Consumer Sentiments VS. Economy Realities

Longitudinal Analysis of Changing Consumer Perceptions in Relation to Employment

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Socio-Economic Background

Since the Global Financial Crisis, U.S. households have experienced two unusually severe labor-market downturns—the Great Recession of 2008–2009 and the COVID-19 recession in 2020—plus a long, uneven recovery in between. These shocks were accompanied by historically large swings in both objective indicators such as the unemployment rate and subjective indicators such as the University of Michigan Index of Consumer Sentiment. Understanding how quickly households anticipate or react to changes in employment conditions is important for policy-makers and forecasters: if survey-based expectations move in advance of labor-market data, they could serve as an early-warning signal of recessions or turning points. Our exploratory analysis focuses on the joint evolution of consumer sentiment, expectations about unemployment over the next year, and realized unemployment and payroll job growth since 2008, a period that covers both crises and the subsequent recovery phases.

Exploratory Data Analysis Executive Summary

- **Project Objective**: To examine whether changes in consumer sentiment and unemployment expectations from the University of Michigan Survey of Consumers contain useful information about near-term labor-market outcomes. Specifically, we ask whether monthly shifts in sentiment and in "expected change in unemployment during the next year" are associated with subsequent changes in the unemployment rate and payroll employment 1–12 months ahead.

- **Data Source**: We combine three publicly available sources: (1) the Michigan Survey of Consumers tables for the Index of Consumer Sentiment (Table 1) and expected change in unemployment (Table 30), scraped directly from the Survey's online data archive; (2) the BLS Current Population Survey (CPS) unemployment rate series (LNS14000000); and (3) the BLS Current Employment Statistics (CES) total nonfarm employment series (CES0000000001), from which we construct monthly job changes. All series are monthly and cover 2008–2025.

- **Data Reliability**: The sentiment and expectations measures are based on nationally representative survey samples but are subject to sampling variation and potential mode and nonresponse biases. The CPS unemployment rate and CES payroll employment are official federal statistics with well-documented methodology; they are widely used as benchmark measures of labor-market conditions. Taken together, these data provide a credible basis for descriptive, but not strictly causal, analysis.

- **Theme Emerged**: Across multiple visualizations, we find that broad consumer sentiment tracks major business-cycle events but is only weakly aligned with near-term movements in unemployment or job growth. In contrast, the more targeted question about expected unemployment changes shows a clear and increasingly strong negative relationship with realized changes in the unemployment rate 3–12 months ahead: when more people expect unemployment to rise, it does tend to rise later, although the

explanatory power remains modest.

- **Limitations of the Analysis**: Our analysis is exploratory and descriptive. We focus on the post-2008 period and do not control for other macroeconomic drivers such as inflation, interest rates, or fiscal policy. Lead-lag correlations are computed on overlapping horizons, which complicates formal inference. We also treat survey measures as error-free, even though they contain sampling noise and potential measurement error. Finally, we do not estimate structural models, so we cannot claim that sentiment causes labor-market changes—only that the two move together in systematic ways.

Research Questions

- Do monthly changes in the Index of Consumer Sentiment anticipate short-run changes in the unemployment rate and payroll employment, and if so, at what lead times?

- Do qualitative expectations about unemployment have predictive content for subsequent changes in the unemployment rate, beyond what is captured by the aggregate sentiment index more directly?

Data Source and Assumptions

Our primary predictors come from the University of Michigan Survey of Consumers. We programmatically request historical tables through the Survey's web interface, using a small wrapper function to POST table numbers, years, and frequency parameters and then parse the resulting HTML tables. Table 1 provides the headline Index of Consumer Sentiment; Table 30 provides the distribution of responses about expected change in unemployment during the next year. From Table 30 we construct a "net unemployment expectation" measure equal to the percentage expecting less unemployment minus the percentage expecting more unemployment.

Outcome variables come from the BLS API. We query the CPS unemployment rate (seasonally adjusted) and CES total nonfarm employment, both at monthly frequency from 2008 onward. We compute monthly job changes as first differences in employment. Throughout, we assume that the SCA and BLS time stamps are aligned to the same reference month and that seasonal adjustment and revisions have already been applied by the source agencies. We treat the post-2008 period as a single sample, implicitly assuming that survey questions and measurement practices are stable enough over time to allow pooling.

Data Cleaning Process

For the SCA tables, we first standardize column names, drop repeated header rows, and coerce month/year fields to integers. We then create a calendar date variable set to the first day of each month and convert index and share variables to numeric form, handling the occasional "DK; NA" responses as missing. For the unemployment expectations table, we compute the net expectation series and reshape the component shares into long format for visualization.

For the BLS data, we query multiple series IDs in a single API call and then unnest them into a long tibble with explicit series_id, year, period, and value columns. We keep only monthly records (M01–M12), derive numeric month values, and again construct a date variable. We then split the long table into a CPS unemployment-rate series and a CES employment series, calculating monthly job changes from the latter. Finally, we merge the SCA and BLS datasets by date, resulting in a panel where each row corresponds to a month with consumer sentiment, unemployment expectations, unemployment rate, and employment growth aligned.

Notable Findings

Finding 1. Consumer Sentiment co-moves with, but does not sharply lead, unemployment or job growth.

Across a range of leads from 0 to 8 months, smoothed dual-axis plots show that the sentiment index falls sharply during the 2008–2009 and 2020 downturns while unemployment rises and job growth turns negative (Visualization 1). However, the turning points in sentiment and the labor market often occur within a few months of each other, and the lines

do not reveal a clean, stable lead of 6–12 months by sentiment. This suggests that the headline index captures broad business-cycle conditions but has limited incremental power for timing short-run labor-market changes.

Finding 2. Net unemployment expectations are systematically related to future unemployment changes.

When we convert the expectations table into a net balance ('less' minus 'more' unemployment) and relate it to subsequent changes in the unemployment rate, we obtain consistently negative slopes and correlations that strengthen with the horizon (Visualization 2). For 6–12-month horizons, the correlation between net expectations and future unemployment changes reaches roughly −0.3 to −0.4, and a 10-point deterioration in net expectations is associated with about a 0.3–0.5 percentage-point increase in unemployment over the following year. Although the R-Squared values are modest (around 0.10–0.18), this pattern indicates that households' specific views about unemployment contain forward-looking information.

Finding 3. Time-series comparisons confirm that expectations move ahead of realized unemployment around major turning points.

In time-series plots that overlay net unemployment expectations and the unemployment rate shifted forward by several months (Visualization 3), we observe that expectations often deteriorate before unemployment peaks and improve before unemployment bottoms out, especially around the 2008–2009 and 2020 episodes. The smoothed series highlight a broad inverted relationship: when a larger share of respondents expects higher unemployment, the future unemployment rate tends to be elevated. This supports the idea that expectations embed information about upcoming labor-market conditions beyond contemporaneous sentiment.

Visualizations

Preview of Consumer Sentiment Data

```
# A tibble: 6 x 4
  date          cs  year month
  <date>     <dbl> <int> <int>
1 2008-01-01  78.4  2008     1
2 2008-02-01  70.8  2008     2
3 2008-03-01  69.5  2008     3
4 2008-04-01  62.6  2008     4
5 2008-05-01  59.8  2008     5
6 2008-06-01  56.4  2008     6
```

Preview of Expected Change in Unemployment During the Next Year

```
# A tibble: 6 x 8
  date       Month  Year  Less  Same  More `DK; NA` Relative
  <date>     <int> <int> <dbl> <dbl> <dbl>    <dbl>    <dbl>
1 2008-01-01     1  2008     6    46    47        1       59
2 2008-02-01     2  2008     9    41    50        0       59
3 2008-03-01     3  2008     7    38    55        0       52
4 2008-04-01     4  2008     5    36    59        0       46
5 2008-05-01     5  2008     3    41    56        0       47
6 2008-06-01     6  2008     5    31    64        0       41
```

Expected change in unemployment over the next year
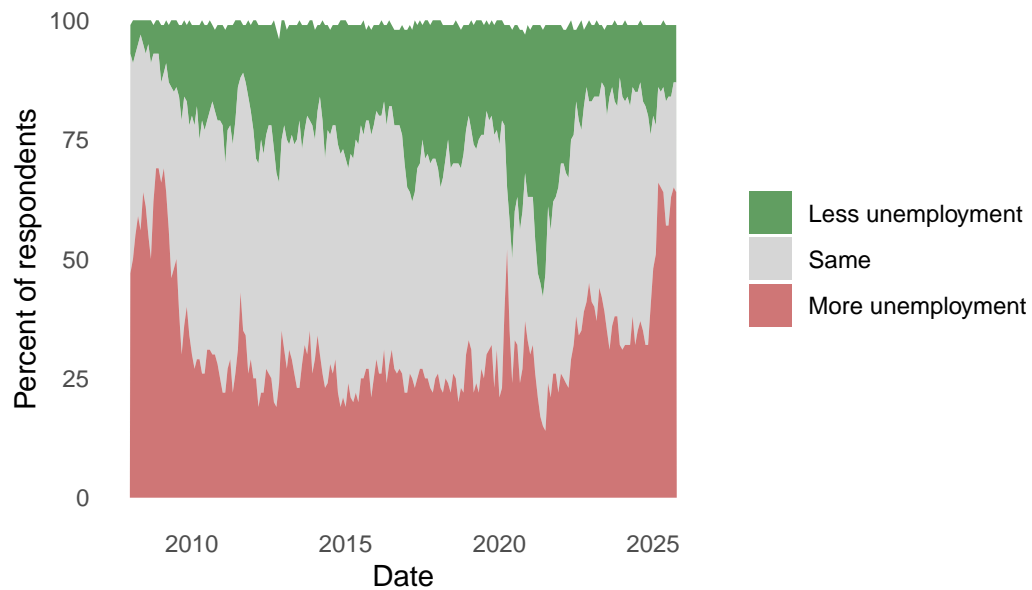
- BRIEF EXPLAIN HERE

