Macroeconomic Forecasts, 3Q2025
Domestic Metrics

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Summary

Our previous two installments of this report for 2025 discussed the six signals that indicated the economy was headed for a recession and the two signals that suggested it was not. For purposes of a review, the six recession-heavy signals were:

- Equities and Bond Markets
- Stubborn Inflation
- Consumer Sentiment
- Consumer Savings and Loan Delinquencies
- Capacity Utilization in the Auto Industry
- Stubborn Federal Reserve

The two signals that the economy was doing fine were:

- The labor market
- Trump is Trump

The signals mostly remain the same; however, we are switching the place of some of these signals. The signals that are now signaling a recession include the following:

- Stubborn Inflation
- Consumer Sentiment
- Consumer Savings and Loan Delinquencies
- An Active Federal Reserve
- The Labor Market

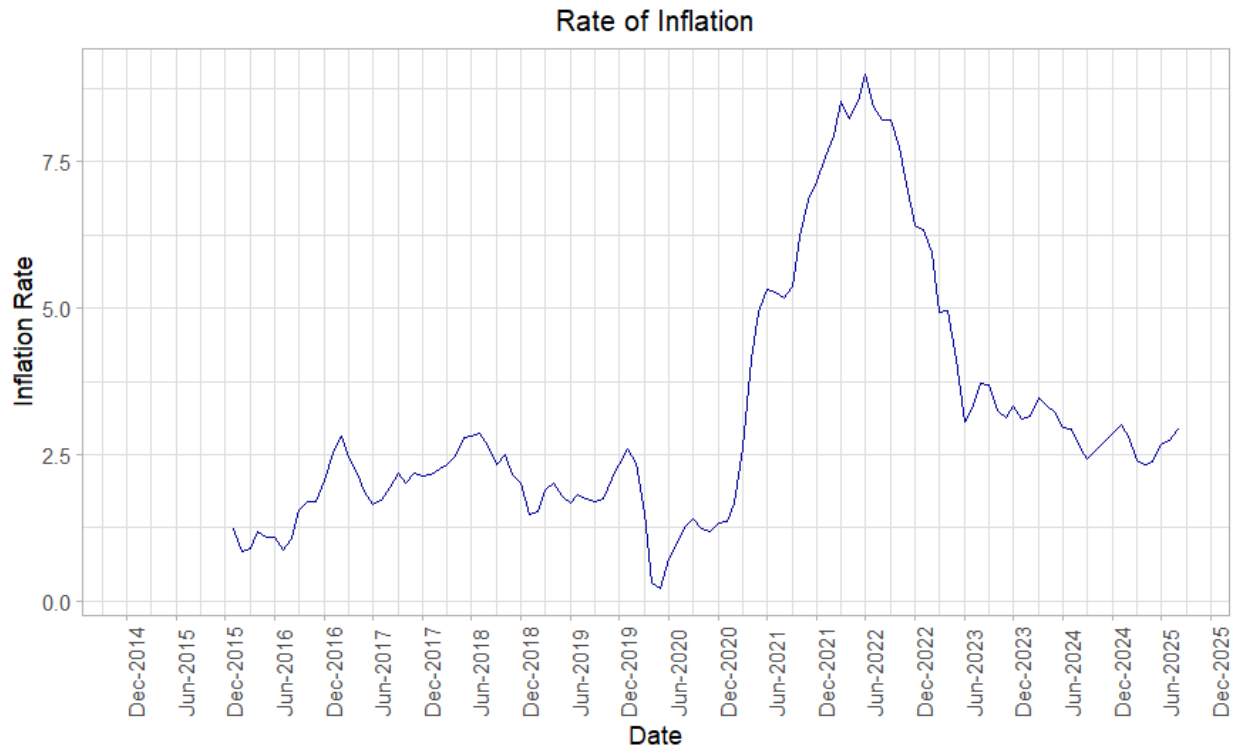
The two signals that the economy is doing fine are:

- The Equities and Bond Markets
- Trump is Trump

Signal 1: Stubborn Inflation and Looming Price Increases

Prices are starting to show some upward trajectory. Although the Fed has continued to broadcast its desire to hold inflation at or near 2%, the recent decrease in the Federal Funds target rate has shown that the Fed is shifting towards containing any upward movement in unemployment rather than keeping prices contained. (See Figure 1.) We believe that the Fed is likely to make at least one more 25 bp decrease in the Federal Funds target before the end of 2025.

Figure 1: US Nationwide Rate of Inflation (2014-present)

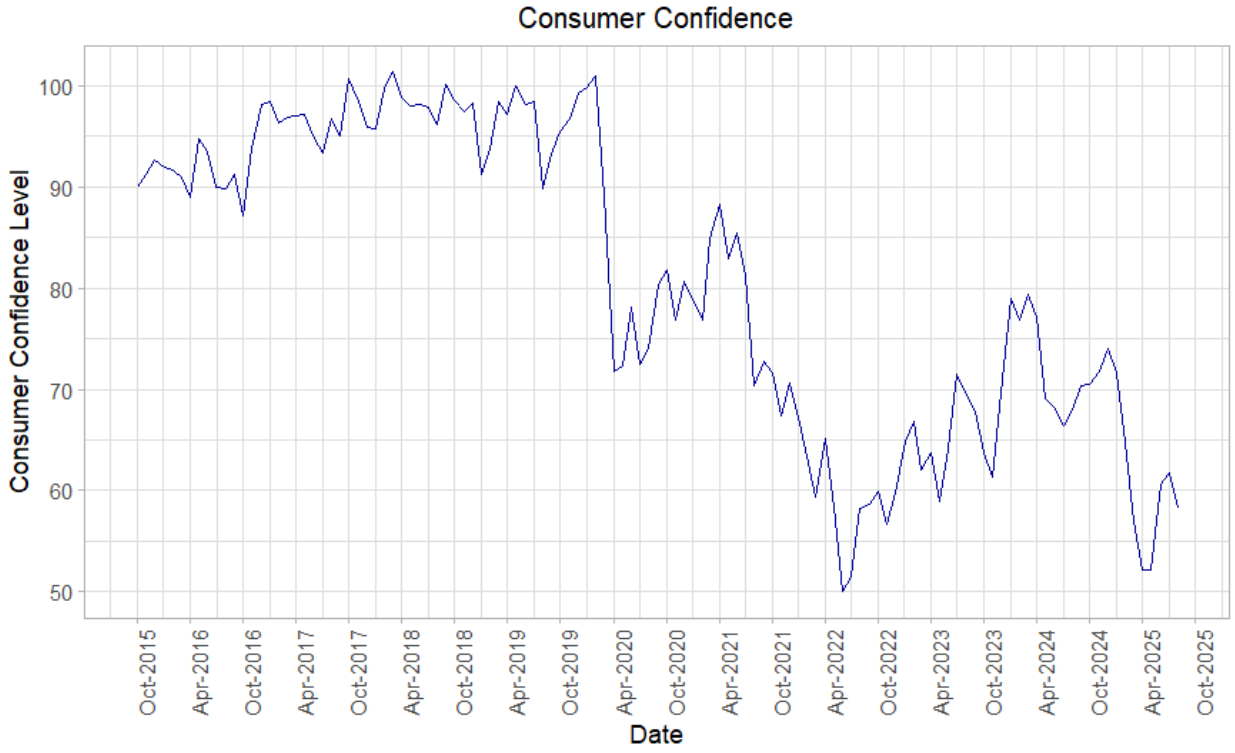


Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

Signal 2: Consumers are Less Content and Becoming Pessimistic Towards the Future

Consumer confidence is trending down and is reaching record lows. The University of Michigan Consumer sentiment spiked briefly after Trump won the election in November 2024, but has dropped steadily since his inauguration. 70% of GDP is comprised of consumer spending, and a drop in consumer confidence will likely translate to lower consumer spending. If consumers lose confidence in the future economic condition, they could very well reduce spending and, in turn, drive the economy towards recession. (See Figure 2.)

Figure 2: University of Michigan Consumer Sentiment Index (2015-present)

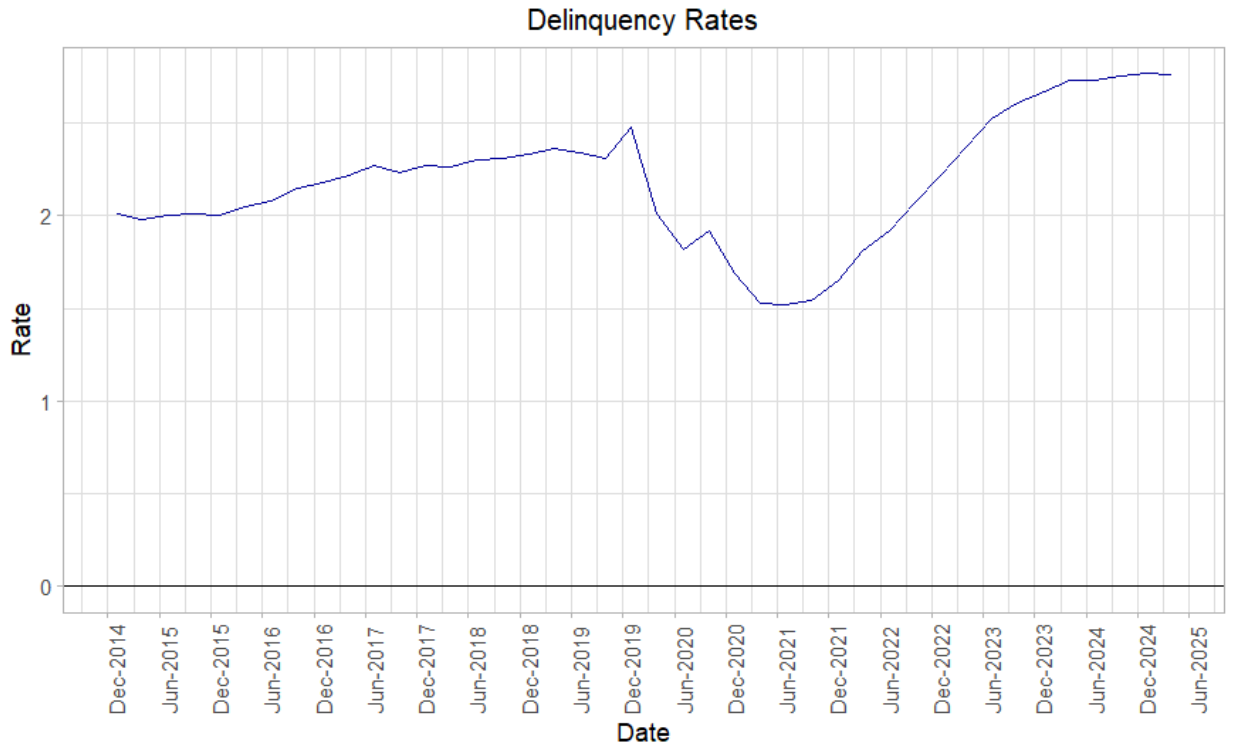


Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

Signal 3: Consumers Have Less Savings, Are Savings Less as a Percentage of their Income and are More Delinquent on Loans

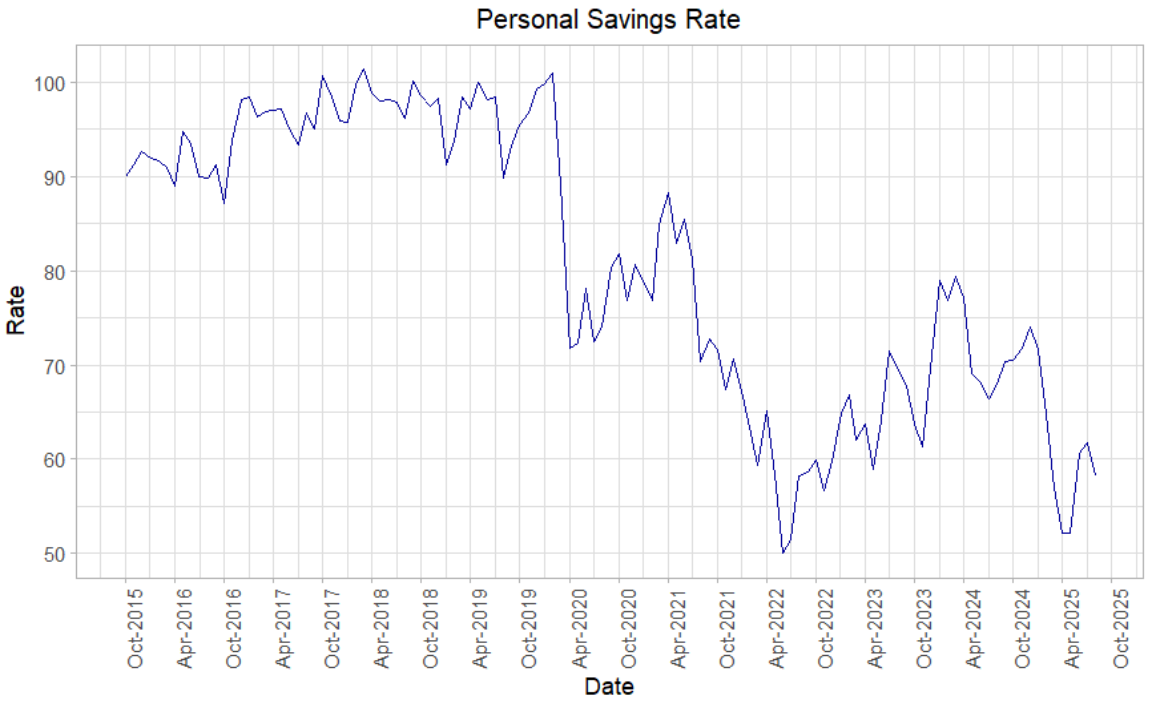
Delinquency rates on all consumer loans are higher than they have been since the Great Recession. This is a troubling trend and one that should concern financial institutions. Consumers accumulated savings at unprecedented rates during the COVID recession and have been steadily dis-saving since. Additionally, Consumers have been consistently more delinquent on loans since the COVID recession. Although the equities market shows gains, most individuals have small (marginal) brokerage accounts. The increase in delinquencies and lower savings rates (see Figure 3 and Figure 4) could indicate that consumers are on a razor's edge with respect to staying afloat. One modest economic shock could create a surge in delinquencies.

Figure 3: US Nationwide Consumer Loan Delinquency Rates



Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

Figure 4: US Nationwide Personal Savings Rate

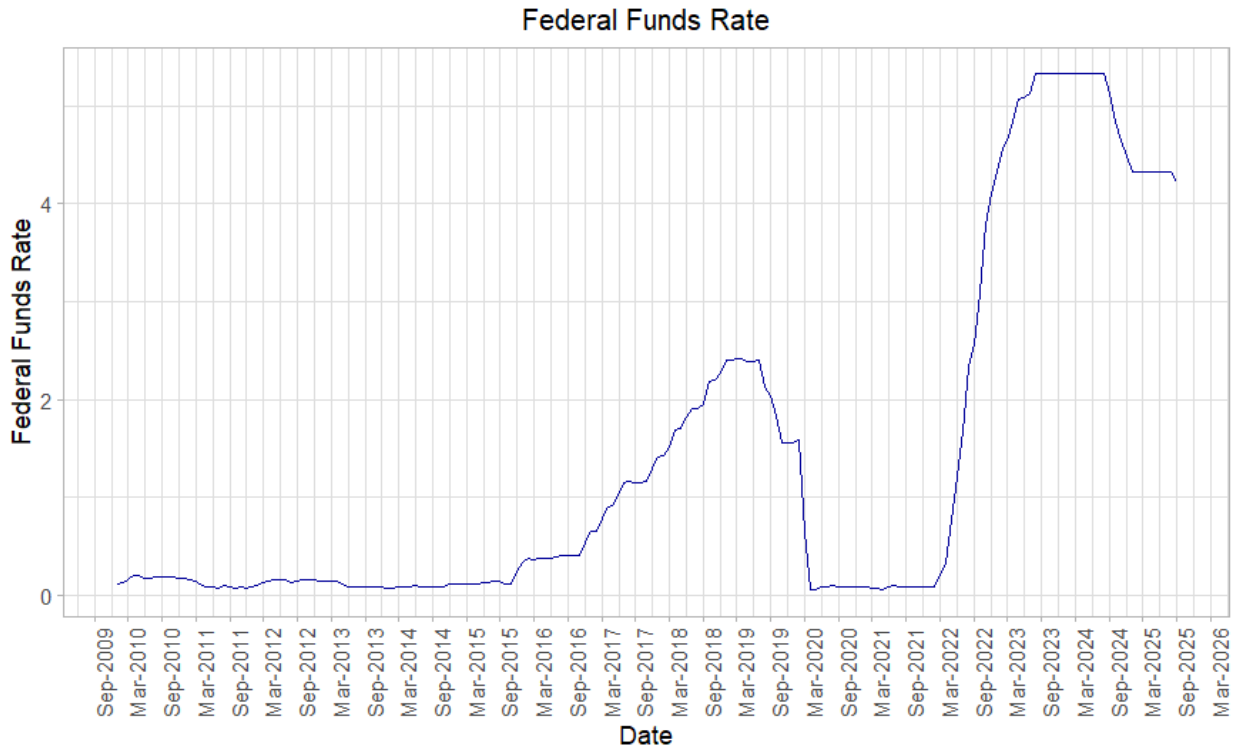


Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

Signal 4: An Active Federal Reserve

Until very recently, the Federal Reserve had placed a strong emphasis on monetary policy aimed at keeping inflationary pressures contained. However, the recent 25 bps drop in the Federal Funds Target Rate (per Figure 5) signals that the Federal Reserve has changed its focus from containing inflation to preventing further increases in unemployment and decreases in GDP. These changes, although small in magnitude, are a strong sign that the economy is either slipping or has already slipped into an economic recession.

Figure 5: US Target Federal Funds Rate

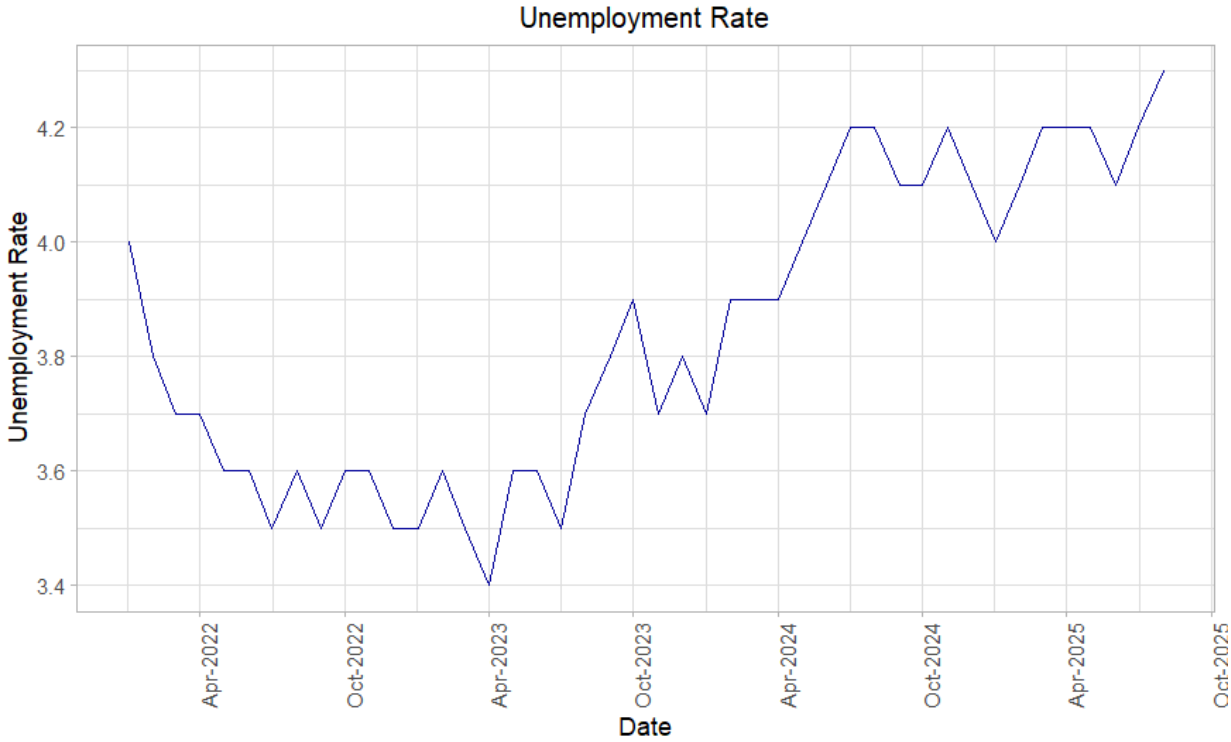


Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

Signal 5: The Labor Market & The Unemployment Rate

After a near record-breaking number of months at a sub 4% unemployment rate, the unemployment rate has been moving above 4% for nearly 18 months. Although the unemployment rate has not started to spike, it is signaling a much tighter labor market. There is an alarming trend of an increase in the unemployment rate for recent college graduates. We believe that this suggests that firms are hesitant to grow their workforce in the face of a challenging economy.

Figure 6: US Nationwide Average Unemployment Rate (2022-present)



Source: Federal Reserve Economic Database (https://fred.stlouisfed.org)

We are Not Heading Towards A Recession

Signal 1: The Equities Market and the Bond Market

The equities market has shown significant growth during the last quarter. Although there was a notable drop in the market in August, the index has rebounded, and the market is currently sitting at an all-time high. Although the equities market is not the economy, it can often foreshadow movements in the economy. Although the US is currently sitting at a standstill with respect to a government budget, the S&P500 continues its strong growth. Perhaps the saying “no news is good news” is appropriate at this point. Although the BLS did not report new unemployment numbers, the market seems to be holding strong. Although this could change, this signal suggests that the economy is relatively strong.

Figure 7: S&P 500 Index (July 2025-present)

Source: TradingView (https://www.tradingview.com/)

Signal 2: President Trump Initiates Policies Only to 'Take them Back'

Trump is Trump. It doesn't really matter what we say about the current president – he will likely announce and then rescind any number of policies in the next 90 days. The one policy 'umbrella' that the President is sticking to is some combination of tariffs and quotas. The Chinese response to these policies is to purchase $0 of US soy. These policies are likely to move the economy towards an economic recession. But, Trump could change these policies tomorrow.

Disruptive ("Black Swan") Events

The past ten years have seen several unusual events that have had a substantial impact on the national and/or global events that warrant mentioning. We mention them from the perspective of considering whether any of these types of events could occur again in the near future, and planning for their potential impact on the economy and or business operations would seem prudent.

1. Biological Events: The world has seen a number of new "Influenza-Like Illnesses" (ILI), with the latest now directly affecting virtually every country on the global in a crippling fashion.

   A. SARS (2002 & 2004)
   B. "Swine flu" (H1N1, 2009)
   C. "Avian flu" (H5N1 in 1997; H7N9 in 2013; H5N6 in 2014; H5N8 in 2016)
   D. COVID-19 (2019-2022), with several different strains

   While questions during the handling of the COVID-19 emergency have shone a light on the globe's ability to address a new pathogen under pressure, any answer is still a function of the contagiousness of the pathogen. Depending on how quickly a new pathogen spreads, along with its incubation period and symptoms, could mean the difference between survival and massive devastation. "Avian flu" (strain H5N1) has been recently reported as being found in a human in Louisiana[1].

2. Disinformation Campaigns: A staple of international conflicts (both military and otherwise), organized campaigns based on disinformation or propaganda have been around for hundreds of years. In the recent past, the U.S. has made allegations against foreign governments that there has been interference in federal elections (and caused social unrest) by using freely available social networks[2].

3. Disruptive Malware and Ransomware: Over the past five years, sophisticated attacks on businesses have (literally) become a business for some entities, foreign and domestic. "Ransomware" is the latest version of malware that "… [locks and encrypts] a victim's computer or device data, then demand a ransom to restore access."[3] In software security company Semperis' 2024 Ransomware Risk Report, 83% of 900 survey respondents reported being targeted in the past year[4], with an average cost of about $5M per breach globally[5].

4. Societal Unrest, including Domestic Social Changes and Terrorism: Since 2020, we saw many social protests turn violent on both ends of the political spectrum. Without warning, these movements have caused rapid and unexpected upheavals in social climates, and upended assumptions on which financial decisions were made. As these questions have been explored socially and officially, the discussions have led to questions of how deep the disdain in the

[1] https://www.nbcnews.com/health/health-news/h5n1-bird-flu-mutations-human-transmission-cdc-rcna185554 and https://www.nytimes.com/2025/01/02/us/politics/bird-flu-biden-trump.html
[2] See, e.g., https://www.cnn.com/2024/10/30/europe/russian-disinformation-harris-walz-us-election-intl/index.html and https://www.nytimes.com/2024/07/09/business/russian-bots-artificial-intelligence-propaganda.html
[3] See https://us.norton.com/internetsecurity-malware-ransomware-5-dos-and-donts.html
[4] https://www.forbes.com/sites/heatherwishartsmith/2024/12/09/the-persistent-ransomware-threat-2024-trends-and-high-profile-attacks/
[5] https://assets.sophos.com/X24WTUEQ/at/9brgj5n44hqvgsp5f5bqcps/sophos-state-of-ransomware-2024-wp.pdf

country remains on both sides of the political fence, and what societal and legislative impacts these investigations may carry.[6]

5. Unanticipated Changes in Leadership: Donald Trump is currently 78 years old, and is currently the oldest President-Elect in the history of the United States. Given his age, his polarizing opinions, and the fact that there were two attempted assassinations against him during his campaign during 2024, one should consider the possibility of him not being able to serve out his Presidential term (which began in January of 2025)[7]. While the rules for succession are clear in the event that he is not able to complete his term, the confusion surrounding any event that calls for succession always inject some ambiguity. Further, despite there being a fully Republican-dominated Congress as of 2025, positions on all issues are never perfectly aligned, allowing for discord if/when a leadership change does occur.

6. Supply Chain Disruptions: Several straits and canals are considered major trade bottlenecks because they are crucial waterways that connect different continents, meaning any disruptions in their operations can significantly impact global trade flows, causing delays and price fluctuations. Some most key bottlenecks are the Panama Canal, the Suez Canal, the Strait of Hormuz, the Strait of Malacca, the Turkish Straits (Bosporus and Dardanelles), and the English Channel. To emphasize this point, heightened hostilities between Israel and Iran in June 2025 have transformed the Strait of Hormuz into an acute chokepoint risk. Roughly 20 million barrels per day of crude and petroleum liquids (about 20% of global consumption), along with one-fifth of worldwide LNG volumes, now transit the corridor under a cloud of potential closure[8]. Further, the threat of war has doubled war-risk insurance premiums for vessels traversing the Gulf[9], spot ocean-freight rates from East Asia to UAE gateways have surged by 76%[10], and container rates into Gulf ports are running 55% above previous levels[11]. Carriers including Maersk and Hapag-Lloyd have suspended or curtailed calls at Israeli ports and placed vessels transiting Hormuz on heightened alert, with reroutes via the Cape of Good Hope adding 10–14 days and effectively removing up to 15% of global box-ship capacity[12].

7. Cryptocurrencies: With the increasing visibility of distributed cryptocurrencies, several countries are currently investigating the benefits of implementing their own cryptocurrencies based on their own hard currencies. Over the past few years, several Caribbean countries have launched successful cryptocurrencies, including the Bahamas, Grenada, and St. Kitt's & Nevis[13]. Ecuador, Senegal, and China have canceled or withdrawn their currencies[14]. Along these lines, on January 10, 2024, the SEC approved the listing and trading of a number of spot bitcoin exchange-traded product (ETP) shares[15].

