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Categories > National Accounts > National Income & Product Accounts > GDP/GNP

☆ Weekly Economic Index (Lewis-Mertens-Stock) (WEI)

DOWNLOAD

Observation: 2020-10-10: -3.91 (+ more)
Updated: 10:31 AM CDT

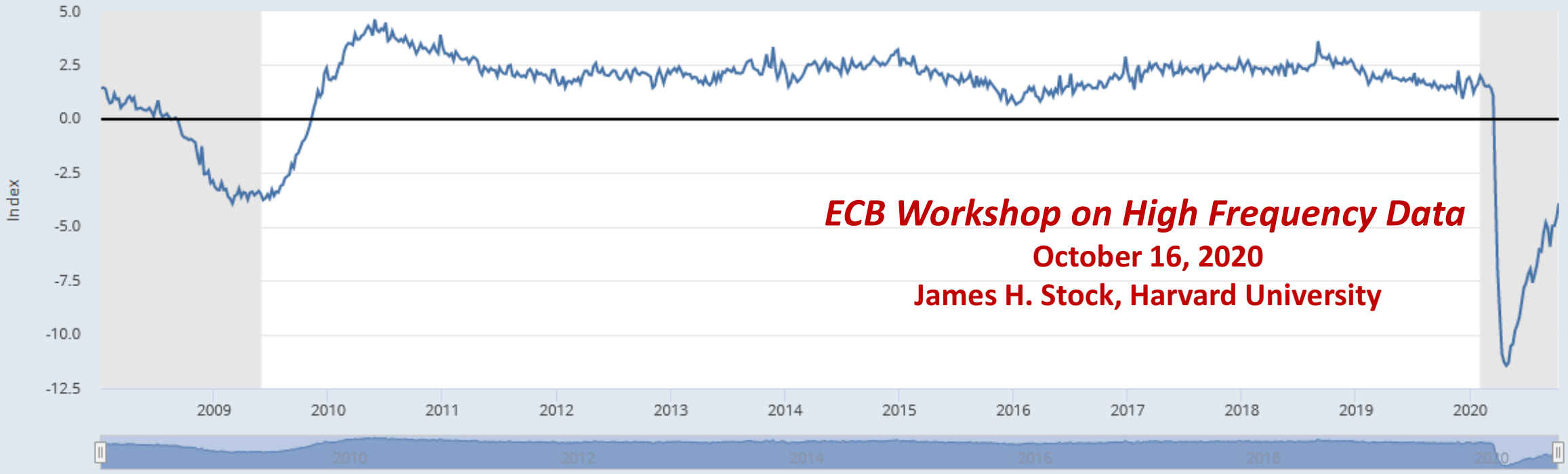
Units: Index, Not Seasonally Adjusted

Frequency: Weekly, Ending Saturday

1Y | 5Y | 10Y | Max 2008-01-05 to 2020-10-10

EDIT GRAPH

FRED — Weekly Economic Index (Lewis-Mertens-Stock)



ECB Workshop on High Frequency Data
October 16, 2020
James H. Stock, Harvard University

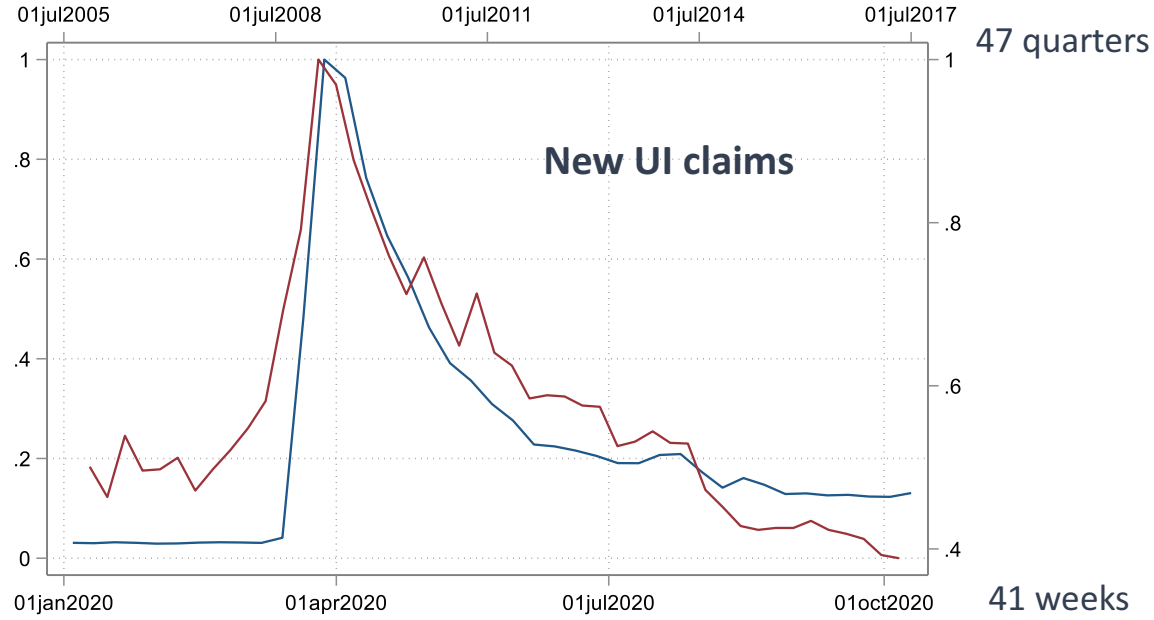
Shading indicates U.S. recessions; the most recent one is ongoing.

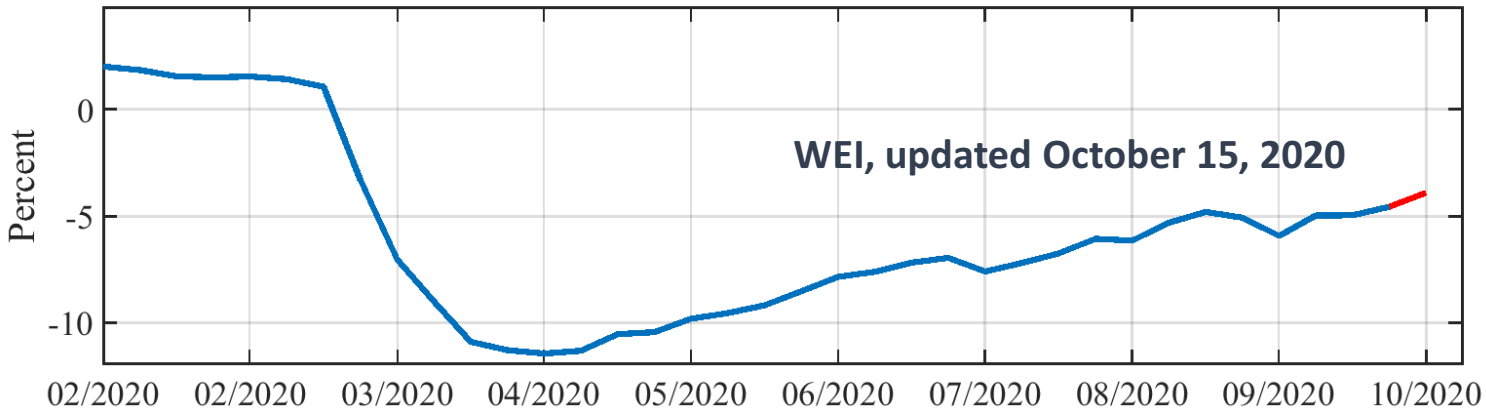
Source: Lewis, Daniel J.

fred.stlouisfed.org

Outline

1. Why high frequency?
2. Purpose: weekly economic index – not nowcast
3. Data
   a) Criteria
   b) Series used
4. Methods
5. Performance
   a) As GDP nowcast
   b) Revisions
   c) Strengths/weaknesses
6. To do list:
   a) Methods: weekly SA
   b) Identification by timing
   c) Incorporating complex/ephemeral data





Data series

Criteria

- Real activity measure, weekly or daily
- Timely availability
- Long enough time series to be confident of correlations
- Stable definition and survey instrument
- Provides signal value
- These criteria eliminate very many interesting series!