Preview of BLS Data - Unemployment Rate and Job Change

```
# A tibble: 6 x 2
  date        unrate
  <date>       <dbl>
1 2008-01-01       5
2 2008-02-01     4.9
3 2008-03-01     5.1
4 2008-04-01       5
5 2008-05-01     5.4
6 2008-06-01     5.6


# A tibble: 6 x 3
```
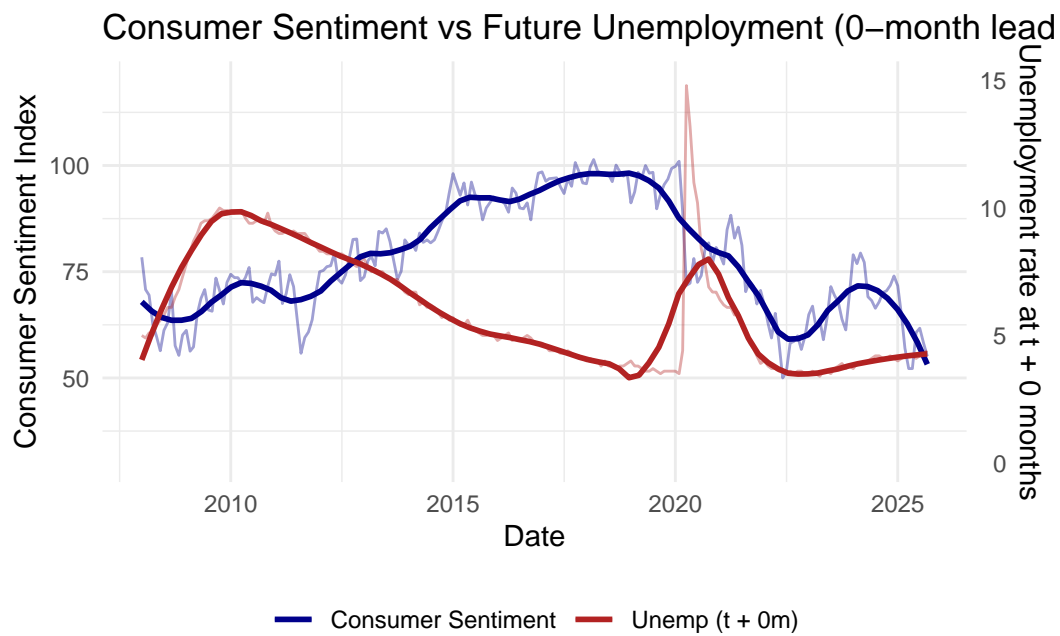
```
   date       nonfarm_emp job_change
   <date>           <dbl>      <dbl>
1 2008-01-01      138391         NA
2 2008-02-01      138327        -64
3 2008-03-01      138257        -70
4 2008-04-01      138038       -219
5 2008-05-01      137851       -187
6 2008-06-01      137698       -153
```

Visualization 1. Lagged Time-Series of Consumer Sentiment and Unemployment Rate/Job Change

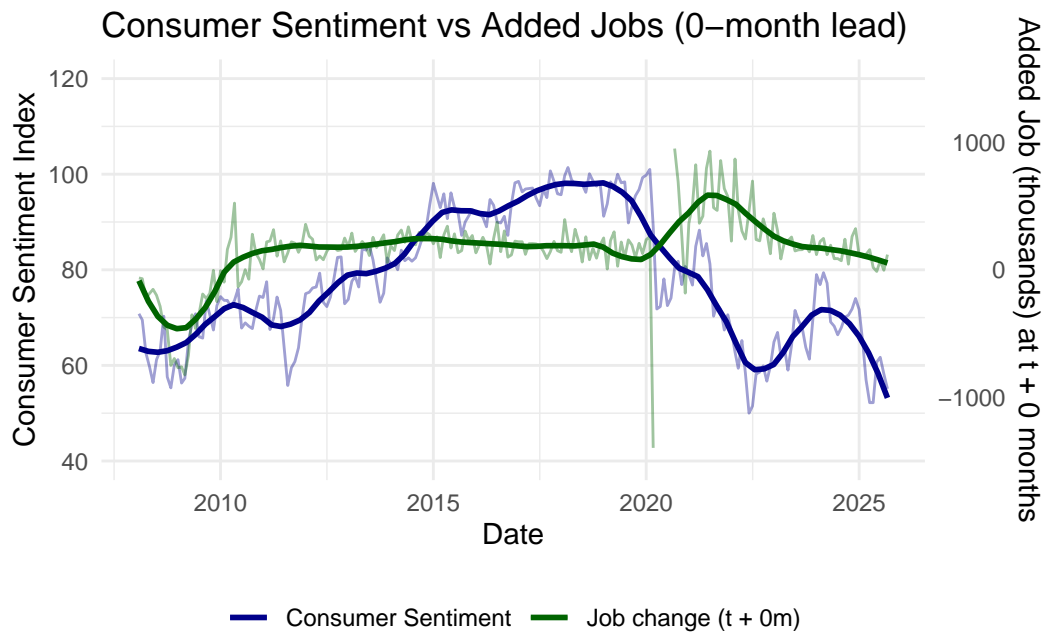**Preview of Merged Monthly Aligned Macro Data**

```
# A tibble: 6 x 5
   date          cs unrate nonfarm_emp job_change
   <date>     <dbl>  <dbl>       <dbl>      <dbl>
1 2008-01-01  78.4      5       138391         NA
2 2008-02-01  70.8    4.9       138327        -64
3 2008-03-01  69.5    5.1       138257        -70
4 2008-04-01  62.6      5       138038       -219
5 2008-05-01  59.8    5.4       137851       -187
6 2008-06-01  56.4    5.6       137698       -153
```
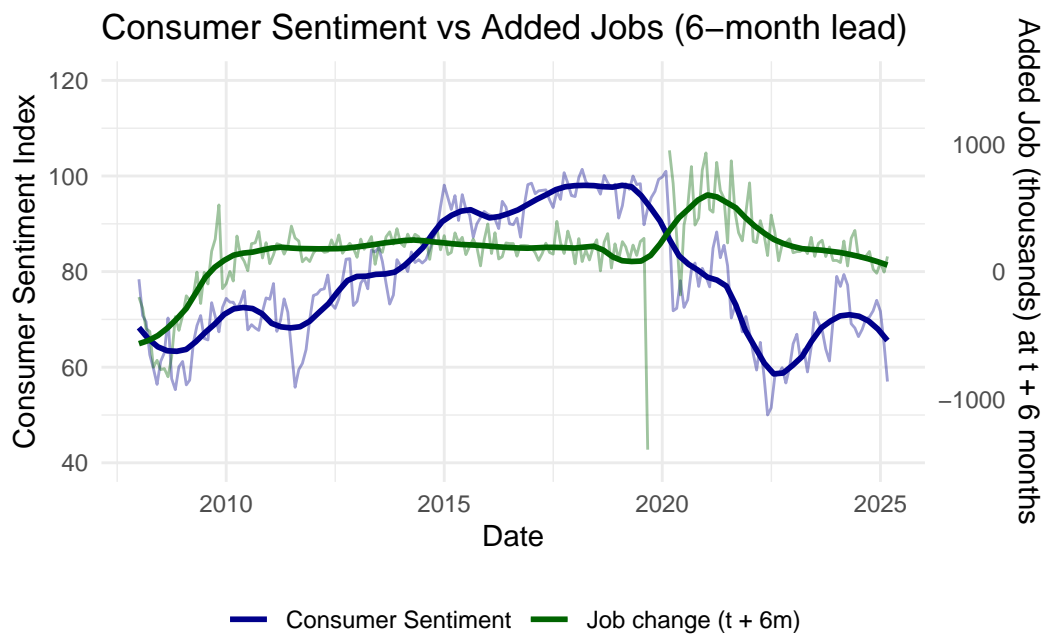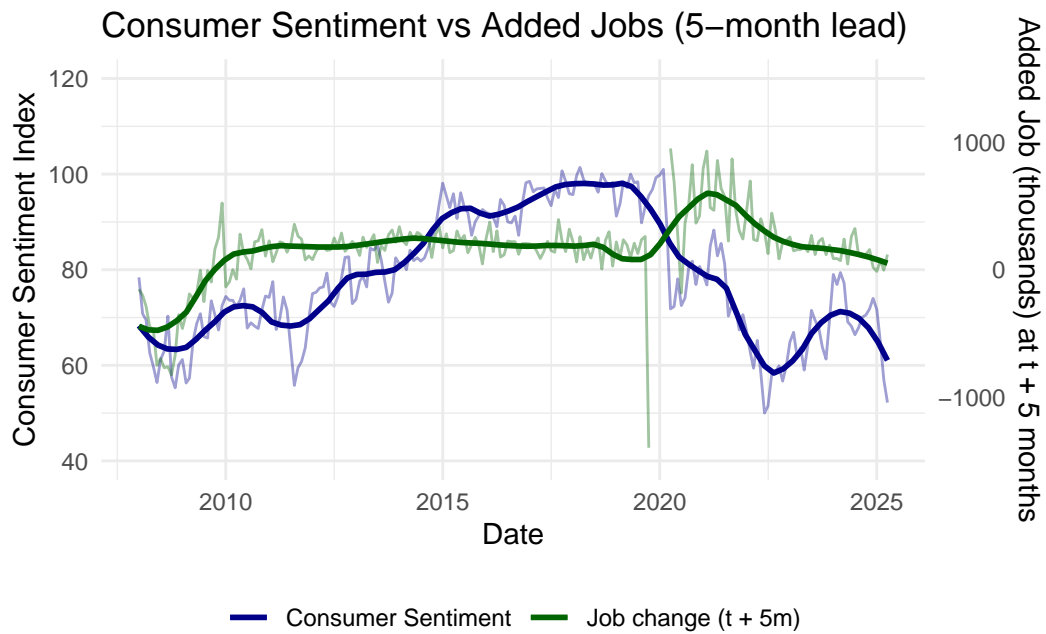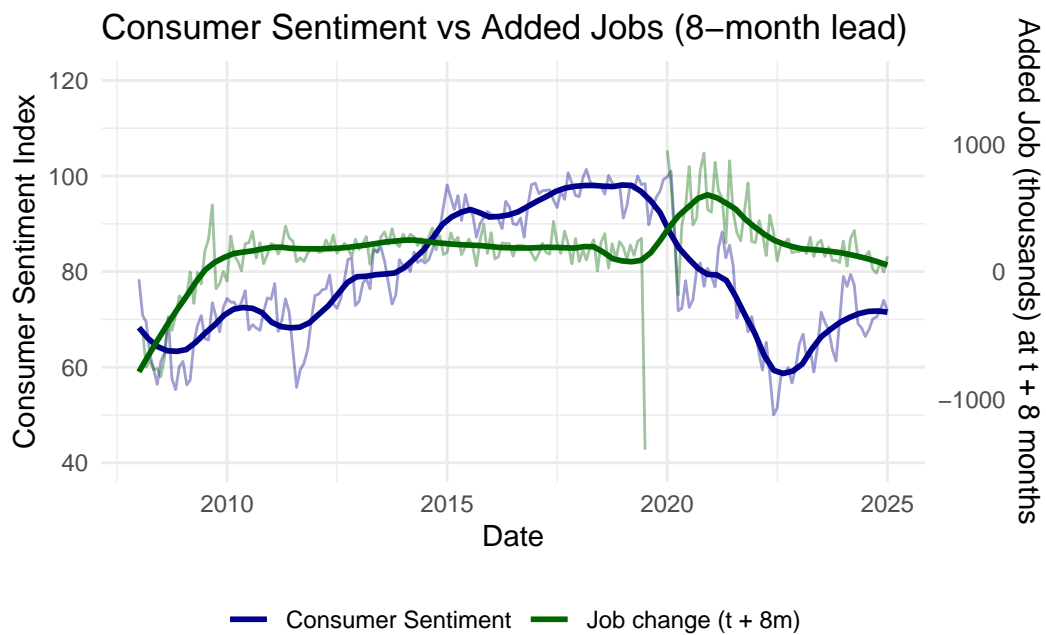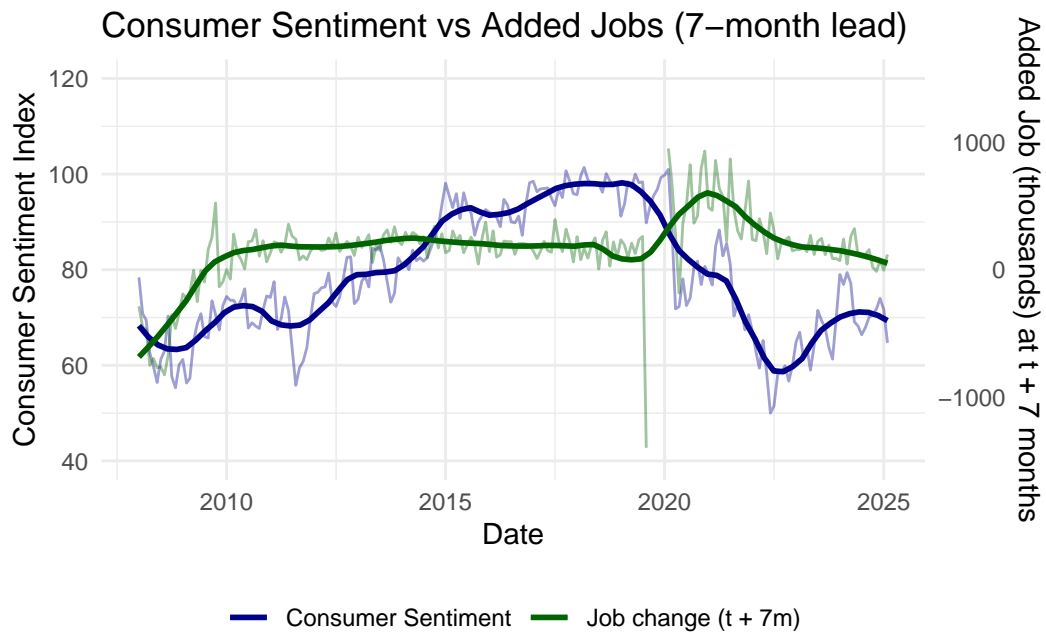
Consumer Sentiment vs Future Unemployment (0–month lead

