Consumer Sentiments VS. Economy Realities

Longitudinal Analysis of Changing Consumer Perceptions in Relation to Employment

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December 2025

Socio-Economic Background

Exploratory Data Analysis Executive Summary

- **Project Objective**
- **Data Source**
- **Data Reliability**
- **THEME FOUND123**
- **Limitations of the Analysis**

Research Questions

-
-

Data Source and Assumptions

Data Cleaning Process

Notable Findings

Finding 1. Finding Theme

State the finding in a few lines (See Visualization 1).

Finding 2. (See Visualization 2).

Finding 3. (See Visualization 3).

Visualizations

Working repo could be fount at:

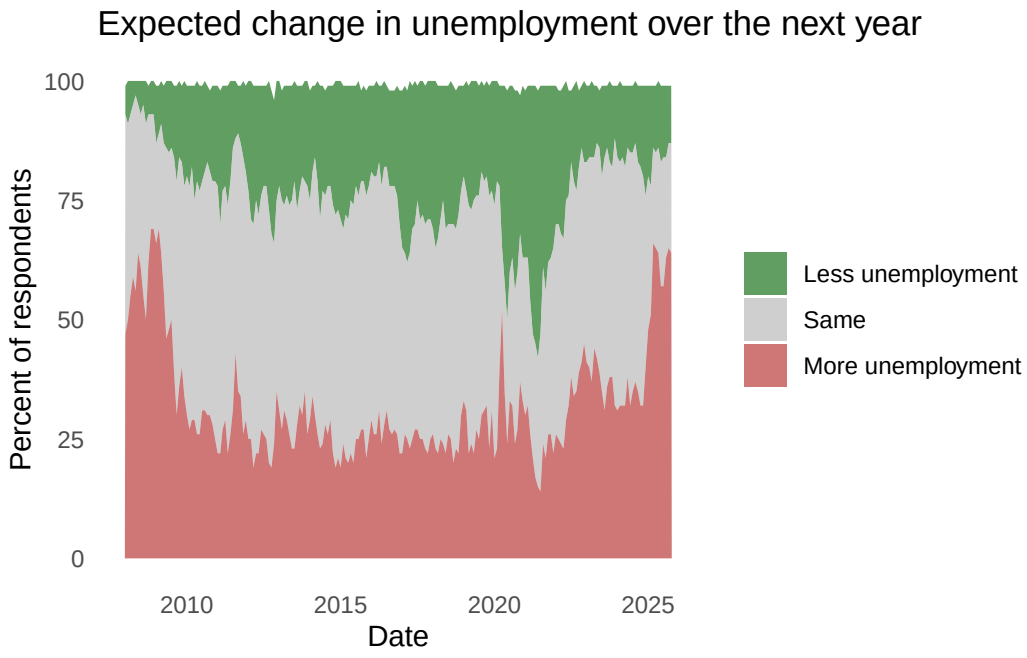
https://github.com/zzeng05/ZENG1-LIU2-727FINAL-scaVSeply.git

```
# 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
```

```
# 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
```

```
# A tibble: 6 x 7
  date       less_unemp same_unemp more_unemp dk_unemp rel_unemp
```

```
  <date>          <dbl>      <dbl>      <dbl>    <dbl>      <dbl>
1 2008-01-01          6         46         47        1         59
2 2008-02-01          9         41         50        0         59
3 2008-03-01          7         38         55        0         52
4 2008-04-01          5         36         59        0         46
5 2008-05-01          3         41         56        0         47
6 2008-06-01          5         31         64        0         41
# i 1 more variable: net_unemp_expect <dbl>
```



- BRIEF EXPLAIN HERE

```
# A tibble: 6 x 6
  series_id    year period value month date
  <chr>       <int> <chr>  <dbl> <int> <date>
1 LNS14000000  2025 M09      4.4     9 2025-09-01
```

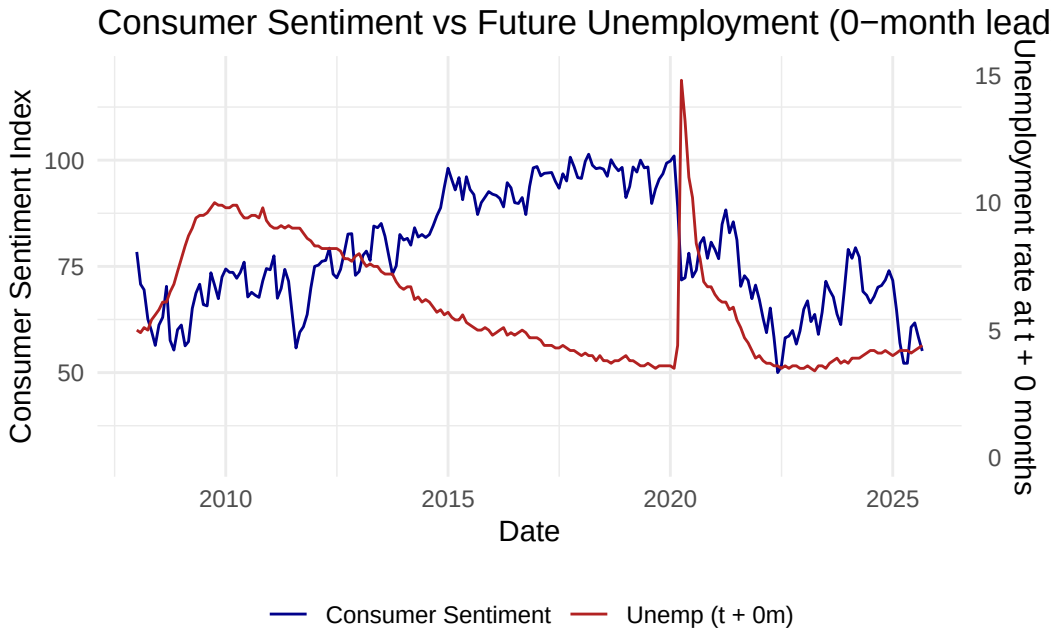
```
2 LNS14000000  2025 M08      4.3     8 2025-08-01
3 LNS14000000  2025 M07      4.2     7 2025-07-01
4 LNS14000000  2025 M06      4.1     6 2025-06-01
5 LNS14000000  2025 M05      4.2     5 2025-05-01
6 LNS14000000  2025 M04      4.2     4 2025-04-01
```

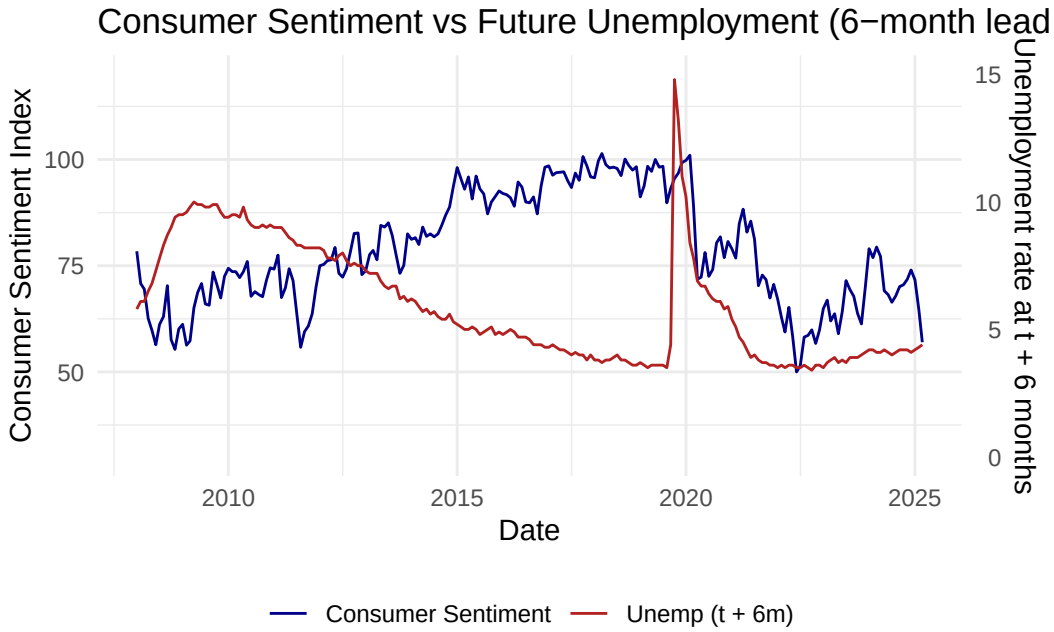
```
# A tibble: 6 x 2
  date       unrate
  <date>      <dbl>
1 2008-01-01    5
2 2008-02-01    4.9
3 2008-03-01    5.1
4 2008-04-01    5
5 2008-05-01    5.4
6 2008-06-01    5.6
```

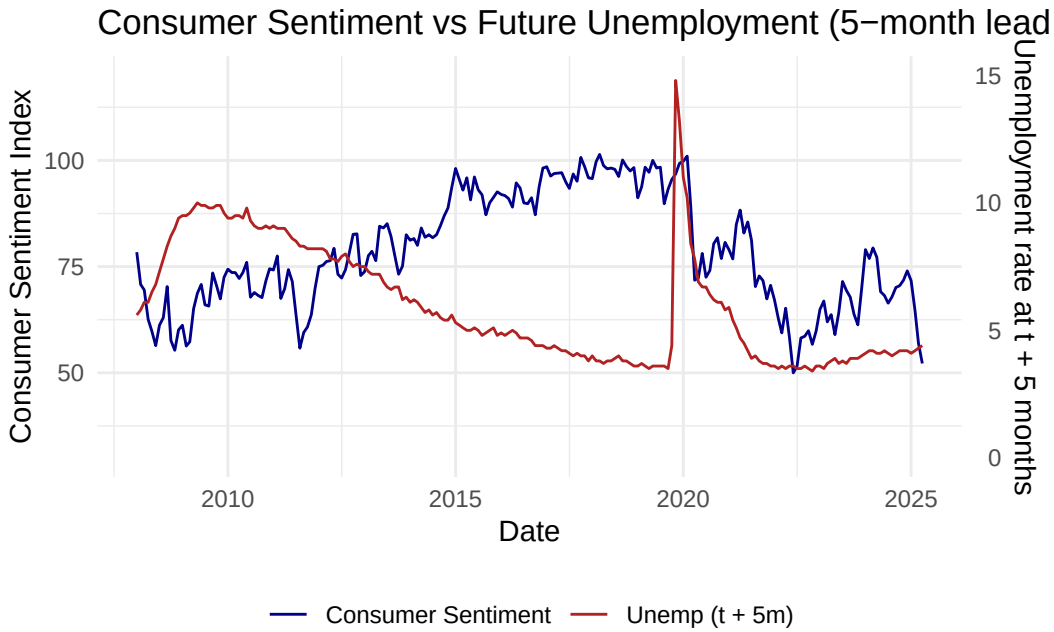
```
# A tibble: 6 x 3
  date       nonfarm_emp job_change
  <date>           <dbl>      <dbl>
1 2008-01-01      138391         NA
2 2008-02-01      138327        -64
3 2008-03-01      138257        -70
4 2008-04-01      138038       -219
5 2008-05-01      137851       -187
6 2008-06-01      137698  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

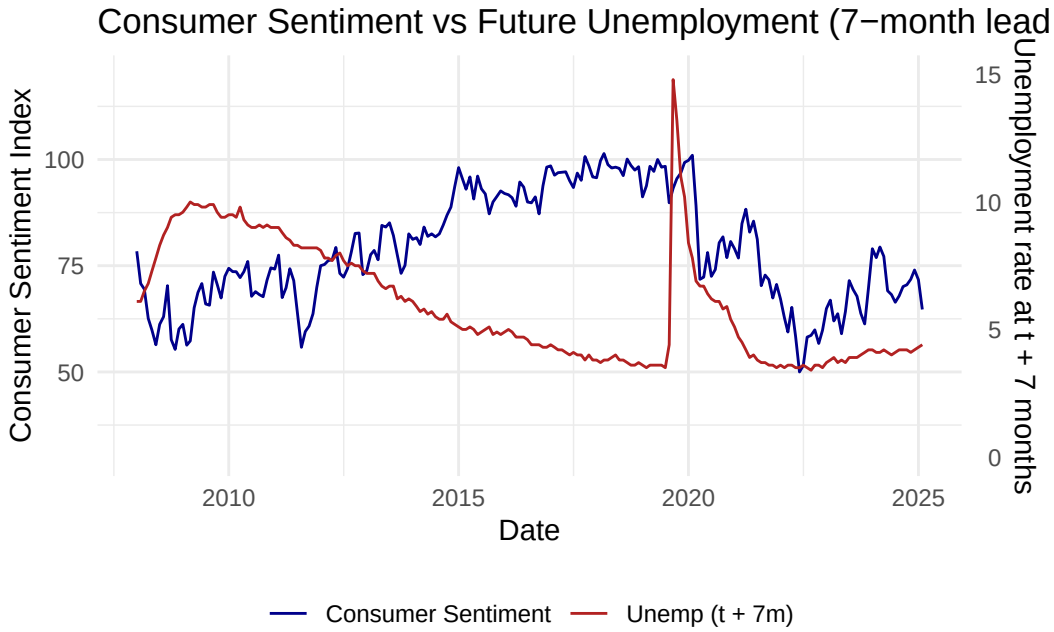
Visualization 1. Lagged Time-Series of Consumer Sentiment and Unemployment Rate/Job Change

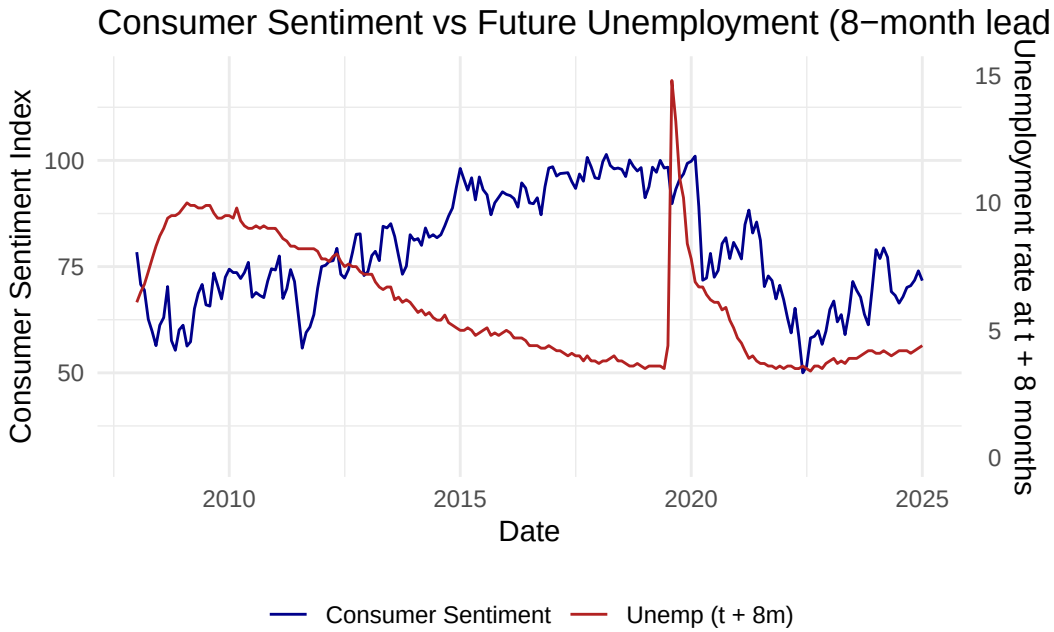
```
# A tibble: 6 x 5
  date          cs unrate nonfarm_emp job_change
  <date>     <dbl>  <dbl>       <dbl>      <dbl>
1 2008-01-01  78.4    5         138391         NA
2 2008-02-01  70.8    4.9       138327        -64
3 2008-03-01  69.5    5.1       138257        -70
4 2008-04-01  62.6    5       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