	Series	Native Units	Time available EST (days from reference week)	Notes
Cons.	Redbook Research: Same Store, Retail Sales	NSA, Y/Y % Chg.	1st Tuesday, 9:00am (3 days)	Sales-weighted, year-over-year same-store sales growth, 9,000 stores (80% of the retail sales) (Redbook Research)
	Rasmussen Consumer Index	Index, 3-day MA	Friday of reference week, 6:00pm (0 days)	Daily survey of 1500 American adults Sun-Thurs. (Rasmussen)
Labor mkts	Unemployment Insurance: Initial Claims	NSA, Thous.	1st Thursday, 8:30am (5 days)	US DOL
	Unemployment Insurance: Continued Claims	NSA, Thous.	2nd Thursday, 8:30am (12 days)	US DOL
	American Staffing Association Staffing Index	NSA, Jun-12-06=100	2nd Tuesday, 8:30am (10 days)	Stratified panel of small, medium, and large staffing companies (American Staffing Association)
	Federal Withholding Tax Collections	Y/Y % Chg.	1st Tuesday, 4:00pm (5 days)	Treasury receipts of income and payroll taxes withheld from paychecks, adjusted (Taxtracking.com)
Ind. Prodn.	Raw Steel Production	NSA, Thous. Net Tons	1st Monday, 4:00pm (2 days)	50% weekly production provided, 50% monthly production (American Iron & Steel Institute)
	U.S Railroad Traffic	NSA, car-loads	1st Wednesday, 9:00am (4 days)	Total carloads and intermodal units (Association of American Railroads)
Energy	US Fuel Sales to End Users	NSA, EOP, Thous. barrels/ day	1st Wednesday 10:30am (4 days)	Weekly product supplied of finished gasoline and distillate fuels (US EIA)
	Electric Utility Output	NSA, Gigawatt Hours	1st Wednesday, 1:00pm (4 days)	U.S. (ex Alaska and Hawaii) investor-owned electric companies (Edison Electric Institute)

Weekly seasonal adjustment

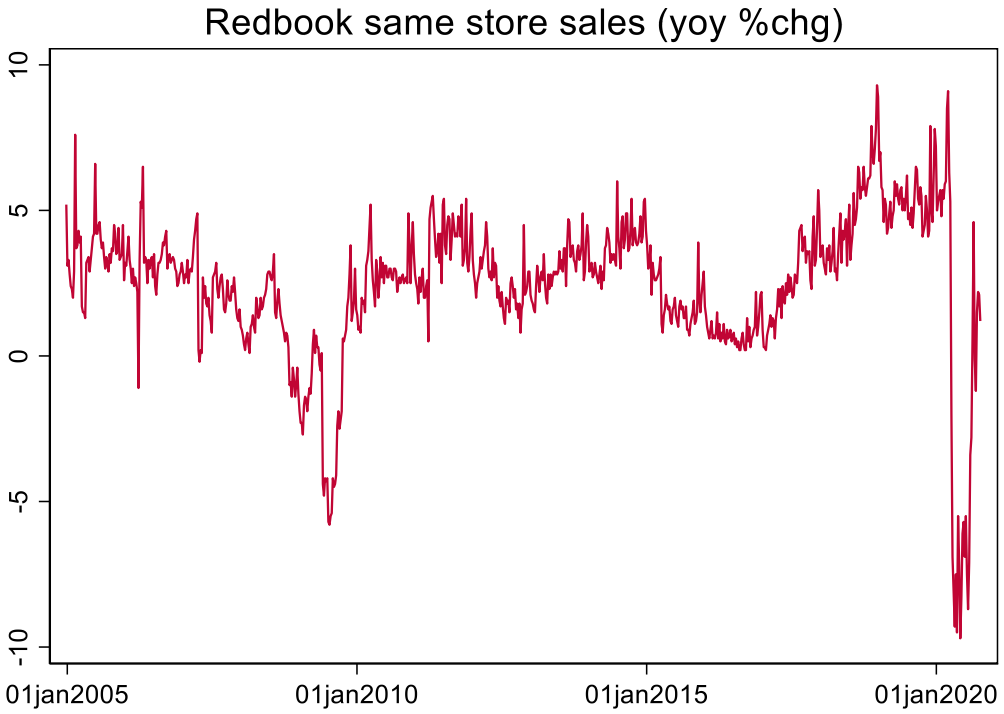
Options are limited

- Hard problem (floating holidays, 4 weeks ≠ 1 month, 52 weeks ≠ 1 year)

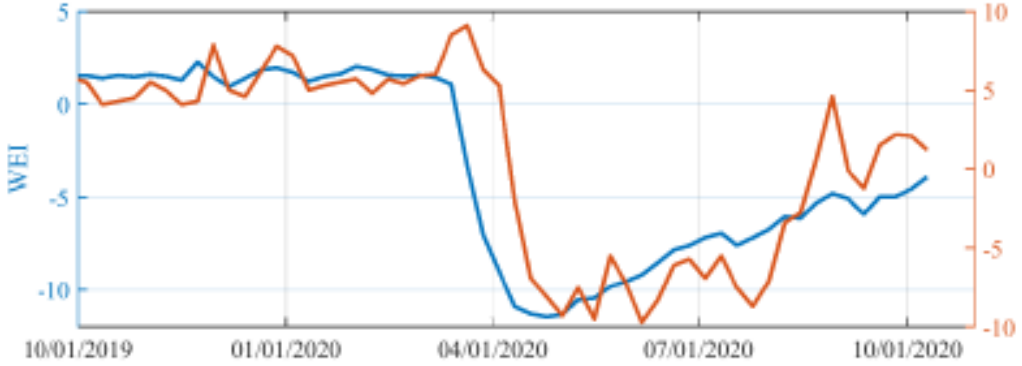
- Standard methods using multiplicative factors but that approach might not make sense in the pandemic (x% of the decline in March is seasonal?)
  - In September 2020, US DOL switched from multiplicative seasonal adjustment to additive

- What we do:
  1. Transform series to logs, or not
  2. 52 week difference
  3. Manual adjustment for problem weeks
  - New years (t) – new years (t-1) = 53 weeks

Data: untransformed (left) and transformed with WEI (right)



(c) Redbook Research: Same Store, Retail Sales Average



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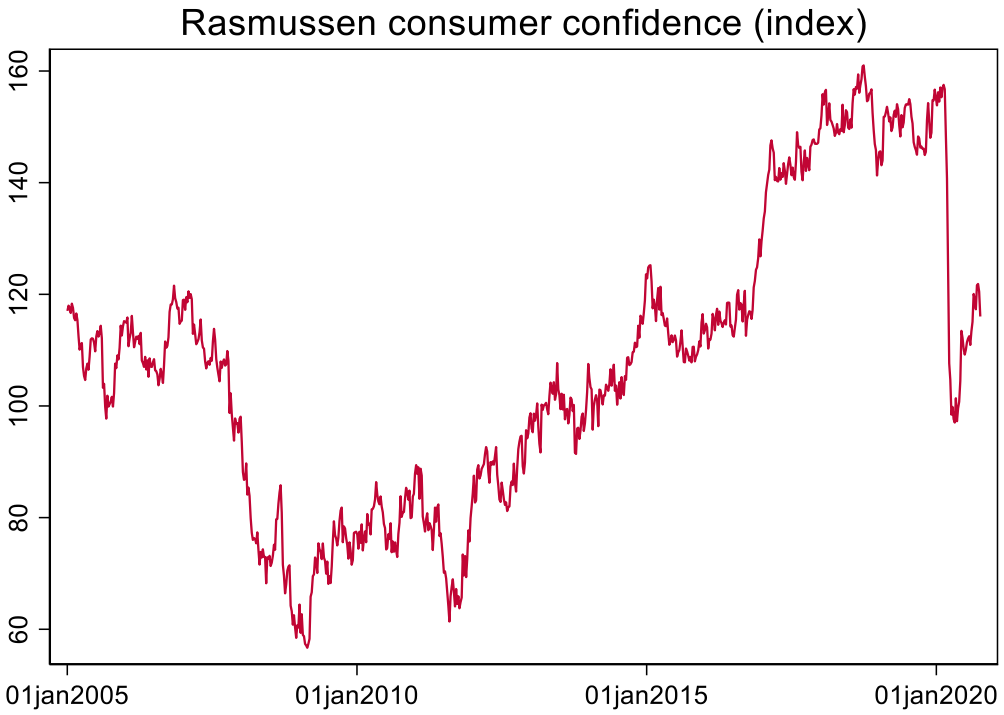
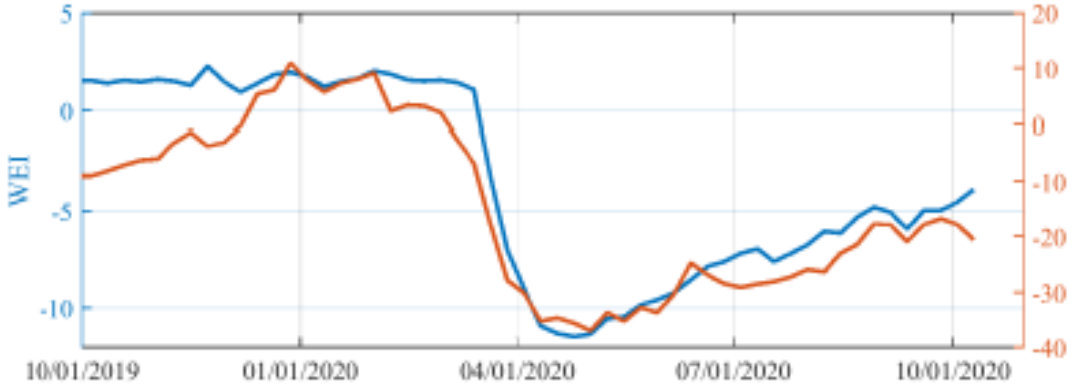


