

Forecasting 10-year US treasury bond yields from PCE inflation rate

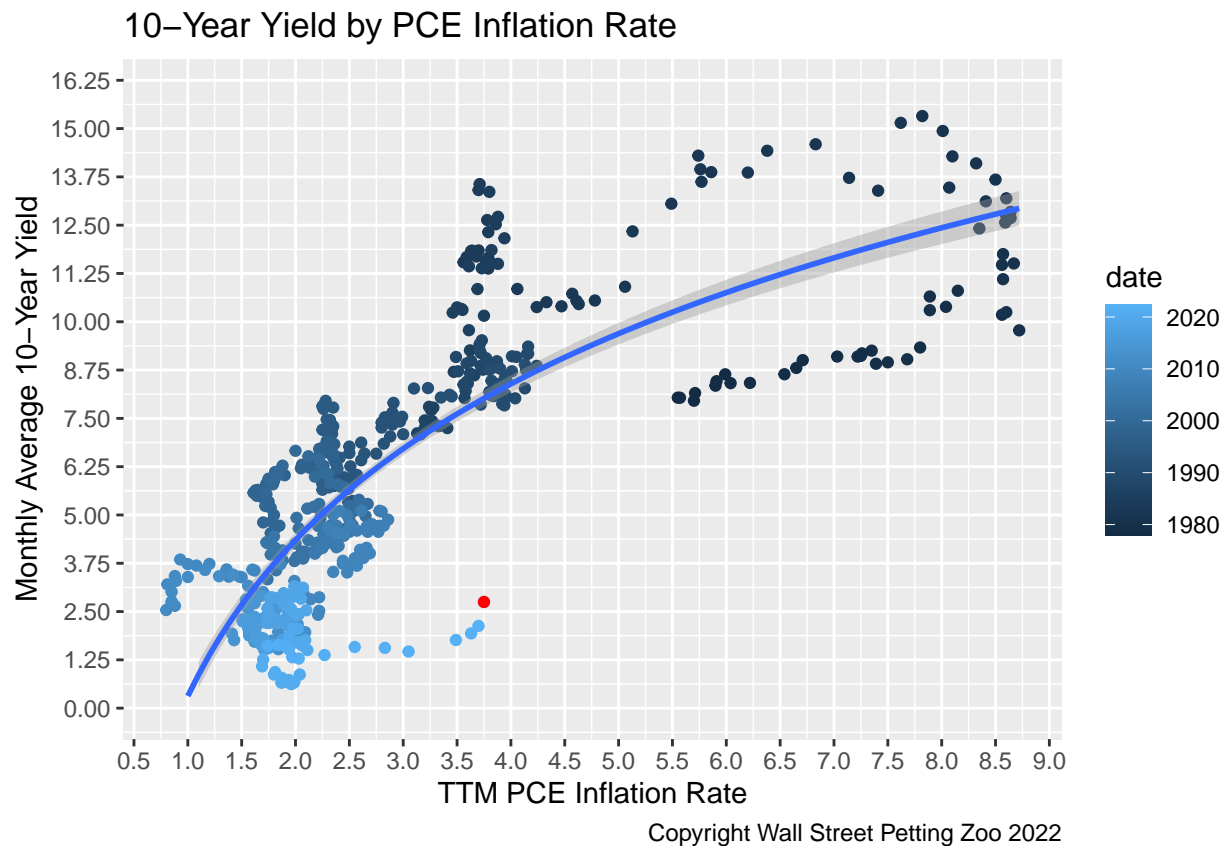
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Introduction