[6] See https://www.insurancebusinessmag.com/us/risk-management/news/global-civil-unrest-on-the-rise-as-costofliving-crisis-intensifies-449683.aspx
[7] https://www.nytimes.com/2024/10/03/health/trump-health-records.html
[8] https://www.eia.gov/todayinenergy/detail.php?id=65504 and https://www.lngindustry.com/liquid-natural-gas/25062025/eia-about-one-fifth-of-global-lng-trade-flows-through-strait-of-hormuz/
[9] https://english.aawsat.com/business/5155964-insurance-costs-ships-strait-hormuz-rise-over-60 and https://www.ainvest.com/news/hormuz-tensions-double-cargo-insurance-premiums-0-5-2506/
[10] https://www.cnbc.com/2025/06/23/mideast-ocean-freight-rates-soar-on-iran-strait-of-hormuz-risks.html
[11] https://customer-hub.ligentia.com/hc/en-gb/articles/20871625011228-Customer-Update-Pending-Closure-of-Strait-of-Hormuz
[12] https://supplychaindigital.com/news/middle-east-conflict-impact-on-air-sea-freight and https://blogs.tradlinx.com/?p=10053
[13] https://www.atlanticcouncil.org/cbdctracker/
[14] Ibid.
[15] See https://www.reuters.com/technology/spot-bitcoin-etfs-start-trading-big-boost-crypto-industry-2024-01-11/ and https://www.sec.gov/news/statement/gensler-statement-spot-bitcoin-011023

8. Global unrest: As we have now seen, Russia's (now stagnant) invasion of the Ukraine has led to a dramatic impact on the energy and grain sectors globally[16]. The impact of the Israel's current conflict(s) (with Hamas, Lebanon, and Iran) has also been speculated as impacting global economies[17]. Speculation regarding Iran's motives entails that Iran is interested in furthering its nuclear weapons program in order to supply arms to Russia to help with their aforementioned conflict in Ukraine[18]; this agenda has also immediately fueled Iran's conflict with Israel (and, now, the United States). Regardless, Iran's unwillingness to work with the International Atomic Energy Agency (as called for by a United Nations resolution)[19] is causing concerns that could lead to actions that would significantly alter the U.S. consumer's economic balance, directly and indirectly.

9. Natural disaster risks: While there has been a significant amount of propaganda about climate warning and similar risks, this comment is intended to focus on events such as strong hurricanes and the recent California wildfires. While we are not passing judgment on the surrounding issues and whether the activities of people are contributing to some disasters, we are more concerned about the financial impact of these events. FEMA's national flood insurance program is at risk of being scuttled, resulting in the elimination of over 4.7M flood insurance policies and over $1.3T in coverage, despite the program being over $22B in arrears since its introduction.[20] State Farm is the primary insurer in California aside from the state's FAIR Plan, and is currently estimating payouts at $7.6B as of this writing.[21] Other disasters are similarly testing financial infrastructures around the country.

10. Governmental shutdown: As of this writing, the current shutdown of the U.S. federal government has halted the operation of most federal agencies not deemed essential, resulting in the suspension of key services and delays in significant economic reporting. Among the agencies most acutely affected are the Bureau of Labor Statistics, the Census Bureau, and the Bureau of Economic Analysis — all of which will cease data collection activities and pause the release of major reports (e.g., monthly jobs data and inflation statistics) until funding is restored. The disruption in data collection and reporting impairs the ability of decision-makers to gauge the state of the economy and make informed choices regarding policy. Delays or long gaps in published data can introduce significant ambiguity, with missed survey windows also affecting the accuracy and integrity of future reports. Should the shutdown extend for more than a brief period, agencies may need to release batched or revised datasets after reopening, complicating trend analysis and policy evaluation for months afterward.

[16] https://www.brookings.edu/articles/how-would-trump-and-harris-handle-the-russia-ukraine-war/
[17] https://www.washingtonpost.com/world/2024/09/30/israel-lebanon-hezbollah-hamas-war-news-gaza/ and https://www.nytimes.com/live/2024/10/01/world/israel-lebanon-hezbollah
[18] https://www.heritage.org/middle-east/report/iran-inching-toward-nuclear-weapons-breakout-what-does-mean-the-united-states
[19] Per https://www.iaea.org/sites/default/files/24/06/gov2024-39.pdf and https://www.iaea.org/sites/default/files/unsc_resolution2231-2015.pdf
[20] https://www.bloomberg.com/news/newsletters/2025-03-31/what-fema-s-demise-could-mean-for-flood-insurance
[21] https://www.coverager.com/state-farm-pays-out-over-2-5-billion-for-ca-wildfire-claims/

Data Analysis

As part of the Dodd-Frank Act, larger banking institutions in the United States are required to use government specified variables, and approved proprietary processes, to determine if they are adequately prepared for unexpected "systemic failures". Some banking institutions are also incorporating portions or components of their forecasting processes to estimate future profitability; in order to do so, however, realistic forecasts (as opposed to extremes) are required.
While arguments could be made about the variables included in this study, as stated in Jiang, et al., "… a conclusion that can be made for … U.S. data is that there is little to no improvement in forecast accuracy when the number of predictors is expanded beyond 20-40 variables."

Capitalytics provides the results of a rigorous analysis of every variable that is included in our quarterly macroeconomic study. These variables include the following[22]:

1. Real GDP growth
2. Nominal GDP growth
3. Real disposable income growth
4. Nominal disposable income growth
5. Unemployment rate
6. CPI inflation rate
7. 1-month Treasury yield
8. 3-month Treasury yield
9. 6-month Treasury yield
10. 1-year Treasury yield
11. 3-year Treasury yield
12. 5-year Treasury yield
13. 7-year Treasury yield
14. 10-year Treasury yield
15. 20-year Treasury yield
16. 30-year Treasury yield
17. BBB corporate yield
18. Mortgage rate
19. Prime rate
20. US Average Retail Gasoline Price ($/gal; all grades, all formulations)
21. S&P 500 Stock Price Index
22. Cost of Federal Funds (Primary Credit Rate)
23. Moody's AAA Rate
24. Moody's BAA Rate
25. Dow Jones Total Stock Market Index
26. House Price Index
27. Commercial Real Estate Price Index
28. Market Volatility Index (VIX)

[22] This study is motivated by the Federal Reserve Board's Dodd-Frank Act, which includes requirements to consider various international factors; however, those factors will not be discussed extensively in this particular report based on the target use and audience of this report.

Our procedure is as follows:

1. Data is collected per the information in Appendix A, "Data sources".
2. Correlations between variables are identified to determine which variables are may be considered as "dependent" (upon other variables, i.e., highly correlated with other variables as part of their nature).
3. Multiple forecast analyses are performed per the procedure in Section I of Appendix B for all variables, with the results of corresponding forecasts aggregated.
4. Regressions are performed per the procedure in Section III of Appendix B for all variables.
5. The rationale for these analyses, modifications, and the conclusions thereto are documented in the following section of this report, "Data Series Conclusions".

Correlations

Part of Capitalytics' analysis of macro-economic variables entails computing the correlation between variables, to establish the existence and level of interdependence of variables. In Appendix C of this document, we document the 135 pairs of variables that showed absolute correlation values greater than or equal to 0.6. As part of this portion of the study, Capitalytics identified the following sets of strong dependencies (correlations with magnitudes greater than 0.95) between variables that were subsequently validated as significant, long-term, recurring correlations as part of the nature of the variables; these pairings of variables are viewed as extremely significant based on the respective definitions of the variables and will be leveraged as discussed in Section I of Appendix B.

Table 14: Variable Dependencies

Regression (Dependent) Variable		**Independent Variable**[23]
1-month, 3-month, 6-month, 3-year Treasury yield		1-year Treasury yield
5-year Treasury yield		3-year Treasury yield*
7-year Treasury yield		5-year Treasury yield*
10-year Treasury yield	**… depends on …**	7-year Treasury yield*
20-year and 30-year Treasury yield, and		10-year Treasury yield*
30-year Mortgage rate		7-year Treasury yield*
Moody's AAA yield		30-year Mortgage rate*
Prime Rate and Fed Funds Rate		1-year Treasury yield

[23] It should be immediately apparent that some of the variables that are listed as "independent" are, in fact, dependent on other variables; these "independent" variables that actually have dependencies are noted by a trailing "*".

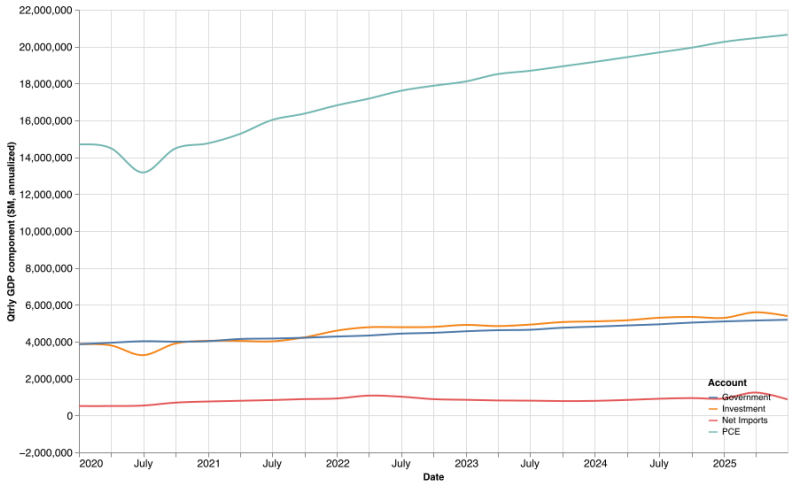
Real & Nominal GDP Growth, Real & Nominal Disposable Income Growth, and CPI Inflation Rate

Analysis

The U.S. economy experienced a pronounced rebound during 2Q2025, with real gross domestic product expanding at an annualized rate of 3.3% according to the Bureau of Economic Analysis' second estimate[24,25]. This marked a sharp reversal from the 0.5% contraction recorded during 1Q2025, representing the most significant Q/Q improvement since the start of the pandemic recovery period[26,27]. On a Y/Y basis, real GDP growth reached 2.0% in 2Q2025, while nominal GDP performance improved by 5.3% (ann.)[28]. The divergence between real and nominal growth primarily reflected the persistent inflationary environment affecting the economy throughout 1H2025.

The economic expansion during 2Q2025 was predominantly driven by a substantial decrease in imports, which contributed positively to GDP calculations as imports represent a subtraction in the accounting framework, and sustained growth in consumer spending[29]. These positive forces offset declines in business investment and exports that had weighed on growth during the period. The import dynamics reflected the continuation of "tariff front-running" behavior that had characterized the first quarter, where businesses and consumers had accelerated purchases of foreign goods ahead of anticipated tariff implementations[30].

Figure 8: Evolution of US GDP Components



Source: Bureau of Economic Analysis (https://www.bea.gov)

[24] https://www.bea.gov/news/2025/gross-domestic-product-2nd-quarter-2025-second-estimate-and-corporate-profits-preliminary
[25] https://tradingeconomics.com/united-states/gdp-growth
[26] https://www.bea.gov/news/2025/gross-domestic-product-2nd-quarter-2025-advance-estimate
[27] https://www.investopedia.com/second-quarter-gdp-revision-11799388
[28] See https://www.jec.senate.gov/public/vendor/_accounts/JEC-R/gdp/Monthly GDP Update (PDF).pdf and https://www.bea.gov/sites/default/files/2025-08/gdp2q25-2nd.pdf
[29] https://www.bea.gov/news/2025/gross-domestic-product-2nd-quarter-2025-second-estimate-and-corporate-profits-preliminary and https://tradingeconomics.com/united-states/gdp-growth
[30] See, e.g., https://qz.com/us-economy-grew-second-quarter-2025-gdp and https://www.investopedia.com/second-quarter-gdp-revision-11799388

Inflation during the 2Q2025 and 3Q2025 has been characterized by an acceleration in price pressures, due to the tariff regime implemented by the Trump administration beginning in April 2025. Inflation peaked at 8.6% during 2Q2022 and fell to below 3% in 3Q2024, where it has remained since. Inflation averaged 2.74% in 1Q2025 and 2.46% in 2Q2025, with a decline from January to May 2025, followed by a consistent increase from May to August 2025.[31] Core inflation (excluding food and energy) was 3.08% in 1Q2025 and 2.82% in 2Q2025, with monthly figures showing 3.11% in August 2025; this metric has risen consistently since May 2025, and its August level is the highest value since February 2025.[32]

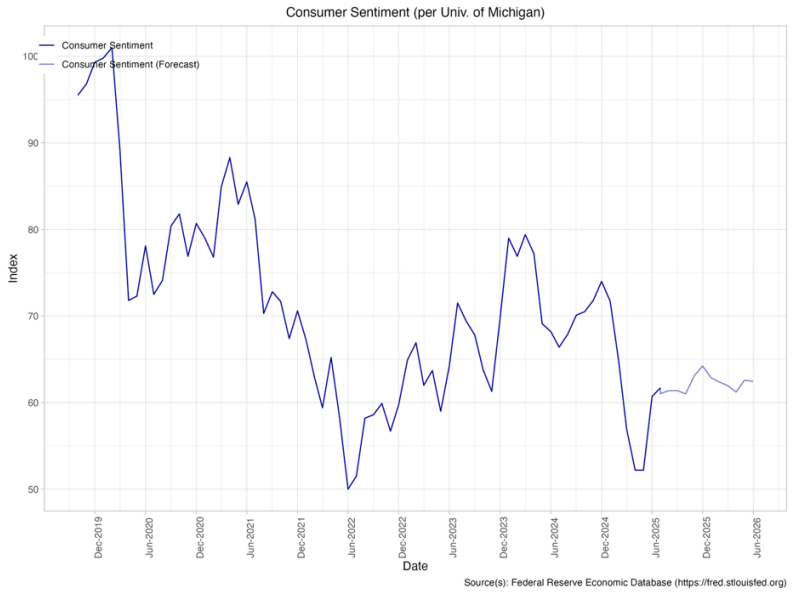
The inflationary impact was most pronounced in sectors with high import content, particularly clothing goods and consumer durables. Clothing prices experienced the most dramatic increases, with tariffs on apparel imports nearly doubling from 14.5% in 2024 to 30.6% in 2025, while footwear tariffs increased by 25% across all major sourcing countries.[33] Data from the Yale Budget Lab documented that consumers faced significant price shocks in these categories, with leather products and shoes experiencing recent price increases of 39% and apparel prices rising 37% in the short run.[34] Coffee prices surged 20% (ann.) by August 2025, while banana prices increased by 15% (ann.), with the universal 10% tariff applied to Central and South American imports.[35]

Many companies had initially absorbed the impact of tariffs by reducing profit margins and depleting inventory stockpiles that had been accumulated during early 2025 (prior to the tariff implementations), thereby temporarily buffering consumers from immediate price impacts.[36] However, by mid-year 2025, businesses were reaching the limits of their ability to absorb higher import costs. The effective average tariff rate had reached 18.6% by September 2025, with one Federal Reserve analysis suggesting that the 2025 tariffs had contributed approximately 0.3% to core goods PCE prices and 0.1% to overall PCE inflation through mid-year.[37] As inventory buffers were exhausted, companies began passing tariff costs to consumers in 3Q2025, thereby generating significant consumer price inflation.[38]

Personal consumption expenditures, comprising approximately 70% of economic activity, showed real consumer spending rising to 1.6% (ann.) during 2Q2025, an improvement from the modest 0.5% growth in 1Q2025[39]. However, this performance remained well below the historical trend, reflecting ongoing consumer caution amid elevated borrowing costs, policy uncertainty, and lingering concerns about employment prospects. Consumer sentiment remained volatile throughout the period, with the University of Michigan Consumer Sentiment Index experiencing significant fluctuations as households grappled with the implications of the new administration's evolving economic policies and their cumulative impact on inflation expectations and real purchasing power. (See Figure 9.)

[31] https://fred.stlouisfed.org/series/CPIAUCSL
[32] https://fred.stlouisfed.org/series/CPILFESL
[33] https://www.cbsnews.com/news/trump-tariffs-consumer-price-hikes-inflation-coffee-autos-apparel-cpi/ and https://www.reuters.com/business/retail-consumer/sporting-goods-makers-adidas-puma-slump-after-trump-announces-tariffs-2025-04-03/
[34] https://budgetlab.yale.edu/research/state-us-tariffs-august-7-2025
[35] https://abcnews.go.com/Business/inflation-expected-climbed-august-fed-weighs-interest-rate/story?id=125436582
[36] https://www.piie.com/blogs/realtime-economics/2025/who-paying-trumps-tariffs-so-far-its-us-businesses
[37] https://www.federalreserve.gov/econres/notes/feds-notes/detecting-tariff-effects-on-consumer-prices-in-real-time-20250509.html
[38] Ibid.
[39] https://www.reuters.com/business/us-second-quarter-gdp-revised-higher-businesses-boost-investment-ai-2025-08-28/

Figure 9: University of Michigan Consumer Sentiment Index



Gross private domestic investment declined notably in 2Q2025, keeping with the policy uncertainty and elevated interest rates. Total private fixed investment increased by 5.7% (ann.), a dramatic slowdown from the 10.3% surge in 1Q2025.[40] Nonresidential fixed investment showed particular weakness, reflecting corporate hesitancy to commit to large-scale capital projects amid evolving tariff policies.[41] Residential investment declined 4.6%, continuing a pattern of weakness in the housing sector as elevated mortgage rates hampered homebuilding activity and residential construction starts fell 8% Y/Y.[42,43] The Deloitte economic forecast projected business investment growth of just 0.7% across 2025 (to date), significantly less than the 3.7% of 2024, as higher tariffs and interest rates created a challenging environment for capital allocation decisions.[44]

Federal government spending contracted 3.7% in 2Q2025, following a 4.6% decline in 1Q2025, as non-defense discretionary programs faced budget constraints.[45] However, state and local government spending increased 3.0%, partially offsetting the federal contraction and contributing positively to GDP growth.[46] The Hutchins Center Fiscal Impact Measure indicated that overall fiscal policy subtracted 0.4 percentage points from GDP growth in the second quarter, with federal purchases declining while state purchases provided some offset.[47] Infrastructure spending continued to support certain segments of the construction industry, with highway, street, and bridge construction firms benefiting from ongoing funding through the Infrastructure Investment and Jobs Act.[48]

Real and nominal disposable personal income per capita demonstrated opposing trends during the 2Q2025 and 3Q2025, with the tariff-induced inflation environment creating an increasingly pronounced

[40] https://www.bea.gov/news/2025/gross-domestic-product-2nd-quarter-2025-second-estimate-and-corporate-profits-preliminary
[41] https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-outlook-analysis.html
[42] https://www.census.gov/construction/nrc/pdf/newresconst.pdf
[43] https://www.oldrepublictitle.com/blog/economic-update-q2-2025/
[44] https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-outlook-analysis.html
[45] https://www.cnbc.com/2025/07/30/gdp-q2-2025-.html
[46] Ibid.
[47] https://www.brookings.edu/articles/hutchins-center-fiscal-impact-measure/
[48] https://lionbusinessbrokers.com/industry-insight-report-construction-q2-2025/

erosion of purchasing power across American households.[49] Nominal disposable personal income per capita reached $65,877 in 2Q2025, representing an increase of 3.8% Y/Y change from $63,450 during 2Q2024.[50] However, real disposable personal income per capita showed a more modest gain of 1.4% Y/Y, reaching $52,192 in 2Q2025 (versus $51,473 in 2Q2024).[51] The 240 basis point difference between nominal and real income growth emphasizes the mounting pressure that the Trump administration's tariff policies are placing on household purchasing power.

Looking ahead to 3Q2025 and beyond, economic forecasters have expressed cautious optimism while acknowledging significant headwinds. Real-time nowcasting models from Federal Reserve Banks suggest GDP growth in the range of 2.1% to 3.3% (ann.) for 3Q2025, though professional forecaster surveys indicate more tempered expectations around 1.3%, reflecting concerns over policy uncertainty and a gradually softening labor market[52]. The 3Q2025 advance estimate is scheduled for release on October 30, 2025, and will provide critical insight into the economy's growth trajectory.

Current economic circumstances and metrics provide substantial justification for projecting persistent inflationary pressures extending well into 2026, despite the Federal Reserve's more optimistic projections. The Survey of Professional Forecasters revised their 3Q2025 headline CPI forecast downward to between 3.0% and 3.5% in the previous survey, yet their 4Q2025 projections remained elevated at 3.0%, and their 2026 annual average inflation is expected to reach 2.5%.[53] This persistence reflects the structural nature of tariff-induced price pressures, with Yale Budget Lab research documenting that tariff pass-through to consumer prices reached 73-80% by June 2025, compared to initial expectations of more gradual transmission.[54]

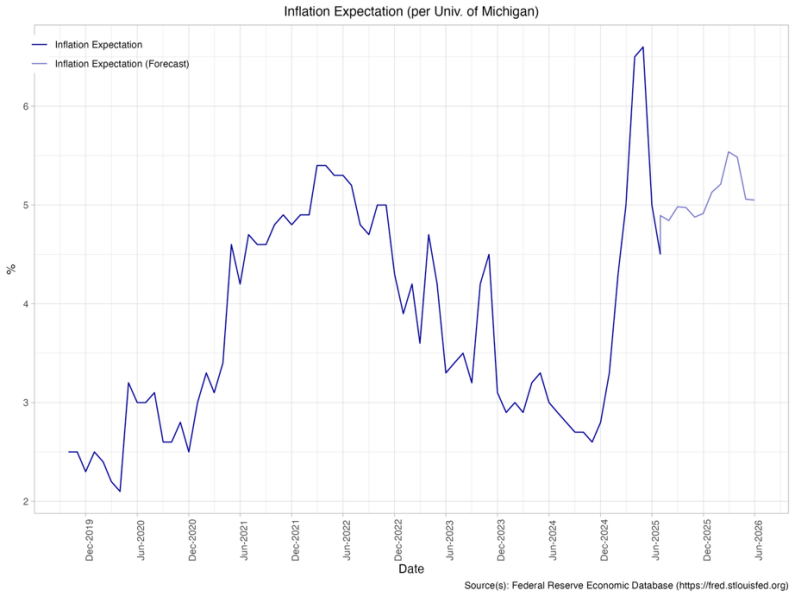
The Federal Reserve's September 2025 Summary of Economic Projections reflected growing acknowledgment of inflation persistence, with the median FOMC participant projecting core PCE inflation at 3.1% for 2025, unchanged from June projections, while 2026 core PCE inflation was revised upward from 2.4% to 2.6%.[55] The dot plot indicated that 16 of 19 FOMC participants assessed uncertainty around inflation projections as "higher" than typical, with no participants viewing uncertainty as "lower".[56] Fed Governor Christopher Waller characterized tariff effects as creating "elevated risk" of persistent inflation, noting that companies directly subject to tariffs had increased their year-ahead price expectations by 0.7 percentage points (pp), while firms experiencing spillover costs planned additional price increases of 0.3 pp.[57] This broad-based expectation adjustment suggests that inflation could remain above 2% through 2027[58], with the Federal Reserve's own projections showing core PCE inflation at 2.1% in 2027 and not reaching the 2% target until 2028.[59]

Forward-looking indicators and economic modeling provide compelling evidence that inflation will remain structurally elevated through the forecast horizon, justifying projections of sustained price pressures extending into 2026-2027. The Conference Board estimated that the bulk of tariff impacts

[49] See https://fred.stlouisfed.org/series/A229RC0Q052SBEA and https://fred.stlouisfed.org/series/A229RX0
[50] https://fred.stlouisfed.org/series/A229RC0Q052SBEA
[51] https://fred.stlouisfed.org/series/A229RX0
[52] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q3-2025
[53] See https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q3-2025 and https://www.federalreserve.gov/econres/notes/feds-notes/detecting-tariff-effects-on-consumer-prices-in-real-time-20250509.html
[54] https://budgetlab.yale.edu/research/short-run-effects-2025-tariffs-so-far
[55] See https://economics.td.com/us-fomc-statement and https://fred.stlouisfed.org/series/PCECTPIRM
[56] https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20250917.pdf
[57] https://www.bis.org/review/r250604c.htm
[58] https://thestatement.bokf.com/articles/2025/by-the-numbers_091925
[59] https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20250917.htm

would affect 4Q2025, 1Q2026, and 3Q2026, creating recurring waves of inflationary pressure as different sectors absorbed and passed through import cost increases.[60] See Figure 10 for the University of Michigan Consumer Expectations for Inflation survey results, illustrating the expectations of inflation to remain above 4% for the next 12 months. Economic research from the Federal Reserve Bank of San Francisco suggested that tariff effects on production costs could create persistent inflation through intermediate input channels, raising ultimate pass-through by up to 30% more than studies assuming single-point-in-time impacts.[61] Given these structural factors, along with the effective U.S. tariff rate reaching 18.6% by September 2025[62], inflation is projected to remain above 3% through 4Q2025, decline gradually to between 2.5% to 2.7% during 2026, and not reach the Federal Reserve's 2% target until either 2027 or 2028.[63]

Figure 10: University of Michigan Consumer Inflation Expectations



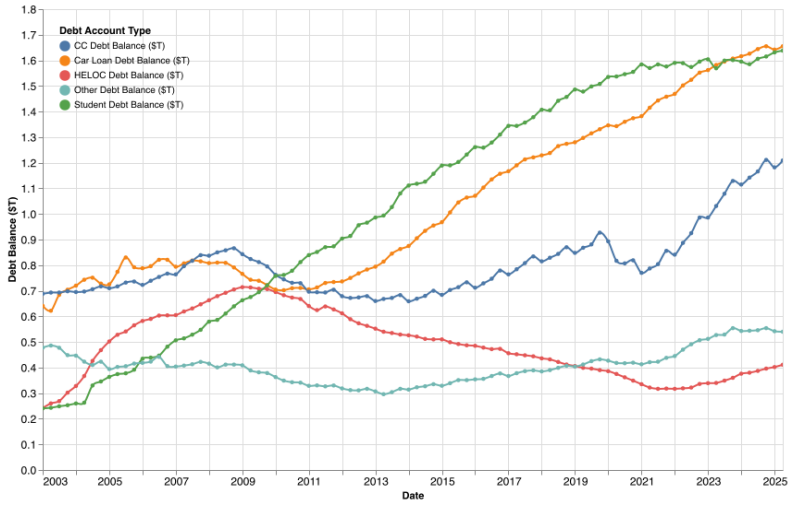
The implication of increased inflation is increased consumer debt and defaults. Mortgage debt in the US has exceeded $13T, with other forms of debt increasing to a peak of almost $18.4T per Figure 11. These levels reflect a 3.33% Y/Y increase (and a 1.02% Q/Q increase) that reflects the mounting financial pressures facing consumers amid the tariff-induced inflationary environment. Mortgage debt comprises $12.9T of debt (i.e., 70.3% of total obligations), with auto and student loans both at approximately $1.6T, and credit card debt over $1.2T[64].

The growth of credit card balances during 2Q2025 is particularly concerning, rising by $27B, a 5.87% Y/Y increase that substantially exceeded the growth rates of other debt categories. The acceleration in revolving debt coincided with the previously discussed pass-through of tariff costs to consumer prices,

[60] https://www.conference-board.org/research/us-forecast
[61] https://www.frbsf.org/research-and-insights/publications/economic-letter/2025/05/effects-of-tariffs-on-inflation-and-production-costs/
[62] https://budgetlab.yale.edu/research/state-us-tariffs-september-4-2025
[63] https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-tariffs-analysis.html
[64] https://www.newyorkfed.org/microeconomics/hhdc

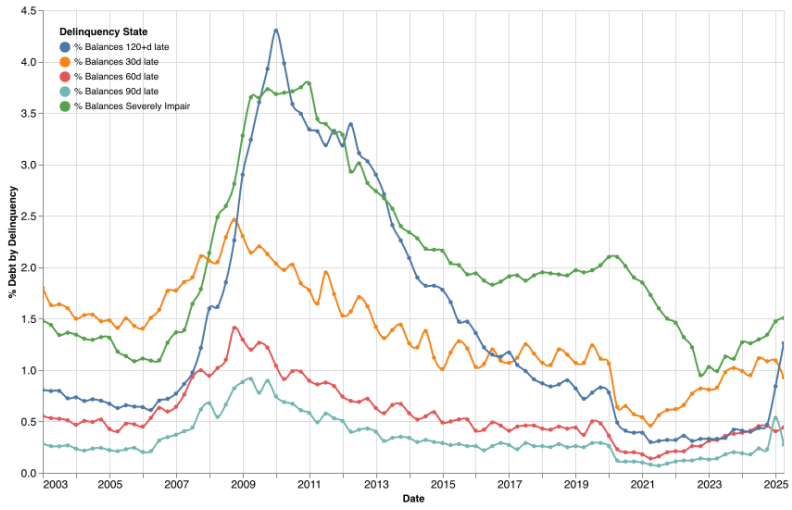
with 47% of Americans (56% of "Generation Z" consumers) surveyed attributing their rising credit card debt to tariff policies.[65]

Figure 11: US Non-Mortgage Consumer Debt Levels



Source: NY Federal Reserve Bank (https://www.newyorkfed.org)

Figure 12: Rates for Delinquency Periods



Source: NY Federal Reserve Bank (https://www.newyorkfed.org)

We mentioned consumer debt delinquency earlier as a concerning trend that could be contributing to a potential recession. Figure 12 reflects the delinquency of all consumer debt by delinquency period; here, we see a significant increase in the percentage of debt that is 120+ days late in 1Q2025. Despite seeing a slight decline in the percentage of balances that are 90-119 days late, the rapid increase in the previously mentioned category (along with the slight increase in the percentage of balances that are "severely impaired") is disturbing, and – based on the trajectory shown in Figure 12 – likely an indicator of a coming trend. Delinquency rates for credit cards remained elevated at 6.93%, with researchers

[65] See https://www.newsweek.com/americans-say-trump-driving-credit-card-debt-2128290 ; https://www.investopedia.com/gen-z-debt-11809241 ; and https://www.cardrates.com/studies/tariffs-credit-debt-survey/

from the New York Fed characterizing this as evidence that consumers "may have overextended themselves" due to rising costs driven by inflation and tariff-related price increases.[66] The Federal Reserve Bank of Boston explained that high-income consumers had supported aggregate spending growth through reduced credit card usage compared to pre-pandemic levels, while low-income consumers held higher credit card debt burdens, suggesting that the household debt accumulation was increasingly concentrated among more financially vulnerable segments of the population.[67]

During 2025, ***we continue to expect for real GDP to be between 1.5% and 2.0% per annum***.