(f) Rasmussen Consumer Index, NSA (YoY % Change)



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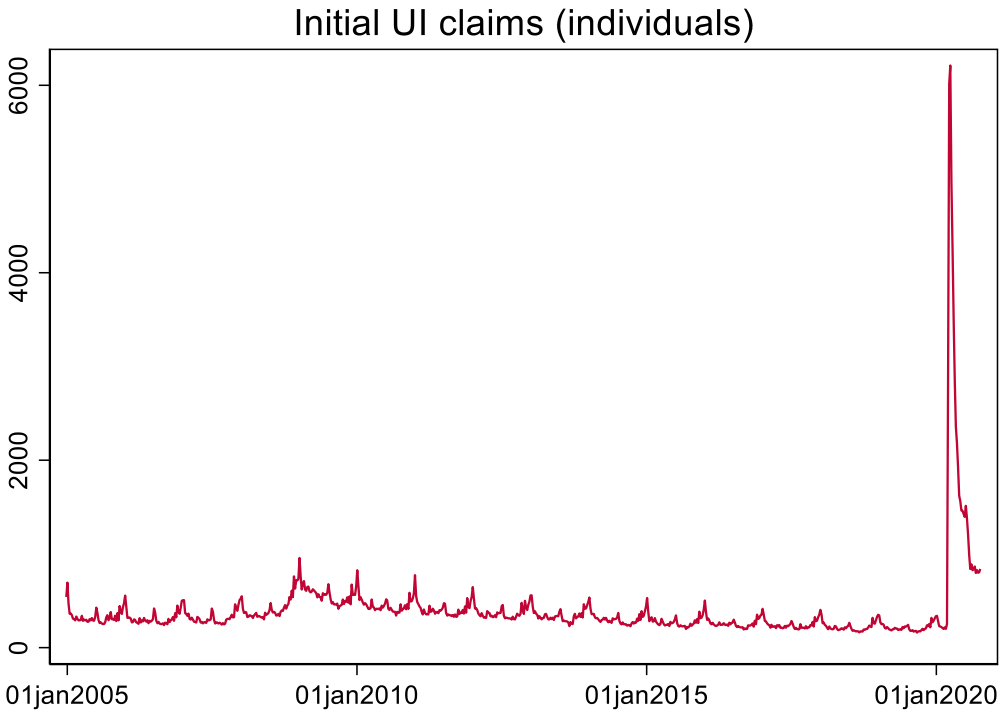
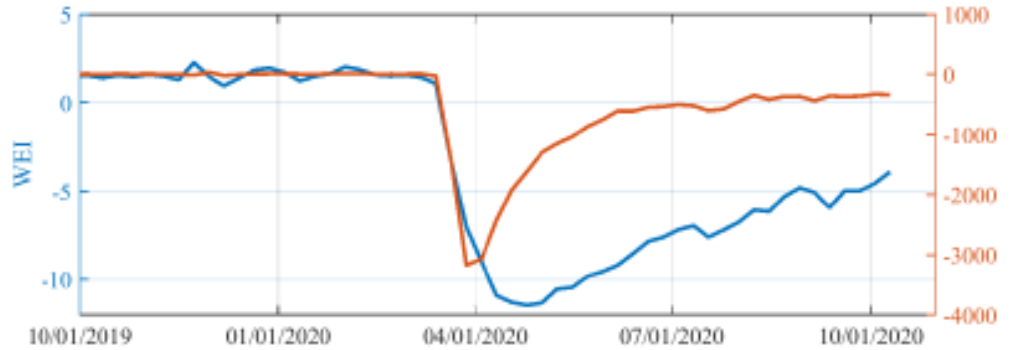


(a) Negative Unemployment Insurance: Initial Claims, NSA (YoY % Change)



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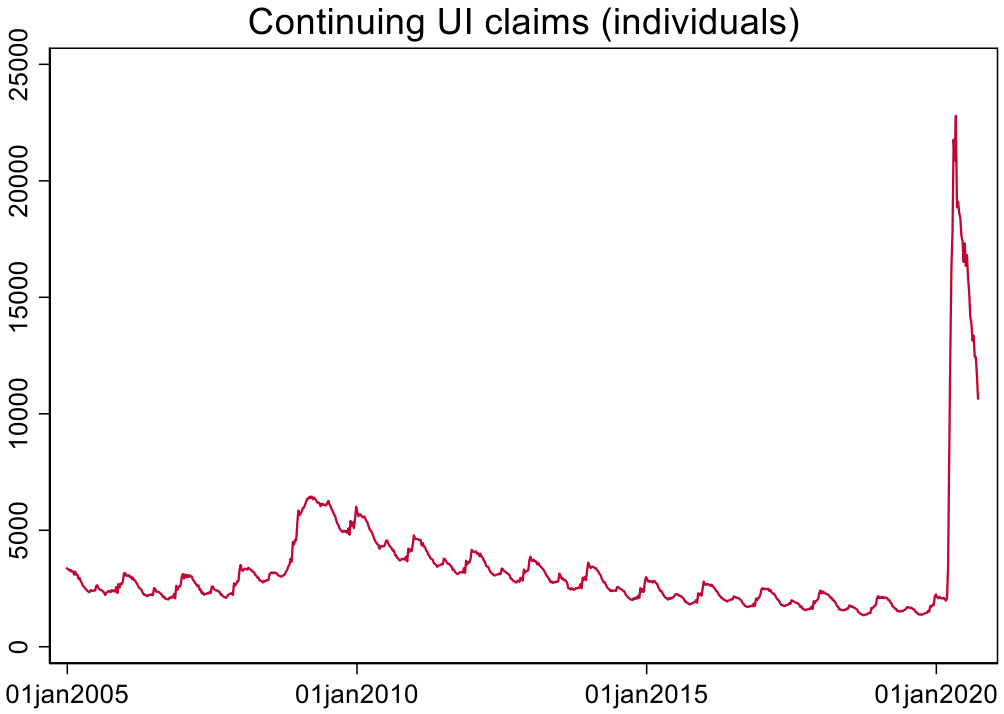
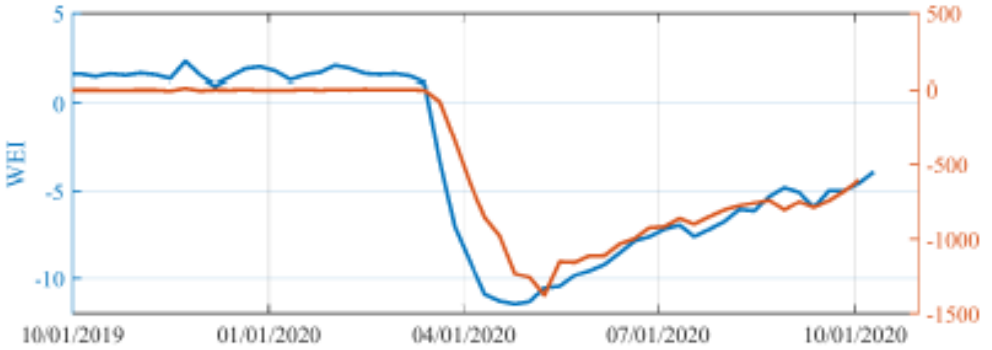


(j) Negative Unemployment Insurance: Continued Claims, NSA (YoY % Change)



(j) Unemployment Insurance: Continued Claims, NSA (Negative YoY % Change)