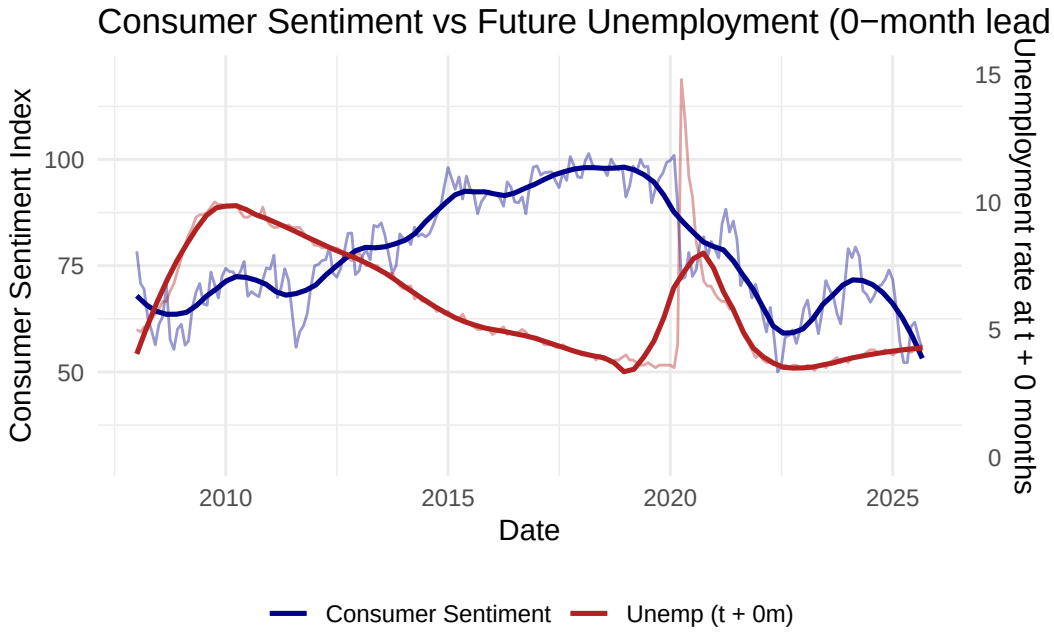


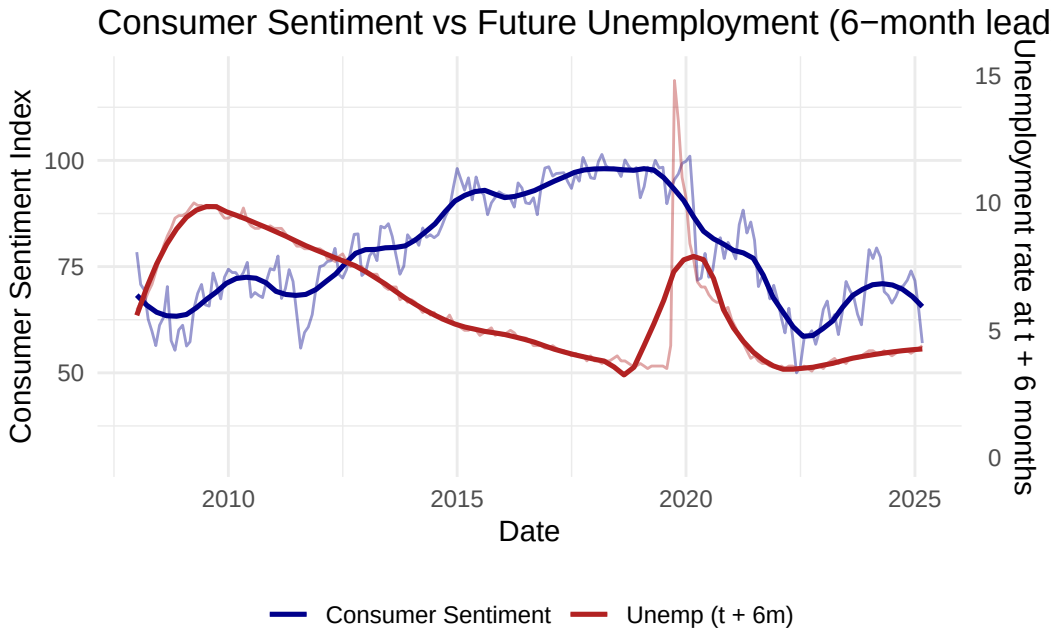

Consumer Sentiment vs Future Unemployment (6−month lead
Consumer Sentiment Index
100
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 6 months
Consumer Sentiment
Unemp (t + 6m)


Consumer Sentiment vs Future Unemployment (5−month lead
Consumer Sentiment Index
100
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 5 months
Consumer Sentiment
Unemp (t + 5m)


Consumer Sentiment vs Future Unemployment (7−month lead
Consumer Sentiment Index
100
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 7 months
Consumer Sentiment
Unemp (t + 7m)


Consumer Sentiment vs Future Unemployment (8−month lead
Consumer Sentiment Index
100
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 8 months
Consumer Sentiment
Unemp (t + 8m)


Consumer Sentiment vs Future Unemployment (0−month lead
Consumer Sentiment Index
100
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 0 months
Consumer Sentiment
Unemp (t + 0m)


Consumer Sentiment vs Future Unemployment (6−month lead
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75
50
2010
2015
2020
2025
Date
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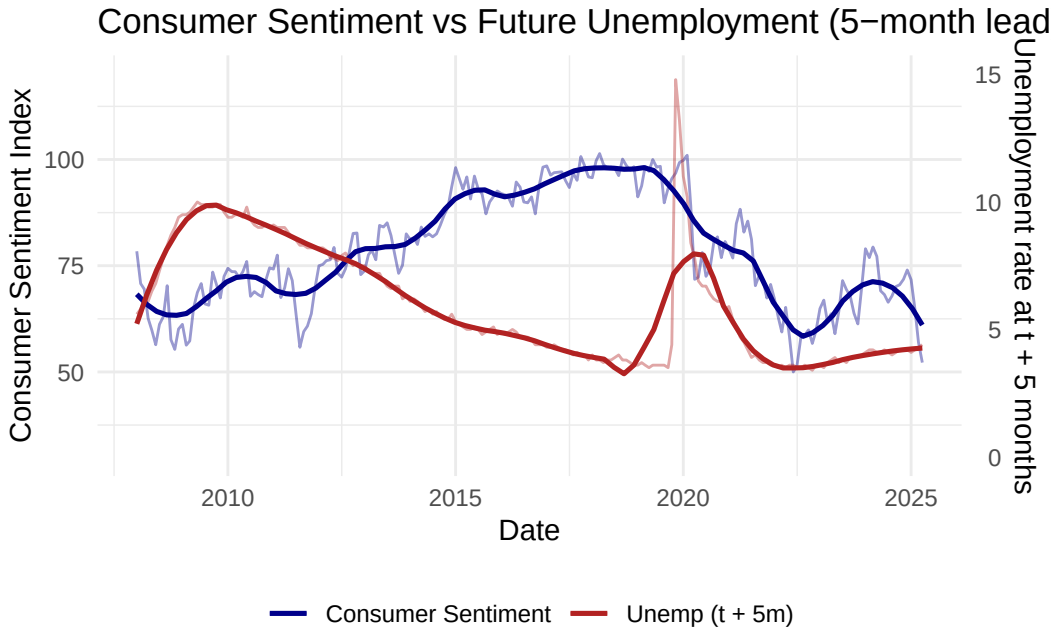
10
5
0
Unemployment rate at t + 6 months
Consumer Sentiment
Unemp (t + 6m)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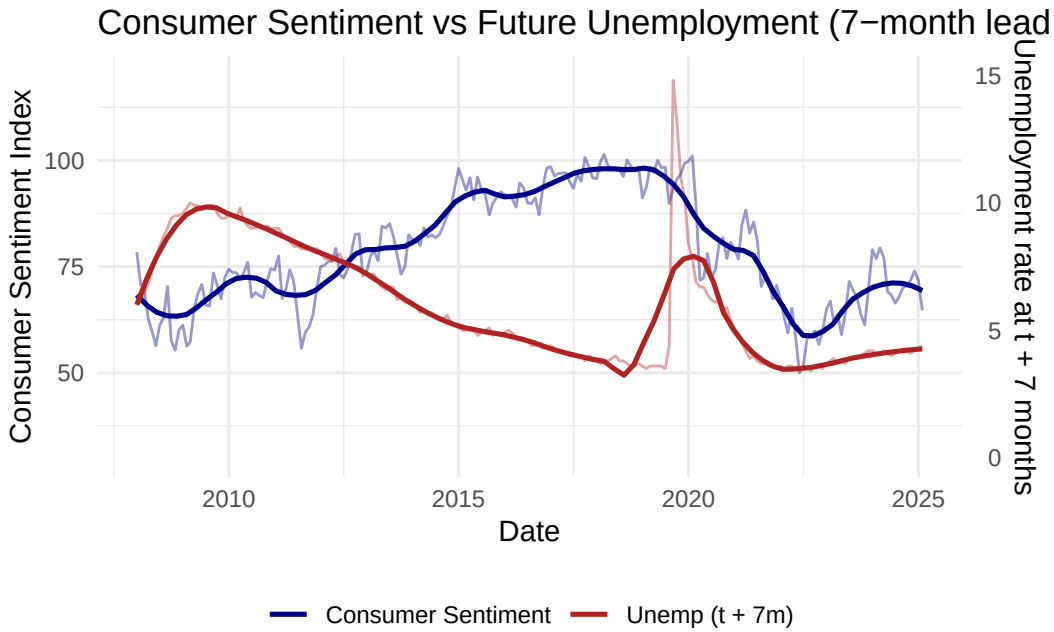
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 5 months
Consumer Sentiment
Unemp (t + 5m)