Other Commentary

- "While the unemployment rate is projected to remain robust, averaging 4.5% in Q4 2025 and gradually declining to 4.3% by 2027, inflation remains a key concern. The median FOMC participant projects core Personal Consumption Expenditures (PCE) inflation to be 3.1% over 2025, with a gradual return to the Fed's 2% target by 2028. Total PCE inflation is seen at 3.0% for 2025. These figures, particularly the upward revisions for 2026, suggest that inflationary pressures are expected to persist for longer than initially hoped. Initial market reactions were mixed; stocks generally rose, and bond yields slipped immediately after the announcement, though some gains were later pared, indicating underlying uncertainty about the Fed's challenging path forward." (https://markets.financialcontent.com/wral/article/marketminute-2025-9-23-federal-reserve-signals-sustained-growth-amidst-rate-cuts-a-cautiously-optimistic-september-sep; September 23, 2025)
- "Early effects of higher tariffs are becoming increasingly visible in spending choices, labor markets and consumer prices, the think tank said. Labor markets are cooling in many countries, leading to higher jobless rates and less vacancies. Inflationary pressures are resuming a rising trend as goods inflation is fueled by higher food prices and services inflation still remaining persistent." (https://www.nasdaq.com/articles/oecd-warns-full-effects-high-us-tariffs-yet-be-felt; September 23, 2025)
- "Tariffs have been contributing to inflation, but the effects are uncertain in terms of measurement, magnitude and persistence. St. Louis Fed economists estimate a direct passthrough of realized tariffs to core PCE of 0.2% from January to July, and of 0.3% to core CPI from January to August. Estimates of direct plus indirect effects are about 0.1% higher. So far, the effects on inflation have been more muted than expected, suggesting that factors other than tariffs are contributing to above-target inflation." (https://www.stlouisfed.org/from-the-president/remarks/2025/brookings-institution-economic-outlook-balance-risks-monetary-policy; September 21, 2025)

Employment

Analysis

The U.S. labor market has deteriorated during 2Q2025 & 3Q2025, with the unemployment rate rising to 4.3% in August 2025, the highest level since October 2021.[68] This deterioration represented a significant

[66] https://www.cnbc.com/2025/08/05/ny-fed-credit-card-debt-second-quarter-2025.html
[67] https://www.bostonfed.org/publications/current-policy-perspectives/2025/why-has-consumer-spending-remained-resilient.aspx
[68] https://www.bls.gov/news.release/empsit.nr0.htm

shift from conditions since the pandemic recovery, with the economy adding only 87,000 jobs in June; 79,000 jobs in July; and 22,000 jobs in August.[69] The Bureau of Labor Statistics data revealed that total nonfarm employment growth averaged just 29,000 jobs per month over the three-month period ending in August, compared to 177,000 during the same period in 2024.[70] Excluding the pandemic period, the first eight months of 2025 represented the fewest jobs added since 2010, when the labor force was 17M people smaller and the economy was recovering from the Great Recession.[71] (See Figure 13 & Figure 14.)

Figure 13: US Nationwide monthly unemployment rate

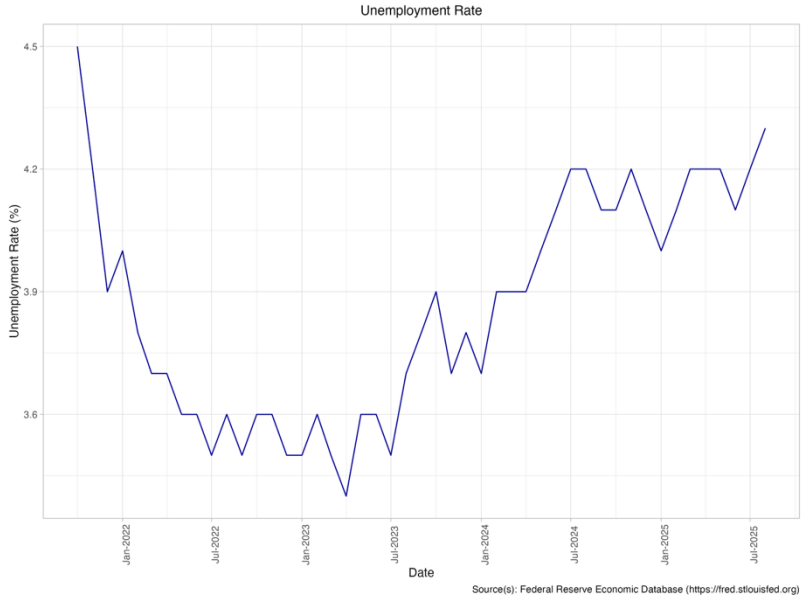
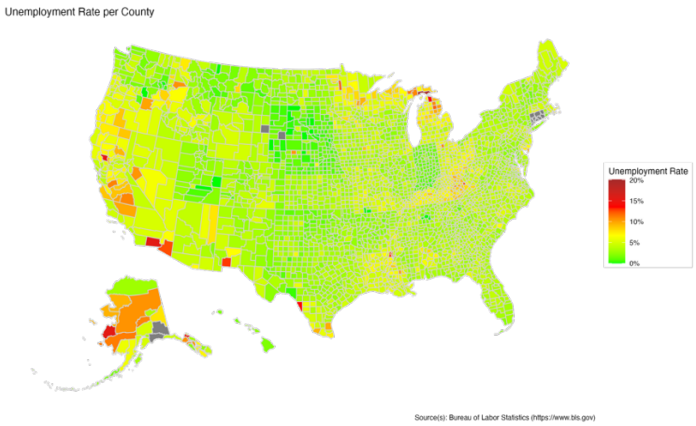


Figure 14: Nationwide unemployment per county

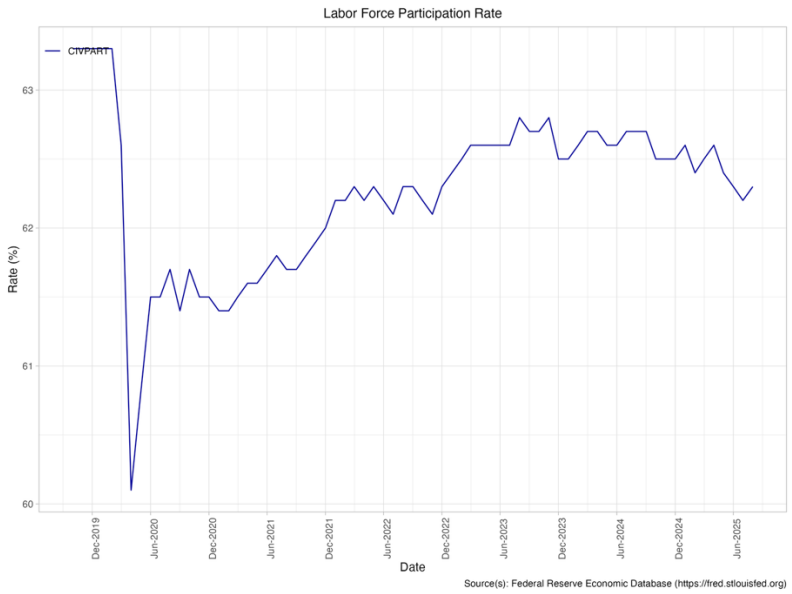


[69] https://www.reuters.com/business/us-unemployment-rate-near-4-year-high-labor-market-hits-stall-speed-2025-09-05/
[70] https://www.bls.gov/news.release/empsit.nr0.htm
[71] https://www.hiringlab.org/2025/09/05/august-2025-jobs-day-statement-not-just-slowing-stalling/

The composition of job losses reflected the broad-based nature of the economic slowdown. Healthcare and social assistance remained the primary sources of job growth, adding 78,300 and 16,000 positions respectively during 2Q2025.[72] As of the BLS' August report, federal government employment was down by 97,000 jobs since YE2024, and manufacturing employment contracted by 8,000 jobs, reversing gains from 1Q2025.[73] Retail trade experienced a 12.5% decline in job openings directly attributed to tariff-related price pressures and consumer spending constraints.[74] The professional and business services sector, which had been a consistent source of employment growth in previous years, showed particular weakness with significant declines in temporary help services and administrative support functions.[75]

Looking deeper, the U-6 unemployment rate, which includes discouraged workers and those employed part-time for economic reasons, rose to 8.1% in August from 7.9% in July (7.8% average during 2Q2025).[76] The labor force participation rate dropped slightly during 2Q2025 (62.4% average during 2Q2025), but has remained essentially unchanged (at ± 62.3%) during 3Q2025 (per Figure 15).[77]

Figure 15: US National Average Labor Force Participation Rate (monthly; Oct 2019 - Aug 2025)



The Chicago Fed Labor Market Indicators projected the unemployment rate would reach 4.32% in September 2025.[78] Economic forecasters projected that unemployment would continue rising through the remainder of 2025, with most estimates suggesting the rate could reach 4.4% to 4.8% percent by year-end as the combined effects of tariff-induced economic uncertainty, federal workforce reductions, and tightening monetary policy continued to weigh on business confidence and hiring decisions.[79]

[72] https://www.bls.gov/news.release/pdf/empsit.pdf
[73] Ibid.
[74] Ibid.
[75] https://www.hiringlab.org/2025/09/05/august-2025-jobs-day-statement-not-just-slowing-stalling/
[76] https://fred.stlouisfed.org/series/U6RATE
[77] https://fred.stlouisfed.org/series/CIVPART
[78] https://www.chicagofed.org/research/data/chicago-fed-labor-market-indicators/latest-release
[79] See, e.g., https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q3-2025; https://www.ibrc.indiana.edu/ibr/2024/outlook/national.html; and https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-outlook-analysis.html

Other Commentary

- "Americans aren't quitting their jobs — and that trend is changing the way the labor market functions. … Consulting firm Korn Ferry calls the trend 'job hugging,' and said fear of the unknown is driving it. Workers are choosing stability over risk, even if it comes at a personal or professional cost." (https://www.cnbc.com/2025/09/24/why-workers-feel-stuck.html; September 24, 2025)
- "Throughout 2025, job gains have been heavily skewed toward healthcare, while many goods-producing industries have stagnated amid economic uncertainty. Although unemployment remains historically low, it has reached a four-year high as the labor market appears to be stalling." (https://www.aerotek.com/en/insights/september-2025-market-trends-report; September 8, 2025)
- "…[O]ver 25% of unemployed workers have been jobless for over 6 months, the highest level since June 2016. The numbers appear to reflect the impact of the administration's tariffs, which have driven up prices, as well as mass layoffs from the federal government, the reverberating impact of cancelled federal grants and contracts, and the administration's immigration crackdown." (https://onlabor.org/september-7-2025/; September 7, 2025)

Federal Funds (Primary Credit) Rate

Analysis

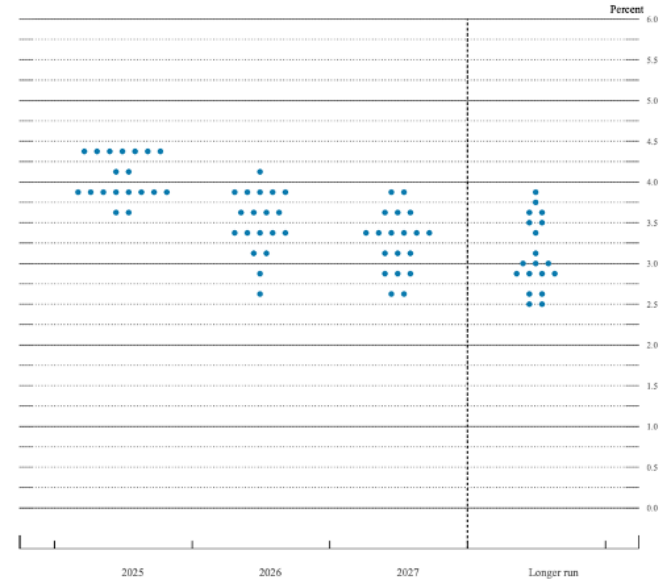
When a depository institution has a shortfall and need for liquidity, it may borrow funds on a short-term basis from the Federal Reserve. The "discount rate" is the interest rate charged to commercial banks and other depository institutions on loans they receive from their regional Federal Reserve Bank's "discount window". The Federal Reserve Banks offer three discount window programs to depository institutions: Primary Credit, Secondary Credit, and Seasonal Credit, each with its own interest rate. Under the Primary Credit program, loans are extended for a very short term (usually overnight) to depository institutions in generally sound financial condition. (Secondary Credit & Seasonal Credit may be available to institutions that do not meet the "sound financial condition" criteria.) The discount rate charged for primary credit (the primary credit rate) is set above the usual level of short-term market interest rates.

Inter-bank loan rates will also track with the primary credit rate for overnight lending. The rate for inter-bank loans is generally driven by the target federal funds rate; the target federal funds rate is the target interest rate set by the Federal Open Market Committee (FOMC), and is intended as a guide for the rate at which commercial banks borrow and lend their excess reserves to each other on an overnight basis. The FOMC sets the target federal funds rate periodically based on key economic indicators that may show signs of inflation, recession, or other issues that can affect sustainable economic growth. The actual interest rate that a lending bank will charge is determined through negotiations between the two banks. The weighted average of interest rates across all transactions of this type is known as the effective federal funds rate.

Despite political pressure, the Federal Reserve has maintained a cautious stance throughout 2025, keeping the target federal funds rate in the range of 4.25% to 4.5% from December 2024 until

September 2025[80], at which point rates were lowered by 25bp. (See Figure 5, Figure 16, and Figure 17.) The Federal Reserve's response to these tariff-induced price pressures reflected a balancing act between fueling inflation and fighting unemployment. Fed Chair Jerome Powell noted the September 2025 rate cut as a "risk management cut," acknowledging that, while tariff pass-through to consumers had been "pretty small" thus far, companies continued to signal intentions to implement additional price increases[81]. Research from the Federal Reserve Bank of Atlanta documented that companies directly subject to tariffs had increased their year-ahead price growth expectations by 0.7 pp, while firms experiencing spillover costs planned an additional 0.3 pp in price growth, creating what economists described as an "elevated risk" of broad-based inflationary pressure[82]. This spillover effect was particularly concerning as it suggested the potential for tariff-related price increases to become self-reinforcing through the broader economy, similar to the supply-chain disruptions that had triggered widespread inflation during the COVID pandemic.[83]

Figure 16: FOMC "Dot Plot" from June 2025 Board of Governors' Meeting

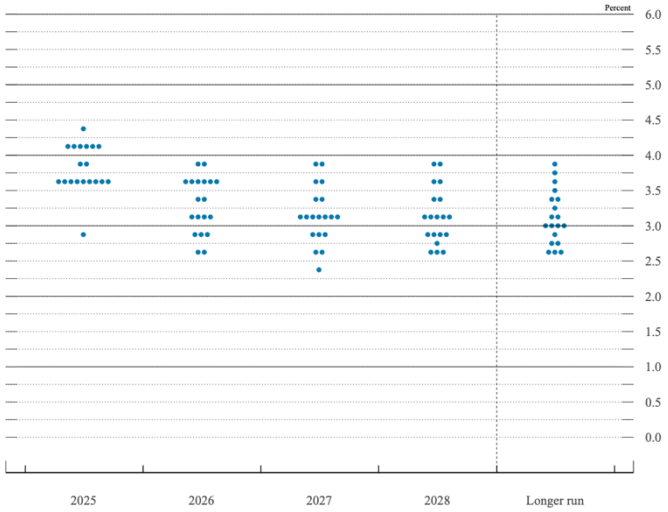


Source: https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20250618.pdf

Current market pricing and comments from the FOMC suggest that the Fed intends to implement an additional 50bp of rate cuts by year-end 2025, which would lower the target range to between 3.5% and 3.75%.[84] However, the timing and magnitude of any rate adjustments will likely depend heavily on incoming inflation data and the continuing evolution of the administration's economic/tariff policies. We believe that ***rates will end 2025 around 3.75%, and YE2026 will see the Fed' Funds rate around 3.0%.***

[80] See https://www.cnbc.com/2025/06/18/fed-rate-decision-june-2025-.html
[81] https://www.federalreserve.gov/newsevents/speech/powell20250923a.htm
[82] https://www.utilitydive.com/news/tariffs-pose-elevated-risk-unleashing-high-inflation-atlanta-fed-Trump-labor-unemployment/758853/
[83] https://www.usbank.com/investing/financial-perspectives/market-news/federal-reserve-tapering-asset-purchases.html
[84] https://finance.yahoo.com/news/fed-signals-2-more-cuts-in-2025-raises-gdp-forecast-for-the-year-183031677.html

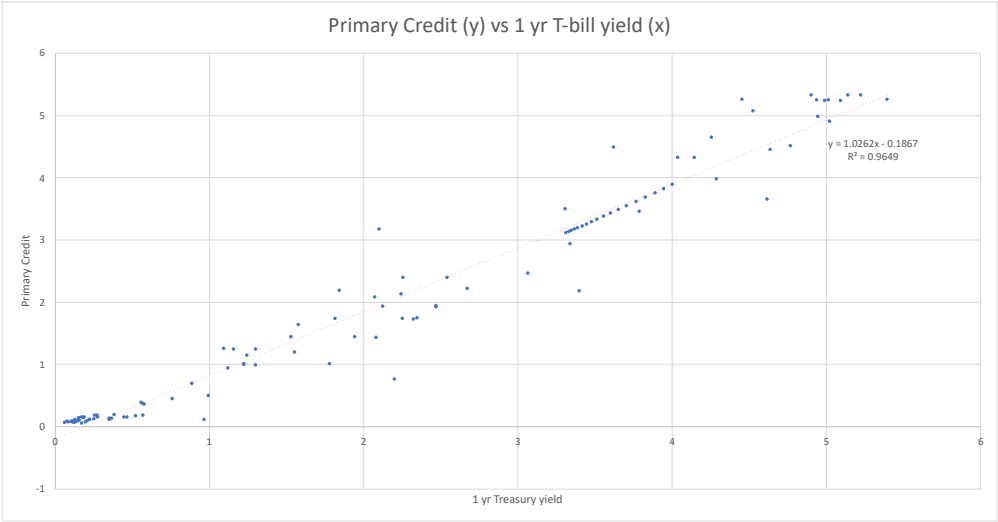
Figure 17: FOMC "Dot Plot" from September 2025 Board of Governors' Meeting



Source: https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20250917.pdf

In Figure 18, we see the historical and projected relationship between the target federal funds rate and the 1-year T-bill yield.

Figure 18: Primary Credit, as a function of 1-year Treasury yield



Source: Authors' calculation

Other Commentary

- "In remarks before Powell spoke on [September 23, 2025], Fed Vice Chair for Supervision Michelle Bowman said the Fed could downplay concerns about persistent inflation and needed to make a commitment to cut rates in support of a job market she worries may be about to rupture. … 'It's a lot easier to support the labor market by lowering the federal funds rate than it is to fix it after it's broken,' Bowman said. While the jobless rate at 4.3% is around estimates of full employment, Bowman said the slowdown in hiring is such that 'it is time for the Committee to act decisively and proactively to address decreasing labor market dynamism and emerging

signs of fragility' with steady rate cuts." (https://www.reuters.com/world/us/fed-chair-powell-downside-risks-employment-shifted-balance-risks-prompting-last-2025-09-23/; September 23, 2025)

- "'While there are signs of a weakening labor market, I worry that conditions could deteriorate further and quite rapidly, and I think it is important that the FOMC not wait until such a deterioration is under way and risk falling behind the curve in setting appropriate monetary policy,' [Federal Reserve governor Christopher Waller] said." (https://www.morningstar.com/news/dow-jones/2025082811043/fed-governor-waller-backs-quarter-point-september-rate-cut; August 28, 2025)

Treasury Yields (1, 3, & 6-month; 1, 3, 5, 7, 10, 20, & 30-year series)

Analysis

The U.S. government raises money to operate the federal government through the sale of U.S. Treasury Securities; these are debt instruments that are offered at fixed interest rates. Rates are expected to generally rise as maturity durations increase. The interest rates vary from day-to-day, and, when collected across all maturities, may be documented as a line chart (rate versus maturity) called a "yield curve". There are several different types of "Treasuries" (a generic name for "Treasury bonds", "Treasury notes", and "Treasury bills"), and most may be re-sold on the open secondary market.

Initial interest rates offered for Treasury Securities ("yields") are set when the security is initially sold, and may be affected by several factors, including (for example)

- The published target federal funds rate;
- Investor sentiment (i.e., supply and demand);
- Currently outstanding debt levels; and
- Anticipated future events (e.g., investors' beliefs regarding economic growth, inflation, and other geopolitical trends).

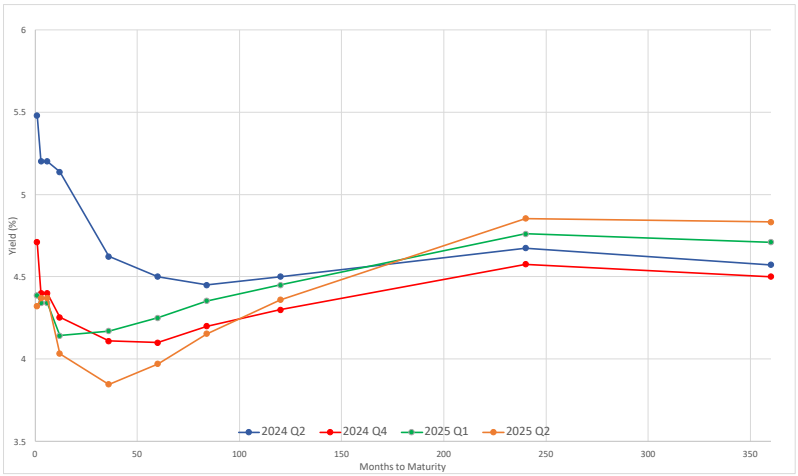
The Treasury yield curve underwent a significant transformation during 2Q2025 and 3Q2025, finally improving its condition in early 2025 as Federal Reserve rate cuts drove short-term yields lower while longer-term yields remained elevated due to fiscal concerns and term premium adjustments.[85] (See Figure 19.) The 2-year/10-year spread steepened from near-zero at the beginning of Q2 to approximately 50-60 basis points by the end of Q3, representing the most significant curve normalization since the pre-pandemic period.[86]

During 2Q2025, Treasury yields experienced notable volatility driven by policy flux and supply dynamics, though ultimately remained within established trading ranges. The 10-year yield fell as low as 3.99% before returning to its more typical 4.2%-4.6% range. Longer-duration bonds underperformed significantly, with 20-year and 30-year yields climbing approximately 20 basis points during Q2 as investors demanded higher term premiums to compensate for increased fiscal risks and higher Treasury debt issuance expectations.[87] This divergence reflected growing market concerns about the

[85] https://am.jpmorgan.com/us/en/asset-management/adv/insights/market-insights/market-updates/on-the-minds-of-investors/was-the-yield-curve-inversion-wrong-in-predicting-a-us-recession/
[86] https://www.wisdomtree.com/investments/blog/2025/01/15/2025-the-year-of-un-inverted-yield-curves
[87] https://www.fr.vanguard/content/dam/intl/europe/documents/en/active-fixed-income-perspectives-q2-2025-eu-en-pro.pdf

sustainability of government spending levels and the long-term inflationary implications of expansive fiscal policy.[88]

Figure 19: Recent Yield Curves from Selected Quarters



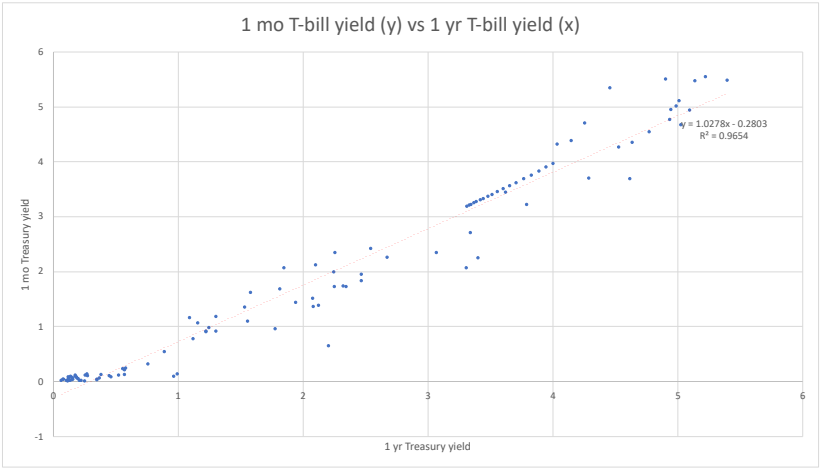
The 25 bp rate cut by the Federal Reserve on September 17 drove further yield curve steepening. Short-term yields changed as a result of the Fed's easing signals, and created the steepest yield curve of the current cycle. The steepening was particularly pronounced at the long end, where concerns about fiscal sustainability and potential political pressures on Federal Reserve independence contributed to elevated term premiums.[89,90]

Market strategists anticipate continued yield curve steepening through the remainder of 2025 and into 2026, with forecasts suggesting the 10-year yield will trade in a 4.10% to 4.25% range while 2-year yields decline toward 3.40% to 3.63%.[91] The consensus expectation for additional Federal Reserve rate cuts totaling 50-75 basis points before 2026 should drive further curve steepening, with the 2-year/10-year spread potentially reaching 85 basis points by late 2025.[92,93] However, significant risks remain, particularly regarding fiscal policy sustainability and potential political interference with Federal Reserve independence. Should bond investors become concerned about the long-term debt trajectory, the 10-year yield could breach 4.50% and potentially test 5.00% levels[94], which could create substantial challenges for economic growth momentum.

Figure 20 through Figure 28 illustrate the most significant correlations between Treasury yields.