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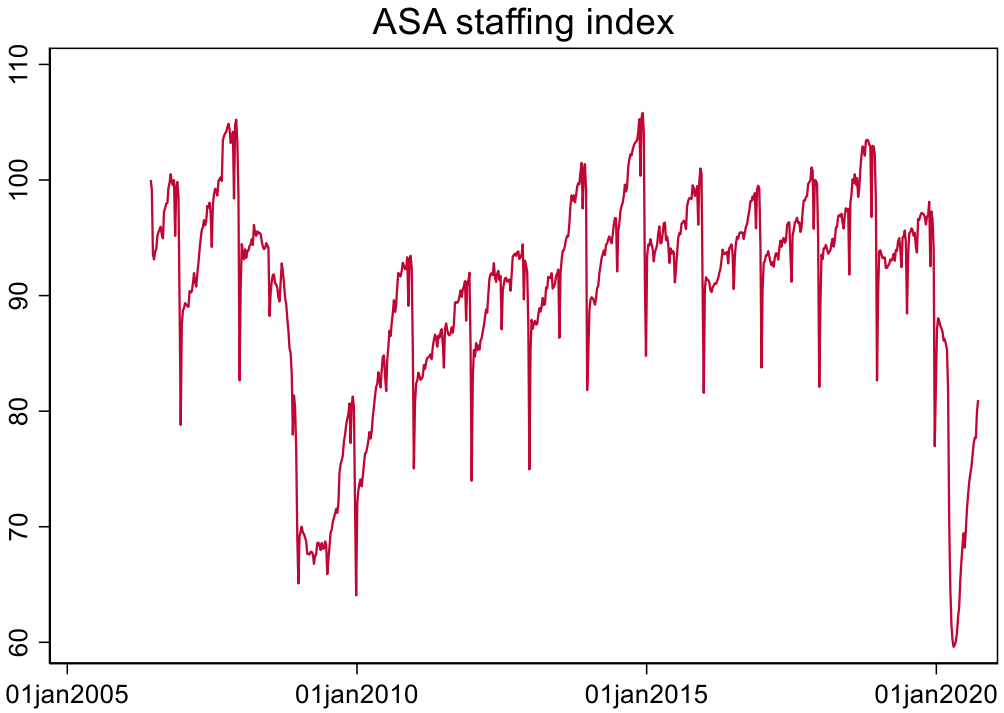
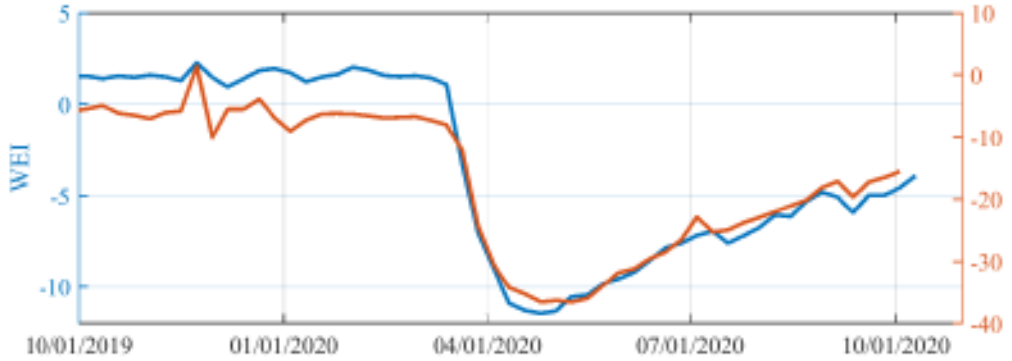


(g) American Staffing Association Staffing Index, NSA (YoY % Change)



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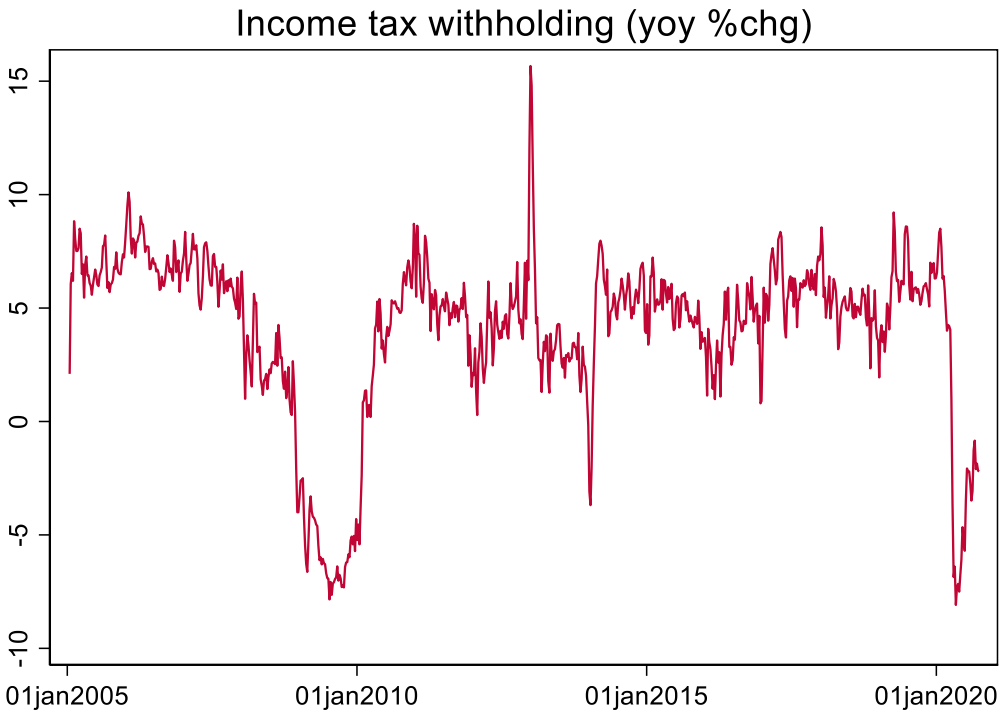
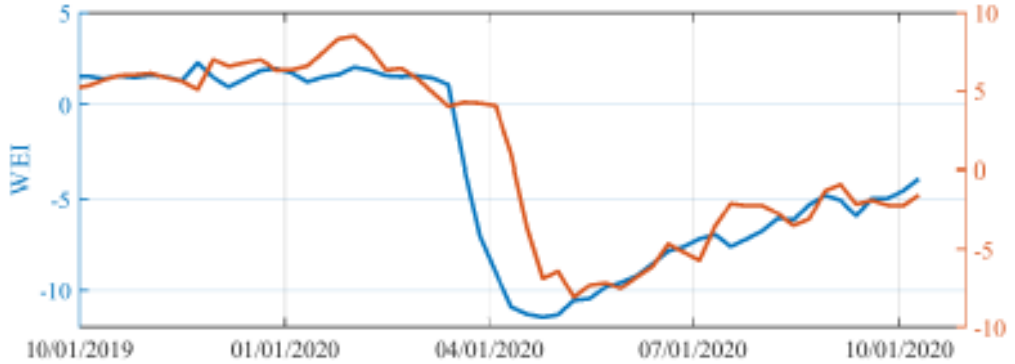


(h) Adjusted Federal Collections of Taxes Withheld From Paychecks (YoY % Change)



