I used the Adobe Digital Price Index (ADPI) MoM Topline Inflation data to construct the following model to forecast the non-vehicle core goods CPI (% m/m NSA). Additional data was downloaded from FRED.

$$\Delta\pi_t = \alpha + \beta_1\Delta\pi_{t-1} + \beta_2\Delta\pi_{t-2} + \beta_3\Delta\pi_{t-3} + \beta_4\mathrm{FedFunds}_{t-6} + \beta_5\mathrm{Unemp}_{t-3} + \beta_6\mathrm{Prod}_{t-1} + \beta_7\Delta\mathrm{FedChange}_{t-3} + \gamma_{m(t)} + \varepsilon_t.$$

Where:

$\Delta\pi_t$: month over month change in inflation in period t

$\Delta\,\pi_{t-k}$: k-month lag of MoM inflation

$FedFunds_{t-6}$: Fed funds rate 6 months ago (allows time for transmission mechanism to work through the economy)

$Unemp_{t-3}$: unemployment rate 3 months ago (consumers gradually adjust demand as unemployment moves)

$Prod_{t-1}$: Industrial production one month ago (changes is supply work quickly)

$FedChange_{t-3}$: Fed rate change lagged 3 months (captures sentiments)

$\gamma_{m(t)}$: month fixed effects for the calendar month of t (captures seasonal patterns in inflation)

α: intercept

ϵ_t: error term

I did not use the entire time-series provided by the ADPI. The dates were restricted to January 2020 - July 2025 (the latest date available). Given that there have been structural changes in the economy in the post-pandemic era, I believe it was best to limit the training of my model during this time period. My one-month ahead forecast for non-vehicle core goods is provided below:

```
==================================================
August 2025 Forecast: 0.63%
95% CI: [-1.79%, 3.06%]
Direction: UP ⬆️
==================================================
==================================================
R^2 Score: 0.1293
Mean Squared Error: 1.5272346706063078
RMSE: 1.235813
Directional Accuracy: 70.0%
     Correct on positive months: 40.0%
```

```
Correct on negative months: 100.0%
```

The August 2025 (m/m NSA) forecast is 0.63%. This is slightly higher than the stated reading on MacroPolicy Perspective's August Inflation Review (9/16/25) non-vehicle core goods CPI before seasonal adjustment of 0.52% (m/m).

Only about 13% of variation in month-over-month inflation is captured by the model as given by the R-squared value. The confidence interval bands are wide and the margin of errors are about ± 1.5 percentage points as shown by the MSE. Predictions should be used with caution given month-over-month inflation can exhibit volatility. There also seems to be a bias towards predicting negative changes in inflation. Information on the data used in the model are the following:

```
==================================================
          Data Distribution:
          Total observations: 61
          Positive inflation months: 31 (50.8%)
          Negative inflation months: 30 (49.2%)
          Mean inflation: -0.109%

          Test set:
          Positive months: 5
          Negative months: 5
==================================================
```

My forecast for non-vehicle CPI for the month is September is:

```
==================================================
September 2025 Forecast: 0.25%
95% CI: [-2.17%, 2.67%]
Direction: UP ⬆️
==================================================
```