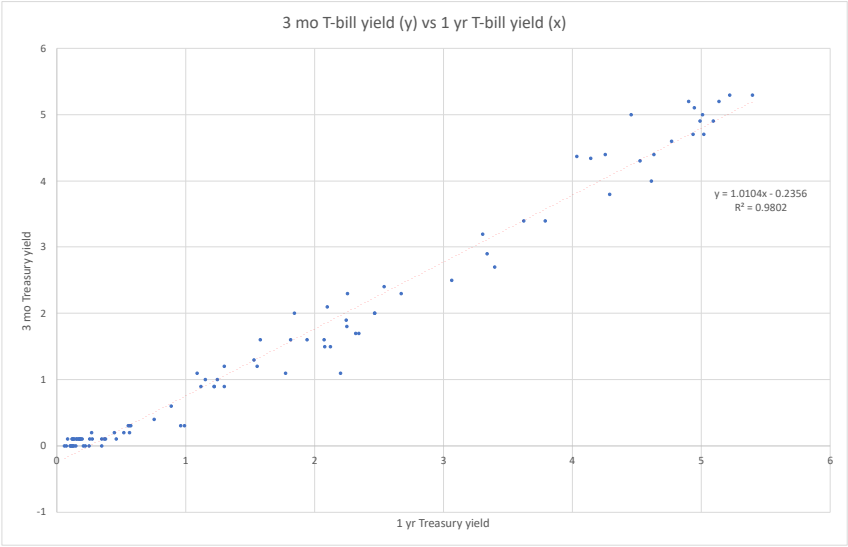
[88] https://www.reuters.com/business/us-treasury-yield-forecasts-anchored-despite-rising-debt-load-inflation-concerns-2025-07-15/
[89] https://www.nuveen.com/en-us/insights/investment-outlook/fixed-income-weekly-commentary
[90] https://www.schwab.com/learn/story/lower-bond-yields-you-cant-get-there-from-here
[91] https://economictimes.indiatimes.com/news/international/us/us-treasury-yields-outlook-2025-two-year-rates-climb-to-3-948-as-debt-fears-grow-but-fed-pivot-may-spark-sharp-curve-steepening/articleshow/122516394.cms
[92] Ibid.
[93] Again, we believe that there will be at least one 25 bp cut before 2026, so the 2/10 spread may only reach approximately 30 bp.
[94] https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-outlook-analysis.html

Figure 20: 1-month Treasury yield rates, as a function of 1-year Treasury yield rates



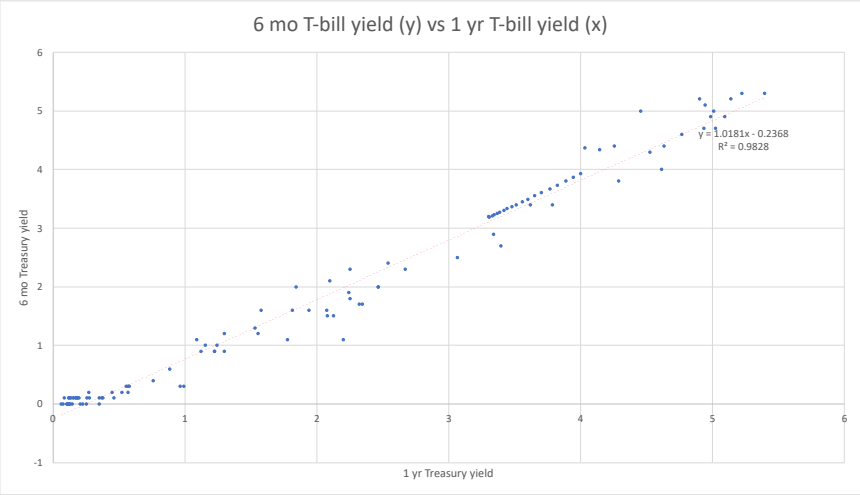
Source: Authors' calculation

Figure 21: 3-month Treasury yields, as a function of 1-year Treasury yields



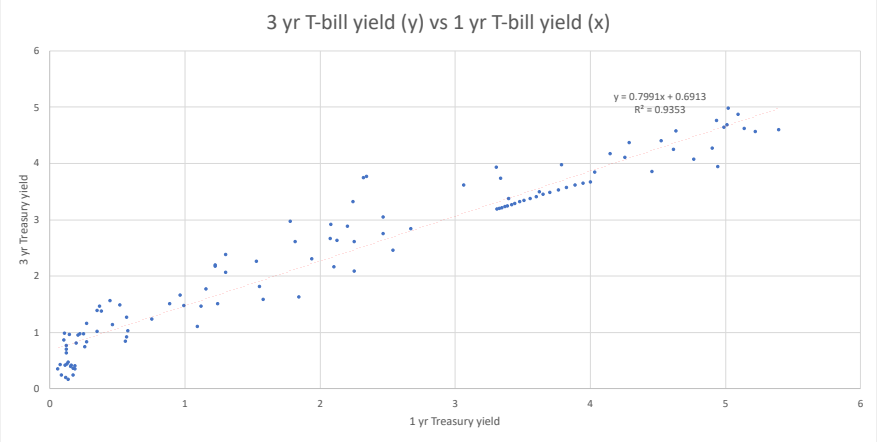
Source: Authors' calculation

Figure 22: 6-month Treasury yields, as a function of 1-year Treasury yields



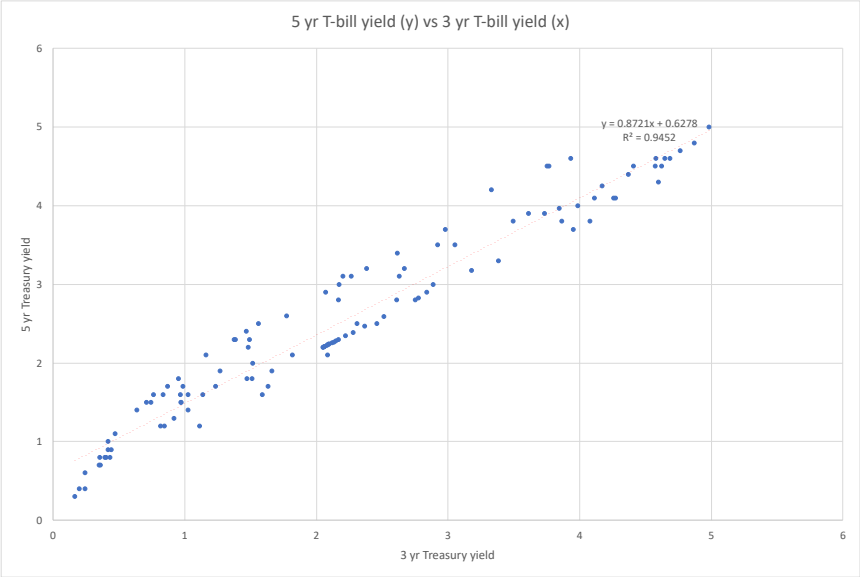
Source: Authors' calculation

Figure 23: 3-year Treasury yields, as a function of 1-year Treasury yields



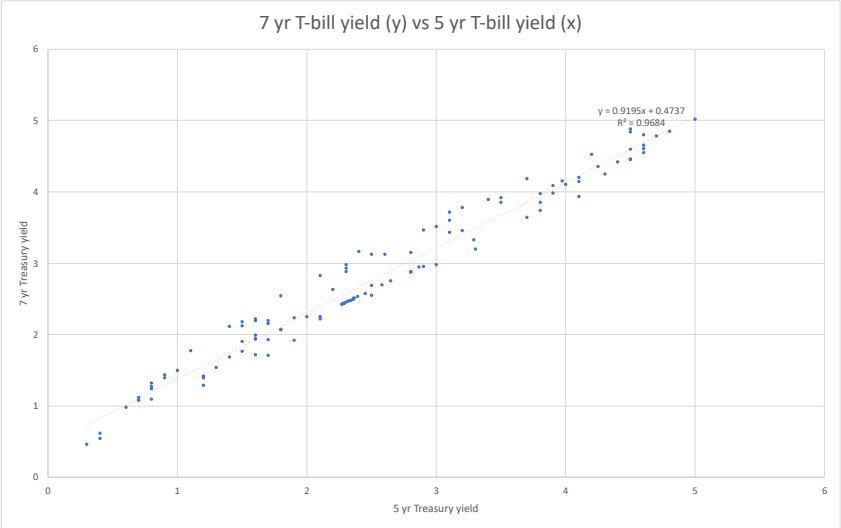
Source: Authors' calculation

Figure 24: 5-year Treasury yields, as a function of 3-year Treasury yields



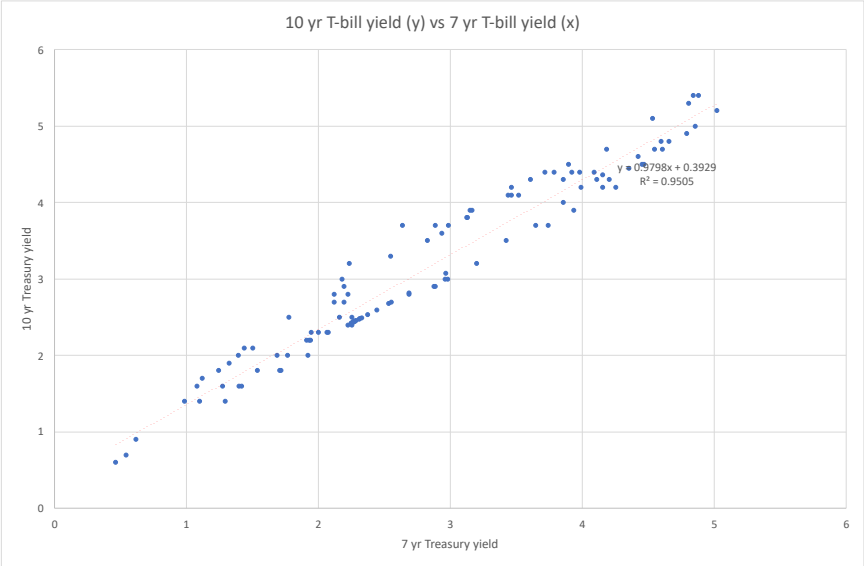
Source: Authors' calculation

Figure 25: 7-year Treasury yields, as a function of 5-year Treasury yields



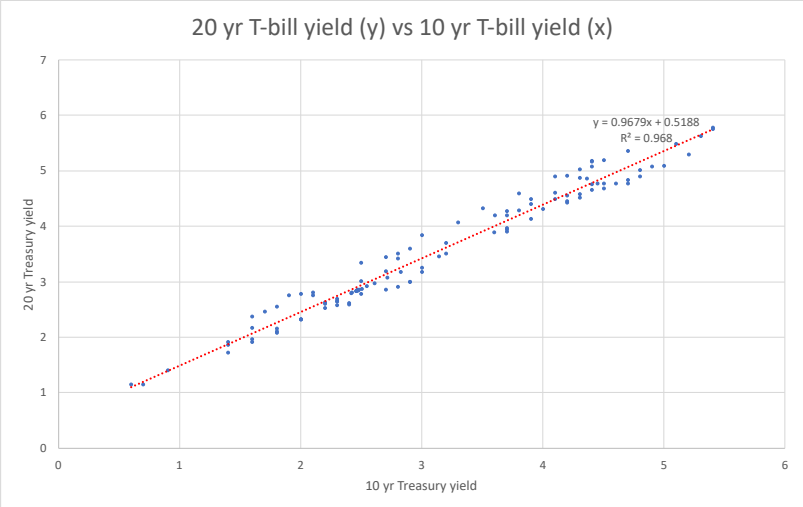
Source: Authors' calculation

Figure 26: 10-year Treasury yields, as a function of 7-year Treasury yields



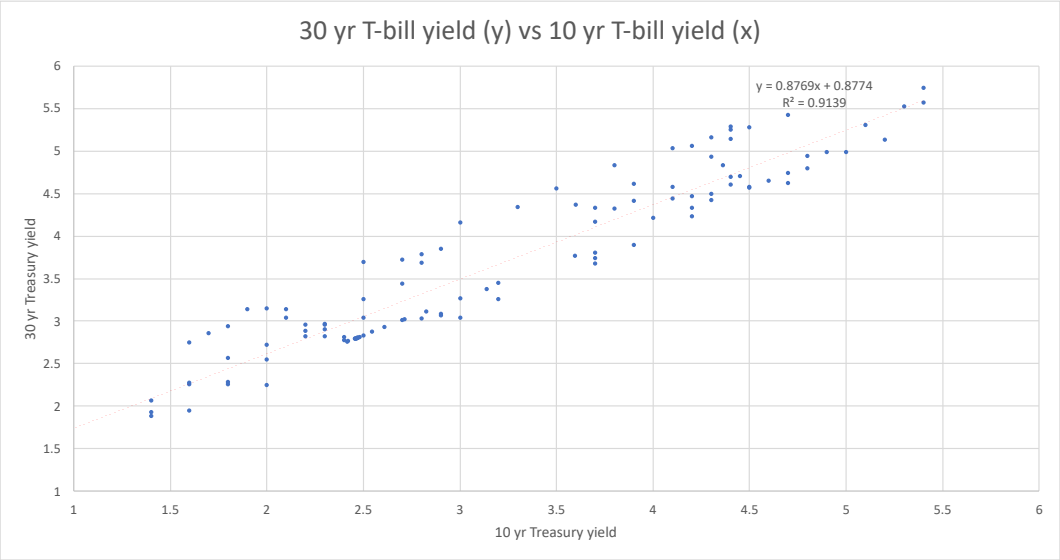
Source: Authors' calculation

Figure 27: 20-year Treasury yields, as a function of 10-year Treasury yields



Source: Authors' calculation

Figure 28: 30-year Treasury yields, as a function of 10-year Treasury yields



Source: Authors' calculation

Other Commentary

- "'Many people are in wait-and-see mode,' said Dominique Toublan, head of U.S. credit strategy at Barclays. 'You still have unknowns, you still have risks.' … Markets are pricing in a 92% chance of a 25 bp cut at the Fed's October meeting, and 8% odds of a pause. U.S. rate futures have also priced in 44 bps worth of cuts through the end of the year, according to LSEG data." (https://economictimes.indiatimes.com/markets/digital-real-estate/realty-news/us-treasury-yields-slide-as-market-digests-powells-cautious-remarks/articleshow/124081315.cms; September 24, 2025)
- "The bond market's yield curve will become fully upward sloping sometime next year. Bond investors' concern that an economic slowdown looms is shown by the fact that current one- to seven-year Treasury notes have lower yields than short-term Treasury bills that mature in a few months. But 20- and 30-year bond yields have picked up by more than the 10-year yield in recent months, indicating that both long-term inflation and government deficits are a rising concern among bond traders. The result is a U-shaped yield curve, with higher short and long yields than medium-term ones. As the uncertainties of tariff policy gradually get resolved, fears of a recession will diminish and medium-term rates are likely to pick up. The long end of the yield curve is likely to stay elevated. We expect short rates to fall next year, so the yield curve by the end of 2026 is likely to be consistently upward sloping along its entire length, for the first time since 2021." (https://www.kiplinger.com/economic-forecasts/interest-rates; September 17, 2025)

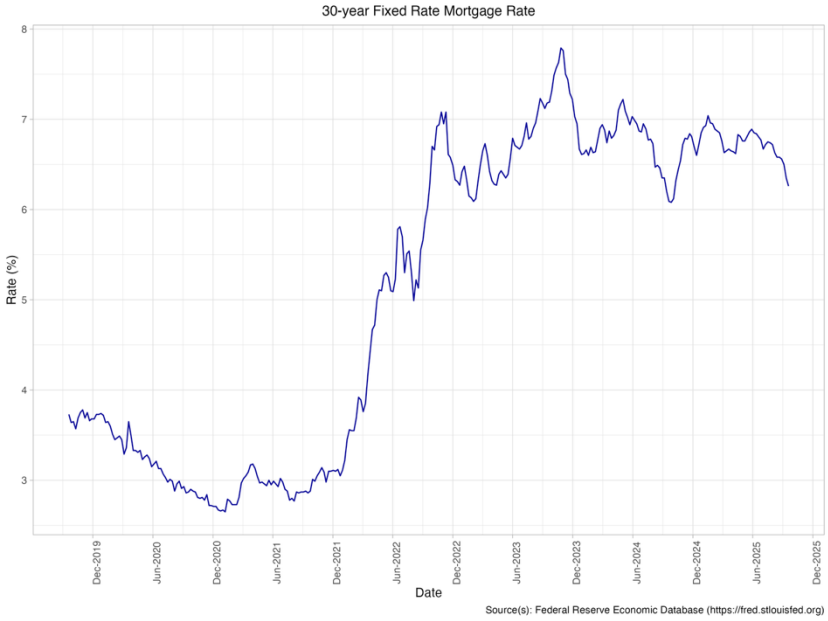
30-year Mortgage Rate & Residential Home Price Index

Analysis

Mortgage rates have traditionally been tightly correlated with mid-duration Treasury yields, given the typical sources of funding and duration of held mortgages. Day-to-day, offered mortgage rates are driven by traditional supply-and-demand forces between mortgage providers, and they are also influenced by the releases of various metrics (and the reactions of investors).

The 30-year fixed mortgage rate fluctuated between a high of approximately 7.0% in early 2Q2025 to lows near 6.13% in late September. The average rate for 2Q2025 settled near 6.8%, slightly above the 6.7% average across 2024.[95] (See Figure 29.) The September 17 Federal Reserve rate cut prompted mortgage rates to decline sharply to their lowest levels in three years, though the trajectory remained highly sensitive to broader economic uncertainty and inflation concerns. Market participants increasingly recognized that mortgage rate movements were driven more by long-term Treasury dynamics and risk premiums rather than direct Federal Reserve policy transmission.[96]

Figure 29: US Nationwide Average 30-Year Fixed Rate Mortgage Rate



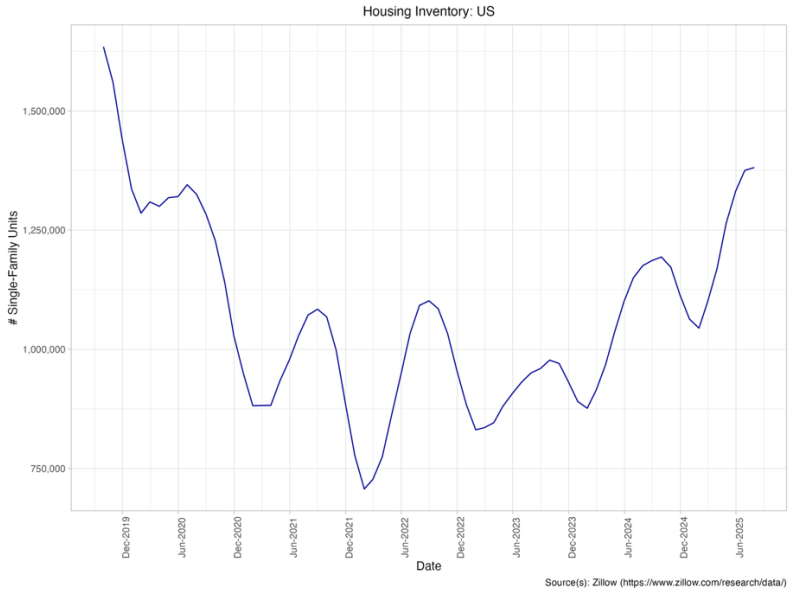
The residential housing market saw increased inventory levels and significant affordability challenges during 2025. (See Figure 30 through Figure 33.) Active housing inventory increased 28.9% Y/Y by June 2025, marking the twentieth consecutive month of inventory growth[97] and pushing total listings above 1 million for the first time since the COVID pandemic[98]. Despite this substantial increase in available homes, buyer response remained slower than historical patterns, with existing home sales projected to

[95] https://www.cbsnews.com/news/heres-what-mortgage-interest-rates-could-look-like-by-the-end-of-2025/
[96] https://wolfstreet.com/2025/09/21/longer-term-treasury-yields-mortgage-rates-jump-after-rate-cut-yield-curve-steepens-bond-market-gets-edgy/
[97] https://www.realtor.com/research/june-2025-data/
[98] https://www.realtor.com/news/trends/housing-market-mortgage-rate-forecast-2025/

decline 1.5% annually to just 4.0 million transactions—potentially marking the slowest year since 1995.[99] The disconnect between rising inventory and stagnant sales reflected the persistent impact of elevated mortgage rates and record-high home prices on buyer affordability.[100]

Home price dynamics during 2Q2025 and 3Q2025 revealed stark regional variations, with national median prices increasing modestly by 1.7% year-over-year to a record $429,400 by mid-year.[101] The Federal Housing Finance Agency reported that U.S. house prices rose 2.9% between 2Q2024 and 2Q2025, though quarter-over-quarter growth remained essentially flat.[102] Regional performance diverged significantly, with the Northeast experiencing 6.1% price growth and the Midwest gaining 3.5%, while the South saw no change and the West managed only 0.6% increases.[103] NAR Chief Economist Lawrence Yun attributed these patterns to affordability driving demand in the Midwest, limited inventory supporting Northeast prices, and price corrections in the South due to increased new construction activity.[104]

Figure 30: US Nationwide Housing Inventory



Market forecasters anticipate mortgage rates will continue their gradual decline through the remainder of 2025, with most projections centering on a 6.2% to 6.5% range by December 2025.[105] Fannie Mae projects rates to end 2025 at approximately 6.4%, with further declines to 5.9% anticipated by the end of 2026.[106,107] These projections assume continued Federal Reserve accommodation and stabilizing inflation, though significant uncertainty remains regarding policy implementation and global economic

[99] Ibid.
[100] https://www.bankrate.com/real-estate/housing-trends/
[101] https://www.nar.realtor/newsroom/three-out-of-four-metro-areas-posted-home-price-increases-in-second-quarter-of-2025
[102] https://www.fhfa.gov/reports/house-price-index/2025/2
[103] https://www.mpamag.com/us/mortgage-industry/market-updates/price-growth-slowing-across-most-us-metro-markets-nar-data-shows/546013
[104] https://www.nar.realtor/research-and-statistics/housing-statistics/metropolitan-median-area-prices-and-affordability
[105] https://www.noradarealestate.com/blog/mortgage-rates-predictions-for-next-90-days-october-to-december-2025/
[106] https://www.thetruthaboutmortgage.com/fannie-mae-is-predicting-a-sub-6-30-year-fixed-mortgage-rate-in-2026/
[107] https://www.fanniemae.com/newsroom/fannie-mae-news/q2-2025-home-price-expectations-survey

conditions.[108] Home price growth is expected to moderate further, with expert panels forecasting national appreciation of 2.9% for full-year 2025 and 2.8% for 2026—substantially below the 5.3% growth recorded in 2024.[109]

Figure 31: Y/Y % Change in US Nationwide Housing Inventory

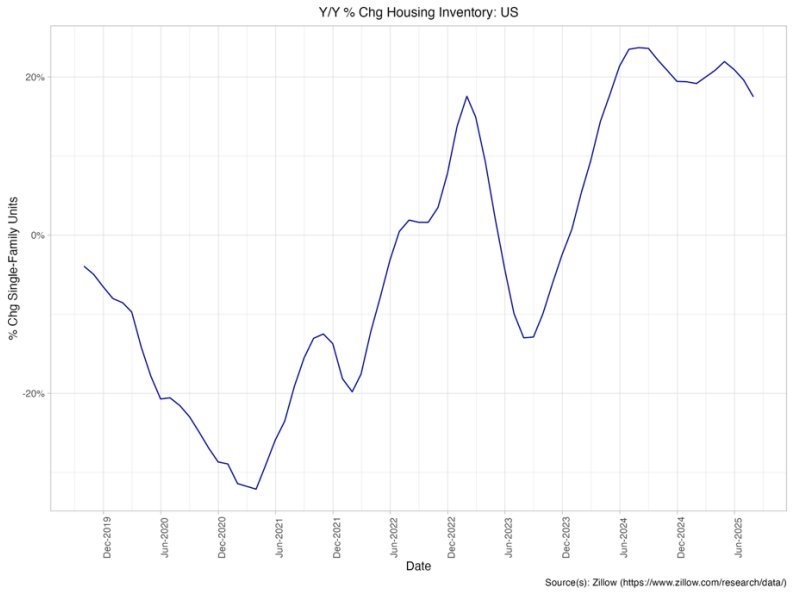
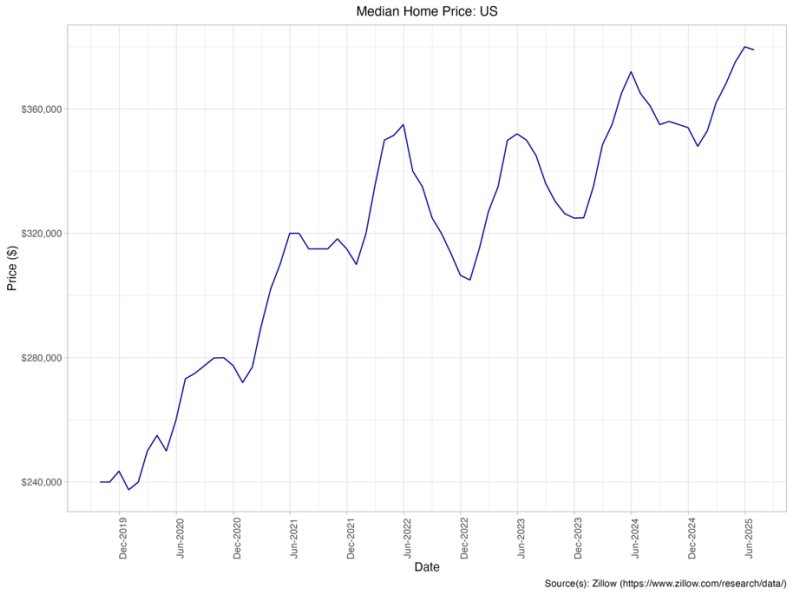


Figure 32: US Nationwide Median Home Price



The housing market outlook for the remainder of 2025 and into 2026 suggests continued gradual normalization, with modest price growth and slowly improving affordability as mortgage rates

[108] https://www.veros.com/q3-2025-quarterly-economic-housing-market-update
[109] https://www.fanniemae.com/newsroom/fannie-mae-news/q2-2025-home-price-expectations-survey

decline.[110] However, significant risks remain, including potential policy-driven inflation, geopolitical uncertainties, and regional economic variations that could disrupt the projected trajectory. The persistence of the rate lock-in effect, where existing homeowners resist selling due to their below-market mortgage rates, continues to constrain inventory turnover and market liquidity.[111] While most analysts do not anticipate a broad-based housing market correction, localized price adjustments are expected in "popular" markets where inventory has expanded substantially.[112]

Figure 33: Y/Y % Change in US Nationwide Median Home Price

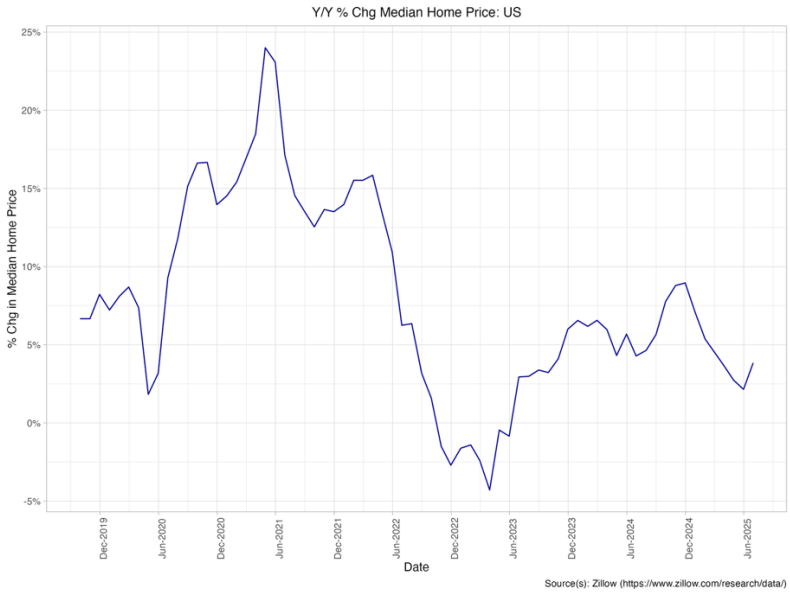
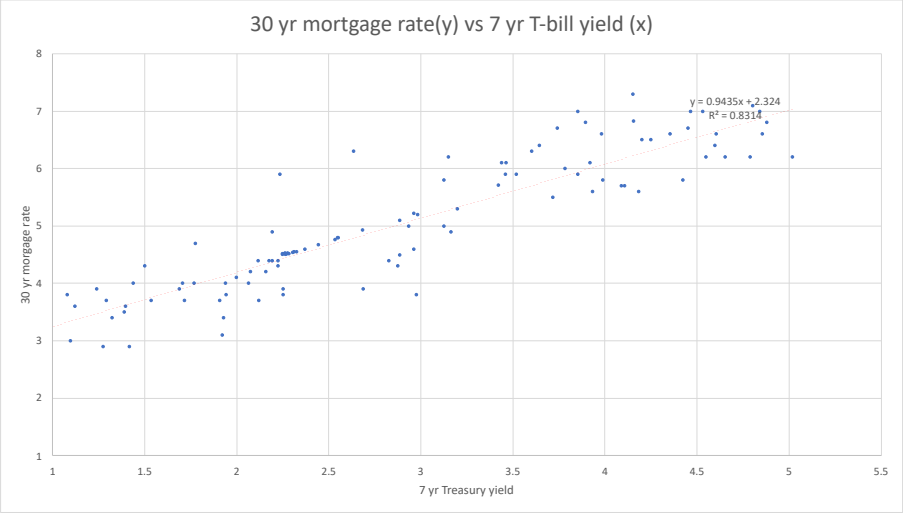


Figure 34: US 30-year (fixed rate) mortgage rate, as a function of a 7-year Treasury yield



Source: Authors' calculation

[110] https://markets.financialcontent.com/wral/article/marketminute-2025-9-22-housing-market-navigates-a-new-normal-expert-forecasts-point-to-moderated-growth-through-2025
[111] https://www.deloitte.com/us/en/insights/topics/economy/us-economic-forecast/united-states-outlook-analysis.html
[112] https://www.resiclubanalytics.com/p/zillow-changes-course-on-2026-home-prices-updated-forecast-for-400-housing-markets

See Figure 34 regarding the correlation between the US 30-year fixed-rate mortgage rates and 7-year Treasury yields.