Consumer Sentiment vs Future Unemployment (7−month lead
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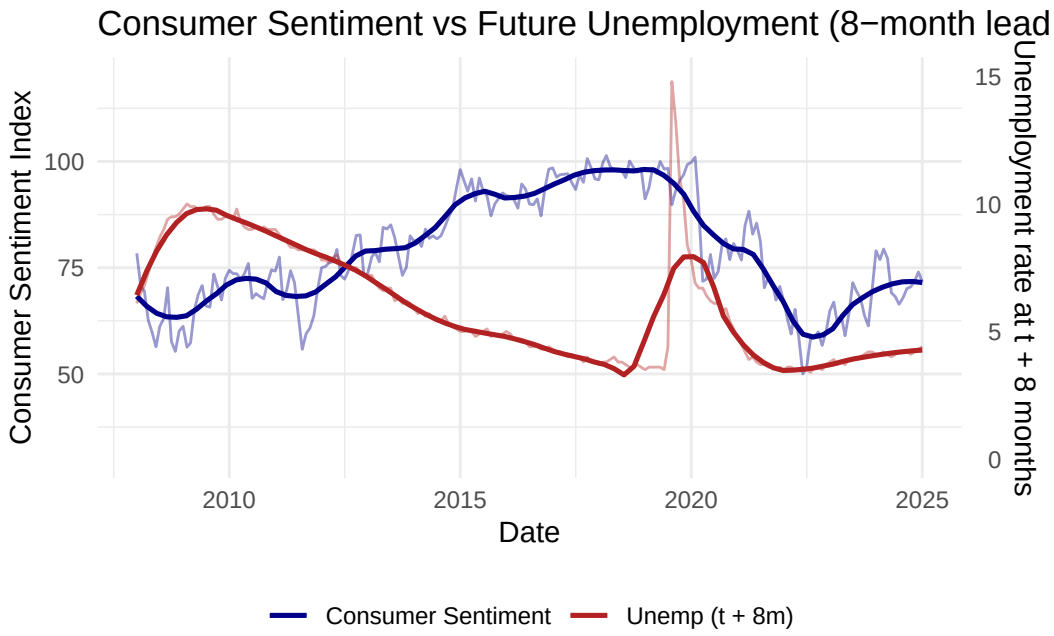
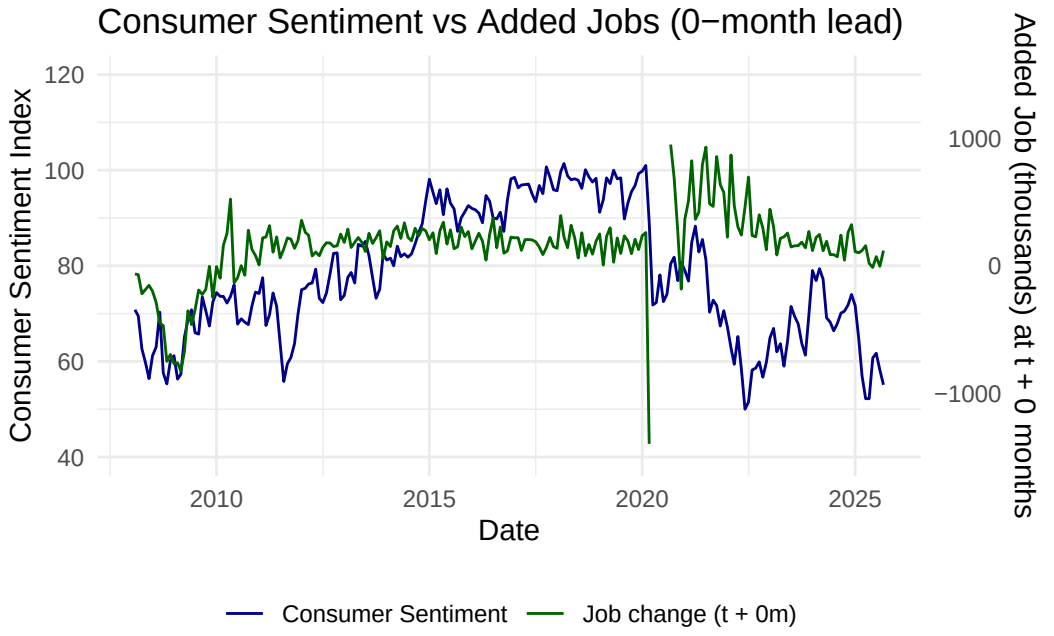
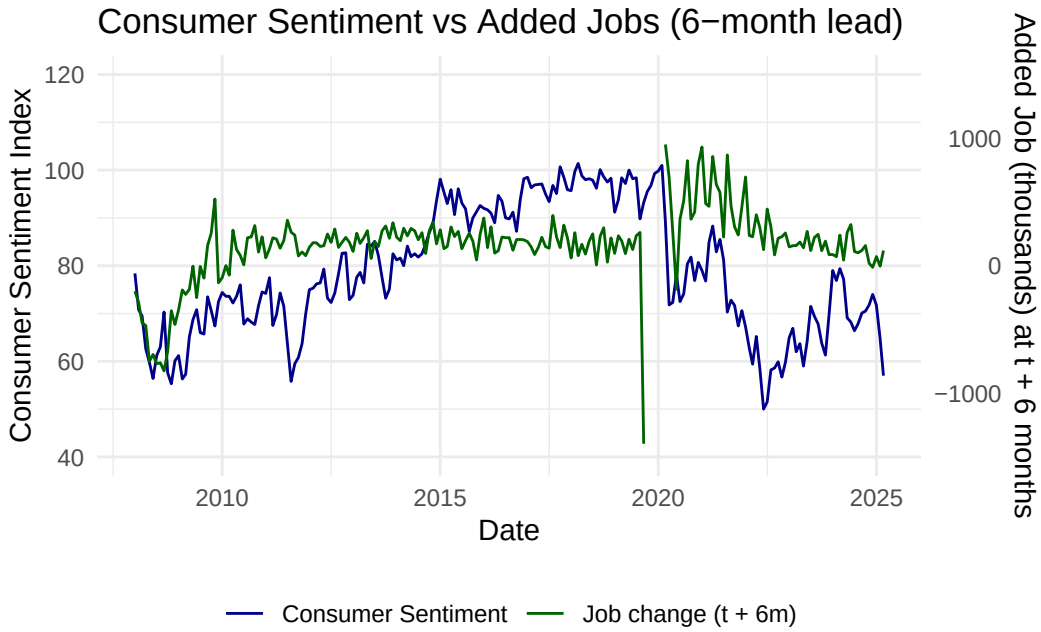
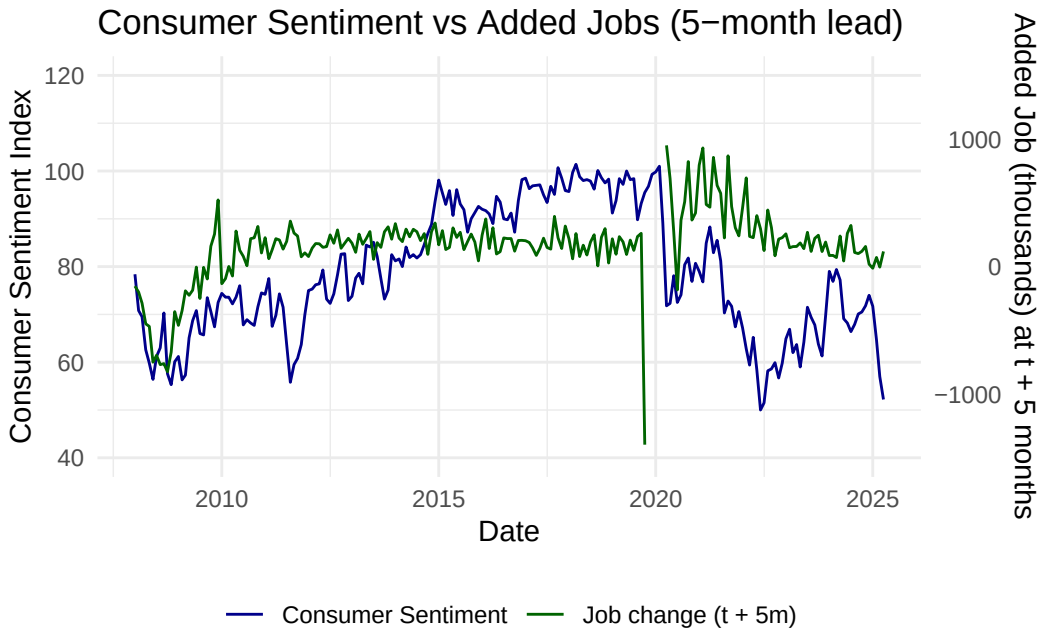
75
50
2010
2015
2020
2025
Date
15
10
5
0
Unemployment rate at t + 7 months
Consumer Sentiment
Unemp (t + 7m)

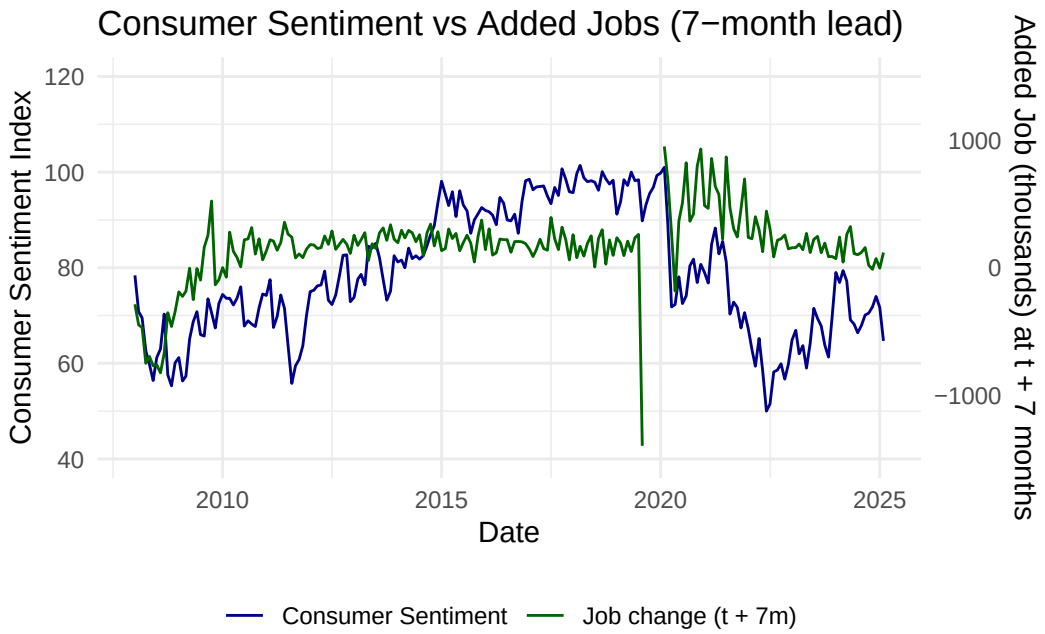


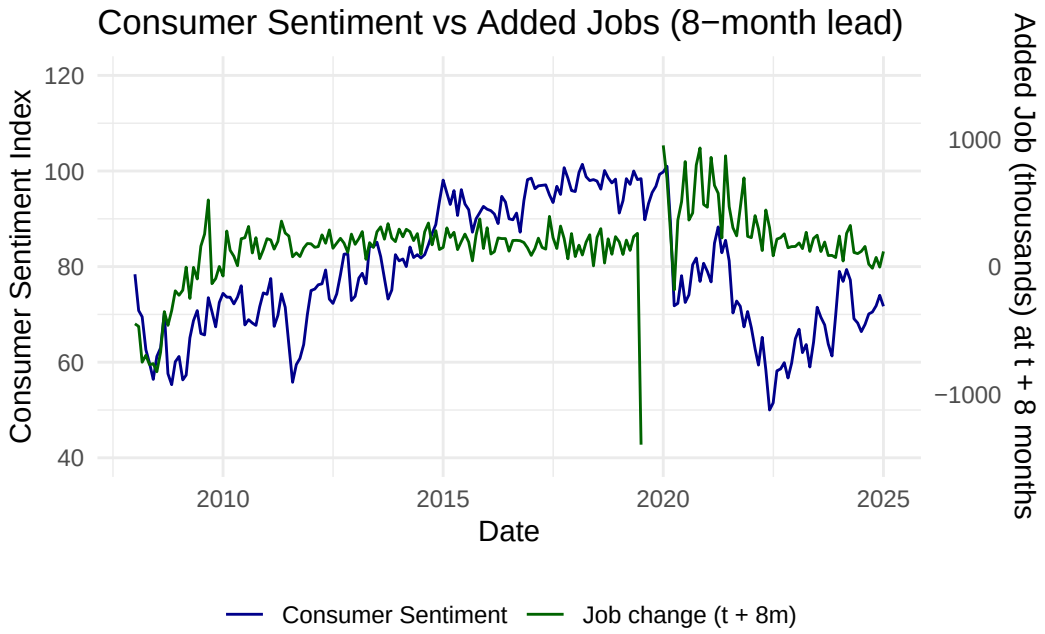
- ANALYSIS HERE
- EXPLAIN LOGISTICS OF SMOOTHING
- ENDED UP NOT THAT CLEAR INDICATING