Consumer Sentiment vs Future Unemployment (6–month lead

Consumer Sentiment vs Future Unemployment (5−month lead

Consumer Sentiment vs Future Unemployment (7−month lead

Consumer Sentiment vs Future Unemployment (8–month lead
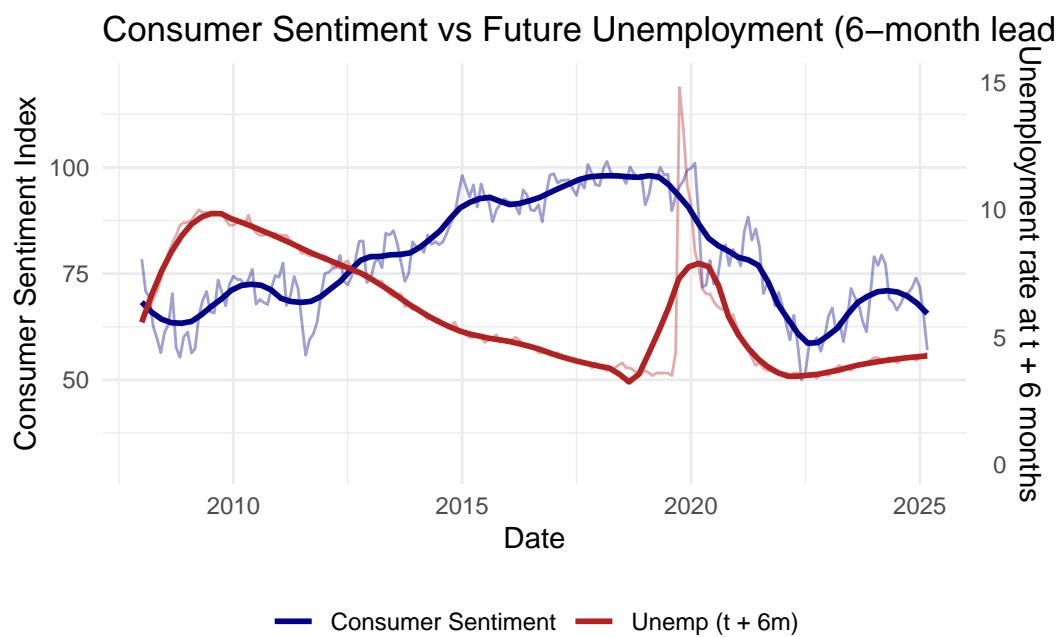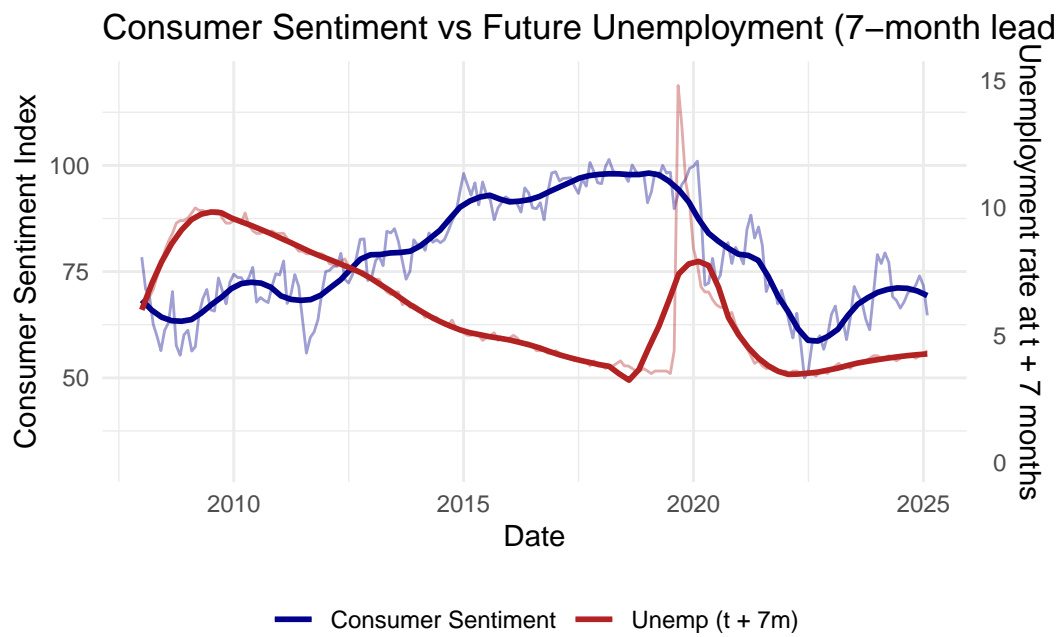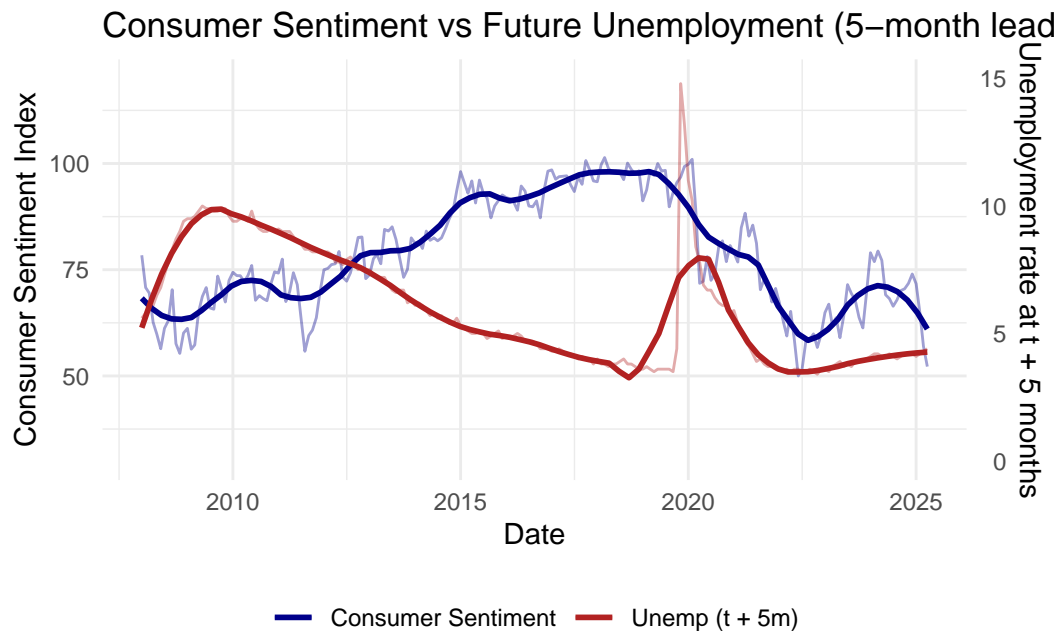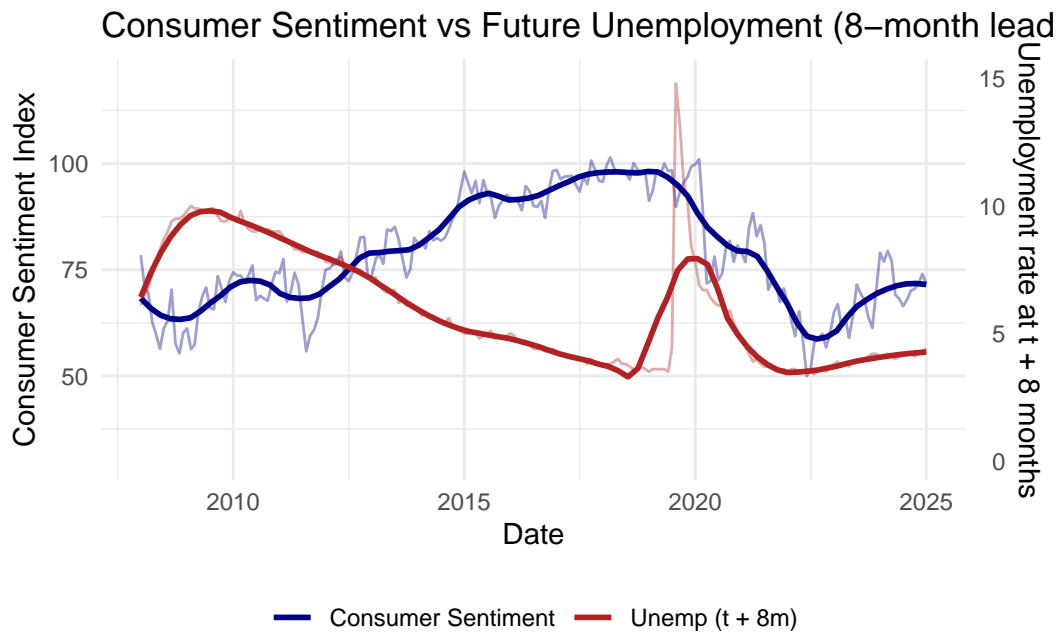
- ANALYSIS HERE