Other Commentary

- "[Per Tony Julianelle, CEO at Atlas Real Estate:] 'I'm cautiously optimistic that mortgage rates will inch lower in September as the Fed leans toward rate cuts, but I'm not anticipating a home-run drop. Bond yields and fresh jobs data will be smarter barometer as they're more closely correlated to long-term rates. If the labor market softens in the early September report, long-term yields may soften further, but if markets sniff resilience, that relief could stall. It's a fine-balance moment for sure: small relief, but nothing to bank on.'" (https://themortgagereports.com/32667/mortgage-rates-forecast-fha-va-usda-conventional; September 18, 2025)
- "… Cotality's Chief Economist Dr. Selma Hepp (formerly CoreLogic) wrote: 'July's decline in home prices is atypical — the last two periods where we saw monthly declines in July was in 2022 and during 2006-2008 period …' In 2022, house prices fell briefly as mortgage rates surged higher, and inventory increased sharply. And the 2006-2008 period was the start of the housing bust." (https://www.calculatedriskblog.com/2025/09/part-2-current-state-of-housing-market.html; September 12, 2025)
- "Forty years ago in 1985, the average sale price of a house was $82,800 and the average household income was $23,620. A house cost 3.5 times the average household income. Today, the average price of a house is $416,900 while the average household income is $83,150. Today's house costs five times the average household income. Conclusion? Housing has become unaffordable." (https://bell.bank/business/insights/economic-outlook-september-2025; September 4, 2025)

Prime Rate

Analysis

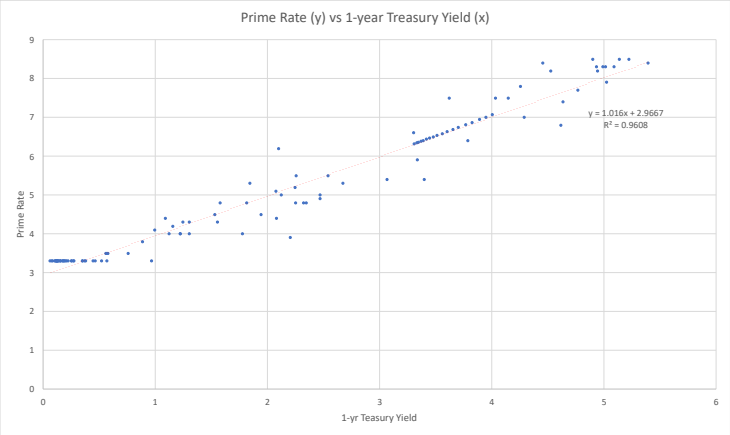
The Prime Rate is a benchmark rate that many banks use for setting consumer credit rates for creditworthy customers. It is generally based on the federal funds rate, and a spread (typically 3%) is dictated by banks as a matter of policy to specify lending rates for mortgages, small business loans, and personal loans[113]. Banks reduced the Prime Rate to 7.25%[114] effective September 18, 2025, aligning with the Fed's quarter-point rate cut and reflecting softer economic growth alongside signs of cooling inflation. This adjustment follows a period of stability at 7.50% since December 2024, during which elevated lending costs constrained some segments of consumer and business borrowing.

Looking forward, market forecasts point to further moderation in the Prime Rate through the end of 2025, the potential of a year-end level near 6.75% if Federal Reserve rate cuts materialize as expected. ***We believe that there will be at least one more 25bp cut this year, resulting in a YE2025 Prime Rate of no more than 7%.*** Nevertheless, commercial banks are likely to retain a fairly conservative posture, adjusting their lending rates gradually to reflect ongoing economic uncertainties. Consequently, while borrowers may see gradual relief from peak rates, lending conditions will likely remain tighter than historical norms for the near term.

[113] https://www.investopedia.com/terms/p/primerate.asp
[114] https://fred.stlouisfed.org/series/DPRIME

See Figure 35 for the relationship between the Prime Rate and 1-year Treasury yield.

Figure 35: Prime Rate as a function of 1-year Treasury yields



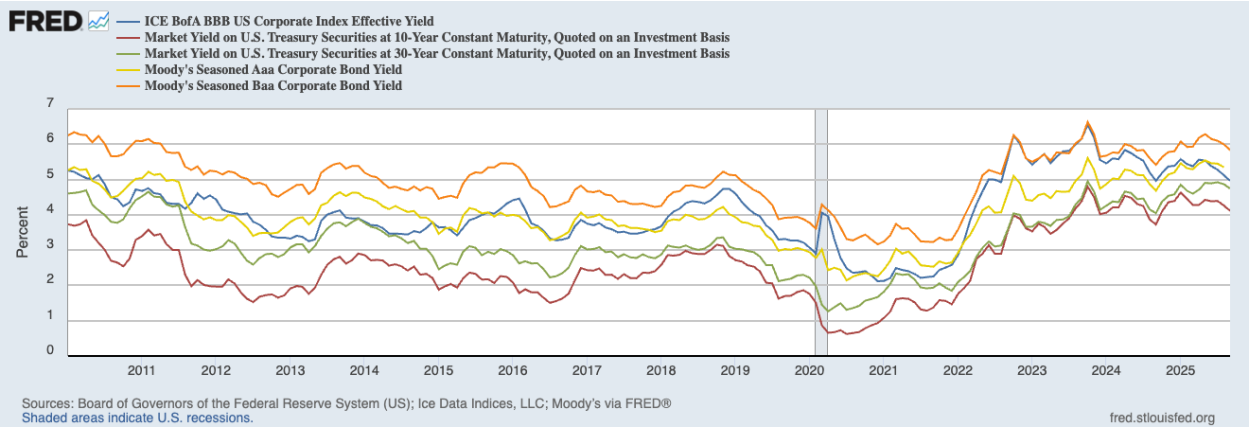
Source: Authors' calculations

Moody's AAA & BAA Rates; and the BofA BBB Corporate Yield

Analysis

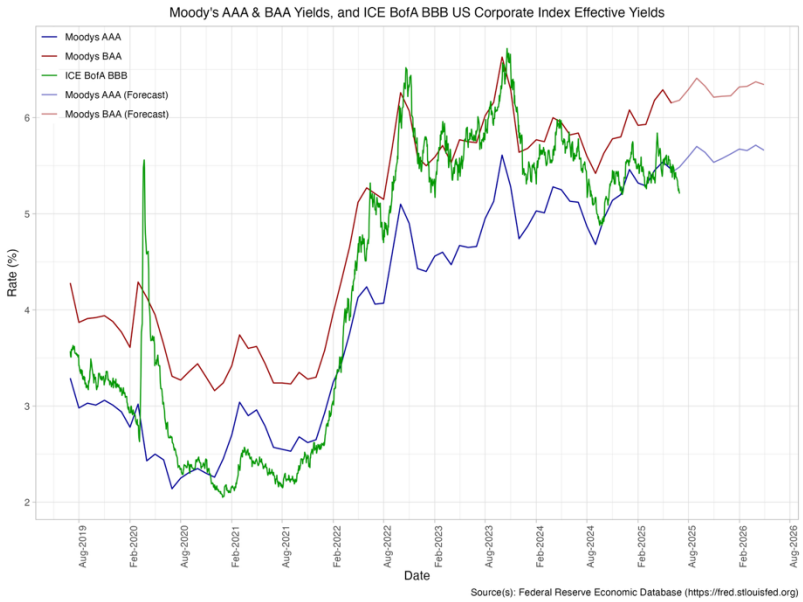
During 2Q2025 and 3Q2025, yields on corporate bonds, including Moody's AAA and BAA rates and the BofA BBB Corporate Yield, reflected changing economic policy conditions. Moody's AAA corporate bond yield trended downward to 5.22% (as of this writing).[115] Moody's BAA corporate bond yield hovered around 6.02% in late August, indicating a persistent risk premium for lower investment-grade debt, even as yields peaked above 6.2% earlier in the quarter.[116] The BofA BBB corporate index yield was 4.97% as of this writing, only marginally below summer levels, declining over the past twelve months.[117] (See Figure 36 and Figure 37.)

Figure 36: Corporate bond yields, as compared to 10Y and 30Y Treasury yields (2010 to present)



[115] https://fred.stlouisfed.org/series/AAA
[116] https://fred.stlouisfed.org/series/BAA
[117] https://fred.stlouisfed.org/series/BAMLC0A4CBBBEY

Figure 37: Moody's AAA, BAA, and ICE BBB Average Bond yields



Throughout this period, investors reacted to Fed policy changes, mixed corporate earnings, softer domestic economic growth, and expansion overseas. However, as inflation showed signs of moderation and the Federal Reserve issued the previously discussed rate cuts in September, noteworthy downward pressure impacted high-grade yield levels, while the intermediate segment experienced muted effects. High-yield bonds outperformed Treasuries during 1H2025.[118]

Looking ahead, professional forecasters expect only slight further declines in AAA and BAA yields into 2026. Forecasts put Moody's AAA yield at 5.30% for mid-2026[119], barely below current rates, while the BAA yield is expected to rise to just above 6%.[120] It also stands that the BofA BBB corporate index will remain near 5%.[121] Some analysts suggest near-term spreads over Treasuries are likely to remain consistent with current-day spreads (again, see Figure 36).

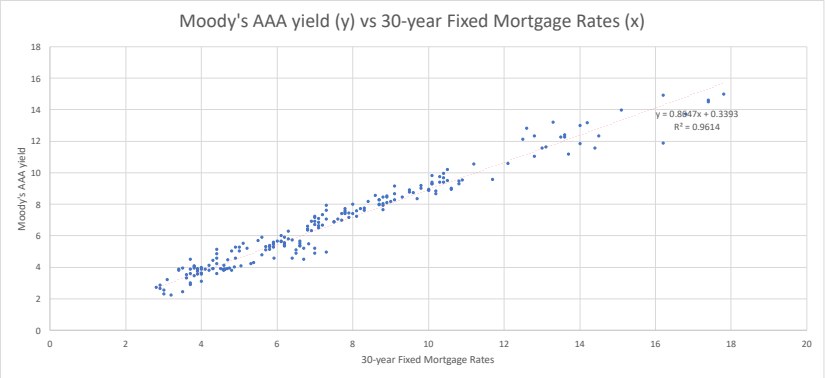
Overall, although volatility will persist as bond investors respond to shifting fiscal policy, global risks, and U.S. monetary signals, the broad corporate bond market outlook through YE2025 is one of cautious optimism. Stable-to-declining high-grade rates, anchored mid-grade yields, and limited room for further spread tightening are expected for the next several quarters, and well-ranked investment-grade issuers are best positioned to weather modest economic headwinds.[122]

See Figure 38 and

Figure 39 for how Moody's AAA & BAA Corporate Bond yields have historically correlated with other macroeconomic metrics.

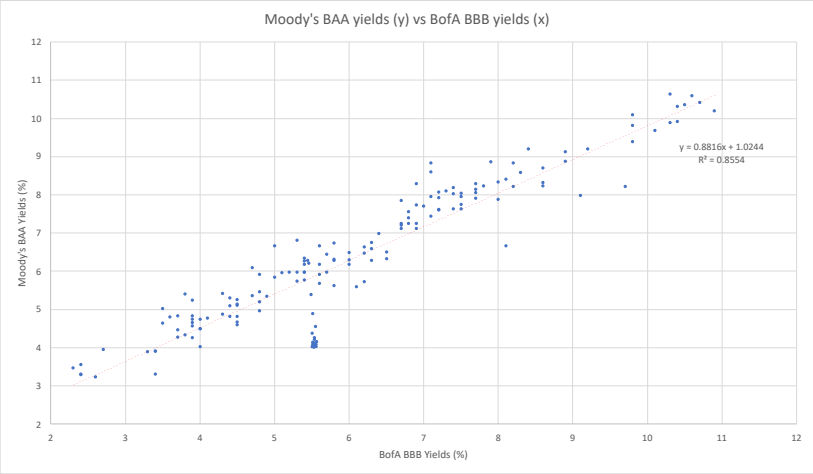
[118] https://www.schwab.com/learn/story/corporate-bond-outlook
[119] https://ycharts.com/indicators/median_forecasts_for_moodys_aaa_corporate_bond_yield
[120] https://ycharts.com/indicators/median_forecasts_for_moodys_baa_corporate_bond_yield
[121] https://www.schwab.com/learn/story/corporate-bond-outlook
[122] Ibid.

Figure 38: Moody's AAA-grade investment yields, as a function of 30-year Fixed Interest Mortgage Rates



Source: Authors' calculation

Figure 39: Moody's BAA-grade investment yields, as a function of BofA BBB yields



Source: Authors' calculation

Other Commentary

- "Top-rated corporate bond yields have also been following Treasury yields. AAA-rated long-term corporate bonds are yielding 4.5%, BBB-rated bonds are at 4.9%, and CCC-rated bonds recently eased to 11.6%. CCC-rated bond rates tend to rise when the risk of recession rises. The fact that they declined, despite the worries about the economy slowing, is likely due to hopes for more Fed rate cuts. That could ease the financial burden of businesses that are heavily indebted." (https://www.kiplinger.com/economic-forecasts/interest-rates; September 18, 2025)
- "Corporate bond performance has been mixed so far this year. Despite uncertainty and concerns about slower growth ahead, high-yield bonds generally outperformed U.S. Treasuries during the first half of 2025, helped by higher coupons and low spreads. Investment-grade corporate bonds barely outperformed Treasuries, while preferred securities have underperformed." (https://www.schwab.com/learn/story/corporate-bond-outlook; June 26, 2025)

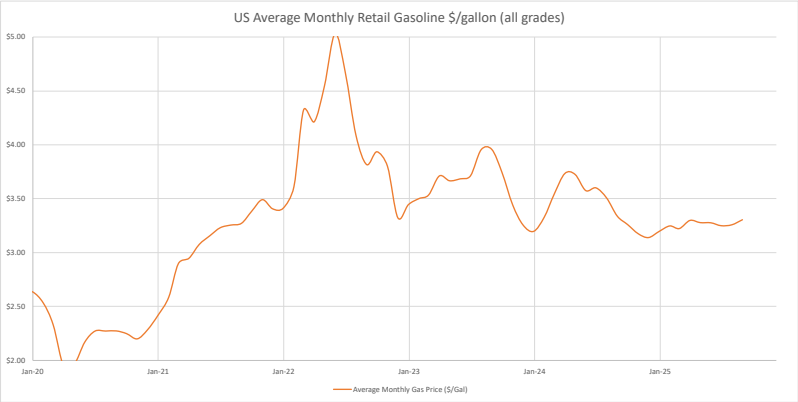
US Average Retail Gasoline Price

Analysis

The U.S. average retail price for regular unleaded gasoline is approximately $3.13 per gallon for regular unleaded as of this writing[123], down approximately 3% Y/Y. Prices for all grades of gasoline have been relatively volatile during 2Q2025, with monthly averages ranging from a low of $3.08 per gallon in January to a seasonal peak of $3.17 per gallon in April.[124] (See Figure 40 and Figure 41.) The spring driving season brought typical price increases (notable at the time, but relatively modest compared to other periods during the current decade), reflecting abundant crude supply and concerns about global economic growth.[125] Regional variations were pronounced during this period, reflecting the magnitude of local tax rates and logistic costs when compared to base prices. The Energy Information Administration reported that gasoline demand averaged approximately 9.0 million barrels per day during 2Q2025, showing resilience despite elevated pricing pressures.[126]

A general stabilization in gasoline prices has been seen in 3Q2025, with prices reflecting the seasonal transition to cheaper winter-blend gasoline formulations. Inventory levels showed mixed signals throughout the quarter, with EIA reporting gasoline stocks declining from 217.6 million barrels to 216.6 million barrels[127], while domestic production remained steady at approximately 9.7 million barrels per day.[128] Geopolitical tensions and supply disruptions, including pipeline issues in the Pacific Northwest that temporarily elevated regional prices by more than 20 cents per gallon, demonstrated the market's continued sensitivity to infrastructure vulnerabilities.[129]

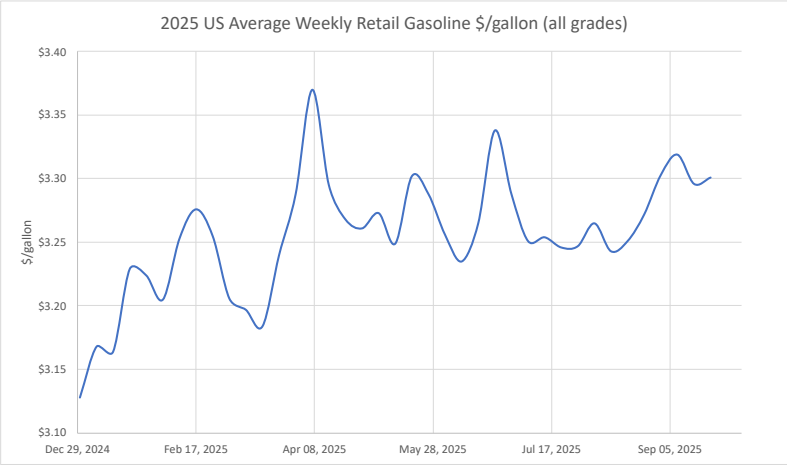
Figure 40: US Monthly Average $/gallon (all grades; 2020-present)



Source: US Energy Information Administration (https://www.eia.gov)

[123] https://gasprices.aaa.com/
[124] https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_NUS_DPG&f=W
[125] https://oilprice.com/Energy/Energy-General/Lower-Oil-Prices-Spur-Strong-Start-to-US-Driving-Season.html
[126] https://www.reuters.com/business/energy/us-gasoline-demand-may-hits-lowest-seasonal-level-since-2020-eia-says-2025-07-31
[127] https://ycharts.com/indicators/us_ending_stocks_of_gasoline
[128] https://www.eia.gov/petroleum/supply/weekly/pdf/highlights.pdf
[129] https://gasprices.aaa.com/gas-demand-down-as-seasonal-shift-begins/

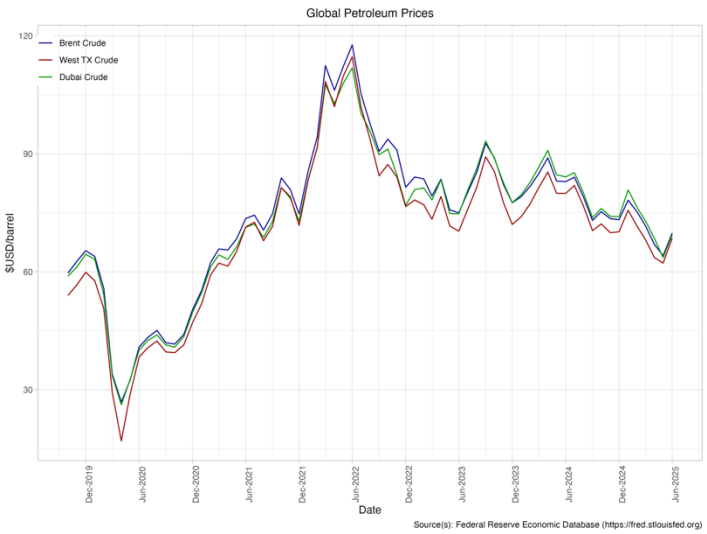
Figure 41: US Weekly Average $/gallon (all grades; Dec 2024-present)



Source: US Energy Information Administration (https://www.eia.gov)

The underlying crude oil market provided the fundamental backdrop for gasoline price movements, with West Texas Intermediate (WTI) crude oil trading domestically between $62.22 and $65.95 per barrel during September 2025.[130] (See Figure 42.) The relatively stable crude oil environment reflected OPEC+ production decisions, ongoing geopolitical tensions, and inventory dynamics that showed US crude stocks declining by 9.3 million barrels in mid-September[131], with exports rising to almost two-year highs.[132] Refinery capacity has remained essentially unchanged at ± 18.4 million barrels per calendar day through 2025.[133]

Figure 42: Global Crude Oil Prices



[130] https://fred.stlouisfed.org/series/DCOILWTICO
[131] https://www.reuters.com/business/energy/us-crude-inventories-fall-sharply-net-imports-hit-record-low-eia-says-2025-09-17/
[132] https://www.ttnews.com/articles/crude-oil-exports-surge-0825
[133] https://www.eia.gov/dnav/pet/pet_pnp_unc_dcu_nus_m.htm

Like every hurricane season, the 2025 Atlantic hurricane season presents significant upside risks to gasoline prices. NOAA has updated its forecast for an above-average season with 13-18 named storms, 6-10 hurricanes, and 5-9 hurricanes, and 2-5 major hurricanes[134]. Colorado State University has dropped its prediction for the 2025 season to 16 named storms and 8 hurricanes for the season[135]. (As of this writing, the season – which ends November 30, i.e., in less than sixty days – has produced six named tropical storms and four hurricanes.[136])

EIA forecasts project declining gasoline prices through the remainder of 2025 and into 2026, with the national average expected to decline to approximately $2.80 per gallon in 4Q2025 and further to $2.70 per gallon in 2026.[137] ***We expect oil prices to remain in the $65/bbl to $75/bbl range under expected circumstances.***

Other Commentary

- "We look for fuel prices to mostly tread water in coming weeks, but to tick down a bit later in the fall. Most years see gas prices retreat in late autumn as seasonal demand wanes, with the low point often coming sometime around Christmas or in January. There is no guarantee that this pattern will play out again this year, but right now, it looks like a good bet." (https://www.kiplinger.com/economic-forecasts/energy; September 19, 2025)
- "States like Arizona, Washington, Oregon, California and Nevada have experienced supply issues stemming from unplanned maintenance, permanent refinery shutdowns and a significant pipeline outage in the Pacific Northwest, [Patrick De Haan, head of petroleum analysis at GasBuddy] says. The Northeast has seen some price increases due to its reliance on imported gasoline. … Prices on the West Coast and in the Northeast are expected to drop "quite substantially" and should return to a more normal balance with the national average over the next six to eight weeks as supply issues are resolved, De Haan says." (https://www.cnbc.com/2025/09/19/gas-expected-to-get-cheaper-this-fall.html; September 19, 2025)

Commercial Real Estate Price Index

The US Commercial Real Estate Price Index declined by 3.10% in 2Q2025 from 1Q2025; further, the index is down 7.01% since 2Q2024[138]. Commercial real estate prices in 2Q2025 and 3Q2025 have shown divergent trends across property sectors, with individual asset quality and macroeconomic concerns being the driving factors in valuation dynamics. Price growth on a per-square-foot basis accelerated sharply in 2Q2025, with annual gains in multifamily (up 18.8%), retail (+18.5%), commercial general (+17.1%), and office (+15.3%).[139] However, prices appear to have begun to soften in late 2Q2025 and 3Q2025, as the current market conditions slowed growth in the sector.[140]

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[134] https://www.noaa.gov/news-release/prediction-remains-on-track-for-above-normal-atlantic-hurricane-season and https://ema.alabama.gov/2025/08/08/active-hurricane-season-still-forecast-2/
[135] https://www.insurancejournal.com/news/national/2025/08/11/835132.htm
[136] https://www.noaa.gov/news-release/prediction-remains-on-track-for-above-normal-atlantic-hurricane-season
[137] https://www.eia.gov/outlooks/steo/data/browser/#/?v=10&f=M&s=0&start=202001&end=202612&ctype=linechart&maptype=0&linechart=~MGRARUS_$&map=
[138] https://ycharts.com/indicators/us_commercial_real_estate_price_index_interest_rates_and_price_indexes
[139] https://www.altusgroup.com/featured-insights/cre-transactions/pricing-pacing/
[140] https://www.trepp.com/trepptalk/commercial-real-estate-prices-stall-amid-tariff-negotiations-tppi-q2-2025

Demand remained strong for higher-quality, larger assets, especially in multifamily and office, even as the total number of properties changing hands declined by 7.4% Y/Y in 2Q2025, meaning that investors are still looking diligently for opportunities.[141] Industrial and logistics continued to outperform, fueled by ongoing shifts in supply chain and e-commerce activity[142], while retail pricing found moderate support from persistent consumer spending[143]. By contrast, hospitality posted the most significant Y/Y decline (down 20.9%), hampered by sensitivity to consumer confidence and affordability constraints.[144]

Figure 43: Residential Home Price Index as a function of the Commercial Real Estate Index

Source: Authors' calculation

Investor sentiment has moderated following the robust activity in early 2025; the Federal Reserve's rate policies, and the uncertain resolution of trade positions remain top risks heading into 4Q2025.[145]

Figure 43 highlights the relationship between residential and commercial prices.

Other Commentary

- "… [C]ommercial real estate (CRE) markets may have reached a critical juncture, with property prices largely stalling or even slightly receding across nearly all CRE sectors. This is a reversal of the TPPI trend in Q1 2025, which pointed to the start of a potential recovery. With the tariff impact trickling through the economy, the CRE market is at a crossroads." (https://www.trepp.com/trepptalk/commercial-real-estate-prices-stall-amid-tariff-negotiations-tppi-q2-2025; September 4, 2025)
- "Investor activity is gravitating toward larger, higher-quality deals, particularly in multifamily and office, even as volume by count remains depressed. The quarter reflected a market finding its footing after a difficult start to the year." (https://www.altusgroup.com/insights/us-cre-transactions/; September 2, 2025)

[141] See https://www.altusgroup.com/insights/us-cre-transactions/ and https://backend.mycbdesk.com/content-store/document-file/78204/
[142] https://buyandsellcre.com/f/2025-cre-outlook-what%E2%80%99s-next-for-retail-office-and-industrial and https://www.clarionpartners.com/insights/ongoing-outperformance-of-us-industrial-real-estate
[143] https://www.matthews.com/market_insights/regional-shopping-center-report
[144] https://www.altusgroup.com/insights/us-cre-transactions/
[145] https://www.jpmorgan.com/insights/real-estate/commercial-real-estate/commercial-real-estate-trends

Dow Jones Total Stock Market Index; S&P 500; and the Market Volatility Index (VIX)

Analysis

The analysis of recent market metrics indicates substantial volatility related to ongoing concerns about corporate debt quality and capital structure in major U.S. indices. The Dow Jones Total Stock Market Index closed at 55,374,920 at the end of 1Q2025, rising to 61,309,500 at the end of 2Q2025, and was observed recently at approximately 65,753.15 by the end of 3Q2025. This represents a quarterly gain of 10.71% in 2Q2025 and about 7.23% in 3Q2025, reflecting persistent investor appetite. The typical daily point change averaged about 107 points in 2Q2025, and 71 points in 3Q2025.[146]

The S&P 500 closed 1Q2025 at 5611.85, then rose to 6204.95 at the end of 2Q2025, and closed 3Q2025 near 6460.26. These values record the following percent changes by quarter: Q1 to Q2 saw an increase of about 10.57%, and Q2 to Q3 saw a further gain of 4.12%. The index moved, on average, approximately 12.6 points per workday in 2Q2025 and 10.9 points per workday in 3Q2025, highlighting that while gains persisted, trading became less aggressive as economic questions intensified.[147]

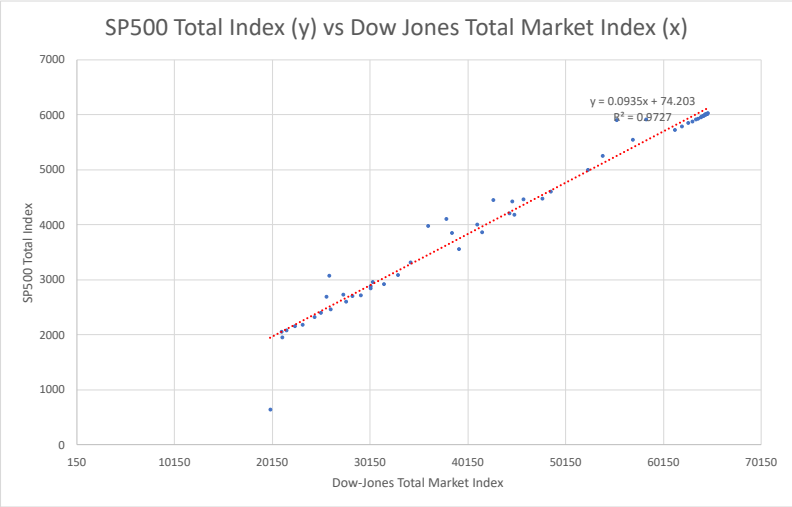
The Market Volatility Index (VIX), a proxy for expected equity market fluctuations and investor concern over systemic risk, closed 1Q2025 at approximately 14.90, ended 2Q2025 at 15.37, and stood at roughly 15.29 at 3Q2025's close.[148] The modest fluctuation and stabilization of VIX during 2025 reflect a market that priced in ongoing credit and other economic jitters, but was not panicking.[149]

Looking ahead, broader equity indices are expected to remain sensitive to shifts in corporate borrowing costs, defaults, and refinancing trends.[150] We know that economic volatility may rise if credit spreads widen further, and, given the rapid shift from pre-COVID rates to those of today, historically high debt levels leave many companies exposed to investor scrutiny of earnings quality and capital resilience. While the indices have managed gains through 2025, a deterioration in credit markets could have dramatic consequences.