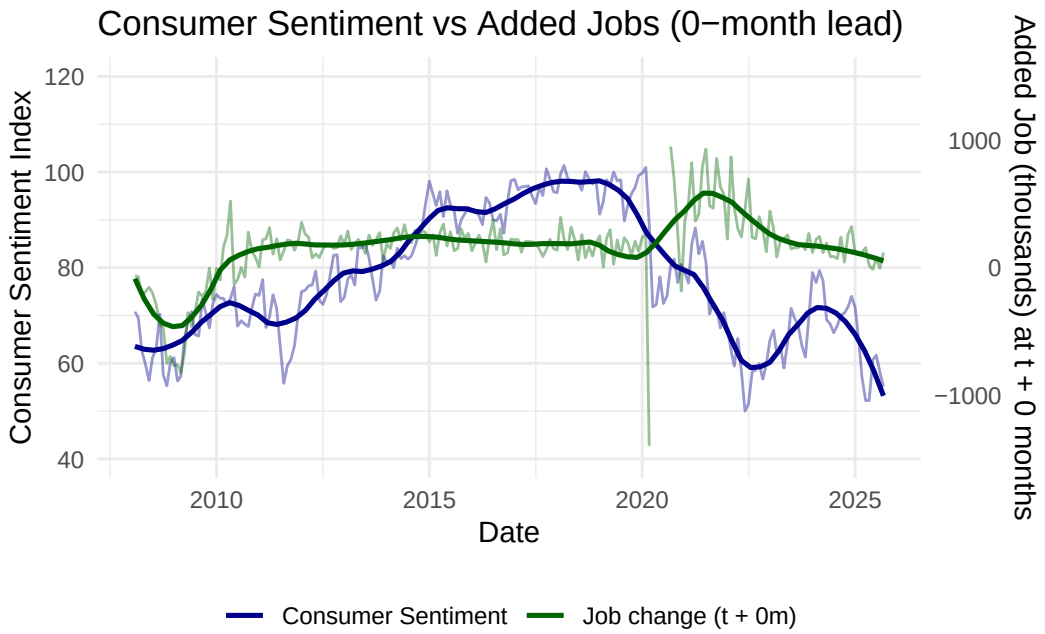


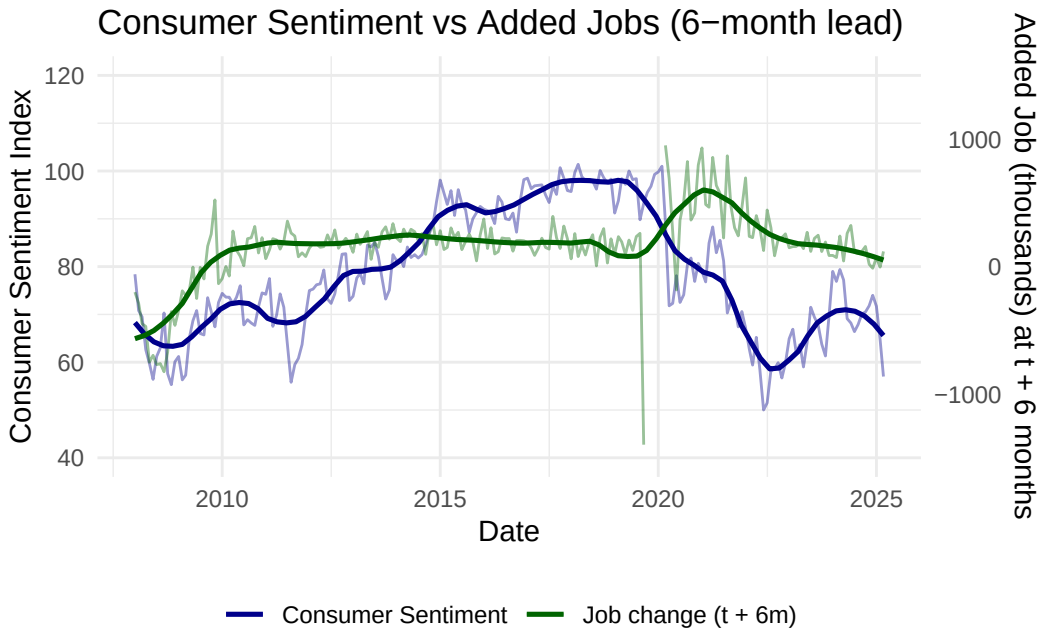

Consumer Sentiment vs Added Jobs (6−month lead)
Consumer Sentiment Index
Added Job (thousands) at t + 6 months
120
100
80
60
40
1000
0
−1000
2010
2015
2020
2025
Date
Consumer Sentiment
Job change (t + 6m)

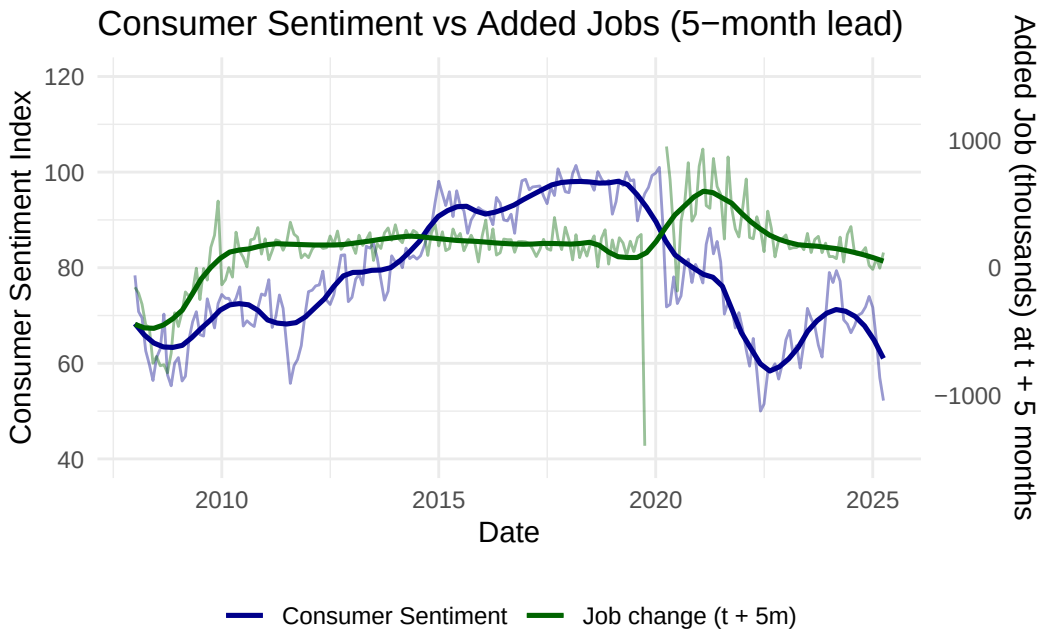

Consumer Sentiment vs Added Jobs (5−month lead)
Consumer Sentiment Index
Added Job (thousands) at t + 5 months
120
100
80
60
40
1000
0
−1000
2010
2015
2020
2025
Date
Consumer Sentiment
Job change (t + 5m)

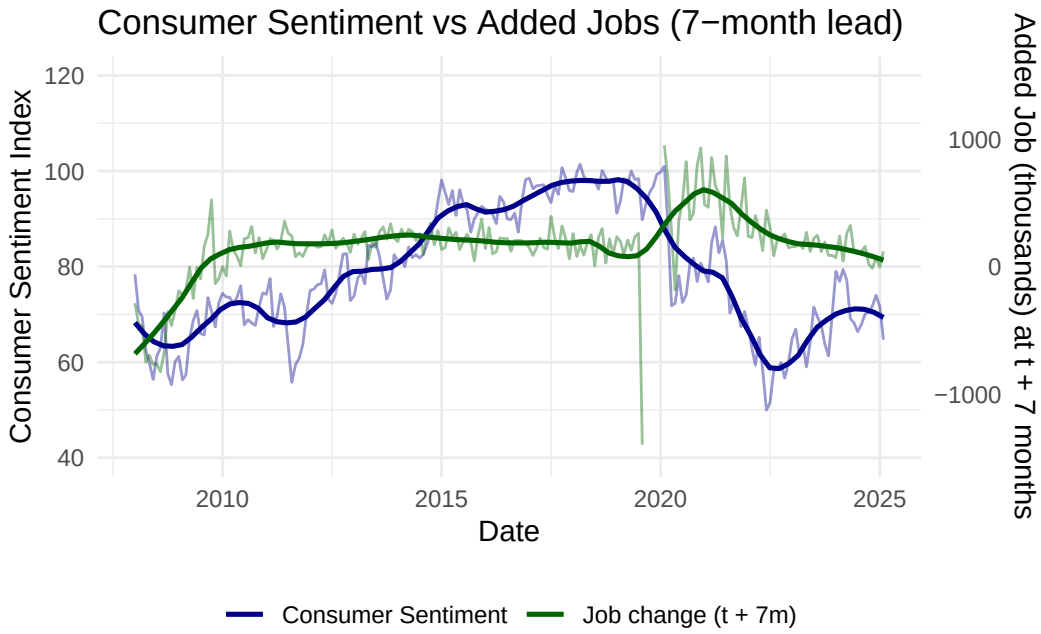

Consumer Sentiment vs Added Jobs (7−month lead)
Consumer Sentiment Index
Added Job (thousands) at t + 7 months
120
100
80
60
40
1000
0
−1000
2010
2015
2020
2025
Date
Consumer Sentiment
Job change (t + 7m)

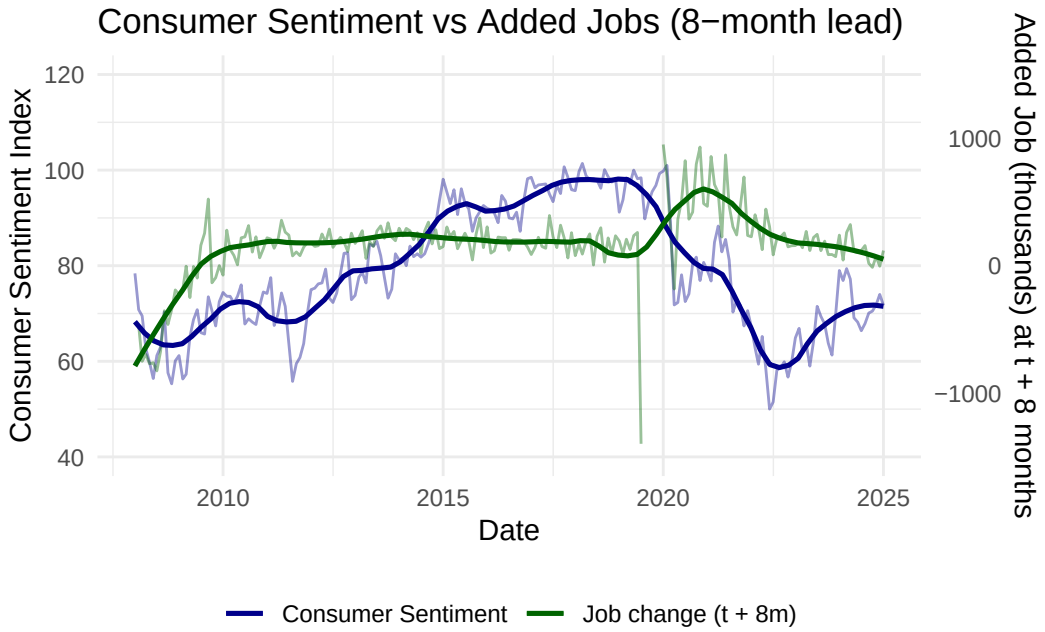

Consumer Sentiment vs Added Jobs (8−month lead)
Consumer Sentiment Index
Added Job (thousands) at t + 8 months
120
100
80
60
40
1000
0
−1000
2010
2015
2020
2025
Date
Consumer Sentiment
Job change (t + 8m)


Consumer Sentiment vs Added Jobs (0−month lead)
Consumer Sentiment Index
120
100
80
60
40
2010
2015
2020
2025
Date
1000
0
−1000
Added Job (thousands) at t + 0 months
Consumer Sentiment
Job change (t + 0m)


Consumer Sentiment vs Added Jobs (6−month lead)
Consumer Sentiment Index
120
100
80
60
40
2010
2015
2020
2025
Date
1000
0
−1000
Added Job (thousands) at t + 6 months
Consumer Sentiment
Job change (t + 6m)


Consumer Sentiment vs Added Jobs (5−month lead)
Consumer Sentiment Index
120
100
80
60
40
2010
2015
2020
2025
Date
1000
0
−1000
Added Job (thousands) at t + 5 months
Consumer Sentiment
Job change (t + 5m)


Consumer Sentiment vs Added Jobs (7−month lead)
Consumer Sentiment Index
120
100
80
60
40
2010
2015
2020
2025
Date
1000
0
−1000
Added Job (thousands) at t + 7 months
Consumer Sentiment
Job change (t + 7m)



- ANALYSIS HERE
- EXPLAIN LOGISTICS OF SMOOTHING

Visualization 2. Scatter: net expectations vs subsequent unemployment change

```
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
```

