Destagionalizzazione e DID

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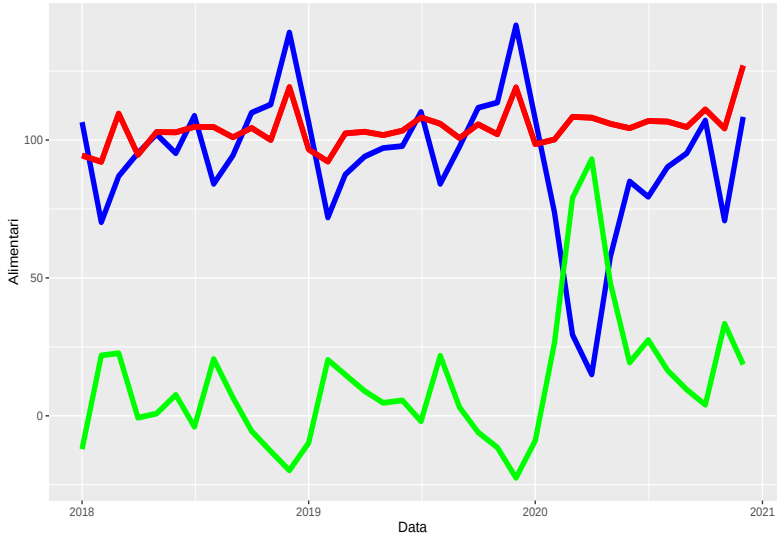
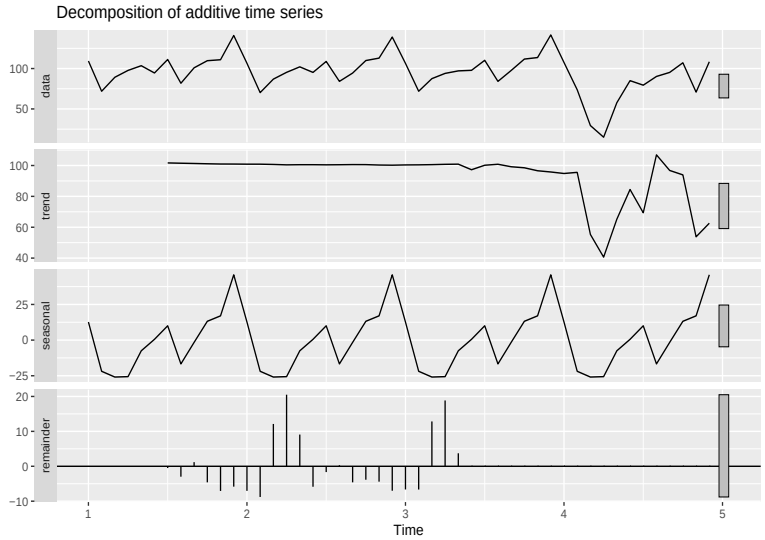
Trend Check

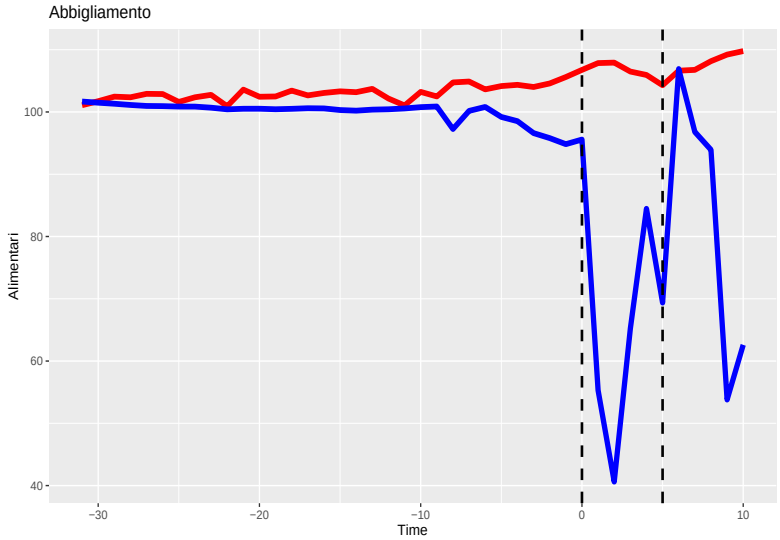
- T Variabile temporale: n numero di mesi prima di Febbraio (ultimo mese senza lock-down)
- $T1$,$T2$ e $T3$ dummy per i 3 livelli di lockdown: T1 per Marzo e Maggio (MEDIUM), T2 Aprile (HIGH) e T3 Giugno (LOW). Nei grafici questo periodo è segnato dalle barre tratteggiate.
- Y_x volume di vendite per il settore x
- I dati sono stati raccolti dal sito ISTAT

$$Y_x - Y_{Alimentare} = \alpha + \delta_{beforeT1}T + \delta_{T1}T_1 + \delta_{T2}T_2 + \delta_{T3}T_3 + \epsilon \quad (1)$$

