



# Money Supply Growth and Inflation Trends Post 2008 Recession:

## A Closer Look at the PCE Inflation Index

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- **Study Purpose:** In this study I use univariate regression models to examine the relationship between money supply growth and inflation pre and post 2008 recession. I also forecast inflation for 2018.
- **Money Supply Variables:**
  - M1
  - M2
  - MZM
- **Inflation Variable:**
  - PCE-ALL
- **Period of Analysis:**
  - 2009-2017
  - 2015-2017
- **Regression Models:**
  - $PCE_t = A_1 + B_1 (M1_t)$
  - $PCE_t = A_2 + B_2 (M2_t)$
  - $PCE_t = A_3 + B_3 (MZM_t)$
- **Forecasting Model:**
  - $PCE_{t+1} = A_1 + B_1 (M1_{t+1}) + RMSE$
  - $PCE_{t+1} = A_2 + B_2 (M2_{t+1}) + RMSE$
  - $PCE_{t+1} = A_3 + B_3 (MZM_{t+1}) + RMSE$
- **Nomenclature:**
  - PCE = Personal Consumption Expenditure – All
  - M1 = M1 Money Supply
  - M2 = M2 Money Supply
  - MZM = Money Supply - Zero Maturity
  - t = Time in Months / Years [2009-2017/2015-2017]
  - t+1 = 2018
  - A1B = Equation Parameters
  - RMSE = Root Mean Square Forecasting Error

Table 1 Regression Analysis, 2009-2017 PCE/Money Supply			
Money Supply	r-squared	b-coefficient	t-stat
M1	0.972	0.006	62.633
M2	0.946	0.002	43.278
MZM	0.932	0.002	38.015

Table 3 PCE Forecast, 2009-2017 PCE/M1			
Time (2018)	Actual	Forecast+RMS	% Error
January	107.41	108.05	0.60%
February	107.56	107.86	0.28%
March	107.61	108.15	0.50%
April	107.87	108.13	0.24%
May	108.08	108.09	0.01%
June	108.21	108.11	-0.09%
July	108.37	108.17	-0.18%
August	108.46	108.37	-0.08%
September	108.60	108.53	-0.06%
October	108.81	108.59	-0.20%
November	108.87	108.46	-0.38%
December	108.93	108.85	-0.07%

Avg. Absolute Forecast Error

0.224%

Table 2 Regression Analysis, 2015-2017 PCE/Money Supply			
Money Supply	r-squared	b-coefficient	t-stat
M1	0.963	0.006	29.659
M2	0.949	0.002	25.137
MZM	0.940	0.002	23.172

Table 4 PCE Forecast, 2015-2017 PCE/M1			
Time (2018)	Actual	Forecast+RMS	% Error
January	107.41	108.03	0.58%
February	107.56	107.83	0.25%
March	107.61	108.13	0.48%
April	107.87	108.11	0.22%
May	108.09	108.07	-0.02%
June	108.21	108.09	-0.11%
July	108.37	108.15	-0.20%
August	108.46	108.35	-0.10%
September	108.60	108.52	-0.07%
October	108.81	108.58	-0.21%
November	108.87	108.45	-0.39%
December	108.93	108.85	-0.07%

Avg. Absolute Forecast Error

0.225%

- **Findings:**
  - Regression equations for PCE/Money Supply have r-squares > .90
  - Slope coefficients statistically significant at 95% confidence level ( $t > 2$ )
  - Best-fit model is PCE/M1
  - Average absolute forecast error the same for both time periods
  - Monthly forecast error < 1%
  - Best forecast model:  $PCE_{t+1} = A_1 + B_1 (M1_{t+1}) + RMSE$
  - Money Supply is a predictor of the PCE inflation index out of sample