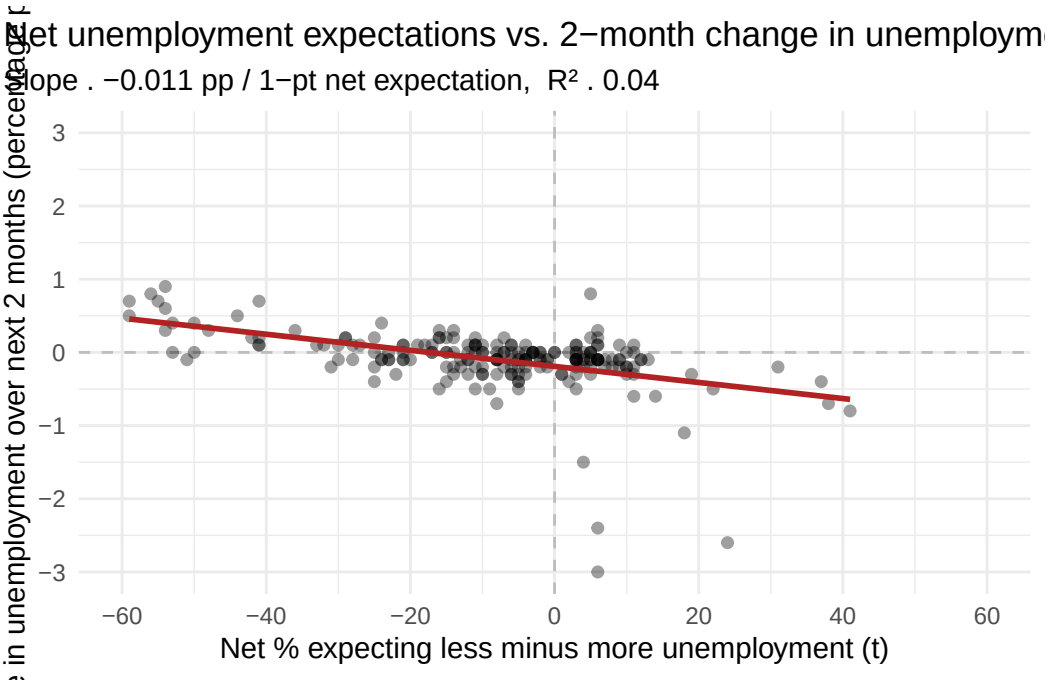
```
R-squared: 0.173
```

```
$h_0m
```

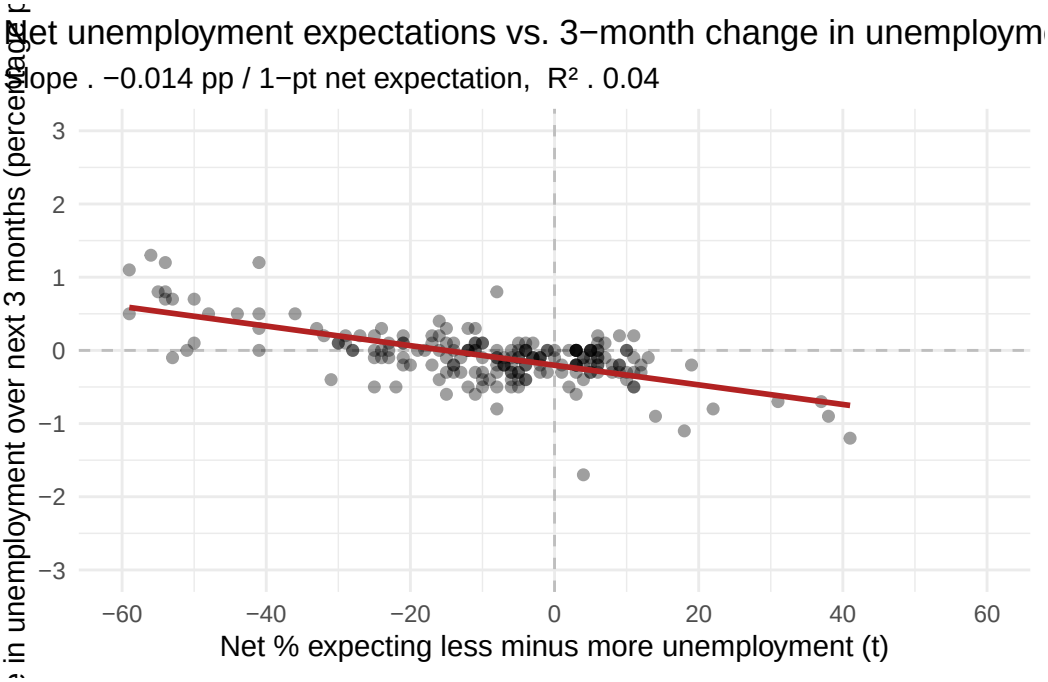

```
$h_1m
```


Net unemployment expectations vs. 1−month change in unemploym
Slope . −0.007 pp / 1−pt net expectation, R² . 0.03
in unemployment over next 1 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

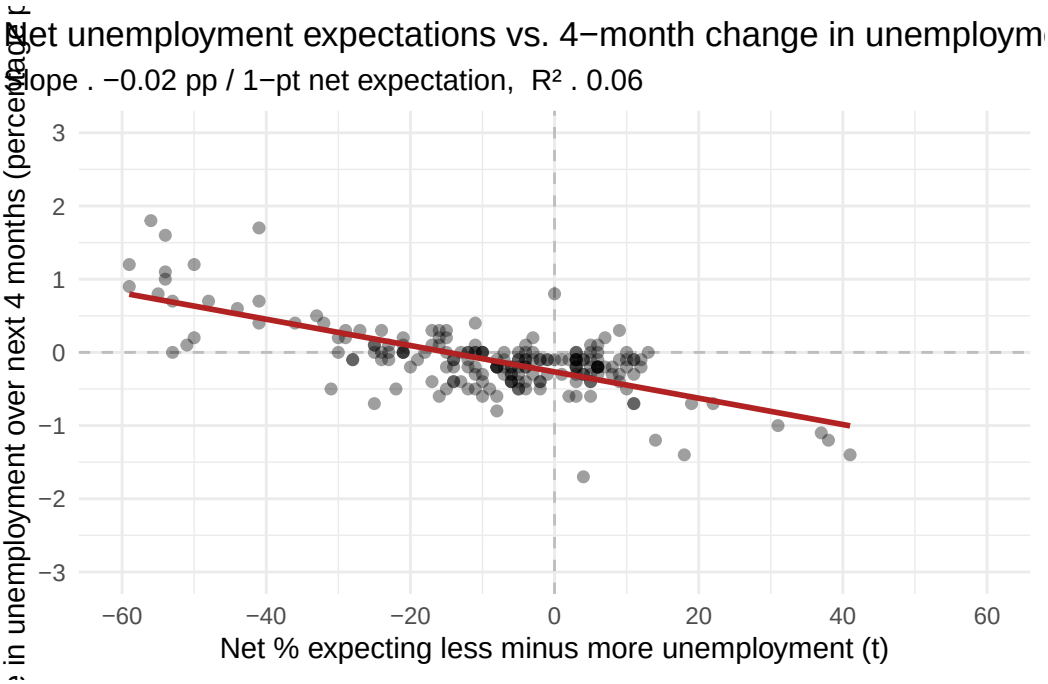
```
$h_2m
```


Net unemployment expectations vs. 2−month change in unemploym
Slope . −0.011 pp / 1−pt net expectation, R² . 0.04
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

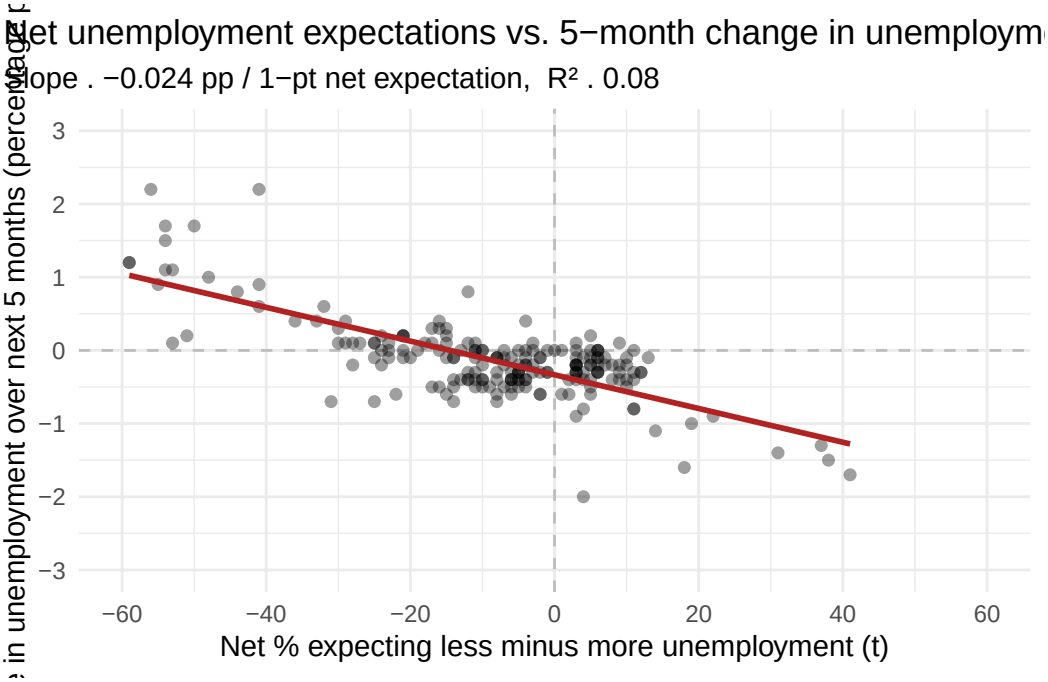
$h_3m


Net unemployment expectations vs. 3−month change in unemploym
Slope . −0.014 pp / 1−pt net expectation, R² . 0.04
in unemployment over next 3 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

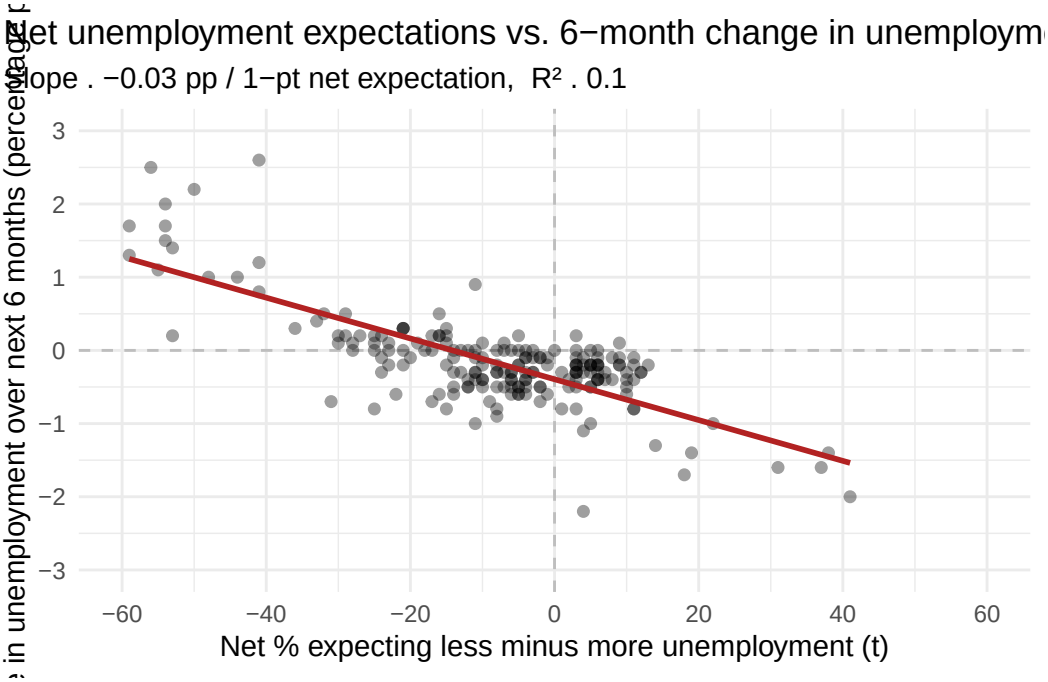
$h_4m


Net unemployment expectations vs. 4−month change in unemploym
Slope . −0.02 pp / 1−pt net expectation, R² . 0.06
in unemployment over next 4 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

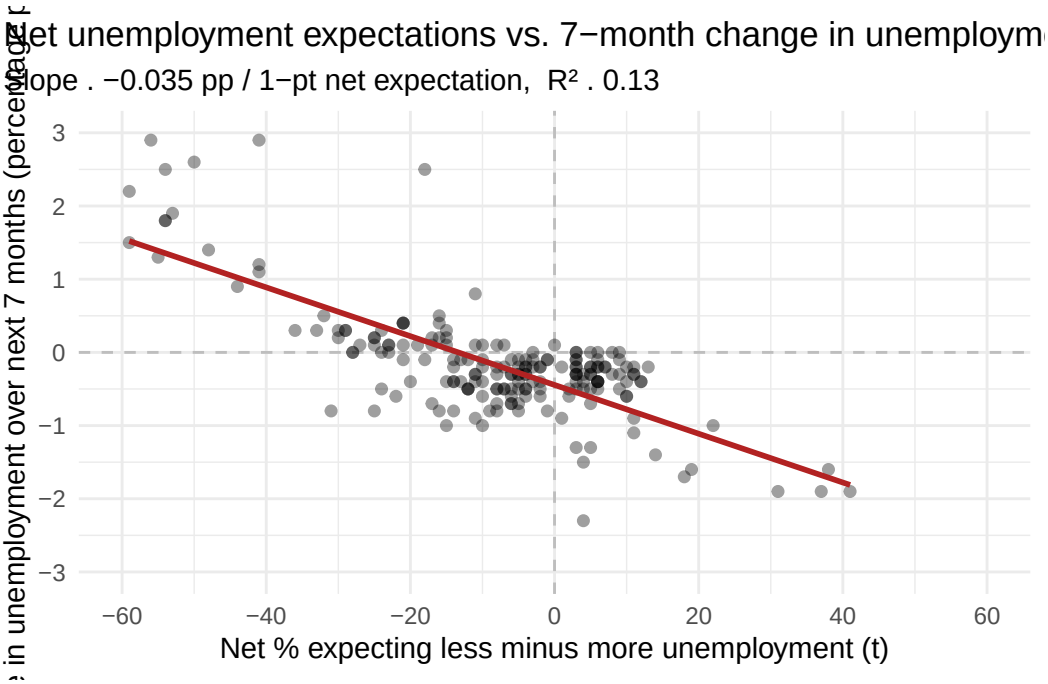
$h_5m


Net unemployment expectations vs. 5−month change in unemploym
Slope . −0.024 pp / 1−pt net expectation, R² . 0.08
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