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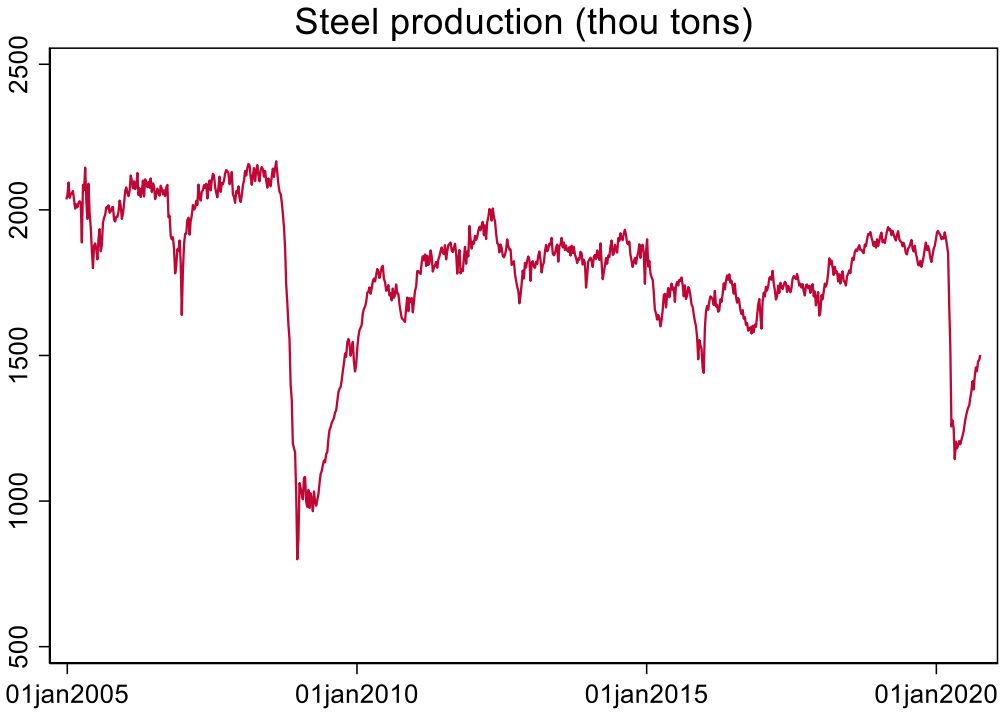
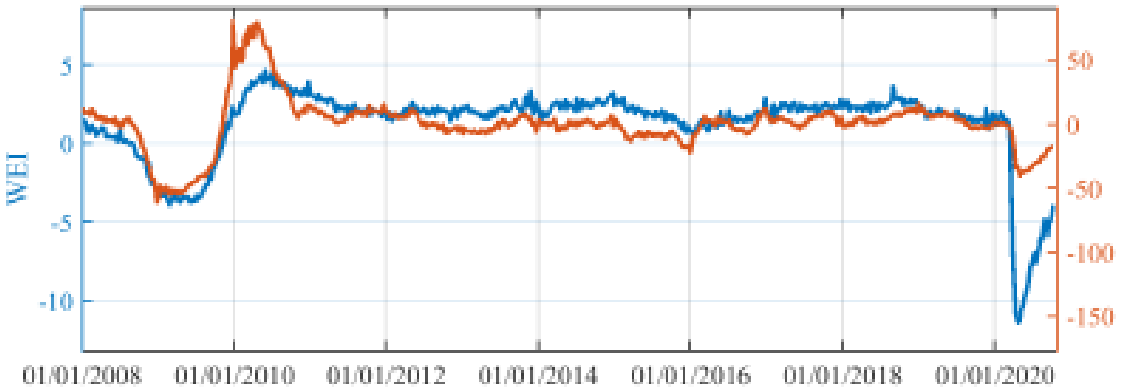
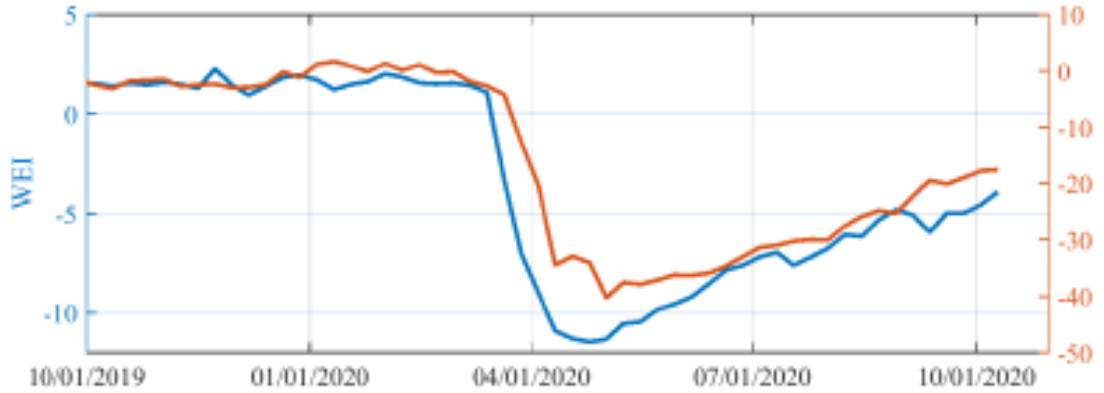




(e) Raw Steel Production, NSA (YoY % Change)



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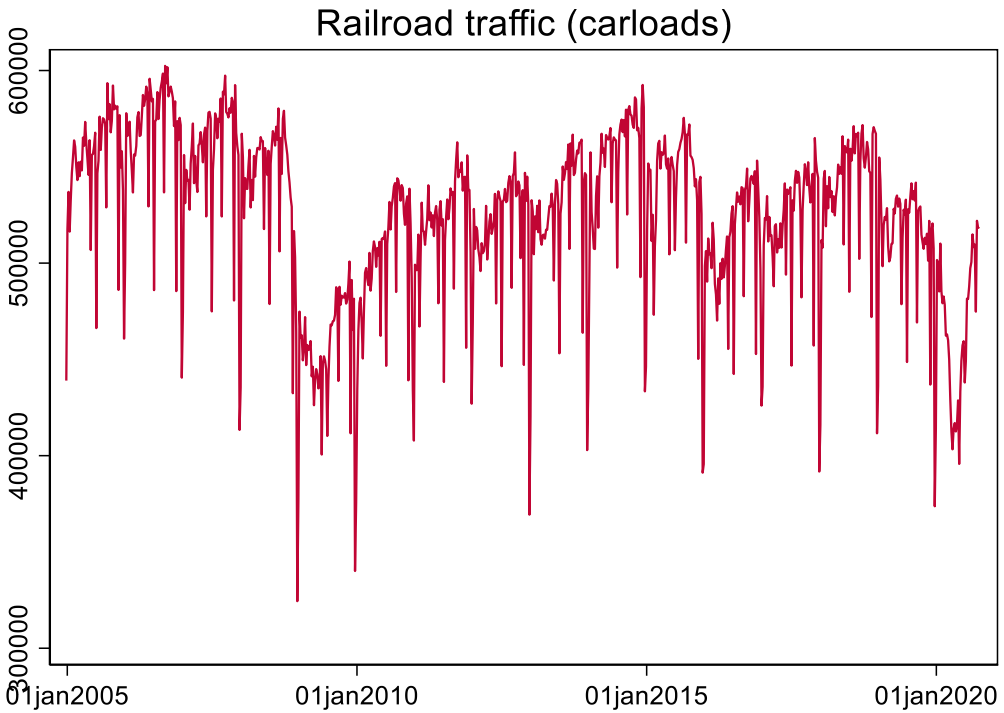
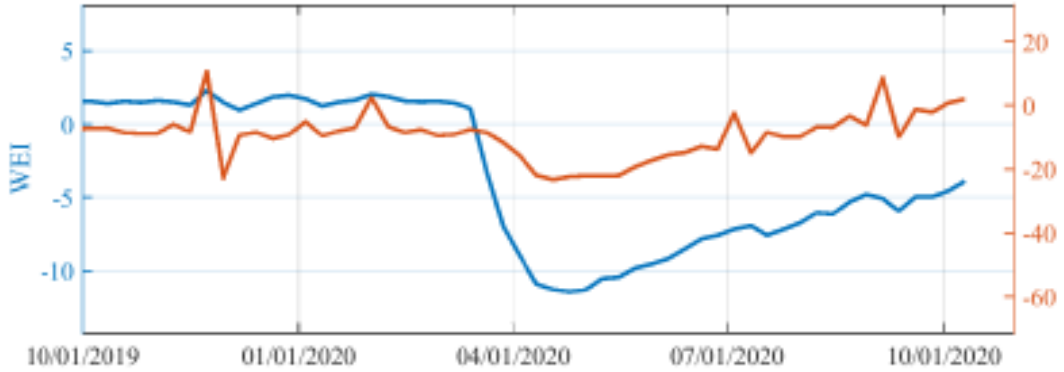


(i) US Railroad Traffic Originated: Intermodal + Carloads, NSA (YoY % Change)