- EXPLAIN LOGISTICS OF SMOOTHING

- ENDED UP NOT THAT CLEAR INDICATING

Consumer Sentiment vs Added Jobs (0–month lead)

Consumer Sentiment vs Added Jobs (5−month lead)

Consumer Sentiment vs Added Jobs (6−month lead)

Consumer Sentiment vs Added Jobs (7−month lead)

Consumer Sentiment vs Added Jobs (8−month lead)

- ANALYSIS HERE

- EXPLAIN TEST & FINDING ON DIFFERENT LAGS

- EXPLAIN LOGISTICS OF SMOOTHING

Visualization 2. Net expectations vs Subsequent unemployment change

- ADD LOGISTICS OF CALCULATING NET EXPECTATIONS OF
  UNEMPLOYMENT HERE! (MAYBE SHOW BRIEF DATAFRAME?)

```
Horizon: 0 months

Correlation (net expectations, future Δunemp): NA

Slope (OLS): 0 pp change in unemp per 1-pt net expectation

R-squared: NaN
```

```
Horizon: 1 months

Correlation (net expectations, future Δunemp): -0.169

Slope (OLS): -0.0069 pp change in unemp per 1-pt net expectation

R-squared: 0.029
```

```
Horizon: 2 months

Correlation (net expectations, future Δunemp): -0.19

Slope (OLS): -0.0111 pp change in unemp per 1-pt net expectation

R-squared: 0.036
```

```
Horizon: 3 months

Correlation (net expectations, future Δunemp): -0.206

Slope (OLS): -0.0144 pp change in unemp per 1-pt net expectation
```

R-squared: 0.042

Horizon: 4 months

Correlation (net expectations, future Δunemp): -0.249

Slope (OLS): -0.0197 pp change in unemp per 1-pt net expectation

R-squared: 0.062

Horizon: 5 months

Correlation (net expectations, future Δunemp): -0.279

Slope (OLS): -0.0239 pp change in unemp per 1-pt net expectation

R-squared: 0.078

Horizon: 6 months

Correlation (net expectations, future Δunemp): -0.323

Slope (OLS): -0.0296 pp change in unemp per 1-pt net expectation

R-squared: 0.104

Horizon: 7 months

Correlation (net expectations, future Δunemp): -0.365

Slope (OLS): -0.0354 pp change in unemp per 1-pt net expectation

R-squared: 0.134

Horizon: 8 months

Correlation (net expectations, future Δunemp): -0.398

Slope (OLS): -0.0401 pp change in unemp per 1-pt net expectation

R-squared: 0.158

Horizon: 9 months

Correlation (net expectations, future Δunemp): -0.412

Slope (OLS): -0.0431 pp change in unemp per 1-pt net expectation

R-squared: 0.17

Horizon: 10 months

Correlation (net expectations, future Δunemp): -0.42

Slope (OLS): -0.0455 pp change in unemp per 1-pt net expectation

R-squared: 0.176

Horizon: 11 months

Correlation (net expectations, future Δunemp): -0.419

Slope (OLS): -0.0467 pp change in unemp per 1-pt net expectation

R-squared: 0.175

Horizon: 12 months

```
Correlation (net expectations, future Δunemp): -0.416

Slope (OLS): -0.0477 pp change in unemp per 1-pt net expectation

R-squared: 0.173
```

$h_0m

Net unemployment expectations vs. 0−month change in unemploym
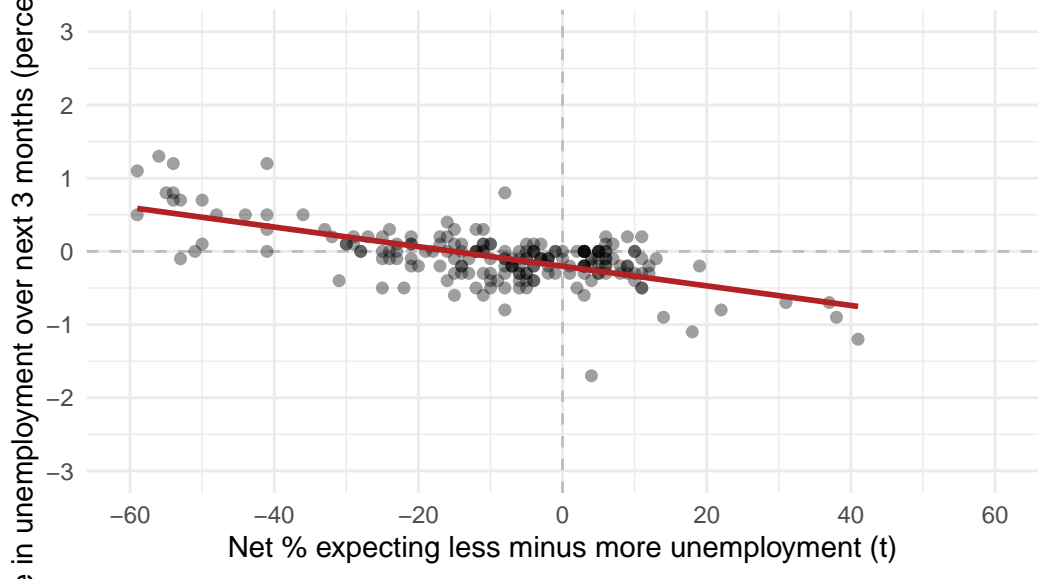Slope . 0 pp / 1−pt net expectation, R² . NaN

$h_1m

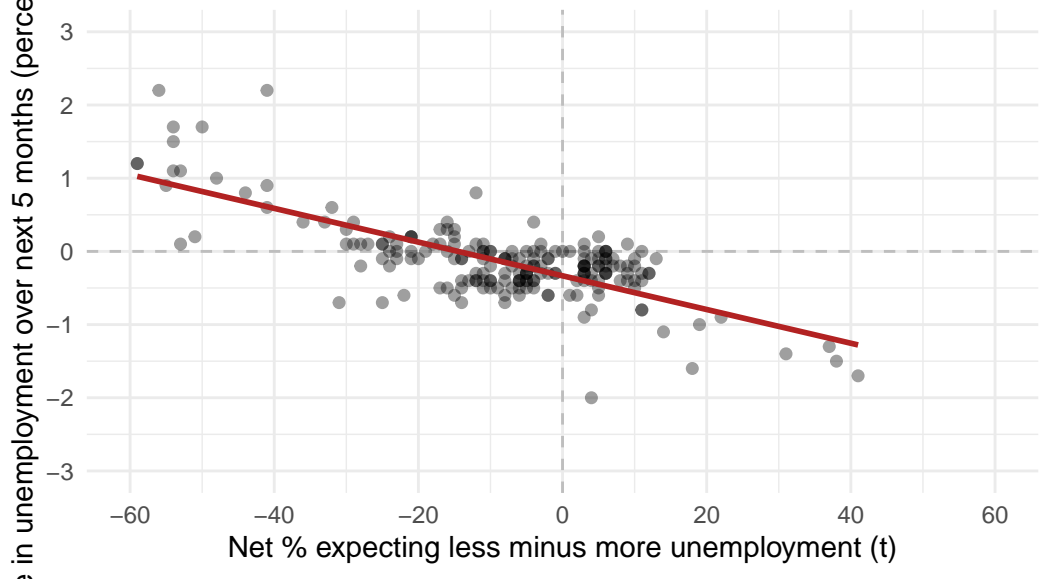Net unemployment expectations vs. 1-month change in unemploym[...]
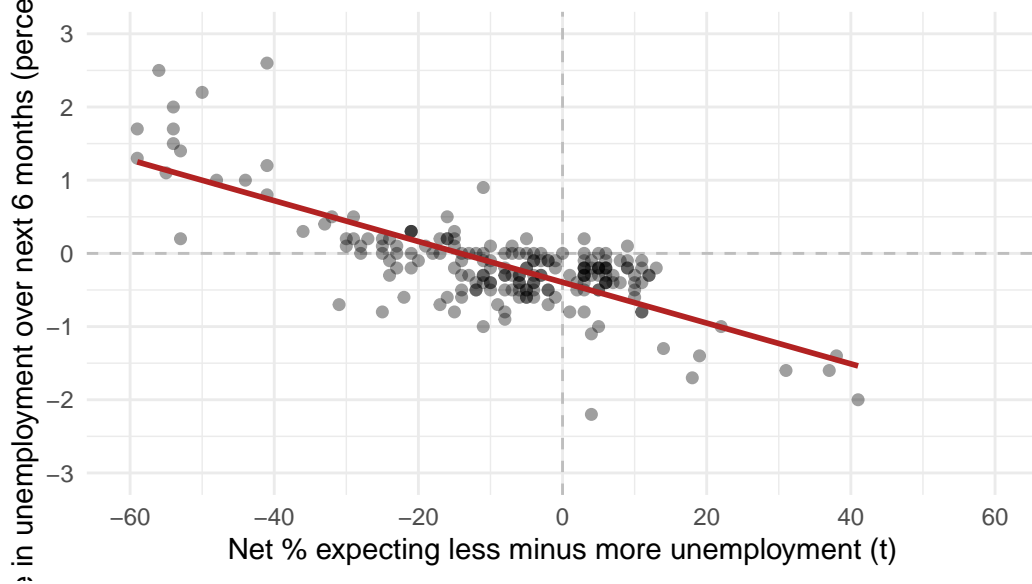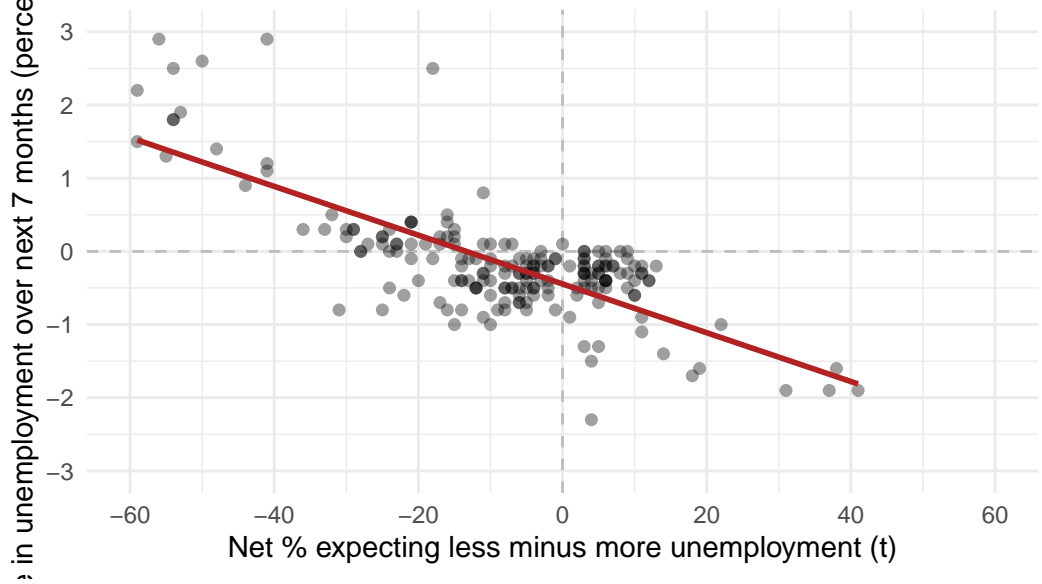Slope . −0.007 pp / 1−pt net expectation, R² . 0.03