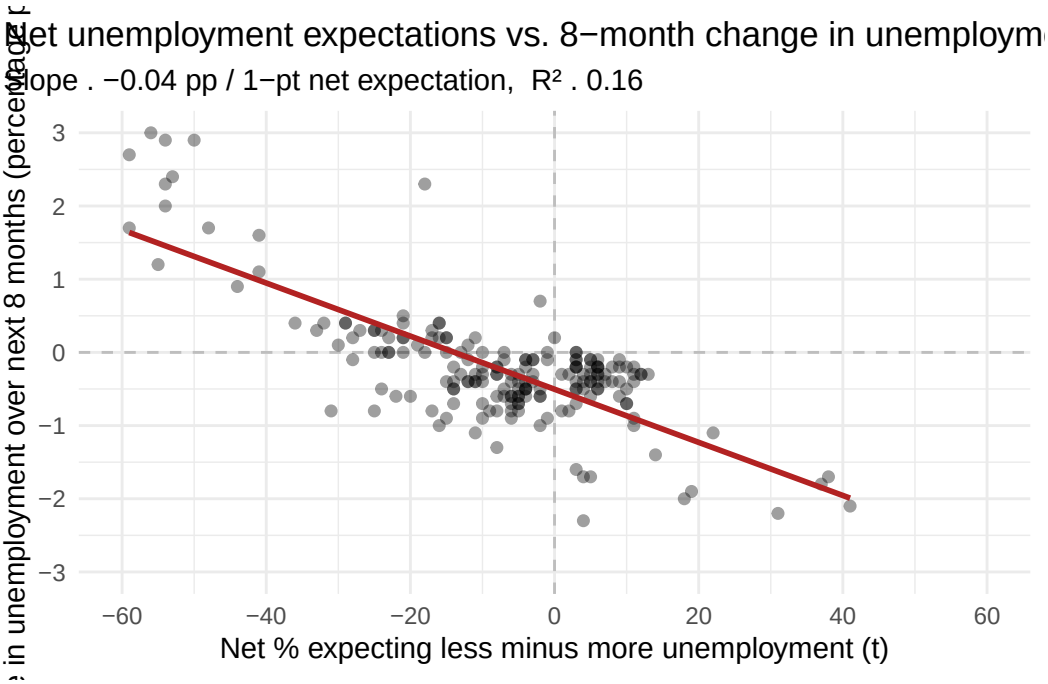
```
$h_6m
```


Net unemployment expectations vs. 6−month change in unemploym
Slope . −0.03 pp / 1−pt net expectation, R² . 0.1
in unemployment over next 6 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

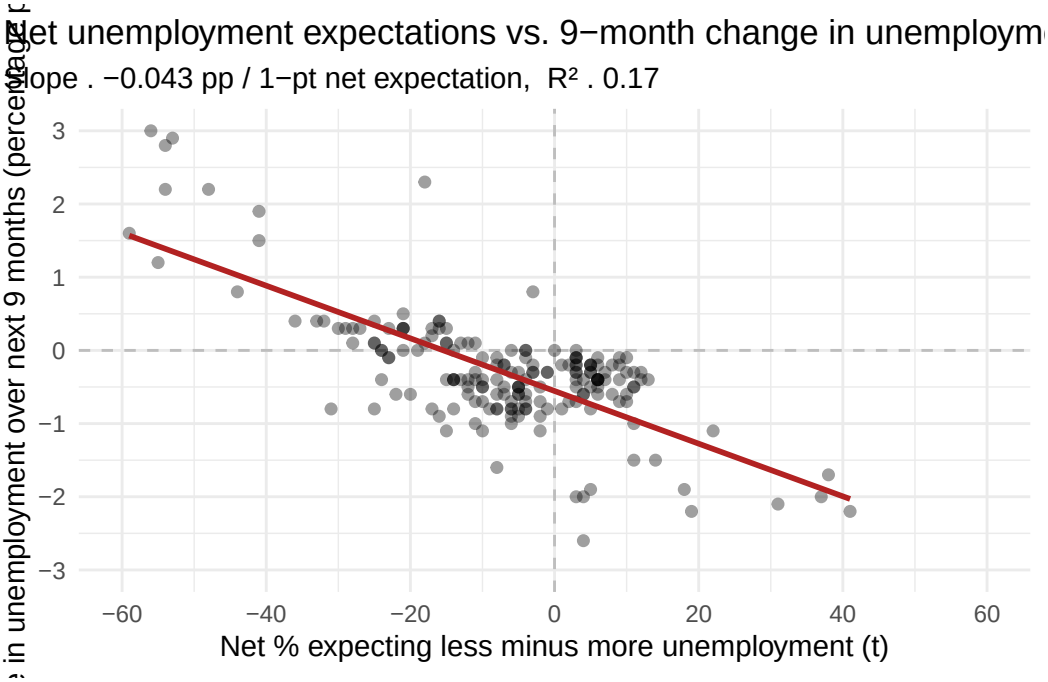
$h_7m


Net unemployment expectations vs. 7−month change in unemploym
Slope . −0.035 pp / 1−pt net expectation, R² . 0.13
in unemployment over next 7 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

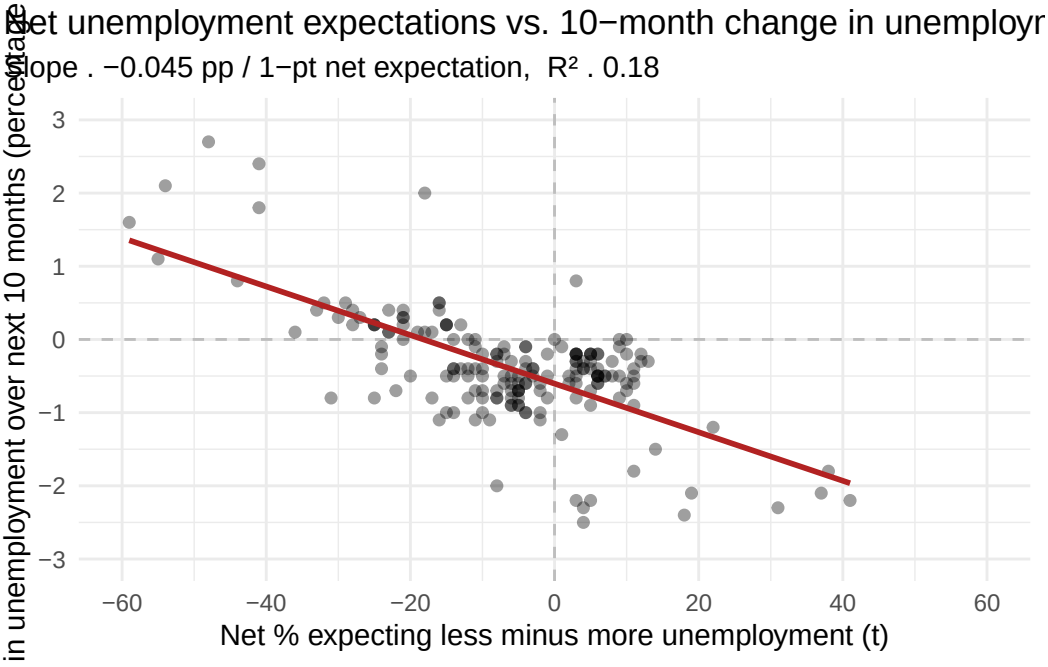
```
$h_8m
```


Net unemployment expectations vs. 8−month change in unemploym
Slope . −0.04 pp / 1−pt net expectation, R² . 0.16
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

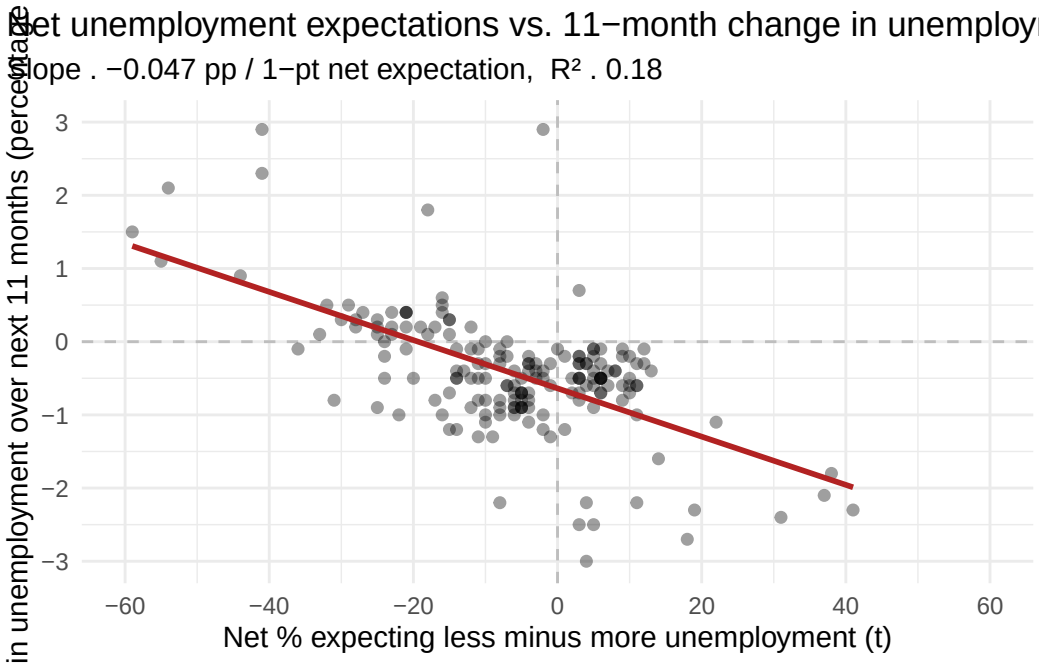
$h_9m


Net unemployment expectations vs. 9−month change in unemploym
Slope . −0.043 pp / 1−pt net expectation, R² . 0.17
in unemployment over next 9 months (percentage p
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

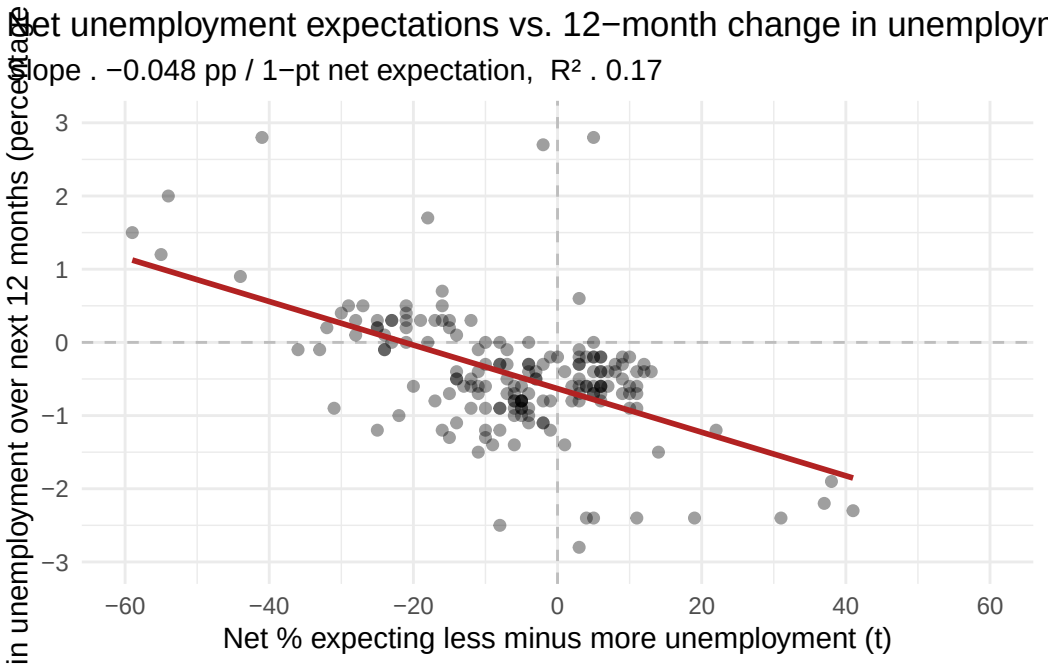
$h_10m


Net unemployment expectations vs. 10−month change in unemployr
Slope . −0.045 pp / 1−pt net expectation, R² . 0.18
in unemployment over next 10 months (percentage
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

```
$h_11m
```