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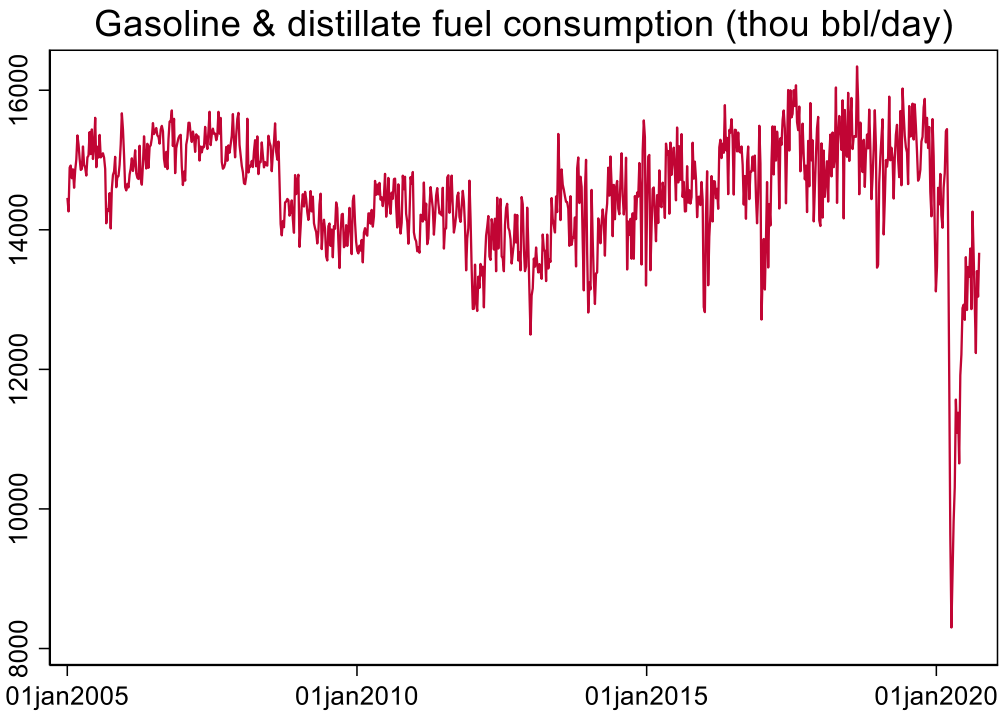
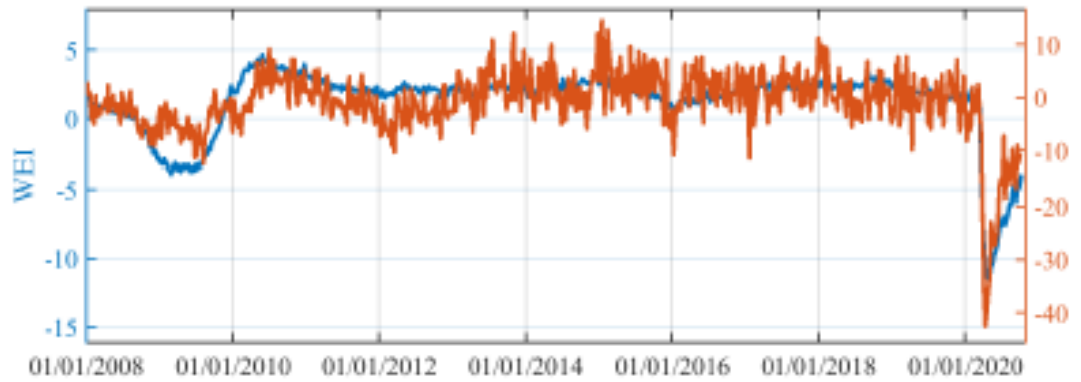
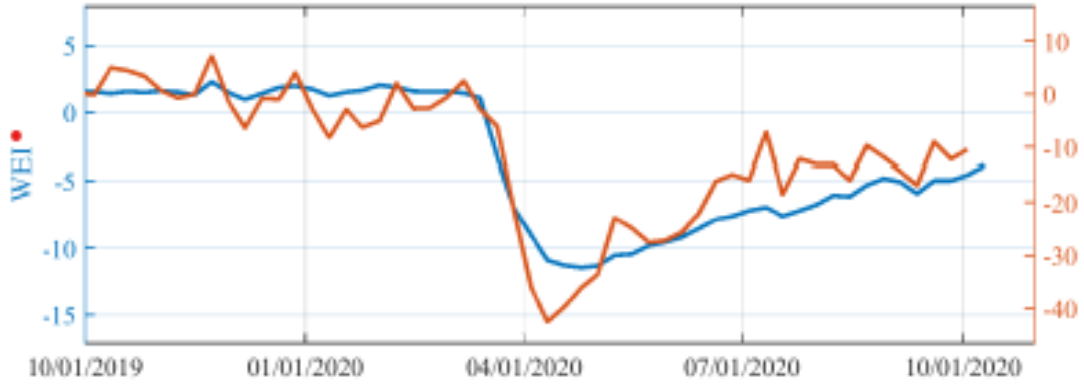




(b) US Motor Gasoline, Diesel, and Jet Fuel End Sales, NSA (YoY % Change)



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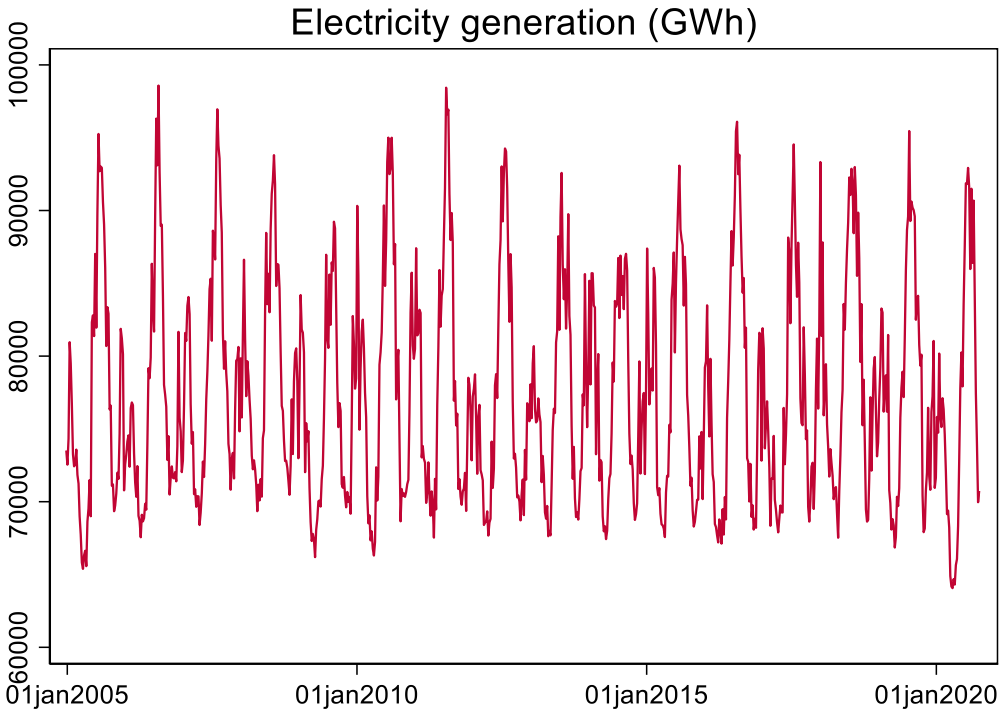
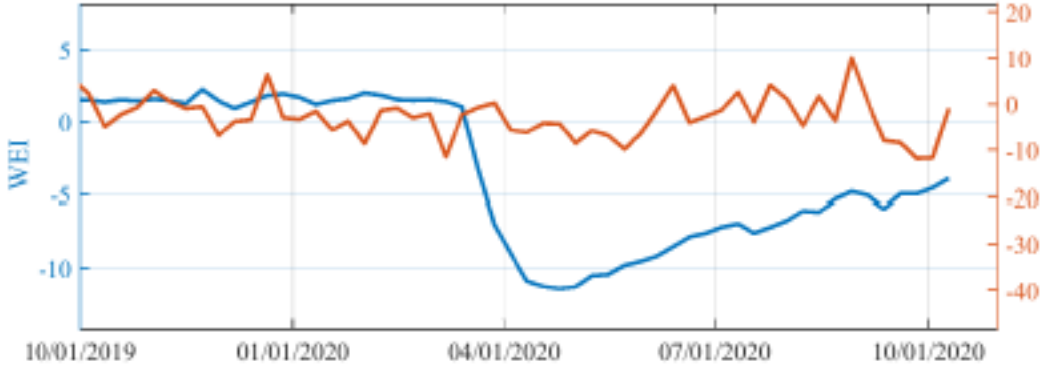


(d) Electric Utility Output: U.S. ex Hawaii and Alaska, NSA (YoY % Change)



(d) Electric Utility Output: U.S. ex Hawaii and Alaska NSA (YoY % Change)

Methods

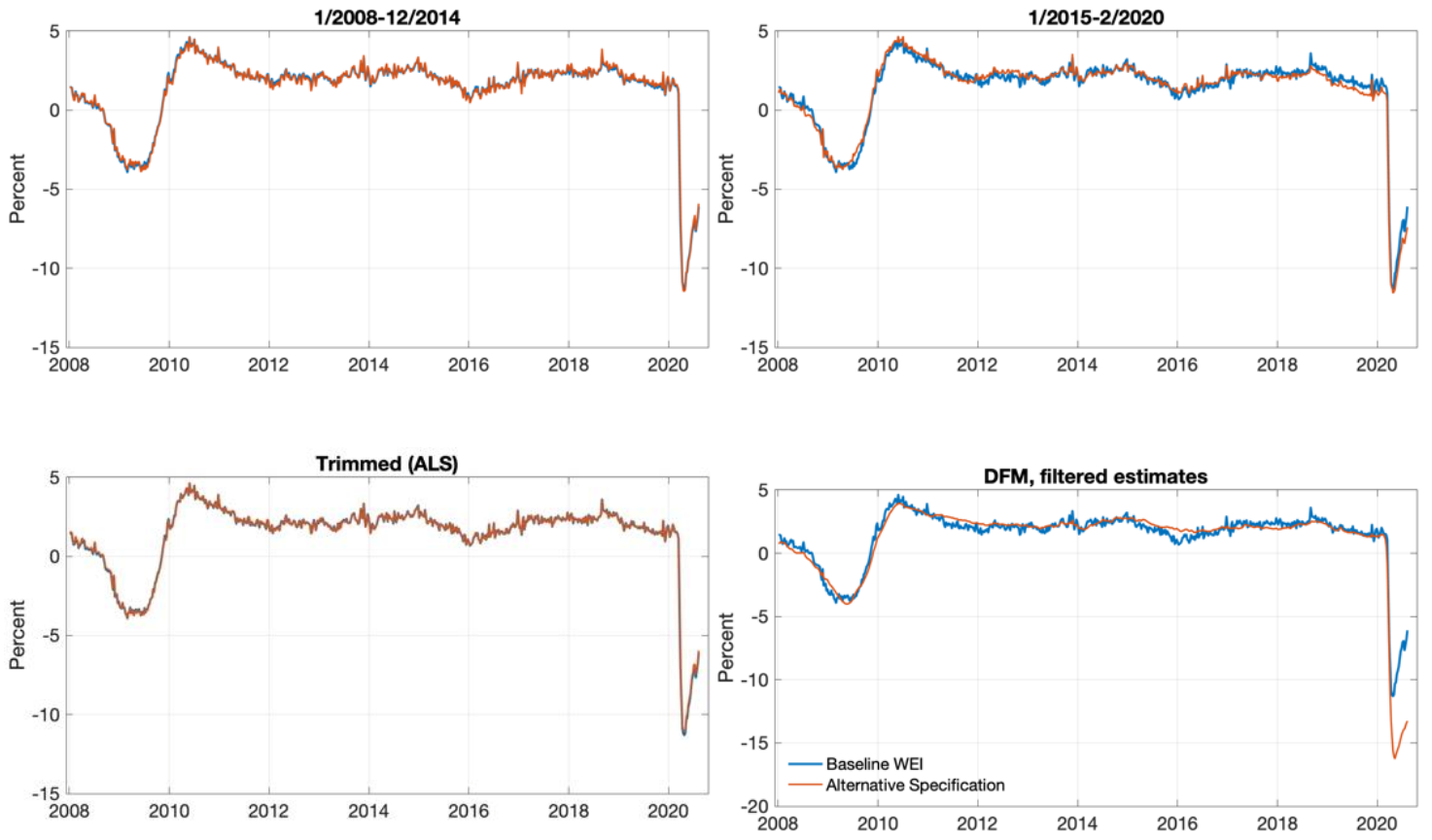
Factor, extracted as first principal component