Figure 44 shows the relationship between the discussed market indexes.

[146] https://www.marketwatch.com/investing/index/dwcf
[147] https://www.marketwatch.com/investing/index/spx and https://finance.yahoo.com/news/does-q4-hold-u-economy-172500870.html
[148] https://fred.stlouisfed.org/series/VIXCLS
[149] https://www.morningstar.com/news/marketwatch/2025092954/a-fearless-stock-market-is-facing-two-rising-risks-says-wedbush
[150] https://www.usbank.com/investing/financial-perspectives/market-news/how-do-rising-interest-rates-affect-the-stock-market.html

Figure 44: SP500 as a function of the Dow-Jones Total Market Index



Source: Authors' calculation

Regression Analyses

The following section documents the linear regression coefficients found for each of the aforementioned variables, as a function of other variables (which are not significantly correlated with the control variable). With this report, we have also included the natural log and the square of all variables as experimental (dependent) variables; these variables are denoted by a "LN_" prefix and a "_2" suffix below (respectively).

To compare the effectiveness of these regressions, we calculate the percentage error between the forecasted value (based on the given regression, using the values from the immediately preceding quarter) and the actual value for the period between 3Q2016 and 2Q2025, inclusive.

Table 4: Regression Aggregate Errors for 3Q2016 through 2Q2025

Variable	Min Abs. Error	Average Error	Max Abs. Error
Real GDP Growth	508.3%	**	***
Nominal GDP Growth	107.9%	**	***
Real Disposable Income Growth	60.4%	**	***
Nominal Disposable Income Growth	350.3%	**	***
Inflation	769.8%	***	***
Unemployment Rate	3.7%	-503.8%	***
1-month Treasury Yield	0.0%	17.9%	911.8%
3-month Treasury Yield	0.0%	8.8%	***
6-month Treasury Yield	0.5%	44.6%	797.2%
1-year Treasury Yield	0.4%	-8.0%	548.5%
3-year Treasury Yield	20.2%	227.0%	***
5-year Treasury Yield	4.1%	-60.9%	361.0%
7-year Treasury Yield	0.2%	12.9%	199.6%
10-year Treasury Yield	0.2%	8.1%	152.5%
20-year Treasury Yield	1.9%	2.1%	63.2%
30-year Treasury Yield	0.2%	1.9%	42.8%
30-year Mortgage Rate	0.3%	0.1%	28.9%
Moody's AAA Curve	1.7%	3.3%	60.2%
Moody's BAA Curve	2.0%	-22.2%	61.9%
BBB Corporate Yield	117.5%	-250.0%	312.4%
Prime Rate	0.3%	-2.0%	23.9%
US Average Retail Gasoline Price	0.8%	-7.0%	27.6%
Cost of Federal Funds	1.4%	7.3%	***
Dow Jones Total Stock Market Index	0.7%	-47.3%	131.4%
S&P 500 Stock Price Index	185.5%	***	***
Commercial Real Estate Price Index	0.4%	-0.2%	7.5%
Residential Home Price Index	4.6%	-385.7%	979.9%
Market Volatility Index	5.3%	46.0%	309.1%

** The indicated value has a percentage error less than -1000%.
*** The indicated value has a percentage error greater than 1000%.

Real & Nominal GDP Growth, Real & Nominal Disposable Income Growth, and CPI Inflation Rate

REGRESSION FOR REAL GDP GROWTH

	Dependent variable (+/- SE):
	Real GDP growth
Constant	-134.664 (+/- 3.979)
	p = 0.00000***
Moody's AAA Curve	-8.486 (+/- 1.797)
	p = 0.004***
Moody's BAA Curve	9.255 (+/- 0.805)
	p = 0.00003***
Real disposable income growth	-1.482 (+/- 0.131)
	p = 0.00003***
Nominal disposable income growth	1.246 (+/- 0.127)
	p = 0.0001***
Unemployment Rate	-9.210 (+/- 0.155)
	p = 0.000***
CPI Inflation Rate	2.609 (+/- 0.122)
	p = 0.00000***
BBB corporate yield	6.480 (+/- 0.391)
	p = 0.00001***
30-year Mortgate Rate	-20.007 (+/- 0.639)
	p = 0.00000***
Home Price Index	0.485 (+/- 0.013)
	p = 0.00000***
Commercial Real Estate Price Index	-0.124 (+/- 0.007)
	p = 0.00001***
Market Volatility Index	-2.053 (+/- 0.037)
	p = 0.000***
LN_Market Volatility Index	49.600 (+/- 0.889)
	p = 0.000***
US Avg Retail Gasoline Price ($-gal; all grades, all formulations)	-17.761 (+/- 0.361)
	p = 0.000***
20-year Treasury Yield	-211.661 (+/- 7.971)
	p = 0.00000***
LN_20-year Treasury Yield	584.244 (+/- 20.601)
	p = 0.00000***
10-year Treasury Yield	-203.939 (+/- 14.425)
	p = 0.00001***

1-month Treasury Yield	31.660 (+/- 0.928)
	p = 0.00000***
LN_1-month Treasury Yield	-6.483 (+/- 0.265)
	p = 0.00000***
7-year Treasury Yield	442.836 (+/- 20.475)
	p = 0.00000***
LN_7-year Treasury Yield	-158.125 (+/- 16.396)
	p = 0.0001***
3-month Treasury Yield	-28.125 (+/- 1.265)
	p = 0.00000***
5-year Treasury Yield	64.608 (+/- 6.176)
	p = 0.00005***
LN_5-year Treasury Yield	-302.876 (+/- 14.589)
	p = 0.00000***
LN_6-month Treasury Yield	-26.902 (+/- 1.384)
	p = 0.00001***
3-year Treasury Yield	-216.290 (+/- 5.460)
	p = 0.00000***
LN_3-year Treasury Yield	107.663 (+/- 4.186)
	p = 0.00000***
1-year Treasury Yield	59.759 (+/- 1.847)
	p = 0.00000***
LN_1-year Treasury Yield	58.052 (+/- 1.433)
	p = 0.00000***
3-year Treasury Yield_2	4.009 (+/- 0.491)
	p = 0.0002***
3-month Treasury Yield_2	-2.180 (+/- 0.095)
	p = 0.00000***
7-year Treasury Yield_2	-21.624 (+/- 2.311)
	p = 0.0001***
10-year Treasury Yield_2	16.457 (+/- 2.517)
	p = 0.001***
30-year Treasury Yield_2	2.762 (+/- 0.327)
	p = 0.0002***
Observations	40
R^2	1.000
Adjusted R^2	0.999
Residual Std. Error	0.191 (df = 6)
F Statistic	1,809.714*** (df = 33; 6)

Note: *p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR REAL GDP GROWTH

	Dependent variable (+/- SE):
	Real GDP growth
Constant	-134.664 (+/- 3.979)
	p = 0.00000***
Moody's AAA Curve	-8.486 (+/- 1.797)
	p = 0.004***
Moody's BAA Curve	9.255 (+/- 0.805)
	p = 0.00003***
Real disposable income growth	-1.482 (+/- 0.131)
	p = 0.00003***
Nominal disposable income growth	1.246 (+/- 0.127)
	p = 0.0001***
Unemployment Rate	-9.210 (+/- 0.155)
	p = 0.000***
CPI Inflation Rate	2.609 (+/- 0.122)
	p = 0.00000***
BBB corporate yield	6.480 (+/- 0.391)
	p = 0.00001***
30-year Mortgate Rate	-20.007 (+/- 0.639)
	p = 0.00000***
Home Price Index	0.485 (+/- 0.013)
	p = 0.00000***
Commercial Real Estate Price Index	-0.124 (+/- 0.007)
	p = 0.00001***
Market Volatility Index	-2.053 (+/- 0.037)
	p = 0.000***
LN_Market Volatility Index	49.600 (+/- 0.889)
	p = 0.000***
US Avg Retail Gasoline Price ($-gal; all grades, all formulations)	-17.761 (+/- 0.361)
	p = 0.000***
20-year Treasury Yield	-211.661 (+/- 7.971)
	p = 0.00000***
LN_20-year Treasury Yield	584.244 (+/- 20.601)
	p = 0.00000***
10-year Treasury Yield	-203.939 (+/- 14.425)
	p = 0.00001***
1-month Treasury Yield	31.660 (+/- 0.928)

	p = 0.00000***
LN_1-month Treasury Yield	-6.483 (+/- 0.265)
	p = 0.00000***
7-year Treasury Yield	442.836 (+/- 20.475)
	p = 0.00000***
LN_7-year Treasury Yield	-158.125 (+/- 16.396)
	p = 0.0001***
3-month Treasury Yield	-28.125 (+/- 1.265)
	p = 0.00000***
5-year Treasury Yield	64.608 (+/- 6.176)
	p = 0.00005***
LN_5-year Treasury Yield	-302.876 (+/- 14.589)
	p = 0.00000***
LN_6-month Treasury Yield	-26.902 (+/- 1.384)
	p = 0.00001***
3-year Treasury Yield	-216.290 (+/- 5.460)
	p = 0.00000***
LN_3-year Treasury Yield	107.663 (+/- 4.186)
	p = 0.00000***
1-year Treasury Yield	59.759 (+/- 1.847)
	p = 0.00000***
LN_1-year Treasury Yield	58.052 (+/- 1.433)
	p = 0.00000***
3-year Treasury Yield_2	4.009 (+/- 0.491)
	p = 0.0002***
3-month Treasury Yield_2	-2.180 (+/- 0.095)
	p = 0.00000***
7-year Treasury Yield_2	-21.624 (+/- 2.311)
	p = 0.0001***
10-year Treasury Yield_2	16.457 (+/- 2.517)
	p = 0.001***
30-year Treasury Yield_2	2.762 (+/- 0.327)
	p = 0.0002***
Observations	40
R^2	1.000
Adjusted R^2	0.999
Residual Std. Error	0.191 (df = 6)
F Statistic	1,809.714*** (df = 33; 6)

Note: *p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR REAL DISPOSABLE INCOME GROWTH

	Dependent variable (+/- SE):
	Real disposable income growth
Constant	4.690 (+/- 10.971)
	p = 0.673
Moody's AAA Curve	19.240 (+/- 6.025)
	p = 0.004***
Real GDP growth	0.920 (+/- 0.232)
	p = 0.0005***
CPI Inflation Rate	-2.178 (+/- 0.455)
	p = 0.00005***
10-year Treasury Yield	277.701 (+/- 53.401)
	p = 0.00002***
LN_10-year Treasury Yield	-977.278 (+/- 119.163)
	p = 0.000***
7-year Treasury Yield	-499.250 (+/- 80.981)
	p = 0.00000***
LN_7-year Treasury Yield	1,452.977 (+/- 158.945)
	p = 0.000***
5-year Treasury Yield	217.620 (+/- 33.649)
	p = 0.00000***
LN_5-year Treasury Yield	-530.742 (+/- 54.338)
	p = 0.000***
Observations	40
R^2	0.856
Adjusted R^2	0.812
Residual Std. Error	5.648 (df = 30)
F Statistic	19.746*** (df = 9; 30)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR NOMINAL DISPOSABLE INCOME GROWTH

	Dependent variable (+/- SE):
	Nominal disposable income growth
Constant	-505.435 (+/- 67.697)
	p = 0.00000***
US Fed Reserve O-N Loan Rate	-73.267 (+/- 19.823)
	p = 0.002***
Moody's BAA Curve	33.464 (+/- 5.340)
	p = 0.00001***
Real GDP growth	0.698 (+/- 0.173)
	p = 0.001***
Unemployment Rate	-12.472 (+/- 3.552)
	p = 0.003***
Dow Total Stock Market Index	0.003 (+/- 0.0004)
	p = 0.00000***
LN_Market Volatility Index	30.380 (+/- 8.968)
	p = 0.003***
LN_20-year Treasury Yield	565.501 (+/- 97.275)
	p = 0.00002***
10-year Treasury Yield	477.767 (+/- 63.220)
	p = 0.00000***
LN_10-year Treasury Yield	-1,590.478 (+/- 143.217)
	p = 0.000***
1-month Treasury Yield	50.263 (+/- 16.763)
	p = 0.008***
LN_7-year Treasury Yield	863.237 (+/- 63.705)
	p = 0.000***
3-year Treasury Yield	-356.604 (+/- 40.036)
	p = 0.00000***
LN_3-year Treasury Yield	-92.613 (+/- 19.966)
	p = 0.0002***
1-year Treasury Yield	133.228 (+/- 16.688)
	p = 0.00000***
LN_1-year Treasury Yield	46.280 (+/- 6.633)
	p = 0.00000***
3-year Treasury Yield_2	20.182 (+/- 3.067)
	p = 0.00001***
6-month Treasury Yield_2	-6.746 (+/- 0.943)

	p = 0.00000***
20-year Treasury Yield_2	-40.375 (+/- 5.029)
	p = 0.00000***
Market Volatility Index_2	-0.027 (+/- 0.006)
	p = 0.0003***
Observations	40
R^2	0.950
Adjusted R^2	0.903
Residual Std. Error	4.033 (df = 20)
F Statistic	20.177*** (df = 19; 20)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR CPI INFLATION RATE

	Dependent variable (+/- SE):
	CPI Inflation Rate
Constant	15.418 (+/- 1.412)
	p = 0.0004***
SP500 Stock Price Index	-0.001 (+/- 0.00003)
	p = 0.00001***
US Fed Reserve O-N Loan Rate	-3.698 (+/- 0.118)
	p = 0.00001***
Moody's BAA Curve	-1.497 (+/- 0.063)
	p = 0.00002***
Real GDP growth	-0.039 (+/- 0.002)
	p = 0.0001***
Real disposable income growth	-0.780 (+/- 0.011)
	p = 0.00000***
Nominal disposable income growth	0.795 (+/- 0.010)
	p = 0.00000***
Unemployment Rate	1.406 (+/- 0.022)
	p = 0.00000***
30-year Mortgate Rate	0.501 (+/- 0.028)
	p = 0.0001***
Dow Total Stock Market Index	-0.00003 (+/- 0.00000)
	p = 0.003***
Market Volatility Index	0.244 (+/- 0.006)
	p = 0.00001***
LN_Market Volatility Index	-5.945 (+/- 0.141)
	p = 0.00001***
US Avg Retail Gasoline Price ($-gal; all grades, all formulations)	1.880 (+/- 0.038)
	p = 0.00001***
30-year Treasury Yield	44.038 (+/- 3.346)
	p = 0.0002***
LN_30-year Treasury Yield	-74.287 (+/- 4.648)
	p = 0.0001***
20-year Treasury Yield	37.557 (+/- 0.867)
	p = 0.00001***
LN_20-year Treasury Yield	-108.409 (+/- 2.548)
	p = 0.00001***
10-year Treasury Yield	-71.876 (+/- 1.796)

	p = 0.00001***
LN_10-year Treasury Yield	159.405 (+/- 3.355)
	p = 0.00001***
1-month Treasury Yield	1.982 (+/- 0.112)
	p = 0.0001***
LN_1-month Treasury Yield	0.270 (+/- 0.019)
	p = 0.0002***
LN_7-year Treasury Yield	-68.895 (+/- 1.693)
	p = 0.00001***
5-year Treasury Yield	6.295 (+/- 0.748)
	p = 0.002***
LN_5-year Treasury Yield	21.259 (+/- 0.699)
	p = 0.00001***
LN_6-month Treasury Yield	7.593 (+/- 0.100)
	p = 0.00000***
3-year Treasury Yield	21.123 (+/- 0.762)
	p = 0.00002***
1-year Treasury Yield	-5.674 (+/- 0.260)
	p = 0.00003***
LN_1-year Treasury Yield	-12.234 (+/- 0.164)
	p = 0.00000***
1-year Treasury Yield_2	-0.430 (+/- 0.030)
	p = 0.0002***
3-year Treasury Yield_2	-1.024 (+/- 0.086)
	p = 0.0003***
6-month Treasury Yield_2	0.956 (+/- 0.016)
	p = 0.00000***
5-year Treasury Yield_2	-1.914 (+/- 0.098)
	p = 0.00005***
7-year Treasury Yield_2	0.864 (+/- 0.090)
	p = 0.001***
1-month Treasury Yield_2	-0.139 (+/- 0.008)
	p = 0.0001***
10-year Treasury Yield_2	3.156 (+/- 0.178)
	p = 0.0001***
30-year Treasury Yield_2	-2.702 (+/- 0.258)
	p = 0.0005***
Observations	40
R^2	1.000

Adjusted R^2	1.000
Residual Std. Error	0.015 (df = 4)
F Statistic	33,531.520*** (df = 35; 4)
Note:	*p<0.1; **p<0.05; ***p<0.01

Unemployment Rate

REGRESSION FOR UNEMPLOYMENT RATE

	Dependent variable (+/- SE):
	Unemployment Rate
Constant	-20.115 (+/- 1.564)
	p = 0.000***
Real GDP growth	-0.079 (+/- 0.008)
	p = 0.00000***
CPI Inflation Rate	0.303 (+/- 0.051)
	p = 0.00003***
30-year Mortgate Rate	-0.885 (+/- 0.193)
	p = 0.0004***
Home Price Index	0.035 (+/- 0.005)
	p = 0.00001***
Market Volatility Index	-0.204 (+/- 0.011)
	p = 0.000***
LN_Market Volatility Index	4.939 (+/- 0.324)
	p = 0.000***
US Avg Retail Gasoline Price ($-gal; all grades, all formulations)	-1.298 (+/- 0.228)
	p = 0.00005***
30-year Treasury Yield	6.536 (+/- 1.130)
	p = 0.00004***
20-year Treasury Yield	-22.315 (+/- 1.992)
	p = 0.000***
LN_20-year Treasury Yield	50.072 (+/- 4.193)
	p = 0.000***
LN_10-year Treasury Yield	-17.307 (+/- 2.283)
	p = 0.00001***
1-month Treasury Yield	2.775 (+/- 0.459)
	p = 0.00003***
7-year Treasury Yield	15.049 (+/- 1.654)
	p = 0.00000***
3-month Treasury Yield	-5.208 (+/- 1.057)
	p = 0.0002***
5-year Treasury Yield	5.686 (+/- 1.591)
	p = 0.003***
LN_5-year Treasury Yield	-23.892 (+/- 2.738)
	p = 0.00000***

6-month Treasury Yield	4.911 (+/- 1.060)
	p = 0.0004***
LN_6-month Treasury Yield	-4.397 (+/- 0.535)
	p = 0.00000***
3-year Treasury Yield	-7.901 (+/- 1.458)
	p = 0.0001***
LN_3-year Treasury Yield	5.513 (+/- 1.431)
	p = 0.002***
LN_1-year Treasury Yield	6.453 (+/- 0.766)
	p = 0.00000***
1-year Treasury Yield_2	0.479 (+/- 0.146)
	p = 0.005***
3-year Treasury Yield_2	-0.517 (+/- 0.158)
	p = 0.006***
6-month Treasury Yield_2	-0.425 (+/- 0.107)
	p = 0.002***
Observations	40
R^2	0.997
Adjusted R^2	0.992
Residual Std. Error	0.153 (df = 15)
F Statistic	202.861*** (df = 24; 15)
Note:	*p<0.1; **p<0.05; ***p<0.01

Treasury Yields (1, 3, & 6-month; 1, 3, 5, 7, 10, 20, & 30-year series)

REGRESSION FOR 1-MONTH TREASURY YIELD

	Dependent variable (+/- SE):
	1-month Treasury Yield
Constant	-1.233 (+/- 0.494)
	p = 0.018**
Moody's AAA Curve	-1.675 (+/- 0.248)
	p = 0.00000***
30-year Mortgate Rate	1.371 (+/- 0.103)
	p = 0.000***
10-year Treasury Yield	1.289 (+/- 0.225)
	p = 0.00001***
Observations	40
R^2	0.972
Adjusted R^2	0.970
Residual Std. Error	0.346 (df = 36)
F Statistic	420.245*** (df = 3; 36)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 3-MONTH TREASURY YIELD

	Dependent variable (+/- SE):
	3-month Treasury Yield
Constant	-13.479 (+/- 3.113)
	p = 0.0002***
Moody's AAA Curve	-6.056 (+/- 0.882)
	p = 0.00000***
Moody's BAA Curve	1.764 (+/- 0.400)
	p = 0.0002***
Nominal GDP growth	-0.025 (+/- 0.008)
	p = 0.005***
Unemployment Rate	-0.246 (+/- 0.051)
	p = 0.00004***
Home Price Index	0.025 (+/- 0.004)
	p = 0.00001***
30-year Treasury Yield	17.197 (+/- 2.717)
	p = 0.00000***
LN_20-year Treasury Yield	-18.437 (+/- 2.803)
	p = 0.00000***
7-year Treasury Yield	2.294 (+/- 0.308)
	p = 0.00000***
30-year Treasury Yield_2	-1.300 (+/- 0.273)
	p = 0.00005***
Market Volatility Index_2	-0.0004 (+/- 0.0001)
	p = 0.00002***
Observations	40
R^2	0.977
Adjusted R^2	0.969
Residual Std. Error	0.340 (df = 29)
F Statistic	121.850*** (df = 10; 29)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 6-MONTH TREASURY YIELD

	Dependent variable (+/- SE):
	6-month Treasury Yield
Constant	-0.677 (+/- 0.415)
	p = 0.112
Moody's AAA Curve	-1.386 (+/- 0.185)
	p = 0.000***
30-year Mortgate Rate	1.044 (+/- 0.092)
	p = 0.000***
7-year Treasury Yield	1.356 (+/- 0.160)
	p = 0.000***
Observations	40
R^2	0.978
Adjusted R^2	0.976
Residual Std. Error	0.302 (df = 36)
F Statistic	522.442*** (df = 3; 36)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 1-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	1-year Treasury Yield
Constant	-1.016 (+/- 0.283)
	p = 0.001***
30-year Mortgate Rate	0.921 (+/- 0.085)
	p = 0.000***
30-year Treasury Yield	-2.585 (+/- 0.291)
	p = 0.000***
10-year Treasury Yield	2.572 (+/- 0.249)
	p = 0.000***
Observations	40
R^2	0.978
Adjusted R^2	0.976
Residual Std. Error	0.281 (df = 36)
F Statistic	528.644*** (df = 3; 36)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 3-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	3-year Treasury Yield
Constant	-14.719 (+/- 1.621)
	p = 0.000***
Unemployment Rate	-0.312 (+/- 0.039)
	p = 0.000***
Market Volatility Index	0.056 (+/- 0.012)
	p = 0.0001***
20-year Treasury Yield	21.838 (+/- 2.305)
	p = 0.000***
LN_20-year Treasury Yield	-29.642 (+/- 3.263)
	p = 0.000***
20-year Treasury Yield_2	-1.687 (+/- 0.194)
	p = 0.000***
Market Volatility Index_2	-0.001 (+/- 0.0002)
	p = 0.00001***
Observations	40
R^2	0.979
Adjusted R^2	0.975
Residual Std. Error	0.233 (df = 33)
F Statistic	254.884*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 5-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	5-year Treasury Yield
Constant	-1.104 (+/- 0.643)
	p = 0.096*
Unemployment Rate	-0.263 (+/- 0.057)
	p = 0.0001***
CPI Inflation Rate	-0.180 (+/- 0.038)
	p = 0.00005***
Dow Total Stock Market Index	-0.0001 (+/- 0.00002)
	p = 0.003***
Home Price Index	0.033 (+/- 0.005)
	p = 0.00000***
Market Volatility Index_2	-0.0003 (+/- 0.0001)
	p = 0.0003***
Observations	40
R^2	0.859
Adjusted R^2	0.838
Residual Std. Error	0.522 (df = 34)
F Statistic	41.438*** (df = 5; 34)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 7-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	7-year Treasury Yield
Constant	3.362 (+/- 1.572)
	p = 0.041**
Moody's BAA Curve	0.802 (+/- 0.066)
	p = 0.000***
Real disposable income growth	-0.071 (+/- 0.017)
	p = 0.0003***
Nominal disposable income growth	0.075 (+/- 0.017)
	p = 0.0002***
Prime Rate	-1.679 (+/- 0.489)
	p = 0.002***
Dow Total Stock Market Index	0.00003 (+/- 0.00001)
	p = 0.00003***
Market Volatility Index	-0.012 (+/- 0.003)
	p = 0.0003***
1-month Treasury Yield	1.588 (+/- 0.467)
	p = 0.002***
LN_1-month Treasury Yield	0.213 (+/- 0.046)
	p = 0.0001***
Observations	40
R^2	0.978
Adjusted R^2	0.972
Residual Std. Error	0.200 (df = 31)
F Statistic	172.978*** (df = 8; 31)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 10-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	10-year Treasury Yield
Constant	3.585 (+/- 0.369)
	p = 0.000***
Dow Total Stock Market Index	0.00003 (+/- 0.00001)
	p = 0.00001***
Commercial Real Estate Price Index	-0.013 (+/- 0.002)
	p = 0.000***
6-month Treasury Yield	-1.186 (+/- 0.320)
	p = 0.001***
LN_6-month Treasury Yield	-1.225 (+/- 0.264)
	p = 0.0001***
1-year Treasury Yield	1.939 (+/- 0.364)
	p = 0.00001***
LN_1-year Treasury Yield	1.267 (+/- 0.296)
	p = 0.0002***
Observations	40
R^2	0.971
Adjusted R^2	0.965
Residual Std. Error	0.210 (df = 33)
F Statistic	181.965*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 20-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	20-year Treasury Yield
Constant	0.493 (+/- 0.139)
	p = 0.002***
SP500 Stock Price Index	-0.0001 (+/- 0.00004)
	p = 0.001***
US Fed Reserve O-N Loan Rate	1.757 (+/- 0.466)
	p = 0.001***
1-month Treasury Yield	-1.974 (+/- 0.412)
	p = 0.00004***
3-month Treasury Yield	1.257 (+/- 0.457)
	p = 0.010***
3-year Treasury Yield	2.196 (+/- 0.154)
	p = 0.000***
1-year Treasury Yield	-1.848 (+/- 0.287)
	p = 0.00000***
LN_1-year Treasury Yield	-0.491 (+/- 0.061)
	p = 0.000***
Observations	40
R^2	0.984
Adjusted R^2	0.981
Residual Std. Error	0.148 (df = 32)
F Statistic	289.622*** (df = 7; 32)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR 30-YEAR TREASURY YIELD

