584946
Sum squared resid	0.065879	Schwarz criterion	-4.491025
Log likelihood	274.5118	Hannan-Quinn criter.	-4.546811
Durbin-Watson stat	2.230828		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCS$_US/FPOP_US)
Method: Least Squares
Date: 08/14/13 Time: 15:34
Sample (adjusted): 1977Q4 2013Q1
Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWFA$_US+FNWRE$_US)/FPOP_US),4))	0.099721	0.023146	4.308261	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),4))	0.660911	0.061377	10.76806	0.0000
DLOG(FCBC_US)	0.006130	0.002621	2.338488	0.0208

R-squared	0.305631	Mean dependent var	0.004208
Adjusted R-squared	0.295640	S.D. dependent var	0.004427
S.E. of regression	0.003716	Akaike info criterion	-8.331611
Sum squared resid	0.001919	Schwarz criterion	-8.269164
Log likelihood	594.5444	Hannan-Quinn criter.	-8.306235
Durbin-Watson stat	1.321816		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FIFNESTR$_US)
Method: Least Squares
Date: 08/01/13 Time: 14:05

Sample: 1985Q1 2013Q1
Included observations: 113

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004091	0.030337	0.134865	0.8930
@MOVAV(((FDEBT_US*FRAAAC_US*(1-FTAXFC_US/100)+FEQUITY_US*(FRGT10Y_US+FERP_US))),40)	-0.003937	0.003660	-1.075826	0.2844
DLOG(FRVEHL_US)	0.645018	0.114393	5.638626	0.0000
DLOG(@MOVAV(FC$_US,4))	4.596429	1.852105	2.481732	0.0146

R-squared	0.306640	Mean dependent var	0.005630
Adjusted R-squared	0.287557	S.D. dependent var	0.088152
S.E. of regression	0.074406	Akaike info criterion	-2.323805
Sum squared resid	0.603451	Schwarz criterion	-2.227260
Log likelihood	135.2950	Hannan-Quinn criter.	-2.284628
F-statistic	16.06850	Durbin-Watson stat	1.517538
Prob(F-statistic)	0.000000		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDFHE$_I_US/FPOP_US)
Method: Least Squares
Date: 08/01/13 Time: 14:05
Sample: 1995Q2 2013Q1
Included observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004374	0.002022	2.162620	0.0341
D(FLBR_US)	-0.007791	0.005961	-1.306936	0.1957
DLOG(@MOVAV((FHN1_US+FHX1_US),4))	0.139922	0.057845	2.418915	0.0183
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.236852	0.094850	2.497137	0.0150
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	0.829400	0.314617	2.636222	0.0104

R-squared	0.485687	Mean dependent var	0.009035
Adjusted R-squared	0.454982	S.D. dependent var	0.016768
S.E. of regression	0.012379	Akaike info criterion	-5.878730
Sum squared resid	0.010267	Schwarz criterion	-5.720628
Log likelihood	216.6343	Hannan-Quinn criter.	-5.815789
F-statistic	15.81772	Durbin-Watson stat	1.908319
Prob(F-statistic)	0.000000		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCSREC$_I_US/FPOP_US)
Method: Least Squares
Date: 08/22/13 Time: 10:53
Sample: 1995Q2 2013Q1
Included observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.

DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),4))	0.234684	0.042010	5.586429	0.0000
DLOG(@MOVAV(FYPDPI$Q_US/FPOP_US,4))	0.303836	0.157708	1.926577	0.0581

R-squared	0.386867	Mean dependent var	0.002825
Adjusted R-squared	0.378108	S.D. dependent var	0.008095
S.E. of regression	0.006384	Akaike info criterion	-7.242778
Sum squared resid	0.002853	Schwarz criterion	-7.179537
Log likelihood	262.7400	Hannan-Quinn criter.	-7.217602
Durbin-Watson stat	1.738936		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCSTRS$_I_US/FPOP_US)
Method: ARMA Conditional Least Squares (Marquardt - EViews legacy)
Date: 08/19/13 Time: 11:24
Sample (adjusted): 1995Q3 2011Q4
Included observations: 66 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FLBR_US)	-0.009569	0.003709	-2.580021	0.0123
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.128735	0.084791	1.518256	0.1340
DLOG(@MOVAV(((FYPDPI$Q_US+FOCF$_US)/FPOP_US),4))	0.365405	0.147790	2.472456	0.0162
AR(1)	0.615522	0.103242	5.961948	0.0000

R-squared	0.770710	Mean dependent var	8.70E-05
Adjusted R-squared	0.759616	S.D. dependent var	0.012811
S.E. of regression	0.006281	Akaike info criterion	-7.243900
Sum squared resid	0.002446	Schwarz criterion	-7.111194
Log likelihood	243.0487	Hannan-Quinn criter.	-7.191462
Durbin-Watson stat	2.241174		

Inverted AR Roots	.62

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDOTH$_I_US/FPOP_US)
Method: Least Squares
Date: 08/22/13 Time: 13:59
Sample: 1990Q1 2013Q1
Included observations: 93

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.428356	0.083700	5.117779	0.0000
PDL01	0.401253	0.091868	4.367701	0.0000

R-squared	0.324417	Mean dependent var	0.007824
Adjusted R-squared	0.316993	S.D. dependent var	0.018330
S.E. of regression	0.015149	Akaike info criterion	-5.520503
Sum squared resid	0.020884	Schwarz criterion	-5.466039