Table 2: PCA Results

Series	Weights Baseline	Weights Trimmed (ALS)
Same-Store Retail Sales	0.28	0.27
Consumer Confidence	0.23	0.20
Initial Claims	-0.37	-0.38
Continued Claims	-0.41	-0.41
Staffing Index	0.40	0.39
Tax Withholding	0.30	0.32
Steel Production	0.36	0.36
Fuel Sales	0.22	0.22
Railroad Traffic	0.34	0.36
Electricity Output	0.12	0.12
Total variance explained	55.4	56.6

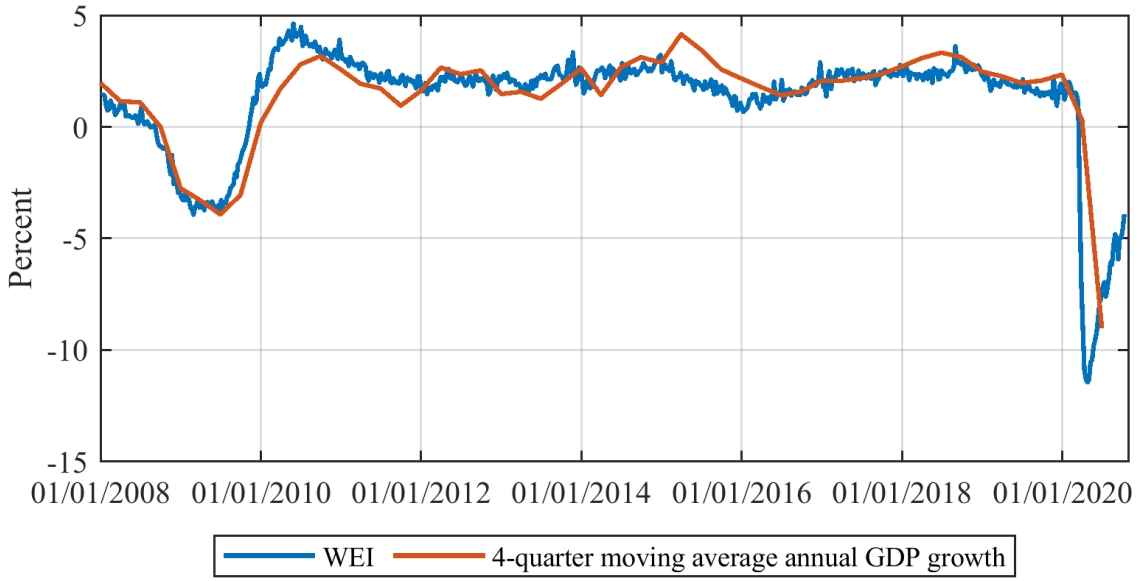
Notes: Estimation sample is first week of 2008 through last week of February 2020. The first column uses all observations. The second column is based on a trimmed sample in which outliers were removed so those observations were treated as missing. In this case, the weights are estimated using alternating least squares, see for instance Stock and Watson (2002b).

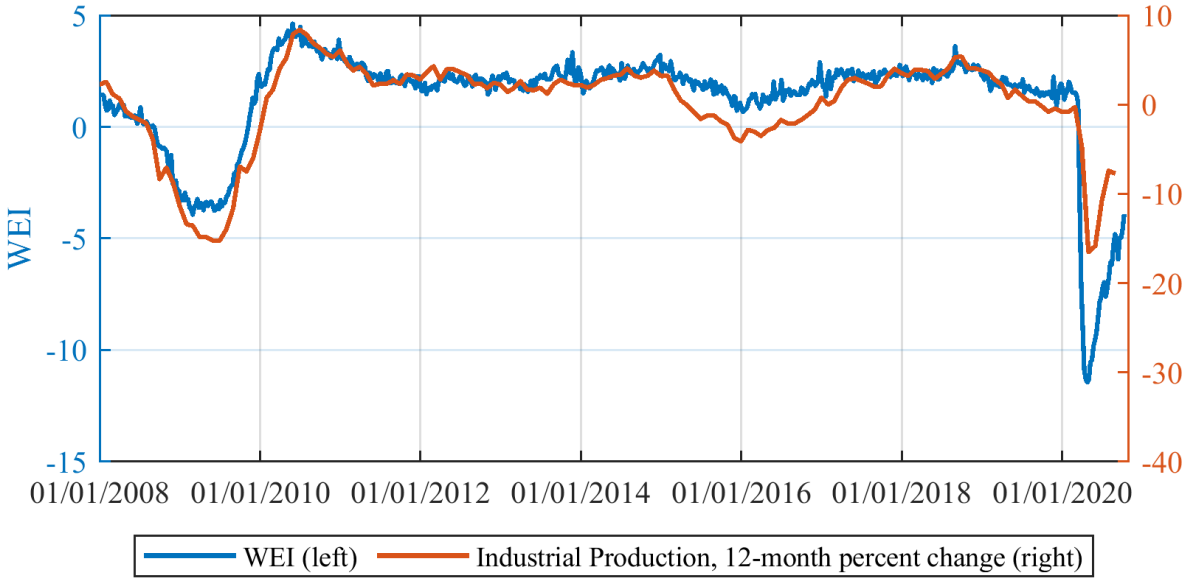
Sensitivity: WEI and alternatives



Notes: Brown = WEI, blue is alternative

The WEI is scaled to 4-quarter GDP growth (100ln(GDP_t/ GDP_{t-4})





Real time updating

$$WEI_t = \mu^d + \theta_1^d WEI_{t-1}^d + \theta_2^d WEI_{t-2} + \sum_{j \in J^d} \delta_j^d X_{jt} + v_t^d,$$

Table 3: Relationship between WEI updates

	Panel a.: 1/5/2008 to 2/29/2020						Panel b.: 3/28/2020 to 8/8/2020					
	RMSE			Correlation			RMSE			Correlation		
	First revision	Second revision	Final	First revision	Second revision	Final	First revision	Second revision	Final	First revision	Second revision	Final
Initial estimate	0.23	0.25	0.26	0.99	0.99	0.99	1.22	1.48	1.39	0.86	0.83	0.83
First revision	–	0.08	0.10	–	1.00	1.00	–	0.56	0.48	–	0.99	0.99
Second revision	–	–	0.06	–	–	1.00	–	–	0.72	–	–	0.99

Notes: For the estimate indicated in each row, the table reports the RMSE with respect to the subsequent estimate indicated in the columns and the pairwise correlations for each pair of estimates. Panel a. considers the pre-pandemic sample, 1/5/2008 to 2/29/2020, based on infeasible historical estimates computed using the baseline weights and update regression coefficients. Panel b. considers the pandemic sample, 3/28/2020 to 8/8/2020, using the published values for each WEI update.