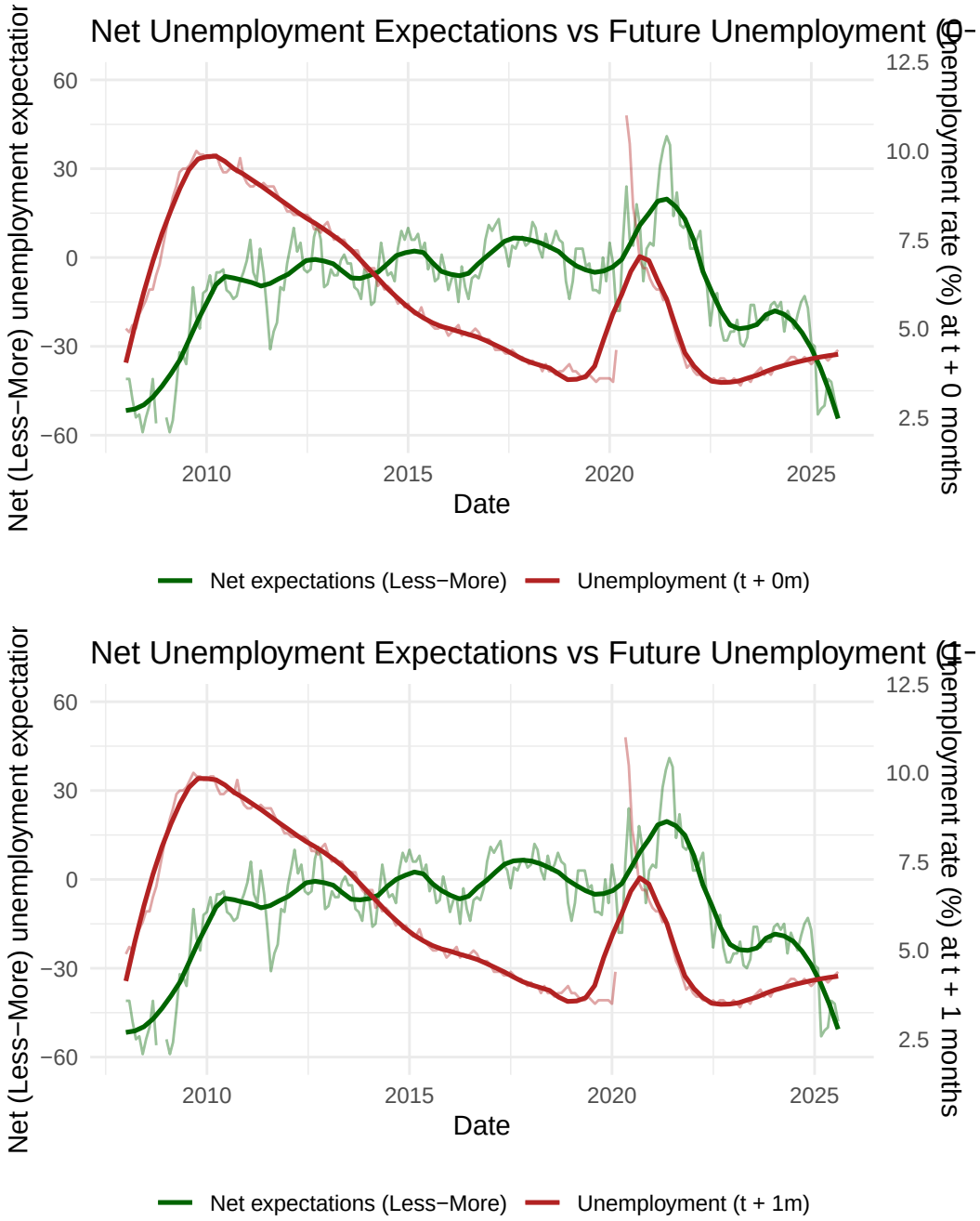

Net unemployment expectations vs. 11−month change in unemployr
Slope . −0.047 pp / 1−pt net expectation, R² . 0.18
in unemployment over next 11 months (percentage
3
2
1
0
−1
−2
−3
−60
−40
−20
0
20
40
60
Net % expecting less minus more unemployment (t)

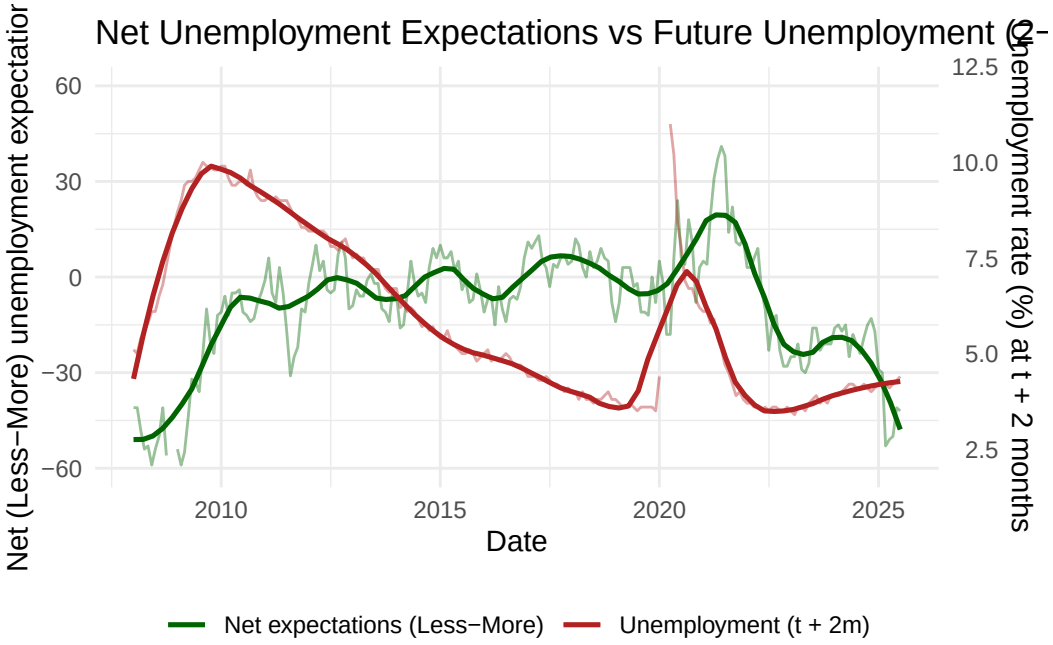
```
$h_12m
```

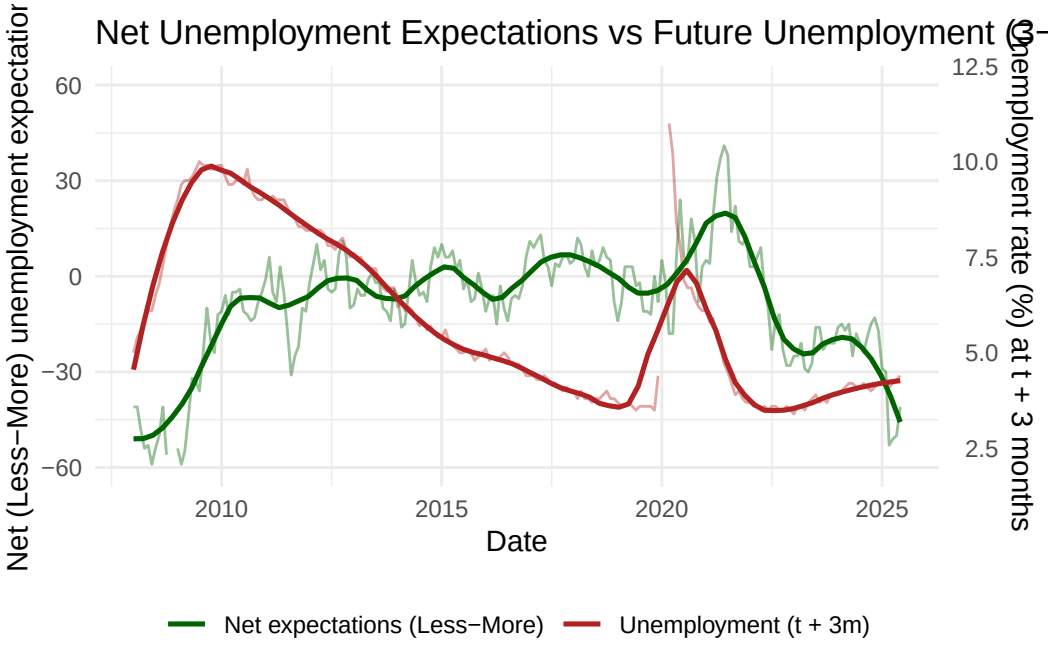


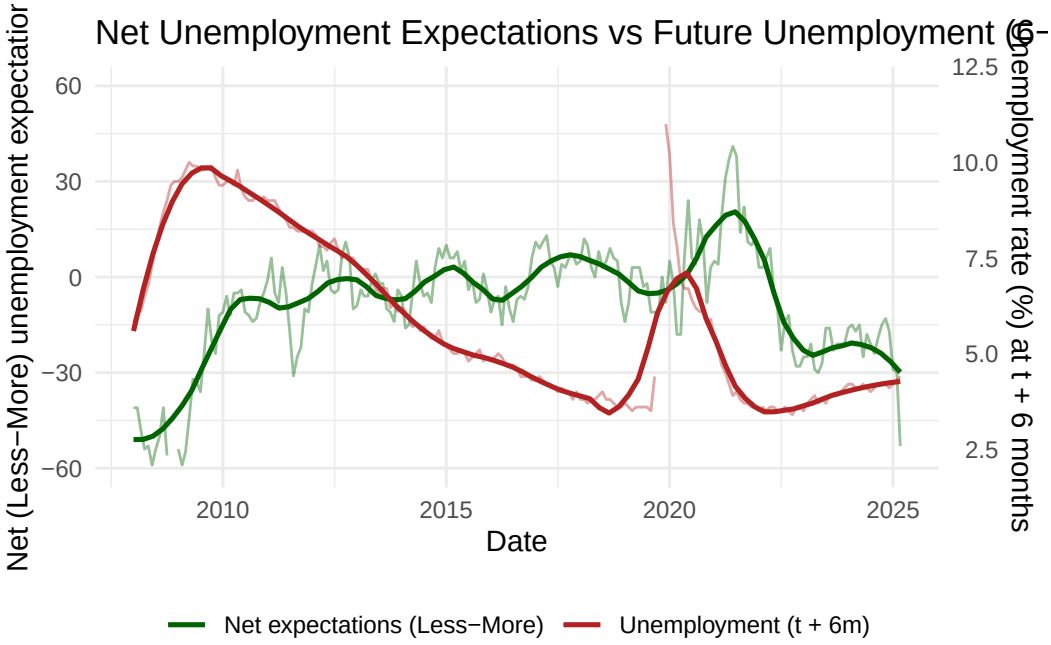
- MAKE A CONCLUSION & INDICATION HERE!

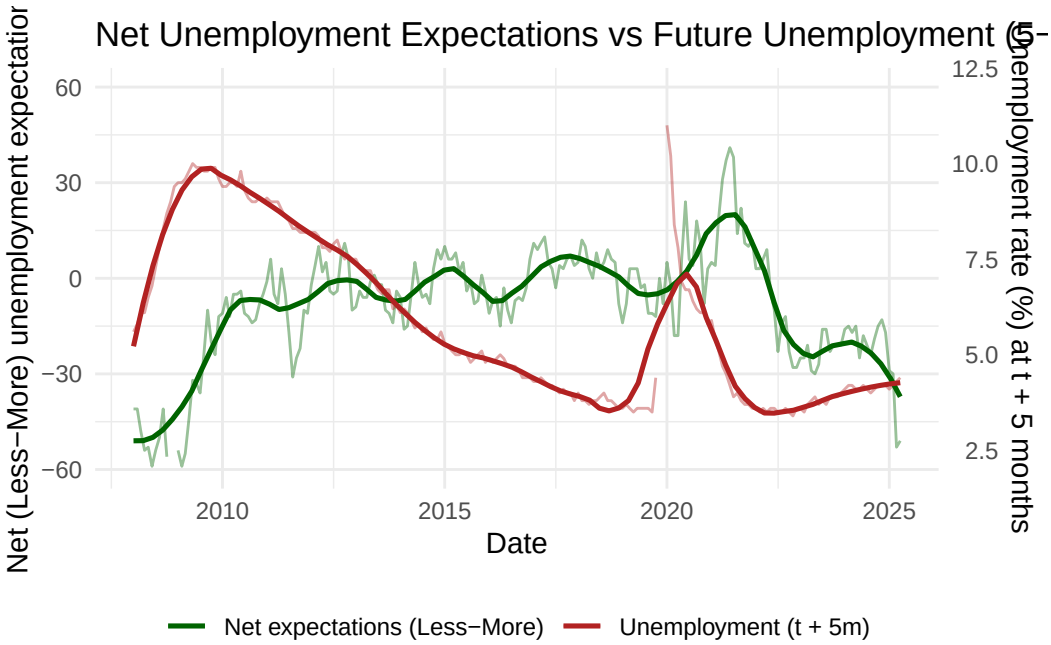
Visualization 3. Time series: net expectations vs actual unemployment (dual axis)