Log likelihood	258.7034	Hannan-Quinn criter.	-5.498512
Durbin-Watson stat	1.844886		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FZFL155035015Q_US)
Method: Least Squares
Date: 04/30/15 Time: 18:25
Sample (adjusted): 1999Q3 2010Q2
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FHHOLDQ_US*FHOWNRQ_US/100*FHOFHOPIQ_US)	1.020848	0.158828	6.427390	0.0000
DLOG(.01*FPDIIFR_US(-1)*FGFAFAPR$Q_US(-1))	0.044715	0.185749	0.240726	0.8110
PDL01	-0.254485	0.097559	-2.608527	0.0128
PDL02	-0.013987	0.069489	-0.201277	0.8415
PDL03	0.128529	0.051405	2.500305	0.0167

R-squared	0.919649	Mean dependent var	0.011505
Adjusted R-squared	0.911408	S.D. dependent var	0.025900
S.E. of regression	0.007709	Akaike info criterion	-6.786184
Sum squared resid	0.002318	Schwarz criterion	-6.583435
Log likelihood	154.2961	Hannan-Quinn criter.	-6.710995
Durbin-Watson stat	0.980408		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDREC$_I_US/FPOP_US)
Method: Least Squares
Date: 08/01/13 Time: 14:05
Sample: 1995Q2 2013Q1
Included observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018472	0.002206	8.372012	0.0000
D(FLBR_US)	-0.002519	0.006531	-0.385638	0.7010
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.438747	0.090563	4.844686	0.0000
DLOG(@MOVAV((FYPDPI$Q_US/FPOP_US),2))	1.210217	0.344728	3.510642	0.0008

R-squared	0.491068	Mean dependent var	0.025806
Adjusted R-squared	0.468615	S.D. dependent var	0.018608
S.E. of regression	0.013564	Akaike info criterion	-5.708806
Sum squared resid	0.012511	Schwarz criterion	-5.582324
Log likelihood	209.5170	Hannan-Quinn criter.	-5.658453
F-statistic	21.87103	Durbin-Watson stat	2.125802
Prob(F-statistic)	0.000000		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet. Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FZFL152010005Q_US)
Method: ARMA Conditional Least Squares (Marquardt - EViews legacy)

Date: 11/25/14 Time: 10:26
Sample (adjusted): 1960Q1 2013Q4
Included observations: 216 after adjustments
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005916	0.000670	8.829947	0.0000
DLOG(FZFL155035015Q_US)	0.625503	0.013913	44.95840	0.0000
DLOG(FGFACD$Q_US)	0.028785	0.014365	2.003820	0.0464
AR(1)	1.838892	0.032800	56.06298	0.0000
AR(2)	-0.881578	0.032841	-26.84416	0.0000

R-squared	0.999183	Mean dependent var	0.016960
Adjusted R-squared	0.999168	S.D. dependent var	0.013133
S.E. of regression	0.000379	Akaike info criterion	-12.89604
Sum squared resid	3.03E-05	Schwarz criterion	-12.81791
Log likelihood	1397.772	Hannan-Quinn criter.	-12.86448
F-statistic	64544.33	Durbin-Watson stat	0.804156
Prob(F-statistic)	0.000000		

Inverted AR Roots	.92-.19i	.92+.19i

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: DLOG(FCDXMVP$_US/FPOP_US)
Method: Least Squares
Date: 09/27/18 Time: 00:30
Sample (adjusted): 1972Q3 2017Q2
Included observations: 180 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(@MOVAV(((FNWRE$_US+FNWFA$_US)/FPOP_US),2))	0.674040	0.086045	7.833576	0.0000
DLOG(FYPDPI$Q_US/FPOP_US)	0.486348	0.125305	3.881316	0.0001
D(FRPERB_US)	-0.015012	0.003921	-3.829032	0.0002

R-squared	0.213604	Mean dependent var	0.010426
Adjusted R-squared	0.204718	S.D. dependent var	0.017851
S.E. of regression	0.015920	Akaike info criterion	-5.425992
Sum squared resid	0.044858	Schwarz criterion	-5.372776
Log likelihood	491.3393	Hannan-Quinn criter.	-5.404416
Durbin-Watson stat	1.685217		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.

Dependent Variable: LOG(FCBC_US)
Method: Least Squares
Date: 01/24/14 Time: 11:03
Sample: 1987Q1 2013Q2
Included observations: 106

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.601629	0.019496	236.0266	0.0000

@PCY(@MOVAV(FCPIUE_US,8))	-0.005410	0.002264	-2.389543	0.0187
@MOVAV(FLBR_US-FNAIRU_US,4)	-0.171961	0.010350	-16.61488	0.0000
D(FLBR_US)	-0.312411	0.063038	-4.955946	0.0000
DLOG(@MOVAV(FNWFA$_US/FPOP_US,4))	3.541641	1.224706	2.891831	0.0047
DLOG(@MOVAV(FNWRE$_US/FPOP_US,8))	1.950298	0.669875	2.911434	0.0044

R-squared	0.854092	Mean dependent var	4.480144
Adjusted R-squared	0.846797	S.D. dependent var	0.325045
S.E. of regression	0.127227	Akaike info criterion	-1.230755
Sum squared resid	1.618661	Schwarz criterion	-1.079994
Log likelihood	71.23002	Hannan-Quinn criter.	-1.169651
F-statistic	117.0726	Durbin-Watson stat	0.847752
Prob(F-statistic)	0.000000		

Mnemonics referenced in the above equation, for example FET, can be defined using the Mnemonic 411 feature on DataBuffet.
Please contact Help@economy.com for assistance.