Table 4: GDP regression results

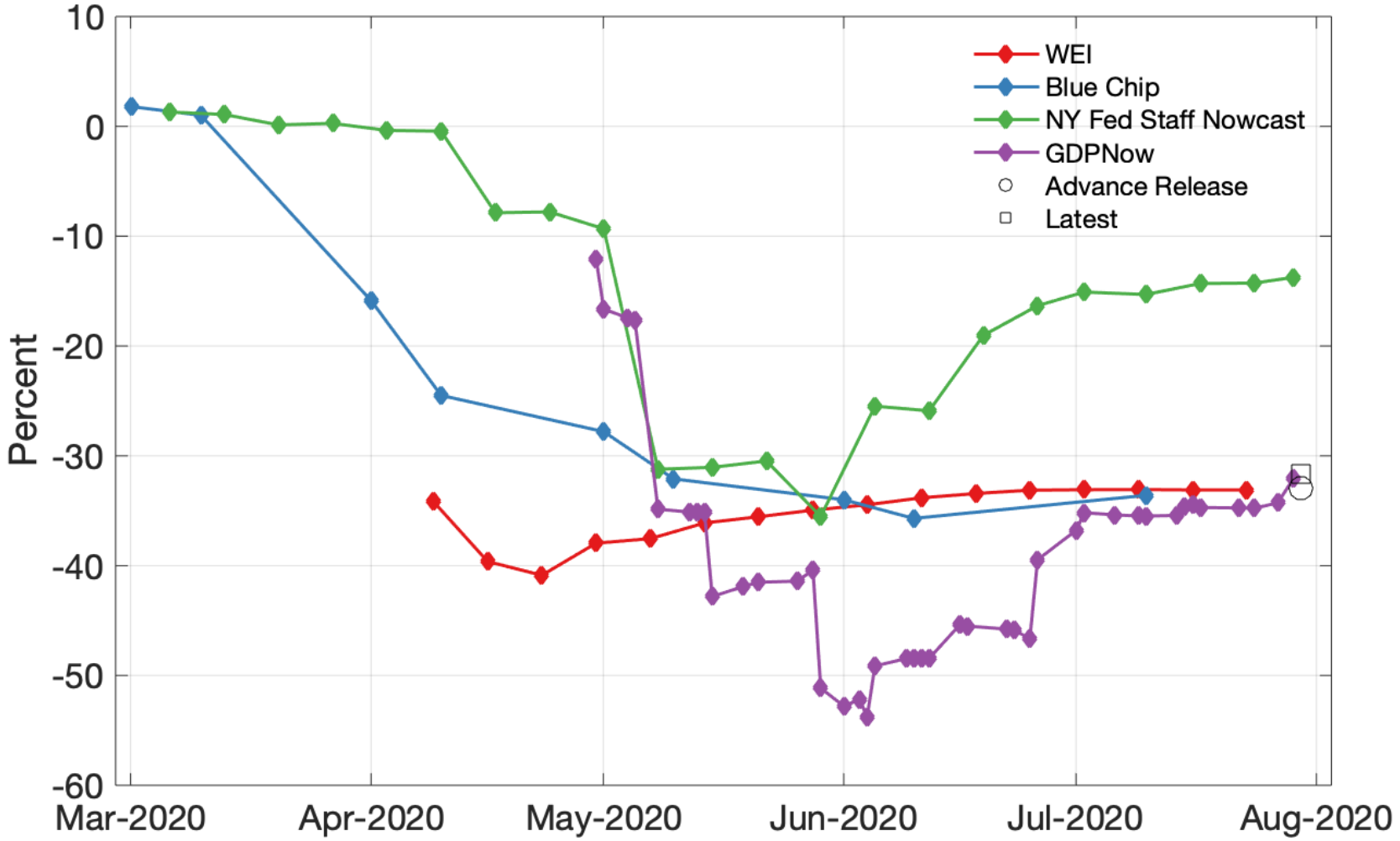
Regressors	(I)	(II)	(III)	(IV)
$WEI_q^{quarterly}$	0.57***			
	(0.13)			
WEI month 3				-0.14
				(0.36)
WEI month 2			1.07***	1.24**
			(0.32)	(0.51)
WEI month 1		0.51***	-0.55*	-0.59*
		(0.13)	(0.32)	(0.33)
F-test: weekly coefficients = 0		15.01	15.02	9.94
		(0.00)	(0.00)	(0.00)
F-test: weekly coefficients equal			3.25	1.94
			(0.05)	(0.14)
SER	0.51	0.54	0.48	0.48
Adjusted R^2	0.89	0.88	0.90	0.90

*Notes: All regressions include 2 lags of four-quarter GDP growth as in (5) (column (I)) and (6) (remaining columns). Results starred at the 1%, 5%, and 10% levels, ***, **, *. Estimation sample is 2008:Q1-2019:Q4 using the latest vintage of WEI and GDP data. Standard errors are given in parentheses for coefficients and p-values are given in parentheses for F-statistics.*

GDP nowcasting

Real-time nowcasting of 2020 Q2 growth (saar)

WEI : -32.7%
Advance GDP: -33.1%
Latest GDP: -31.4%

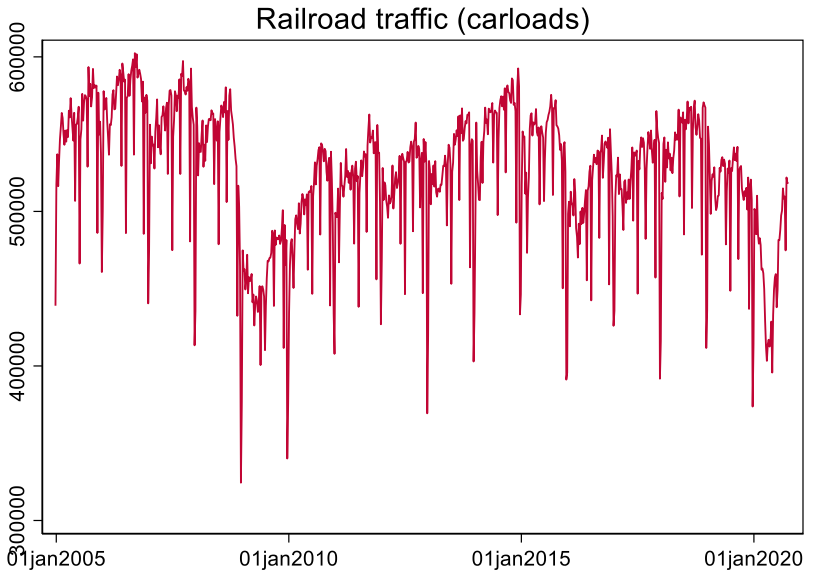
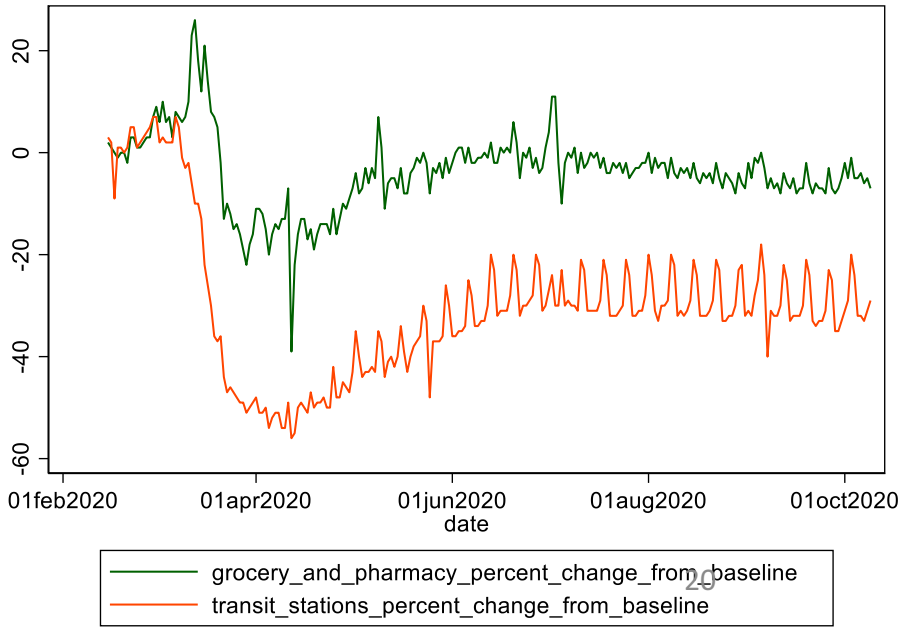


Future opportunities

1. Weekly seasonal adjustment

2. Integrate nonstandard series which are frequently:
   - Short
   - Nonstationary coverage or definitions
   - Potentially highly informative at very short horizons (days/weeks)

3. Exploit high frequency for causal analysis
   - This is standard in the monetary shock literature (announcement days – e.g. Kuttner (2000))
   - Being done in COVID/NPI literature, e.g. Arnon et al (2020), Chetty et al (2020)
   - Carry over into SVAR/SVAR-IV/LP/LP-IV analysis?



Google mobility indexes