Net % expecting less minus more unemployment (t)
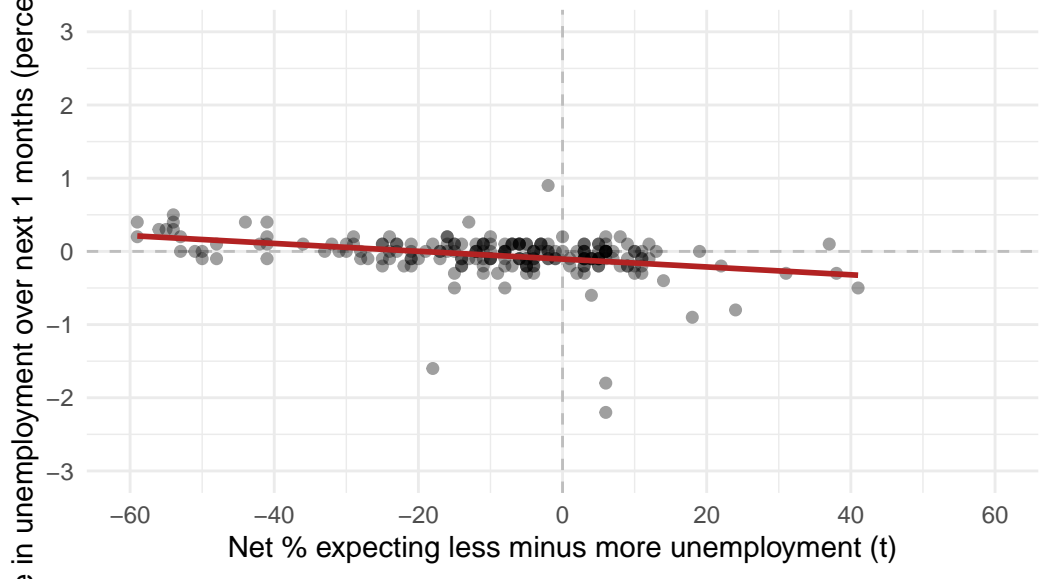
$h_2m

Net unemployment expectations vs. 2−month change in unemploym[e]
Slope . −0.011 pp / 1−pt net expectation, R² . 0.04

in unemployment over next 2 months (percentage p

Net % expecting less minus more unemployment (t)
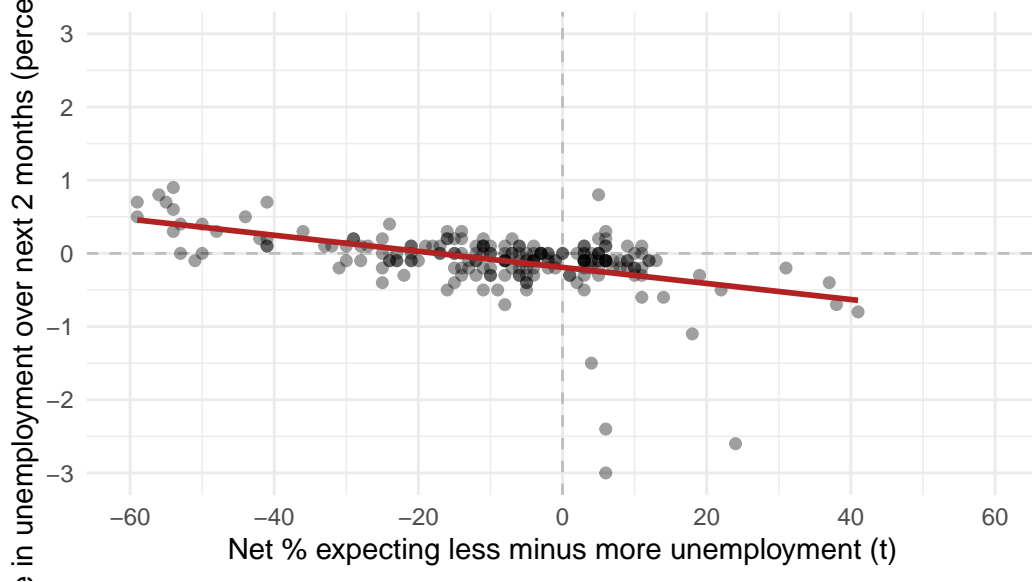
$h_3m

Net unemployment expectations vs. 3-month change in unemploym
Slope . –0.014 pp / 1-pt net expectation, R² . 0.04

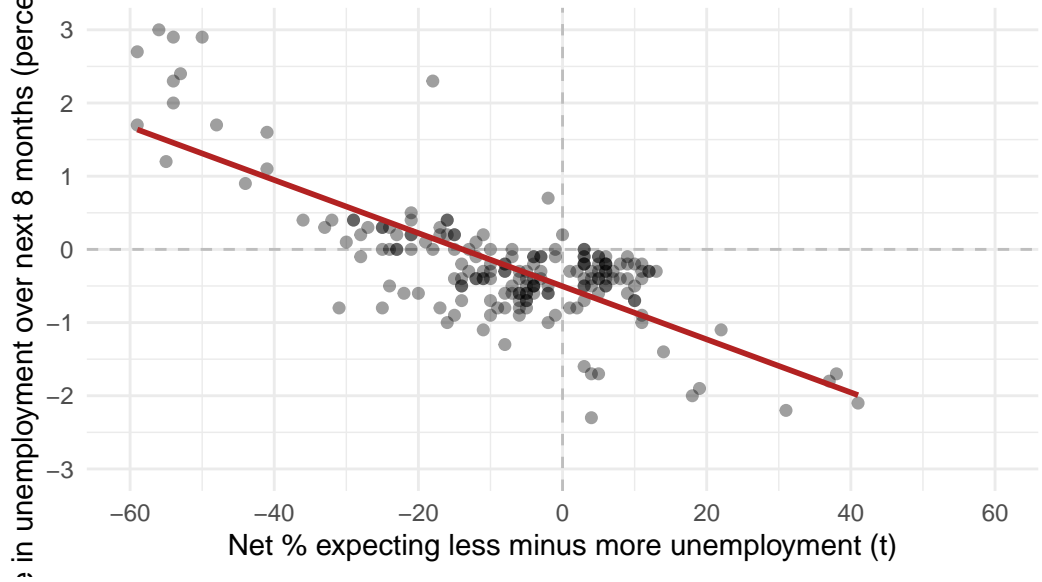Net % expecting less minus more unemployment (t)

$h_4m

Net unemployment expectations vs. 4–month change in unemploym

Slope . −0.02 pp / 1–pt net expectation, R² . 0.06

Net % expecting less minus more unemployment (t)
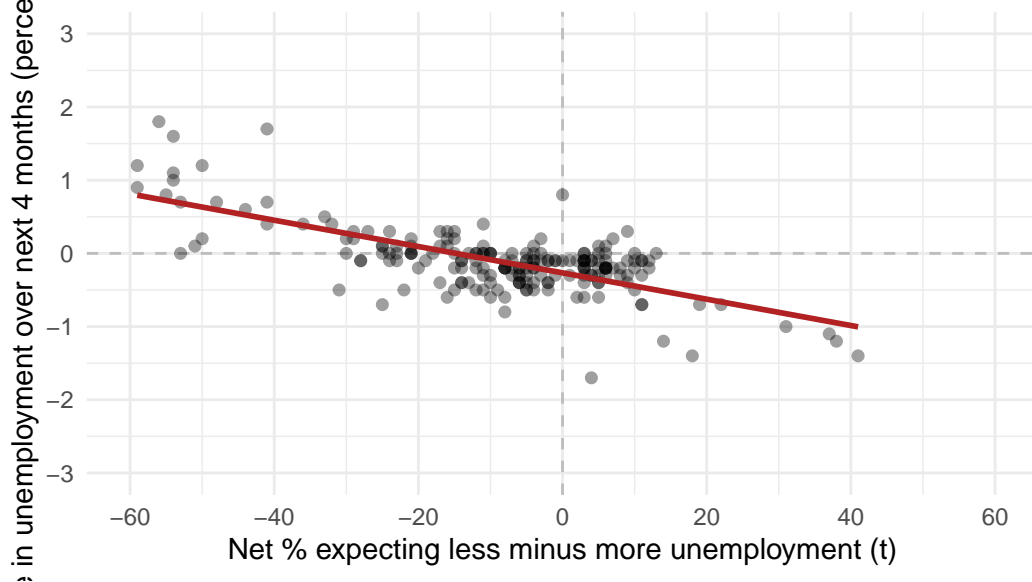
$h_5m

Net unemployment expectations vs. 5–month change in unemploym

Slope . –0.024 pp / 1–pt net expectation, R² . 0.08

Y-axis label: in unemployment over next 5 months (percentage

X-axis label: Net % expecting less minus more unemployment (t)

$h_6m

Net unemployment expectations vs. 6–month change in unemploym[...]
Slope . –0.03 pp / 1–pt net expectation, R² . 0.1

Net % expecting less minus more unemployment (t)