	Dependent variable (+/- SE):
	30-year Treasury Yield
Constant	3.738 (+/- 0.333)
	p = 0.000***
Commercial Real Estate Price Index	-0.009 (+/- 0.001)
	p = 0.00000***
1-month Treasury Yield	-1.294 (+/- 0.338)
	p = 0.001***
3-month Treasury Yield	1.986 (+/- 0.437)
	p = 0.0001***
3-year Treasury Yield	1.648 (+/- 0.144)
	p = 0.000***
1-year Treasury Yield	-1.572 (+/- 0.262)
	p = 0.00001***
LN_1-year Treasury Yield	-0.217 (+/- 0.070)
	p = 0.005***
1-month Treasury Yield_2	0.048 (+/- 0.014)
	p = 0.002***
Observations	40
R^2	0.975
Adjusted R^2	0.970
Residual Std. Error	0.165 (df = 32)
F Statistic	180.122*** (df = 7; 32)
Note:	*p<0.1; **p<0.05; ***p<0.01

30-year Mortgage Rate

REGRESSION FOR 30-YEAR MORTGATE RATE

	Dependent variable (+/- SE):
	30-year Mortgate Rate
Constant	5.603 (+/- 0.425)
	p = 0.000***
Home Price Index	0.010 (+/- 0.002)
	p = 0.00002***
Commercial Real Estate Price Index	-0.016 (+/- 0.002)
	p = 0.00000***
6-month Treasury Yield	0.657 (+/- 0.034)
	p = 0.000***
Observations	40
R^2	0.970
Adjusted R^2	0.967
Residual Std. Error	0.255 (df = 36)
F Statistic	387.962*** (df = 3; 36)
Note:	*p<0.1; **p<0.05; ***p<0.01

Moody's AAA & BAA Rates

REGRESSION FOR MOODY'S AAA CURVE

	Dependent variable (+/- SE):
	Moody's AAA Curve
Constant	2.141 (+/- 0.182)
	p = 0.000***
US Fed Reserve O-N Loan Rate	2.192 (+/- 0.591)
	p = 0.001***
Dow Total Stock Market Index	-0.00003 (+/- 0.00001)
	p = 0.00000***
1-month Treasury Yield	-2.442 (+/- 0.519)
	p = 0.0001***
LN_1-month Treasury Yield	-0.482 (+/- 0.112)
	p = 0.0002***
3-month Treasury Yield	1.804 (+/- 0.599)
	p = 0.006***
LN_6-month Treasury Yield	1.197 (+/- 0.420)
	p = 0.008***
3-year Treasury Yield	2.389 (+/- 0.233)
	p = 0.000***
1-year Treasury Yield	-2.526 (+/- 0.387)
	p = 0.00000***
LN_1-year Treasury Yield	-1.253 (+/- 0.395)
	p = 0.004***
Observations	40
R^2	0.967
Adjusted R^2	0.958
Residual Std. Error	0.184 (df = 30)
F Statistic	99.223*** (df = 9; 30)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR MOODY'S BAA CURVE

	Dependent variable (+/- SE):
	Moody's BAA Curve
Constant	5.111 (+/- 0.444)
	p = 0.000***
Dow Total Stock Market Index	-0.0001 (+/- 0.00001)
	p = 0.00000***
Home Price Index	0.018 (+/- 0.004)
	p = 0.0002***
Commercial Real Estate Price Index	-0.014 (+/- 0.003)
	p = 0.00002***
LN_1-month Treasury Yield	-0.226 (+/- 0.056)
	p = 0.0004***
7-year Treasury Yield	0.602 (+/- 0.091)
	p = 0.00000***
3-month Treasury Yield	0.235 (+/- 0.079)
	p = 0.006***
Observations	40
R^2	0.943
Adjusted R^2	0.932
Residual Std. Error	0.235 (df = 33)
F Statistic	90.551*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

BBB Corporate Yield

REGRESSION FOR BBB CORPORATE YIELD

	Dependent variable (+/- SE):
	BBB corporate yield
Constant	0.719 (+/- 0.396)
	p = 0.079*
Real GDP growth	-0.021 (+/- 0.006)
	p = 0.003***
30-year Treasury Yield	-1.636 (+/- 0.437)
	p = 0.001***
LN_30-year Treasury Yield	11.193 (+/- 1.680)
	p = 0.00000***
LN_7-year Treasury Yield	-6.268 (+/- 0.802)
	p = 0.000***
LN_3-year Treasury Yield	2.099 (+/- 0.274)
	p = 0.000***
6-month Treasury Yield_2	0.065 (+/- 0.010)
	p = 0.00000***
Observations	40
R^2	0.950
Adjusted R^2	0.941
Residual Std. Error	0.273 (df = 33)
F Statistic	104.245*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

Prime Rate

REGRESSION FOR PRIME RATE

	Dependent variable (+/- SE):
	Prime Rate
Constant	1.055 (+/- 0.706)
	p = 0.145
Moody's AAA Curve	-1.503 (+/- 0.250)
	p = 0.00000***
Real GDP growth	0.258 (+/- 0.037)
	p = 0.00000***
Nominal GDP growth	-0.226 (+/- 0.035)
	p = 0.00000***
BBB corporate yield	0.820 (+/- 0.126)
	p = 0.00000***
Home Price Index	0.014 (+/- 0.002)
	p = 0.000***
7-year Treasury Yield	1.447 (+/- 0.214)
	p = 0.00000***
Observations	40
R^2	0.973
Adjusted R^2	0.969
Residual Std. Error	0.341 (df = 33)
F Statistic	201.153*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

US Average Retail Gasoline Price

REGRESSION FOR US AVG RETAIL GASOLINE PRICE (-GAL; ALL GRADES, ALL FORMULATIONS)

	Dependent variable (+/- SE):
	US Avg Retail Gasoline Price ($-gal; all grades, all formulations)
Constant	1.994 (+/- 0.265)
	p = 0.000***
Nominal GDP growth	-0.016 (+/- 0.004)
	p = 0.0005***
CPI Inflation Rate	0.115 (+/- 0.019)
	p = 0.00001***
30-year Mortgate Rate	-0.374 (+/- 0.083)
	p = 0.0001***
Home Price Index	0.005 (+/- 0.001)
	p = 0.00003***
LN_20-year Treasury Yield	0.543 (+/- 0.180)
	p = 0.005***
1-year Treasury Yield	0.255 (+/- 0.059)
	p = 0.0002***
Observations	40
R^2	0.932
Adjusted R^2	0.920
Residual Std. Error	0.175 (df = 33)
F Statistic	75.790*** (df = 6; 33)
Note:	*p<0.1; **p<0.05; ***p<0.01

US Federal Reserve Overnight Lending Rate

REGRESSION FOR US FED RESERVE O-N LOAN RATE

	Dependent variable (+/- SE):
	US Fed Reserve O-N Loan Rate
Constant	-0.316 (+/- 0.662)
	p = 0.637
Moody's AAA Curve	-1.404 (+/- 0.243)
	p = 0.00001***
Real GDP growth	0.132 (+/- 0.035)
	p = 0.001***
Nominal GDP growth	-0.125 (+/- 0.032)
	p = 0.0005***
Unemployment Rate	-0.205 (+/- 0.064)
	p = 0.004***
BBB corporate yield	0.950 (+/- 0.129)
	p = 0.00000***
Dow Total Stock Market Index	0.00004 (+/- 0.00001)
	p = 0.00002***
7-year Treasury Yield	2.168 (+/- 0.348)
	p = 0.00000***
LN_7-year Treasury Yield	-2.059 (+/- 0.748)
	p = 0.010***
Market Volatility Index_2	-0.0003 (+/- 0.0001)
	p = 0.004***
Observations	40
R^2	0.979
Adjusted R^2	0.973
Residual Std. Error	0.314 (df = 30)
F Statistic	158.794*** (df = 9; 30)
Note:	*p<0.1; **p<0.05; ***p<0.01

Dow Jones Total Stock Market Index (end-of-quarter) and S&P 500 (quarterly average)

REGRESSION FOR DOW TOTAL STOCK MARKET INDEX

	Dependent variable (+/- SE):
	Dow Total Stock Market Index
Constant	149,116.700 (+/- 16,641.960)
	p = 0.000***
Moody's BAA Curve	-13,203.800 (+/- 1,362.861)
	p = 0.000***
20-year Treasury Yield	-102,199.500 (+/- 22,916.720)
	p = 0.0002***
10-year Treasury Yield	52,990.230 (+/- 14,808.280)
	p = 0.002***
7-year Treasury Yield	-221,820.400 (+/- 27,726.020)
	p = 0.00000***
LN_7-year Treasury Yield	328,073.900 (+/- 52,279.380)
	p = 0.00001***
5-year Treasury Yield	225,710.500 (+/- 28,182.580)
	p = 0.00000***
LN_5-year Treasury Yield	-323,171.200 (+/- 49,799.410)
	p = 0.00001***
LN_3-year Treasury Yield	72,490.930 (+/- 14,038.770)
	p = 0.00003***
1-year Treasury Yield	-22,070.080 (+/- 4,102.242)
	p = 0.00002***
LN_1-year Treasury Yield	-9,119.955 (+/- 2,329.891)
	p = 0.001***
3-year Treasury Yield_2	6,604.104 (+/- 1,869.564)
	p = 0.002***
5-year Treasury Yield_2	-18,558.170 (+/- 3,357.045)
	p = 0.00002***
3-month Treasury Yield_2	1,351.676 (+/- 288.698)
	p = 0.0001***
20-year Treasury Yield_2	18,507.250 (+/- 2,697.904)
	p = 0.00000***
Market Volatility Index_2	2.693 (+/- 0.534)
	p = 0.00004***
Observations	40

R^2	0.982
Adjusted R^2	0.970
Residual Std. Error	2,045.295 (df = 24)
F Statistic	85.655^{***} (df = 15; 24)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR SP500 STOCK PRICE INDEX

	Dependent variable (+/- SE):
	SP500 Stock Price Index
Constant	6,357.869 (+/- 1,117.021)
	p = 0.00002***
Moody's AAA Curve	-2,609.657 (+/- 410.647)
	p = 0.00001***
Real GDP growth	-59.957 (+/- 11.428)
	p = 0.00003***
Real disposable income growth	-621.835 (+/- 137.309)
	p = 0.0002***
Nominal disposable income growth	611.388 (+/- 130.034)
	p = 0.0002***
Unemployment Rate	327.055 (+/- 83.312)
	p = 0.001***
CPI Inflation Rate	-496.712 (+/- 102.825)
	p = 0.0001***
20-year Treasury Yield	27,574.640 (+/- 2,538.302)
	p = 0.000***
LN_20-year Treasury Yield	-68,230.280 (+/- 8,570.538)
	p = 0.00000***
10-year Treasury Yield	-21,421.040 (+/- 2,473.380)
	p = 0.00000***
LN_10-year Treasury Yield	59,283.530 (+/- 8,413.013)
	p = 0.00000***
LN_7-year Treasury Yield	-18,993.970 (+/- 3,903.644)
	p = 0.0001***
LN_6-month Treasury Yield	3,127.045 (+/- 663.244)
	p = 0.0002***
3-year Treasury Yield	13,637.580 (+/- 1,886.818)
	p = 0.00000***
1-year Treasury Yield	-5,764.515 (+/- 860.109)
	p = 0.00000***
LN_1-year Treasury Yield	-4,040.898 (+/- 884.406)
	p = 0.0002***
3-year Treasury Yield_2	-940.108 (+/- 148.498)
	p = 0.00001***
6-month Treasury Yield_2	366.761 (+/- 58.933)

	p = 0.00001***
Observations	40
R^2	0.974
Adjusted R^2	0.954
Residual Std. Error	264.815 (df = 22)
F Statistic	49.017*** (df = 17; 22)
Note:	*p<0.1; **p<0.05; ***p<0.01

House and Commercial Real Estate Price Indexes

REGRESSION FOR HOME PRICE INDEX

	Dependent variable (+/- SE):
	Home Price Index
Constant	500.536 (+/- 63.315)
	p = 0.00001***
Moody's BAA Curve	-17.041 (+/- 2.819)
	p = 0.0001***
Nominal GDP growth	1.159 (+/- 0.122)
	p = 0.00000***
Nominal disposable income growth	0.226 (+/- 0.053)
	p = 0.002***
Unemployment Rate	18.884 (+/- 1.877)
	p = 0.00000***
CPI Inflation Rate	-8.029 (+/- 0.730)
	p = 0.00000***
30-year Mortgate Rate	16.994 (+/- 1.848)
	p = 0.00000***
Market Volatility Index	3.309 (+/- 0.376)
	p = 0.00001***
LN_Market Volatility Index	-75.502 (+/- 9.839)
	p = 0.00001***
US Avg Retail Gasoline Price ($-gal; all grades, all formulations)	22.782 (+/- 2.717)
	p = 0.00001***
30-year Treasury Yield	-1,559.280 (+/- 266.843)
	p = 0.0001***
LN_30-year Treasury Yield	1,805.186 (+/- 358.398)
	p = 0.0003***
20-year Treasury Yield	2,089.095 (+/- 223.110)
	p = 0.00000***
LN_20-year Treasury Yield	-3,113.283 (+/- 298.617)
	p = 0.00000***
LN_10-year Treasury Yield	758.675 (+/- 77.070)
	p = 0.00000***
1-month Treasury Yield	-86.808 (+/- 5.861)
	p = 0.000***
7-year Treasury Yield	-671.072 (+/- 35.923)
	p = 0.000***

3-month Treasury Yield	92.474 (+/- 7.929)
	p = 0.00000***
LN_5-year Treasury Yield	294.819 (+/- 24.810)
	p = 0.00000***
LN_6-month Treasury Yield	74.677 (+/- 7.496)
	p = 0.00000***
3-year Treasury Yield	198.442 (+/- 17.311)
	p = 0.00000***
1-year Treasury Yield	-85.380 (+/- 8.413)
	p = 0.00000***
LN_1-year Treasury Yield	-126.789 (+/- 10.967)
	p = 0.00000***
7-year Treasury Yield_2	45.449 (+/- 5.566)
	p = 0.00001***
1-month Treasury Yield_2	3.934 (+/- 0.276)
	p = 0.000***
10-year Treasury Yield_2	-24.707 (+/- 5.103)
	p = 0.0005***
20-year Treasury Yield_2	-138.795 (+/- 19.413)
	p = 0.00002***
30-year Treasury Yield_2	132.164 (+/- 21.928)
	p = 0.0001***
Observations	40
R^2	1.000
Adjusted R^2	0.999
Residual Std. Error	1.699 (df = 12)
F Statistic	1,404.308*** (df = 27; 12)
Note:	*p<0.1; **p<0.05; ***p<0.01

REGRESSION FOR COMMERCIAL REAL ESTATE PRICE INDEX

	Dependent variable (+/- SE):
	Commercial Real Estate Price Index
Constant	364.812 (+/- 7.653)
	p = 0.000***
30-year Treasury Yield	-201.428 (+/- 11.382)
	p = 0.000***
20-year Treasury Yield	180.590 (+/- 11.128)
	p = 0.000***
3-month Treasury Yield_2	1.164 (+/- 0.320)
	p = 0.001***
Observations	40
R^2	0.933
Adjusted R^2	0.928
Residual Std. Error	9.139 (df = 36)
F Statistic	167.394*** (df = 3; 36)
Note:	*p<0.1; **p<0.05; ***p<0.01

Market Volatility Index

REGRESSION FOR MARKET VOLATILITY INDEX

	Dependent variable (+/- SE):
	Market Volatility Index
Constant	-92.380 (+/- 20.207)
	p = 0.0001***
Unemployment Rate	-3.890 (+/- 1.211)
	p = 0.004***
BBB corporate yield	16.024 (+/- 3.143)
	p = 0.00002***
Home Price Index	0.217 (+/- 0.053)
	p = 0.0003***
5-year Treasury Yield	38.591 (+/- 8.424)
	p = 0.0001***
LN_3-year Treasury Yield	-45.324 (+/- 7.204)
	p = 0.00000***
6-month Treasury Yield_2	-1.990 (+/- 0.422)
	p = 0.00005***
20-year Treasury Yield_2	-3.596 (+/- 0.851)
	p = 0.0002***
Observations	40
R^2	0.733
Adjusted R^2	0.674
Residual Std. Error	7.313 (df = 32)
F Statistic	12.518*** (df = 7; 32)
Note:	*p<0.1; **p<0.05; ***p<0.01

Appendix A: Data Sources

The following table lists the attributes provided by Capitalytics as part of its macro-economic forecast service. The sources for data that are defined by the document "2025 Stress Test Scenarios" (found at https://www.federalreserve.gov/publications/files/2025-stress-test-scenarios-20250205.pdf) are listed. Please note that shaded attributes are not discussed within this report.

Table 16: Data Values and Referenced Sources

Attribute	Referenced Source[151]
Real GDP growth	Bureau of Economic Analysis (NIPA table 1.1.6, line 1)
Nominal GDP growth	Bureau of Economic Analysis (NIPA table 1.1.5, line 1)
Real disposable income growth	Bureau of Economic Analysis (NIPA table 2.1, line 27, and NIPA table 1.1.4, line 2)
Nominal disposable income growth	Bureau of Economic Analysis (NIPA table 2.1, line 27)
Unemployment rate	Bureau of Labor Statistics (series LNS14000000)
CPI inflation rate	Bureau of Labor Statistics (series CUSR0000SA0)
3-month Treasury yield	Quarterly average of 3-month Treasury bill secondary market rate on a discount basis, H.15 Release, Selected Interest Rates, Federal Reserve Board (series RIFSGFSM03_N.B)
5-year Treasury yield	Quarterly average of the yield on 5-year U.S. Treasury bonds, constructed for the FRB/U.S. model by Federal Reserve staff based on the Svensson smoothed term structure model; see Lars E. O. Svensson (1995), "Estimating Forward Interest Rates with the Extended Nelson-Siegel Method," Quarterly Review, no. 3, Sveriges Riksbank, pp. 13–26
10-year Treasury yield	Quarterly average of the yield on 10-year U.S. Treasury bonds, constructed for the FRB/U.S. model by Federal Reserve staff based on the Svensson smoothed term structure model; see Lars E. O. Svensson (1995), "Estimating Forward Interest Rates with the Extended Nelson-Siegel Method," Quarterly Review, no. 3, Sveriges Riksbank, pp. 13–26
BBB corporate yield	Ice Data Indices, LLC, ICE BofA BBB US Corporate Index Effective Yield [BAMLC0A4CBBBEY], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBBEY[152]

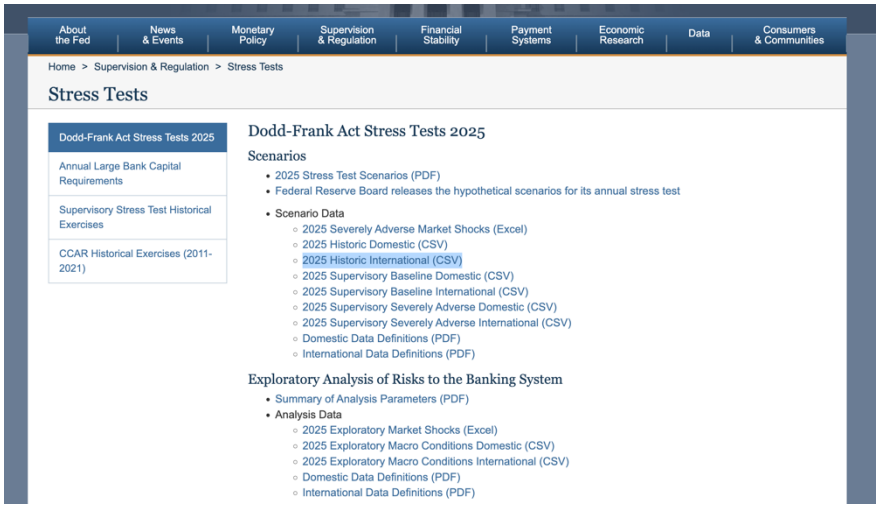
[151] Per https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20190213a1.pdf

[152] Capitalytics does not have license to use the data referenced in https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20210212a1.pdf, specifically "Quarterly average of ICE BofAML U.S. Corporate 7-10 Year Yield-to-Maturity Index, ICE Data Indices, LLC, used with permission. (C4A4 series.)", but we use the referenced series as a proxy.

Mortgage rate	Quarterly average of weekly series for the interest rate of a conventional, conforming, 30-year fixed-rate mortgage, obtained from the Primary Mortgage Market Survey of the Federal Home Loan Mortgage Corporation.
Prime rate	Quarterly average of monthly series, H.15 Release, Selected Interest Rates, Federal Reserve Board (series RIFSPBLP_N.M).
Dow Jones Total Stock Market Index (end-of-qtr value)	Dow-Jones
House Price Index	Price Index for Owner-Occupied Real Estate, CoreLogic National, Z.1 Release (Financial Accounts of the United States), Federal Reserve Board (series FL075035243.Q divided by 1000).
Commercial Real Estate Price Index	Commercial Real Estate Price Index, Z.1 Release (Financial Accounts of the United States), Federal Reserve Board (series FL075035503.Q divided by 1000).
Market Volatility Index (VIX)	VIX converted to quarterly frequency using the maximum close-of-day value in any quarter, Chicago Board Options Exchange.
Euro Area Real GDP Growth	Percent change in real gross domestic product at an annualized rate, staff calculations based on Statistical Office of the European Communities via Haver, extended back using ECB Area Wide Model dataset (ECB Working Paper series no. 42).
Euro Area Inflation	Percent change in the quarterly average of the harmonized index of consumer prices 16 Federal Reserve Supervisory Scenarios at an annualized rate, staff calculations based on Statistical Office of the European Communities via Haver.
Euro Area Bilateral Dollar Exchange Rate (USD/Euro)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
Developing Asia Real GDP Growth	Percent change in real gross domestic product at an annualized rate, staff calculations based on Bank of Korea via Haver; Chinese National Bureau of Statistics via CEIC; Indian Central Statistical Organization via CEIC; Census and Statistics Department of Hong Kong via CEIC; and Taiwan Directorate-General of Budget, Accounting, and Statistics via CEIC.
Developing Asia Inflation	Percent change in the quarterly average of the consumer price index, or local equivalent, at an annualized rate, staff calculations based on Chinese National Bureau of Statistics via CEIC; Indian Ministry of Statistics and Programme Implementation via Haver; Labour Bureau of India via CEIC; National Statistical Office of Korea via CEIC; Census and Statistic Department of Hong Kong via CEIC; and Taiwan Directorate General of Budget, Accounting, and Statistics via CEIC.

Developing Asia bilateral dollar exchange rate (F/USD, index)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
Japan Real GDP Growth	Percent change in gross domestic product at an annualized rate, Cabinet Office via Haver.
Japan Inflation	Percent change in the quarterly average of the consumer price index at an annualized rate, staff calculations based on Ministry of Internal Affairs and Communications via Haver.
Japan Bilateral Dollar Exchange Rate (Yen/USD)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
UK Real GDP Growth	Percent change in gross domestic product at an annualized rate, Office for National Statistics via Haver.
UK Inflation	Percent change in the quarterly average of the consumer price index at an annualized rate, staff calculations based on Office for National Statistics via Haver.
UK Bilateral Dollar Exchange Rate (USD/Pound)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.

The above dataset from the Federal Reserve can be downloaded manually or automatically. Manual downloads are available at https://www.federalreserve.gov/supervisionreg/files/2025-Table_1A_Historic_Domestic.csv and https://www.federalreserve.gov/supervisionreg/files/2025-Table_1B_Historic_International.csv (shown below, as of March 2025) by clicking the links marked "2025 Historical Domestic (CSV)" and "2025 Historical International (CSV)"[153].



Since the CCAR dataset is only released annually (through 4Q2024 as of this writing), and Capitalytics provides quarterly updates to its forecasts, the CCAR dataset is supplemented by the data sources shown below on a quarterly basis.

[153] Again, due to the requirements of this client, international data elements are not being discussed in this document.

Table 17: Supplementary Data Sources for Data Attributes

Attribute	Supplementary Data Source
Real GDP growth	Bureau of Economic Analysis (NIPA table 1.1.6, line 1)
Nominal GDP growth	Bureau of Economic Analysis (NIPA table 1.1.5, line 1)
Real disposable income growth	Bureau of Economic Analysis (NIPA table 2.1, line 27, and NIPA table 1.1.4, line 2)
Nominal disposable income growth	Bureau of Economic Analysis (NIPA table 2.1, line 27)
Unemployment rate	Bureau of Labor Statistics (series LNS14000000)
CPI inflation rate	Bureau of Labor Statistics (series CUSR0000SA0)
3-month Treasury yield	Quarterly average of 3-month Treasury bill secondary market rate on a discount basis, H.15 Release
5-year Treasury yield	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/GS5), with "Quarterly" frequency and "Average" aggregation method
10-year Treasury yield	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/GS10), with "Quarterly" frequency and "Average" aggregation method
BBB corporate yield	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/BAMLC0A4CBBBEY), with "Quarterly" frequency and "Average" aggregation method
Mortgage rate	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/MORTGAGE30US), with "Quarterly" frequency and "Average" aggregation method
Prime rate	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/MPRIME), with "Quarterly" frequency and "Average" aggregation method
Dow Jones Total Stock Market Index (end-of-qtr value)	Dow-Jones as provided by the Wall Street Journal (https://quotes.wsj.com/index/DWCF/advanced-chart)
House Price Index	https://data.nasdaq.com/data/FED/FL075035243_Q-interest-rates-and-price-indexes-owneroccupied-real-estate-corelogic-national-sa-quarterly-levels-nsa
Commercial Real Estate Price Index	https://data.nasdaq.com/data/FED/FL075035503_Q-interest-rates-and-price-indexes-commercial-real-estate-price-index-quarterly-levels-nsa
Market Volatility Index (VIX)	Federal Reserve Economic Research website (https://fred.stlouisfed.org/series/VIXCLS), with "Quarterly" frequency and "Average" aggregation method
Euro Area Real GDP Growth	Quarterly series for "European Union GDP Annual Growth Rate" per tradingeconomics.com
Euro Area Inflation	Quarterly average of monthly series for "European Union Inflation Rate" per tradingeconomics.com

Euro Area Bilateral Dollar Exchange Rate (USD/Euro)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
Developing Asia Real GDP Growth	The nominal GDP-weighted aggregate of the Real GDP growth for China, India, South Korea, Hong Kong Special Administrative Region, and Taiwan per OECD
Developing Asia Inflation	The nominal GDP-weighted aggregate of the inflation rate for China, India, South Korea, Hong Kong Special Administrative Region, and Taiwan per OECD
Developing Asia bilateral dollar exchange rate (F/USD, index)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
Japan Real GDP Growth	Quarterly average of monthly series for "Japan GDP Growth Rate" per tradingeconomics.com
Japan Inflation	Quarterly average of monthly series for "Japan Inflation Rate" per tradingeconomics.com
Japan Bilateral Dollar Exchange Rate (Yen/USD)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.
UK Real GDP Growth	Quarterly average of monthly series for "United Kingdom GDP Growth Rate" per tradingeconomics.com
UK Inflation	Quarterly average of monthly series for "United Kingdom Inflation Rate" per tradingeconomics.com
UK Bilateral Dollar Exchange Rate (USD/Pound)	End-of-quarter rates from the H.10 Release, Foreign Exchange Rates, Federal Reserve Board.

While all data that is required for the Annual Stress Tests is available from at https://www.federalreserve.gov/supervisionreg/files/2024-Table_2A_Historic_Domestic.csv and https://www.federalreserve.gov/supervisionreg/files/2024-Table_2B_Historic_International.csv, Capitalytics provides 13 additional metrics per the information in the following table. These values are available from the point at which they are collected (which varies from metric to metric) through (and including) 3Q2024.