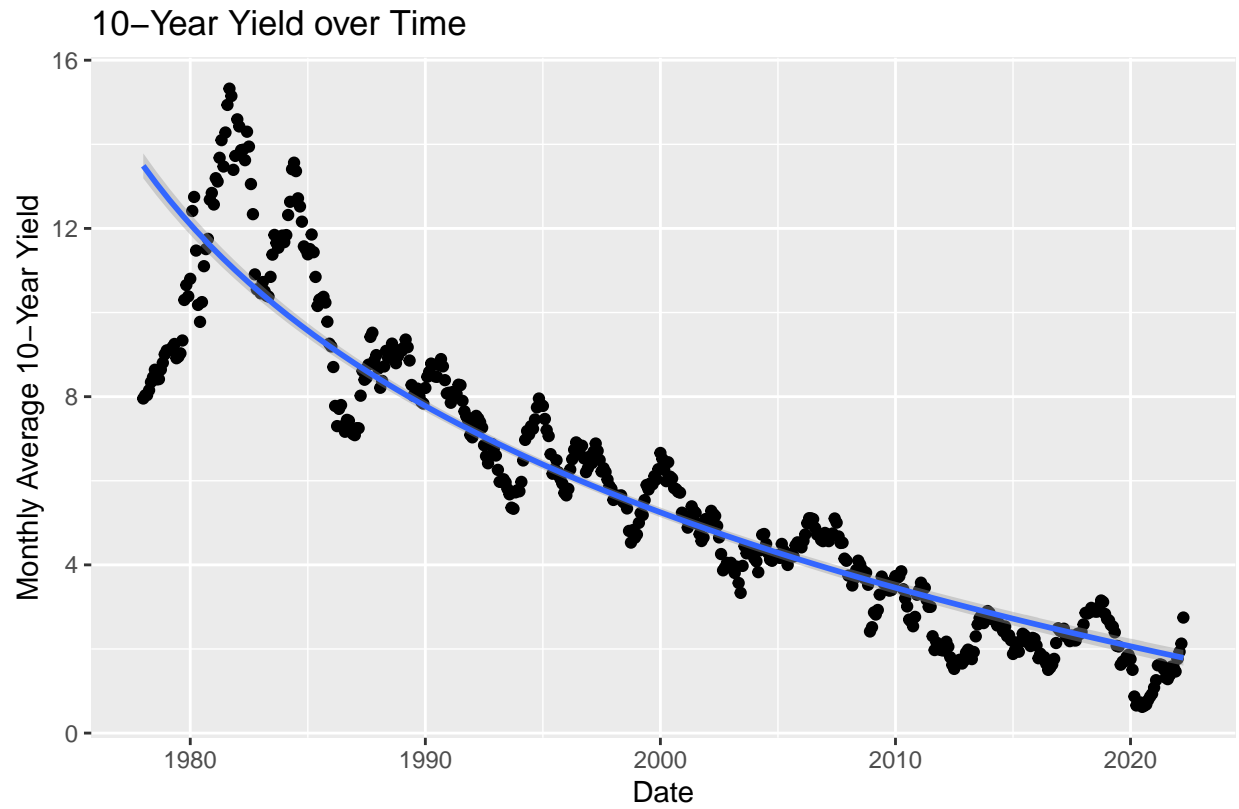
Versions of this chart have been making the rounds. I've shared it myself. Plot historical 10-year bond yields against historical PCE inflation rates, run a simple log regression, and *voila!* today's 10-year yield should be 8.02%!

But this is not quite right.



Controlling for time effects

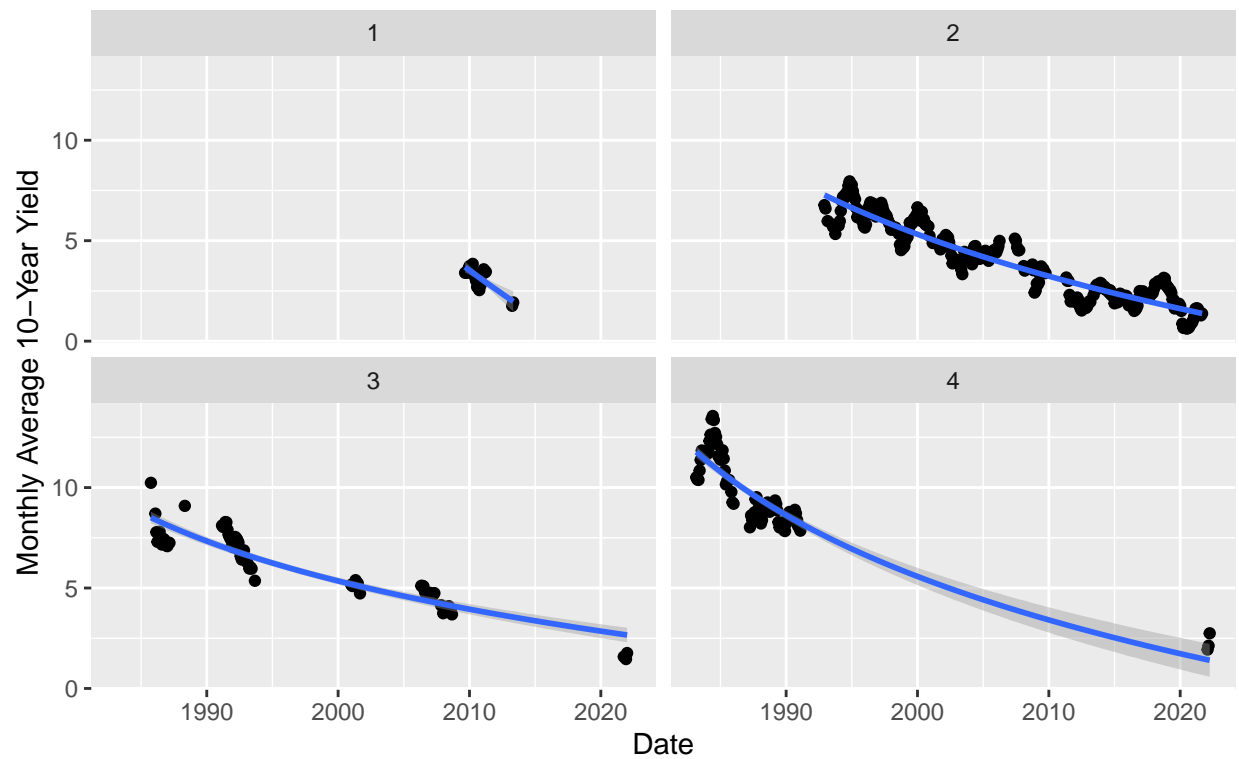
The problem with this plot is that it fails to control for the decrease of 10-year yields over time. Let's investigate whether the time effect on yields is separate from the inflation rate effect. (Spoiler: it is.)