$h_7m

Net unemployment expectations vs. 7−month change in unemployme

Slope . −0.035 pp / 1−pt net expectation, R² . 0.13

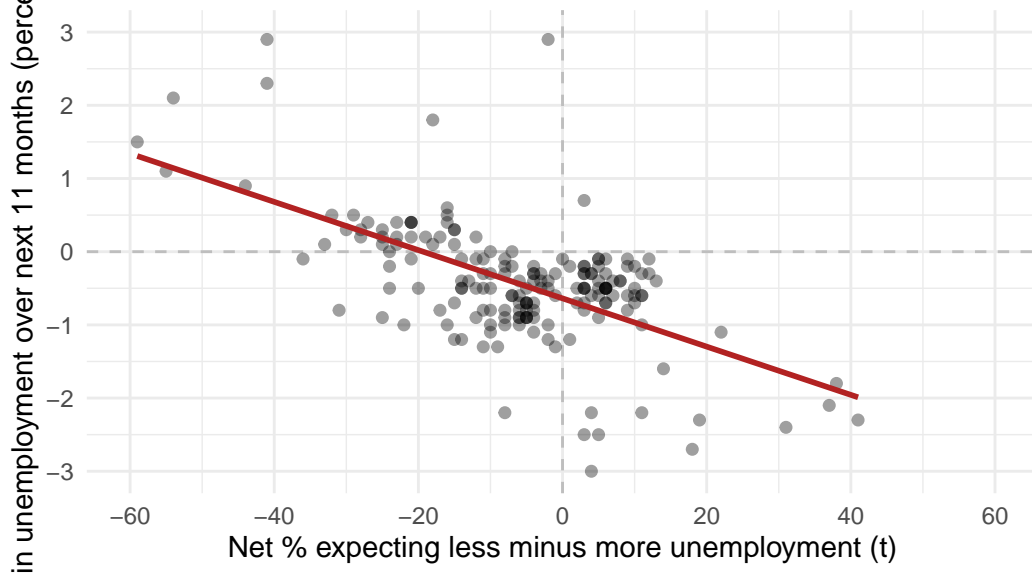Net % expecting less minus more unemployment (t)

$h_8m
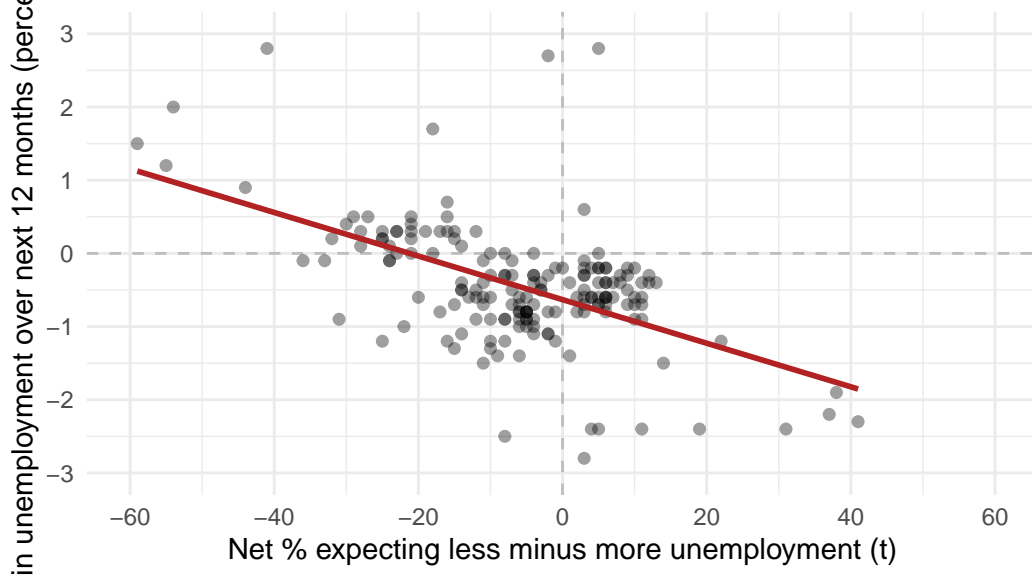
Net unemployment expectations vs. 8–month change in unemploym[e]
Slope . –0.04 pp / 1–pt net expectation, R² . 0.16

Net unemployment expectations vs. 8–month change in unemployment

Y-axis: in unemployment over next 8 months (percentage [p...])

X-axis: Net % expecting less minus more unemployment (t)

$h_9m

Net unemployment expectations vs. 9–month change in unemploym[e]
Slope . –0.043 pp / 1–pt net expectation, R² . 0.17
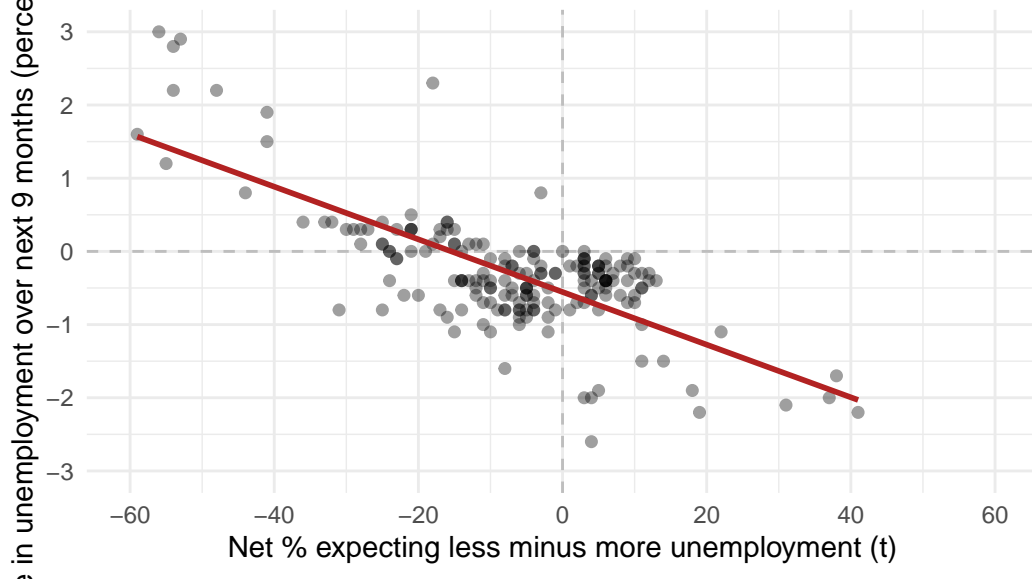
$h_10m

Net unemployment expectations vs. 10–month change in unemploy[r]
Slope . –0.045 pp / 1–pt net expectation, R² . 0.18
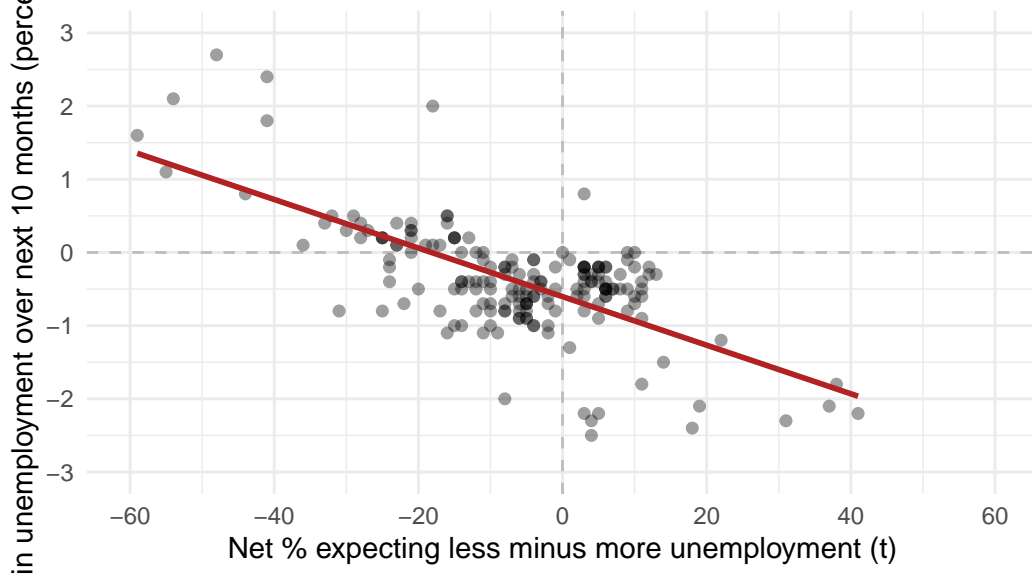
$h_11m