Table 17: Supplementary Data Attributes and Sources

Attribute	Capitalytics' Source
1-month Treasury yield	https://fred.stlouisfed.org/series/dgs1mo
6-month Treasury yield	https://fred.stlouisfed.org/series/dgs6mo
1-year Treasury yield	https://fred.stlouisfed.org/series/dgs1
3-year Treasury yield	https://fred.stlouisfed.org/series/dgs3
7-year Treasury yield	https://fred.stlouisfed.org/series/dgs7
20-year Treasury yield	https://fred.stlouisfed.org/series/dgs20
30-year Treasury yield	https://fred.stlouisfed.org/series/dgs30
US Average Retail Gasoline Price ($/gal; all grades, all formulations)	https://fred.stlouisfed.org/series/gasallm
S&P 500 Stock Price Index	https://fred.stlouisfed.org/series/sp500

Primary Credit	https://fred.stlouisfed.org/series/FEDFUNDS
Moody's AAA Rate	https://fred.stlouisfed.org/series/aaa
Moody's BAA Rate	https://fred.stlouisfed.org/series/baa
Dow Jones Total Industrial Average	https://fred.stlouisfed.org/series/djia

Appendix B: Methodologies

Capitalytics uses non-structured macroeconomic forecasting techniques in order to prepare its clients for what trends and relationships drive certain metrics, and what values those metrics may take on in the coming months.

Section I: General Forecasting Methodology

Generally, the most effective overall forecasting techniques have been found to be a hybridization of multiple other techniques. Capitalytics uses several forecasting schemes, and aggregates the results, as part of its analysis methodology. This section describes the process that is executed for generating these results.

For each metric, four distinct forecasts are produced.

1. The first forecast uses the full quarterly history of the metric as an input to an additive exponential smoothing representation. The process that is executed is that provided by R's[154] "forecast" package[155]; specifically, the "ets" function (see p.39 of https://cran.r-project.org/web/packages/forecast/forecast.pdf)[156] is designed to automatically determine the best fitting representation out of the "Generic 'ETS' Methodology" (discussed later in this section), including optimal parameters thereto, given a sequence of values. In our work, we have restricted our study to only "additive" forms (i.e., we set "`additive.only`=TRUE" in our calls), and our optimization criteria is set to the mean of absolute residuals (i.e., "`opt.crit`=`mae`"). Therefore, calls to generate our estimates through this procedure look something like the following command, where "s" is an appropriately populated array, vector, time series, or similar object.

```
> m<–ets(s, model='ZZZ', opt.crit=c('mae'), additive.only=TRUE)
```

   The results of this call are shown above each dataset, including the representation type returned (as described later this section), the initial values that are used by the software, the optimal smoothing parameters estimated, and the *n+1*st forecasted value given the first *n* values of the metric's sequence (the "fitted" values)[157], and the determined parameters. While fitting forecasts to previous values,

   - "forecast error" is defined as being actual values less forecasted values,
   - "% error" is defined as forecast error divided by actual value, and

[154] As of this writing, v.4.1.2 of the "R" language is available at https://cran.r-project.org/.

[155] As of this writing, v.8.16 of the forecast package is available at https://CRAN.R-project.org/package=forecast.

[156] It should be noted that Microsoft's Excel software includes a FORECAST.ETS function which is documented as potentially producing comparable results; however, we have not been able to re-create its output independently, and, given the documentation, flexibility, and source availability of the R packages, Capitalytics has decided that it is a preferable option at this time.

[157] While this procedure does generate fitted values for intermediate samples within a sequence -- and allow for generating a forecasted set of samples to extend a sequence – according to the identified parameter set, it does not directly provide for determining the optimal parameter set of a sub-sequence. Capitalytics is currently codifying the process herein so that we may prescribe a "most likely" long term representation for each forecast, and determine the likely effects of errors in the forecasts by estimating the "recent term" values of dy/dx_i (where y is the metric being estimated and x_i is each of the parameters within the representation) and then compensating for recent quantified errors. We can also consider how "finite" a window to account for in building a set of parameters; these representations are theoretically using all history in building a forecast, but the values for alpha, beta, etc. implicitly give an indication of how much history of a metric is truly impacting a specific value.

- "score" is defined as mean absolute forecast error over an appropriate range (generally the duration of the collected past values, less the first two to four years of collected values)[158].

2. The second forecast uses the differences between successive quarterly values in order to forecast the future quarterly differences. It should be noted that these sequences are (obviously) one data-point shorter than those in the preceding procedure. These values are forecasted using the same procedure as described in the first section, with forecasted values for the actual metric being built using the last known value for the metric and forecasts of incremental changes to the metric provided.

   An edited example for loading the SP500 end-of quarter values, and the differences between successive quarterly values, is shown below.

```
> sp<-c(130.659129, 1250.520109, 998.4076848, 812.047, 799.5264066, 927.5045326,
1041.372826, … )
> sp_ts<-ts(sp,freq=4,end=c(2017,4))
> sp_ts
   Qtr1      Qtr2      Qtr3      Qtr4
2008           130.6591 1250.5201  998.4077
2009  812.0470  799.5264  927.5045 1041.3728
…

> m<-ets(sp_ts,model='ZZZ',opt.crit=c('mae'),additive.only=TRUE)
> dsp_ts<-diff(sp_ts)
> dsp_ts
    Qtr1        Qtr2        Qtr3        Qtr4
2008                    1119.860980 -252.112424
2009 -186.360685  -12.520593  127.978126  113.868293
…

> m<-ets(dsp_ts,model='ZZZ',opt.crit=c('mae'),additive.only=TRUE
```

3. The third forecast uses the sequence of numbers from the second forecast, but partitions the dataset based on the quarter in which they are incurred. Assuming that the differences between quarters are associated with the ending points of each quarter (i.e., the difference between third and fourth quarter values are associated with a date of December 31st), four sequences of numbers are now created, with annual forecasts now being produced for each sequence using the same procedures as previously outlined. The final sequence appropriately interleaves the forecasted data-points.

4. The fourth forecast builds three sequences of values based the history of the metric to an observed point:

   - the slope of the "best fitting" line (based on minimizing the total absolute error) using the immediately preceding 2 years of values[159];
   - the same slope using the immediately preceding 4 years of values; and,
   - the same slope using the immediately preceding 8 years of values.

   While two years of data would provide for a relatively responsive change in aggregate values to be reflected given a change in the economic conditions, eight years of data (a not unreasonable

[158] It bears noting that a lower value for the "score" indicates better accuracy of an algorithm.
[159] The value for this slope is calculated using Microsoft Excel's SLOPE function, with the first argument being the appropriate number of preceding values for the metric, and the second argument being the same number of corresponding "end-of-quarter" dates.

estimate for an "economic cycle") would allow for a much more slowly moving change in average window for a counterbalance.
Using these datasets independently, we are able to use our previous procedure to generate forecasts for each slope, and then average the results on a quarterly basis. Multiplying the average slope by the duration of the following quarter (in days) provides an estimate for the change in the metric's value during that following quarter, just as in our second forecast. Obviously, this technique requires at least eight years of data to pass before being able to produce any data. However, in order to err on the side of conservatism, we generally allow a sequence to "mature" for two to four years before believing that its initial transience has become less significant and its results are trustworthy. If a dataset does not have enough data to complete one of these analyses, the analysis is dropped. In other words, if the metric does not have +/-11 years of data available, the 8-year slopes cannot be reliably calculated, and the average slope is only based on the 2- & 4-year slopes[160].

5. In some cases, we may find variables with extremely tight cross-connections that can be justified as part of their nature (treasury bill yield rates, for example, with a magnitude or correlation greater than ~0.95). In these cases, we are able to additionally enhance our forecast by building a forecast that expresses one variable (the "dependent" variable, *y(t)*) in terms of another (the "independent" variable, *x(t)*) with a coefficient of determination (R^2), such that

$$y(t) = m(t) * x(t) + b(t) .$$

Notice that the "slope" and "intercept" terms in this expression are time varying expressions that are re-evaluated with each data-point, not simply constants.

By averaging the results of these distinct forecasts in order to provide an aggregate forecast, the error for which can be characterized and measured, Capitalytics aims to provide a robust dataset that can be used for future business decisions.
It was stated earlier that Capitalytics uses each metric's complete history in order to generate a matching representation and forecast. It should be recognized that we also perform the same analyses for periods starting no more than 100, 80, 60, and 40 quarters prior to the forecasted period. However, we have found the results of all of these analyses are more reactionary and less coherent than that already presented within this report.

Section II: Exponentially Smoothed State Space Representations & Generic "ETS" Methodology

Exponential smoothing was proposed in the late 1950s (Brown 1959, Holt 1957 and Winters 1960 are key pioneering works) and has motivated some of the most successful forecasting methods. Forecasts produced using exponential smoothing methods are weighted averages of past observations, with the weights decaying exponentially as the observations get older. In other words, the more recent the observation the higher the associated weight. (See the following equation for one example of this type of equation which requires $0 \le \alpha \le 1$, and estimates future values of $\hat{y}$ given a history of values denoted as y_t. The ε_{T+1} term denotes an error term, the *residual*, which determines the value of the forecasting function.) This framework generates reliable forecasts quickly and for a wide spectrum of time series.

$$\hat{y}_{T+1|T} = \alpha y_T + \alpha(1-\alpha)y_{T-1} + \alpha(1-\alpha)^2 y_{T-2} + \cdots + \varepsilon_{T+1}$$

[160] See the SP500 metric's analysis.

In this study, the relevance of quarterly samples more than 3 years old is eliminated by setting the number of terms in this type of expression to no more than 13.
The challenge with these forecasting techniques is to estimate the value of α such that some criteria is optimized, e.g., minimizing the sum of squared errors (SSE), across all values of a set of historical values.
There are other forms of exponential smoothing methods that may account for any combination of forecasting *levels* (as in the Theta method), *trends* (for which a metric may, for instance, be growing or lessening according to a linear or higher order function), and *seasonality* (for which a metric may have engrained "cycles" on, e.g., a monthly, quarterly, or annual basis).

By considering variations in the combination of the trend and seasonal components, fifteen exponential smoothing methods are possible. Each method is labelled by a pair of letters (T,S) defining the type of 'Trend' and 'Seasonal' components. For example, (A,M) is the method with an additive trend and multiplicative seasonality; (M,N) is the method with multiplicative trend and no seasonality; and so on.
Per Section 7.6 of Hyndman & Athanasopoulos, some of these methods are well known per the following table.

Table 18: Mathematical Methods Associated with Trend & Seasonal Components

Trend & Seasonal Components	Method
(N,N)	simple exponential smoothing
(A,N)	Holts linear method
(M,N)	Exponential trend method
(A_d,N)	additive damped trend method
(M_d,N)	multiplicative damped trend method
(A,A)	additive Holt-Winters method
(A,M)	multiplicative Holt-Winters method
(A_d,M)	Holt-Winters damped method

Additionally, the following table (again from Section 7.6 of Hyndman & Athanasopoulos) gives the recursive formulae for applying all possible fifteen exponential smoothing methods. Each cell includes the forecast equation for generating h-step-ahead forecasts and the smoothing equations for applying the method. By recursively applying the appropriate expressions to generate consecutive forecasts, this framework can be an extremely powerful tool.

Section III: Regression Construction

Capitalytics also generates a regression to estimate future values of the variables that we track in terms of current-day values. By using R's "lm" function, we estimate the next quarter's values for each variable in terms of the preceding set of variables' values. These regressions are built using the immediately preceding 57 sets of variables' values.

Each output variable is considered in turn as the response variable, with all other variables as possibilities for the control (independent) variables *excluding* any variables that have an 80% correlation with the response variable. Successive linear regressions are built; if any of the control variables' p-

values exceed 5%, or if the model's p-value exceeds 5% and the number of considered control variables is greater than one, the most offensive control variable is dropped, and the regression is re-run.

Trend	Seasonal N	Seasonal A	Seasonal M
N	$\hat{y}_{t+h\|t} = \ell_t$ $\ell_t = \alpha y_t + (1-\alpha)\ell_{t-1}$	$\hat{y}_{t+h\|t} = \ell_t + s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t - s_{t-m}) + (1-\alpha)\ell_{t-1}$ $s_t = \gamma(y_t - \ell_{t-1}) + (1-\gamma)s_{t-m}$	$\hat{y}_{t+h\|t} = \ell_t s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t / s_{t-m}) + (1-\alpha)\ell_{t-1}$ $s_t = \gamma(y_t / \ell_{t-1}) + (1-\gamma)s_{t-m}$
A	$\hat{y}_{t+h\|t} = \ell_t + hb_t$ $\ell_t = \alpha y_t + (1-\alpha)(\ell_{t-1} + b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)b_{t-1}$	$\hat{y}_{t+h\|t} = \ell_t + hb_t + s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t - s_{t-m}) + (1-\alpha)(\ell_{t-1} + b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)b_{t-1}$ $s_t = \gamma(y_t - \ell_{t-1} - b_{t-1}) + (1-\gamma)s_{t-m}$	$\hat{y}_{t+h\|t} = (\ell_t + hb_t)s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t / s_{t-m}) + (1-\alpha)(\ell_{t-1} + b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)b_{t-1}$ $s_t = \gamma(y_t / (\ell_{t-1} + b_{t-1})) + (1-\gamma)s_{t-m}$
A_d	$\hat{y}_{t+h\|t} = \ell_t + \phi_h b_t$ $\ell_t = \alpha y_t + (1-\alpha)(\ell_{t-1} + \phi b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)\phi b_{t-1}$	$\hat{y}_{t+h\|t} = \ell_t + \phi_h b_t + s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t - s_{t-m}) + (1-\alpha)(\ell_{t-1} + \phi b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)\phi b_{t-1}$ $s_t = \gamma(y_t - \ell_{t-1} - \phi b_{t-1}) + (1-\gamma)s_{t-m}$	$\hat{y}_{t+h\|t} = (\ell_t + \phi_h b_t)s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t / s_{t-m}) + (1-\alpha)(\ell_{t-1} + \phi b_{t-1})$ $b_t = \beta^*(\ell_t - \ell_{t-1}) + (1-\beta^*)\phi b_{t-1}$ $s_t = \gamma(y_t / (\ell_{t-1} + \phi b_{t-1})) + (1-\gamma)s_{t-m}$
M	$\hat{y}_{t+h\|t} = \ell_t b_t^h$ $\ell_t = \alpha y_t + (1-\alpha)\ell_{t-1}b_{t-1}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}$	$\hat{y}_{t+h\|t} = \ell_t b_t^h + s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t - s_{t-m}) + (1-\alpha)\ell_{t-1}b_{t-1}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}$ $s_t = \gamma(y_t - \ell_{t-1}b_{t-1}) + (1-\gamma)s_{t-m}$	$\hat{y}_{t+h\|t} = \ell_t b_t^h s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t / s_{t-m}) + (1-\alpha)\ell_{t-1}b_{t-1}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}$ $s_t = \gamma(y_t / (\ell_{t-1}b_{t-1})) + (1-\gamma)s_{t-m}$
M_d	$\hat{y}_{t+h\|t} = \ell_t b_t^{\phi_h}$ $\ell_t = \alpha y_t + (1-\alpha)\ell_{t-1}b_{t-1}^{\phi}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}^{\phi}$	$\hat{y}_{t+h\|t} = \ell_t b_t^{\phi_h} + s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t - s_{t-m}) + (1-\alpha)\ell_{t-1}b_{t-1}^{\phi}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}^{\phi}$ $s_t = \gamma(y_t - \ell_{t-1}b_{t-1}^{\phi}) + (1-\gamma)s_{t-m}$	$\hat{y}_{t+h\|t} = \ell_t b_t^{\phi_h} s_{t-m+h_m^+}$ $\ell_t = \alpha(y_t / s_{t-m}) + (1-\alpha)\ell_{t-1}b_{t-1}^{\phi}$ $b_t = \beta^*(\ell_t / \ell_{t-1}) + (1-\beta^*)b_{t-1}^{\phi}$ $s_t = \gamma(y_t / (\ell_{t-1}b_{t-1}^{\phi})) + (1-\gamma)s_{t-m}$

Appendix C: Variable Correlations

The following table shows the correlation factors between all of the listed variables for which the absolute value of the correlation is greater than 0.6, indicating a noteworthy degree of correlation. As is discussed in Appendix B of this report, (absolute) correlations greater than 0.95 warrant further investigation as the relationship between variables may be useful for our research.

Table 1: Correlation Factors found as of 1Q2025

Variable 1	Variable 2	Correlation
S&P 500 Stock Price Index	Cost of Federal Funds	0.641056
S&P 500 Stock Price Index	US 30-year Fixed Interest Mortgage Rate	0.615402
S&P 500 Stock Price Index	Prime Rate	0.653396
S&P 500 Stock Price Index	**Dow-Jones Total Stock Market Index**	**0.974057**
S&P 500 Stock Price Index	US Nat'l Residential Home Price Index	0.940573
S&P 500 Stock Price Index	US Nat'l Commercial Real Estate Index	0.730072
S&P 500 Stock Price Index	Average Retail Gasoline Price (all grades)	0.667462
S&P 500 Stock Price Index	20-year Treasury Yield	0.607611
S&P 500 Stock Price Index	1-month Treasury Yield	0.649707
S&P 500 Stock Price Index	3-month Treasury Yield	0.646601
S&P 500 Stock Price Index	6-month Treasury Yield	0.626983
S&P 500 Stock Price Index	1-year Treasury Yield	0.608668
Cost of Federal Funds	Moody's AAA Yield	0.757022
Cost of Federal Funds	Moody's BAA Yield	0.697151
Cost of Federal Funds	BofA BBB Corporate Yield	0.73047
Cost of Federal Funds	US 30-year Fixed Interest Mortgage Rate	0.869209
Cost of Federal Funds	**Prime Rate**	**0.996316**
Cost of Federal Funds	10-year Treasury Yield	0.824637
Cost of Federal Funds	**1-month Treasury Yield**	**0.991298**
Cost of Federal Funds	7-year Treasury Yield	0.779326
Cost of Federal Funds	**3-month Treasury Yield**	**0.995654**
Cost of Federal Funds	5-year Treasury Yield	0.902928
Cost of Federal Funds	**6-month Treasury Yield**	**0.989098**
Cost of Federal Funds	3-year Treasury Yield	0.923999
Cost of Federal Funds	**1-year Treasury Yield**	**0.979994**
Moody's AAA Yield	**Moody's BAA Yield**	**0.979001**
Moody's AAA Yield	BofA BBB Corporate Yield	0.947773
Moody's AAA Yield	**US 30-year Fixed Interest Mortgage Rate**	**0.958691**
Moody's AAA Yield	Prime Rate	0.731709
Moody's AAA Yield	Dow-Jones Total Stock Market Index	-0.648678
Moody's AAA Yield	US Nat'l Residential Home Price Index	-0.708694
Moody's AAA Yield	US Nat'l Commercial Real Estate Index	-0.814384
Moody's AAA Yield	Average Retail Gasoline Price (all grades)	-0.695178
Moody's AAA Yield	**30-year Treasury Yield**	**0.968276**
Moody's AAA Yield	**20-year Treasury Yield**	**0.967605**
Moody's AAA Yield	**10-year Treasury Yield**	**0.982777**
Moody's AAA Yield	7-year Treasury Yield	0.858075
Moody's AAA Yield	3-month Treasury Yield	0.751205
Moody's AAA Yield	5-year Treasury Yield	0.935945
Moody's AAA Yield	3-year Treasury Yield	0.630558
Moody's BAA Yield	**BofA BBB Corporate Yield**	**0.983334**
Moody's BAA Yield	US 30-year Fixed Interest Mortgage Rate	0.929381
Moody's BAA Yield	Prime Rate	0.67098
Moody's BAA Yield	Dow-Jones Total Stock Market Index	-0.676142
Moody's BAA Yield	US Nat'l Residential Home Price Index	-0.708258
Moody's BAA Yield	US Nat'l Commercial Real Estate Index	-0.797007
Moody's BAA Yield	Average Retail Gasoline Price (all grades)	-0.664782
Moody's BAA Yield	30-year Treasury Yield	0.865248
Moody's BAA Yield	20-year Treasury Yield	0.872286
Moody's BAA Yield	10-year Treasury Yield	0.945087

Moody's BAA Yield	7-year Treasury Yield	0.733613
Moody's BAA Yield	3-month Treasury Yield	0.689167
Moody's BAA Yield	5-year Treasury Yield	0.88379
Real GDP Growth Rate	**Nominal GDP Growth Rate**	**0.958536**
Real Disposable Income Growth Rate	**Nominal Disposable Income Growth Rate**	**0.972976**
US Nat'l Unemployment Rate (annualized)	6-month Treasury Yield	-0.610761
US Nat'l Unemployment Rate (annualized)	1-year Treasury Yield	-0.620191
BofA BBB Corporate Yield	US 30-year Fixed Interest Mortgage Rate	0.92875
BofA BBB Corporate Yield	Prime Rate	0.706786
BofA BBB Corporate Yield	US Nat'l Residential Home Price Index	-0.622667
BofA BBB Corporate Yield	US Nat'l Commercial Real Estate Index	-0.700196
BofA BBB Corporate Yield	30-year Treasury Yield	0.771912
BofA BBB Corporate Yield	20-year Treasury Yield	0.807457
BofA BBB Corporate Yield	10-year Treasury Yield	0.924567
BofA BBB Corporate Yield	7-year Treasury Yield	0.731151
BofA BBB Corporate Yield	3-month Treasury Yield	0.724127
BofA BBB Corporate Yield	5-year Treasury Yield	0.882445
US 30-year Fixed Interest Mortgage Rate	Prime Rate	0.85064
US 30-year Fixed Interest Mortgage Rate	US Nat'l Commercial Real Estate Index	-0.645303
US 30-year Fixed Interest Mortgage Rate	30-year Treasury Yield	0.874989
US 30-year Fixed Interest Mortgage Rate	20-year Treasury Yield	0.920079
US 30-year Fixed Interest Mortgage Rate	**10-year Treasury Yield**	**0.981201**
US 30-year Fixed Interest Mortgage Rate	1-month Treasury Yield	0.756079
US 30-year Fixed Interest Mortgage Rate	**7-year Treasury Yield**	**0.957162**
US 30-year Fixed Interest Mortgage Rate	3-month Treasury Yield	0.873398
US 30-year Fixed Interest Mortgage Rate	**5-year Treasury Yield**	**0.977766**
US 30-year Fixed Interest Mortgage Rate	6-month Treasury Yield	0.777208
US 30-year Fixed Interest Mortgage Rate	3-year Treasury Yield	0.885173
US 30-year Fixed Interest Mortgage Rate	1-year Treasury Yield	0.799495
Prime Rate	10-year Treasury Yield	0.801228
Prime Rate	**1-month Treasury Yield**	**0.991242**
Prime Rate	7-year Treasury Yield	0.765052
Prime Rate	**3-month Treasury Yield**	**0.992561**
Prime Rate	5-year Treasury Yield	0.884388
Prime Rate	**6-month Treasury Yield**	**0.98799**
Prime Rate	3-year Treasury Yield	0.914766
Prime Rate	**1-year Treasury Yield**	**0.977066**
Dow-Jones Total Stock Market Index	US Nat'l Residential Home Price Index	0.938347
Dow-Jones Total Stock Market Index	US Nat'l Commercial Real Estate Index	0.884896
Dow-Jones Total Stock Market Index	Average Retail Gasoline Price (all grades)	0.601803
US Nat'l Residential Home Price Index	**US Nat'l Commercial Real Estate Index**	**0.95201**
US Nat'l Residential Home Price Index	Average Retail Gasoline Price (all grades)	0.710835
US Nat'l Residential Home Price Index	10-year Treasury Yield	-0.623737
US Nat'l Commercial Real Estate Index	Average Retail Gasoline Price (all grades)	0.753542
US Nat'l Commercial Real Estate Index	10-year Treasury Yield	-0.744531
US Nat'l Commercial Real Estate Index	5-year Treasury Yield	-0.638812
Average Retail Gasoline Price (all grades)	10-year Treasury Yield	-0.664612
Average Retail Gasoline Price (all grades)	5-year Treasury Yield	-0.630208
30-year Treasury Yield	**20-year Treasury Yield**	**0.990467**
30-year Treasury Yield	**10-year Treasury Yield**	**0.957168**
30-year Treasury Yield	7-year Treasury Yield	0.887993
30-year Treasury Yield	5-year Treasury Yield	0.802078
30-year Treasury Yield	3-year Treasury Yield	0.667332
20-year Treasury Yield	**10-year Treasury Yield**	**0.983231**
20-year Treasury Yield	7-year Treasury Yield	0.928658
20-year Treasury Yield	5-year Treasury Yield	0.857405
20-year Treasury Yield	3-year Treasury Yield	0.736158
10-year Treasury Yield	1-month Treasury Yield	0.641161
10-year Treasury Yield	**7-year Treasury Yield**	**0.976197**
10-year Treasury Yield	3-month Treasury Yield	0.825733
10-year Treasury Yield	**5-year Treasury Yield**	**0.978625**
10-year Treasury Yield	6-month Treasury Yield	0.665063
10-year Treasury Yield	3-year Treasury Yield	0.832124

10-year Treasury Yield	1-year Treasury Yield	0.696007
1-month Treasury Yield	7-year Treasury Yield	0.761626
1-month Treasury Yield	**3-month Treasury Yield**	**0.995738**
1-month Treasury Yield	5-year Treasury Yield	0.835236
1-month Treasury Yield	**6-month Treasury Yield**	**0.990458**
1-month Treasury Yield	3-year Treasury Yield	0.917568
1-month Treasury Yield	**1-year Treasury Yield**	**0.979751**
7-year Treasury Yield	3-month Treasury Yield	0.775684
7-year Treasury Yield	**5-year Treasury Yield**	**0.985394**
7-year Treasury Yield	6-month Treasury Yield	0.787229
7-year Treasury Yield	3-year Treasury Yield	0.926641
7-year Treasury Yield	1-year Treasury Yield	0.816145
3-month Treasury Yield	5-year Treasury Yield	0.908481
3-month Treasury Yield	**6-month Treasury Yield**	**0.997443**
3-month Treasury Yield	3-year Treasury Yield	0.932963
3-month Treasury Yield	**1-year Treasury Yield**	**0.990063**
5-year Treasury Yield	6-month Treasury Yield	0.86461
5-year Treasury Yield	**3-year Treasury Yield**	**0.975096**
5-year Treasury Yield	1-year Treasury Yield	0.891525
6-month Treasury Yield	3-year Treasury Yield	0.945559
6-month Treasury Yield	**1-year Treasury Yield**	**0.996752**
3-year Treasury Yield	**1-year Treasury Yield**	**0.965103**

References

Fiorucci, Jose A., Tiago R. Pellegrini, Francisco Louzada, Fotios Petropoulos, Anne B. Koehler, "Models for optimising the theta method and their relationship to state space models", In International Journal of Forecasting, Volume 32, Issue 4, 2016, Pages 1151-1161, ISSN 0169-2070, https://doi.org/10.1016/j.ijforecast.2016.02.005. (http://www.sciencedirect.com/science/article/pii/S0169207016300243)

De Livera, Alysha M. "Automatic forecasting with a modified exponential smoothing state space framework." Monash Econometrics and Business Statistics Working Papers 10, no. 10 (2010).

De Livera, Alysha M., Rob J Hyndman, Ralph D Snyder, "Forecasting time series with complex seasonal patterns using exponential smoothing", Journal of the American Statistical Association, Volume 106, Number 496, pp 1513-1527, (2011)

Hyndman, R.J. and Athanasopoulos, G, Forecasting: principles and practice. OTexts: Melbourne, Australia. http://otexts.org/fpp/. Accessed on December 23, 2017 (2013)

Hyndman, Rob J., Baki Billah, "Unmasking the Theta method", In International Journal of Forecasting, Volume 19, Issue 2, 2003, Pages 287-290, ISSN 0169-2070, https://doi.org/10.1016/S0169-2070(01)00143-1. (http://www.sciencedirect.com/science/article/pii/S0169207001001431)

Jiang, Bin, George Athanasopoulos, Rob J Hyndman, Anastasios Panagiotelis, Farshid Vahid, "Macroeconomic forecasting for Australia using a large number of predictors", Unpublished working paper, http://business.monash.edu/econometrics-and-business-statistics/research/publications/ebs/wp02-17.pdf. Accessed on December 27, 2017 (2017)