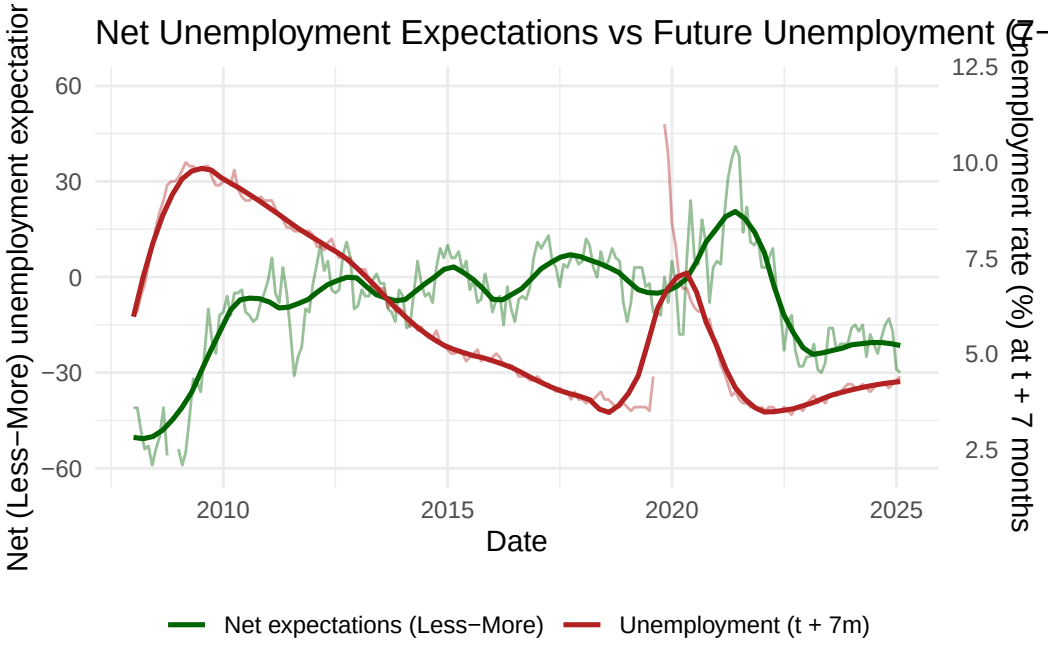


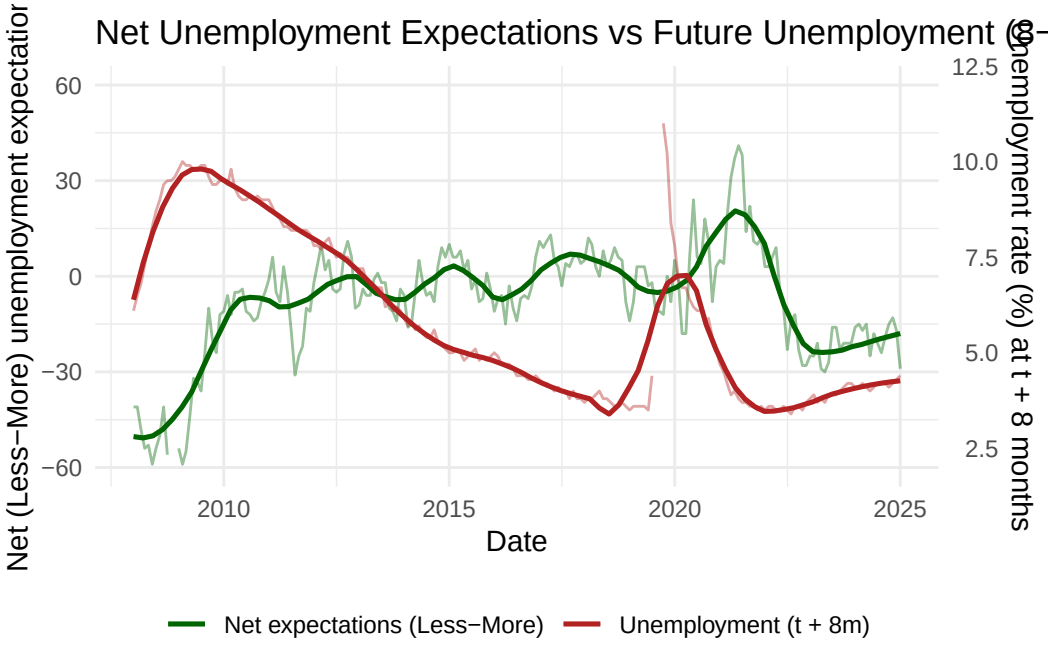

Net Unemployment Expectations vs Future Unemployment (2-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 2 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 2m)

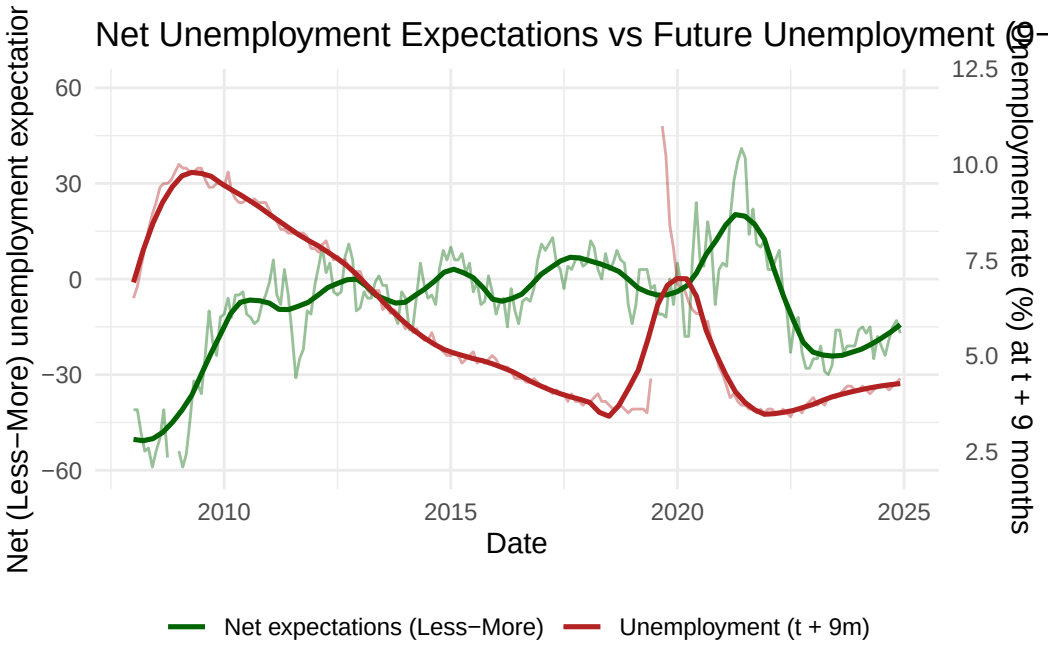

Net Unemployment Expectations vs Future Unemployment (3-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 3 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 3m)

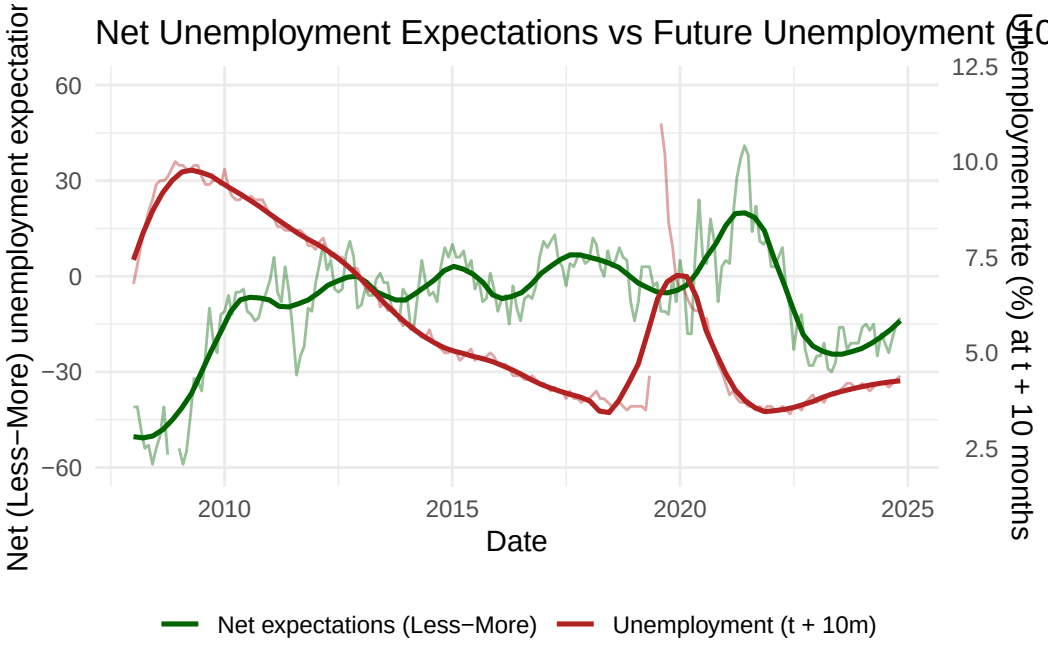

Net Unemployment Expectations vs Future Unemployment (6-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 6 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 6m)

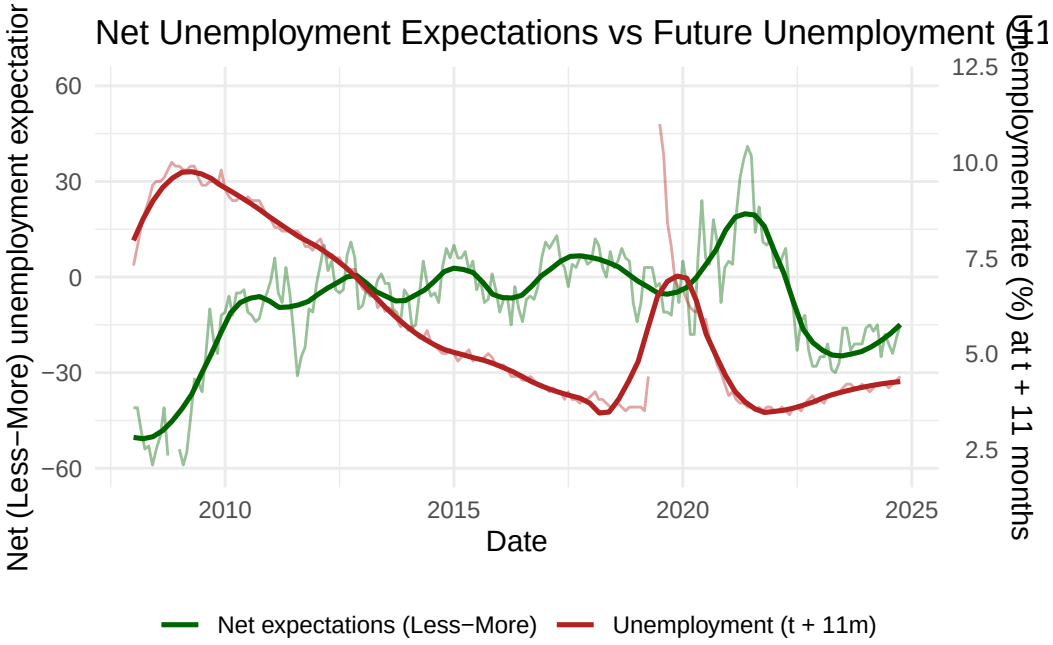

Net Unemployment Expectations vs Future Unemployment (5-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 5 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 5m)

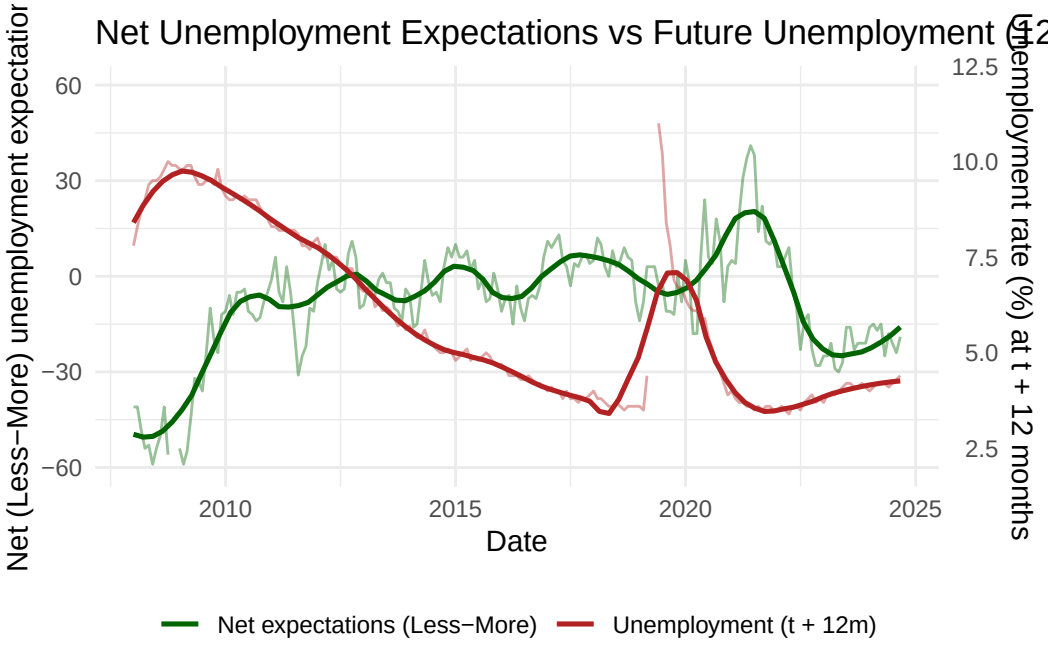

Net Unemployment Expectations vs Future Unemployment (7-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 7 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 7m)


Net Unemployment Expectations vs Future Unemployment (8-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 8 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 8m)


Net Unemployment Expectations vs Future Unemployment (9-
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 9 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 9m)


Net Unemployment Expectations vs Future Unemployment (10
Net (Less−More) unemployment expectation
Unemployment rate (%) at t + 10 months
60
30
0
−30
−60
12.5
10.0
7.5
5.0
2.5
2010
2015
2020
2025
Date
Net expectations (Less−More)
Unemployment (t + 10m)





- EXPLAIN LOGISTICS
- MAKE A CONCLUSION & INDICATION HERE!

Indications

SOME REAL WORLD INDICATIONS.

Conclusion & Outlook

Limitation

References

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

https://www.bls.gov/cps

https://www.bls.gov/ces