Net unemployment expectations vs. 11−month change in unemployr
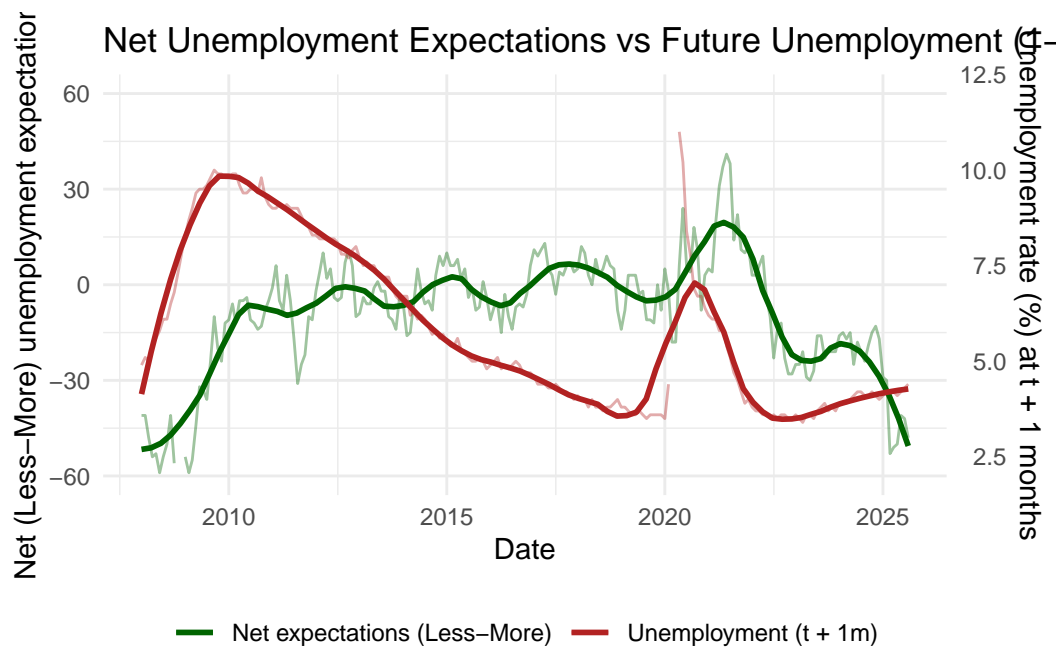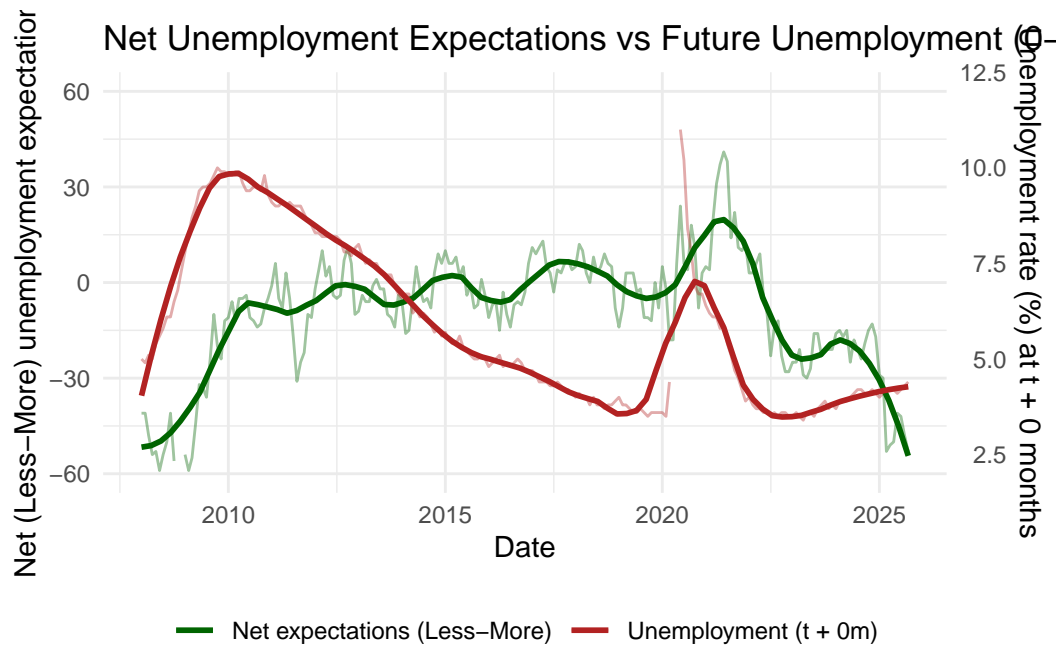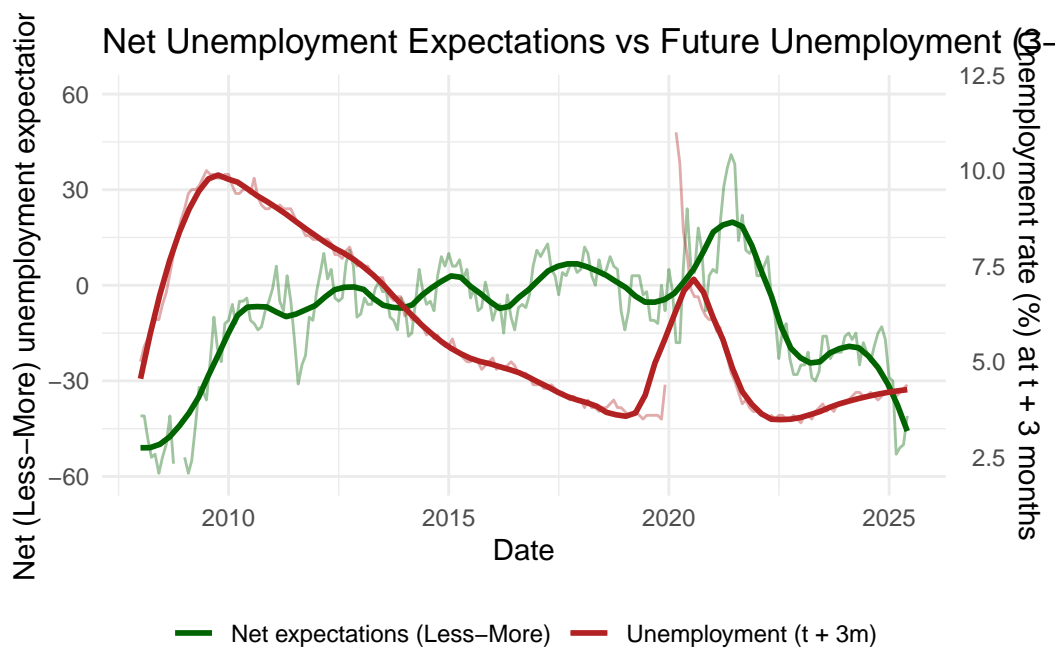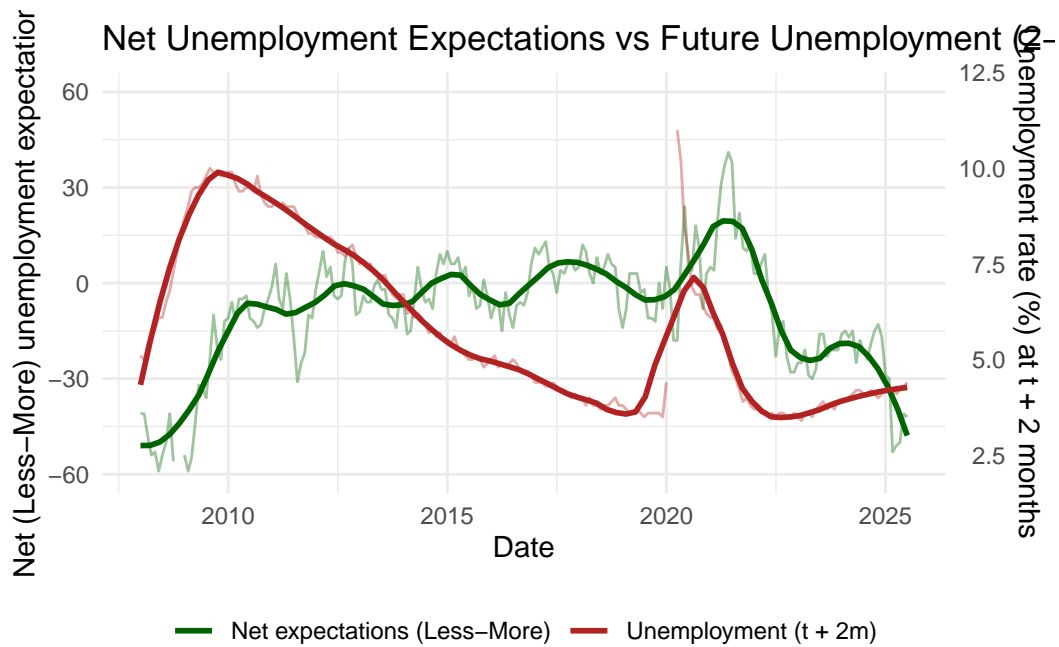Slope . −0.047 pp / 1−pt net expectation, R² . 0.18

$h_12m

Net unemployment expectations vs. 12–month change in unemployr

Slope . −0.048 pp / 1–pt net expectation, R² . 0.17

Net unemployment over next 12 months (percentage)
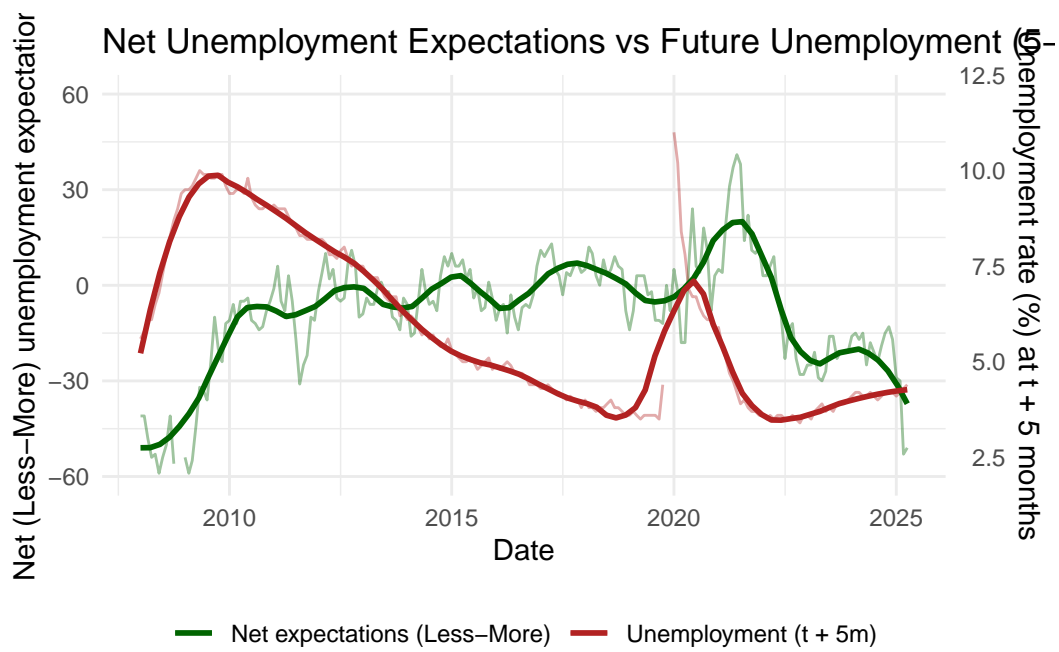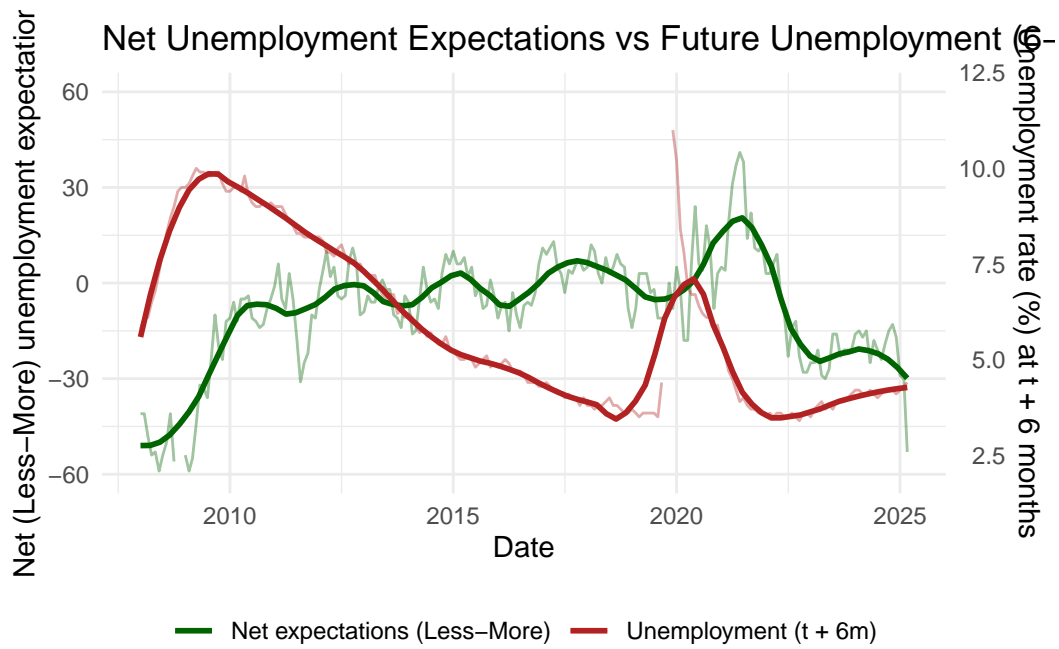
Net % expecting less minus more unemployment (t)