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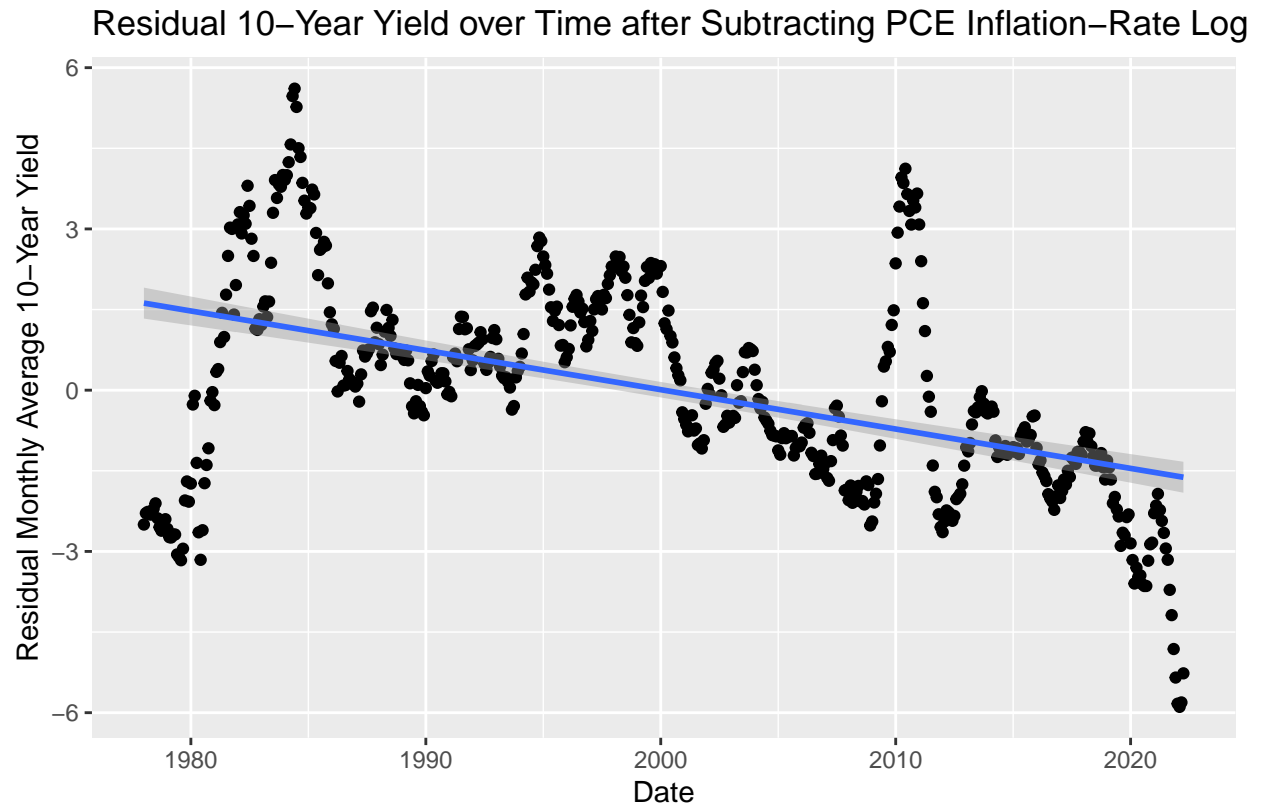
One way to check whether the time effect is separate from the inflation rate effect is to stratify by inflation rate, and then plot yield vs. time for each stratum. Removing strata with fewer than 20 data points, we get four plots that all show a decline in yields over time.

10-Year Yield over Time, Stratified by PCE Inflation Rate



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Another way to check for an independent time effect is to subtract our PCE inflation-rate regression model's "predicted" yields from every y-value in our data set. Then we plot the leftover "residual" y-values against the date. Here, again, we find a decline in yields over time.



Running a multiple regression on our data gives us a combined model that incorporates both the PCE inflation rate effect and the time effect. With this model, we can predict 10-year yields by PCE inflation rate for the year 2022. This gives us a predicted 10-year yield of 5.94%.

Conclusion

The full model's predicted terminal 10-year yield at about 6% is still well above today's roughly 3% yield, but well below the approximately 8% yield predicted by a log regression on the PCE inflation rate without controlling for the change in yields over time.