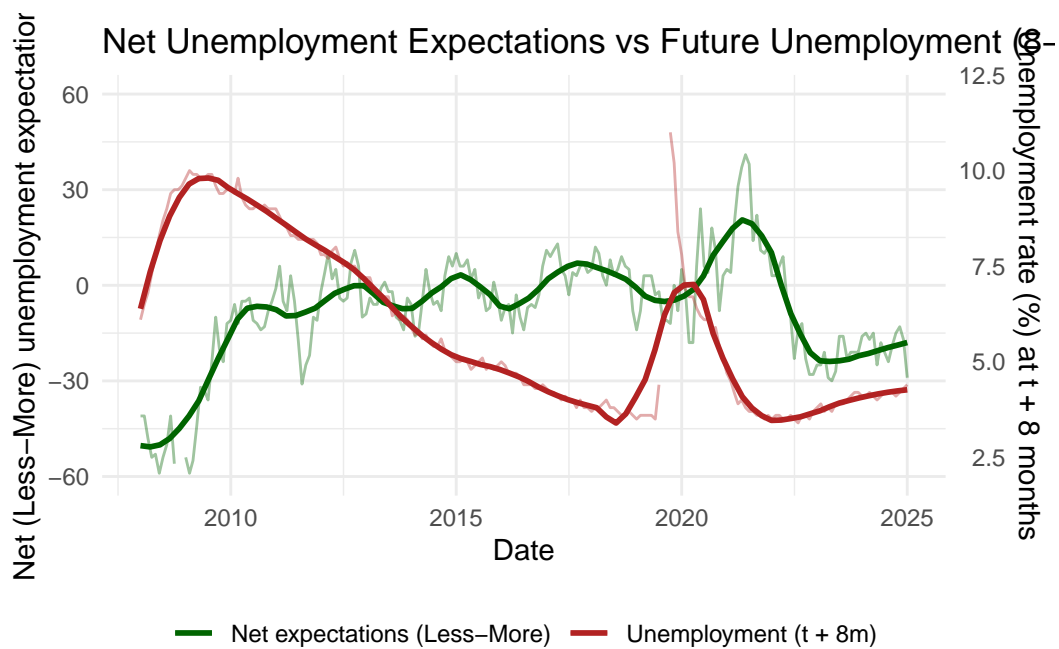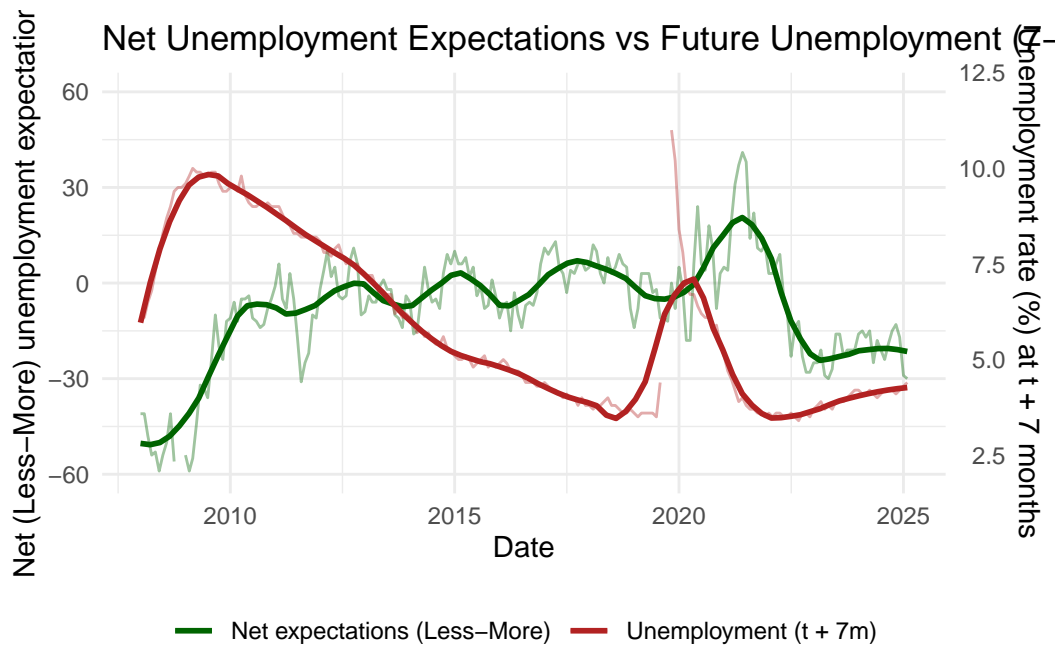- MAKE A CONCLUSION & INDICATION HERE!

Visualization 3. Time series of net expectations vs actual unemployment - NEED TO FINE TUNE PLOT SIZES FOR ALL PLOTS

Net Unemployment Expectations vs Future Unemployment (t + 0 months)

Legend: Net expectations (Less–More), Unemployment (t + 0m)

Net Unemployment Expectations vs Future Unemployment (t + 1 months)

Legend: Net expectations (Less–More), Unemployment (t + 1m)

Net Unemployment Expectations vs Future Unemployment (2-

Net Unemployment Expectations vs Future Unemployment (3-

Net Unemployment Expectations vs Future Unemployment (6-

Net Unemployment Expectations vs Future Unemployment (5-

Net Unemployment Expectations vs Future Unemployment (7-

Net Unemployment Expectations vs Future Unemployment (8-

Net Unemployment Expectations vs Future Unemployment (9...

Net Unemployment Expectations vs Future Unemployment (10...

Net Unemployment Expectations vs Future Unemployment (t+11)

Net expectations (Less–More) — Unemployment (t + 11m)

Net Unemployment Expectations vs Future Unemployment (t+12)

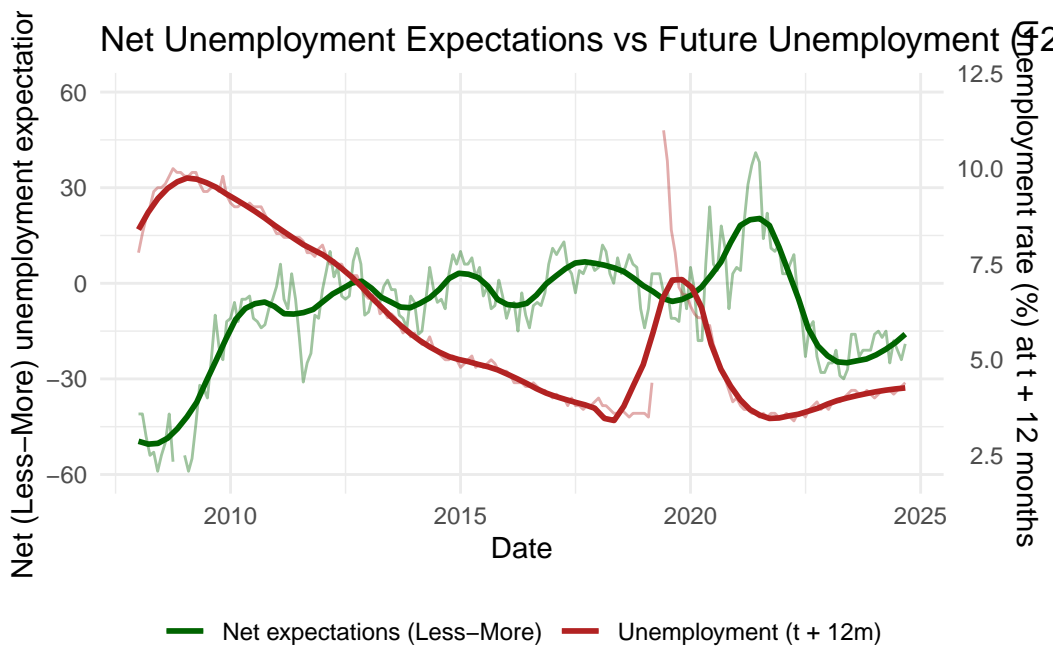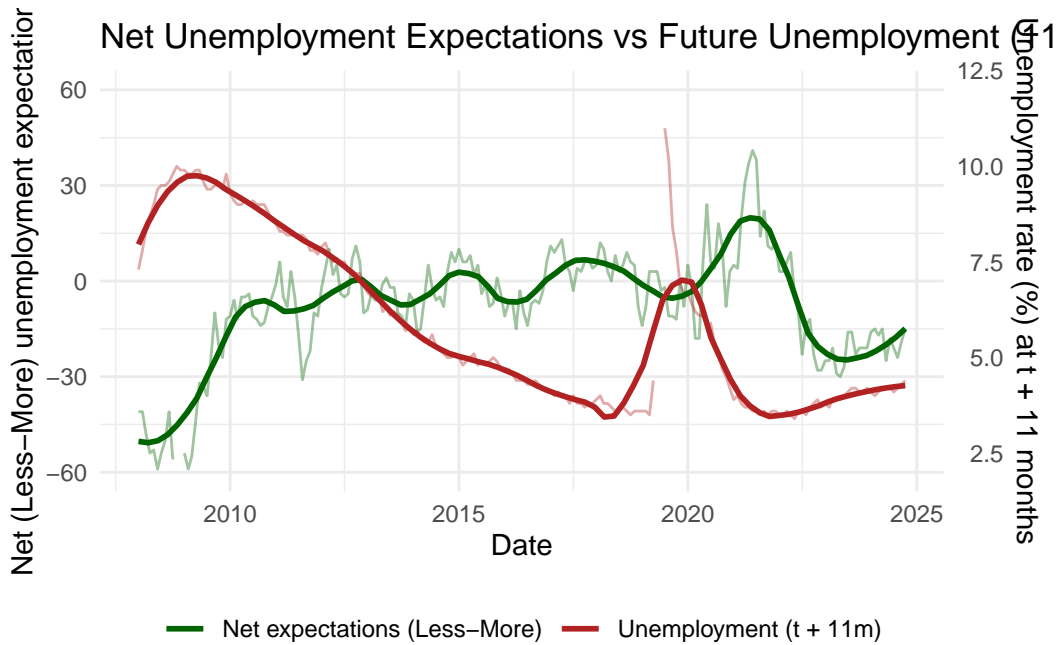Net expectations (Less–More) — Unemployment (t + 12m)

- EXPLAIN LOGISTICS
- MAKE A CONCLUSION & INDICATION HERE!

Implications

SOME REAL WORLD INDICATIONS.

Conclusion & Outlook

Limitation

Working repo could be fount at:

https://github.com/zzeng05/ZENG1-LIU2-727FINAL-scaVSeply.git

References

https://data.sca.isr.umich.edu/data-archive/mine.php

https://www.bls.gov/cps

https://www.bls.gov/ces