Abbigliamento

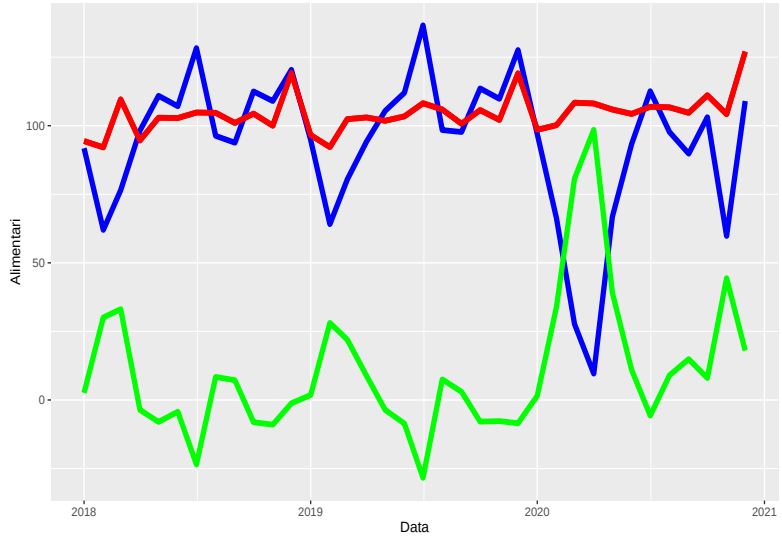


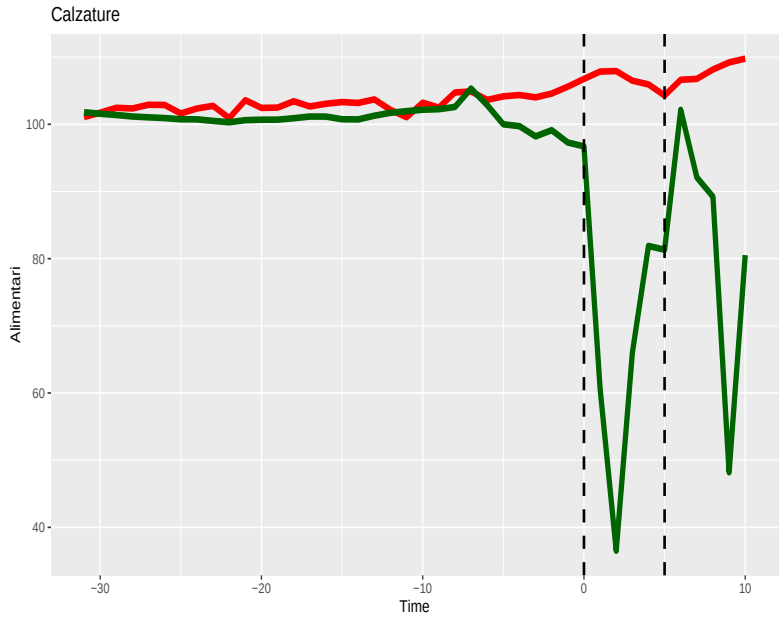


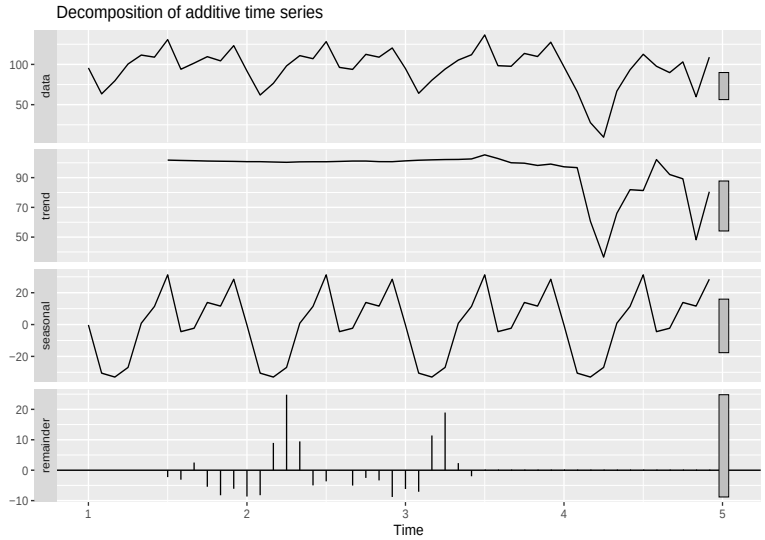


	Value	Error
δ Slope before T1	-0.33	0.09
δ_{T1}	-36.33	2.15
δ_{T2}	-56.23	2.77
δ_{T3}	-11.95	2.86
δ_{T4} (Plc T= -3)	14.55	13.14
δ_{T6} (Plc T= -1)	13.90	13.30

Calzature

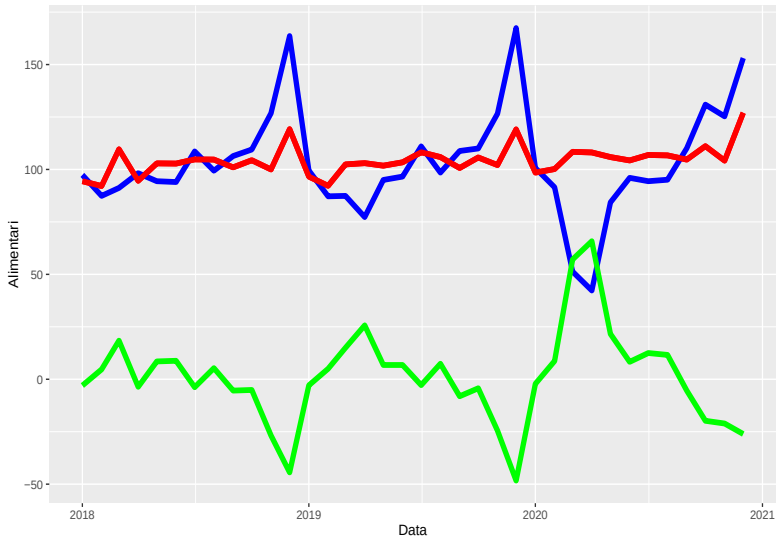


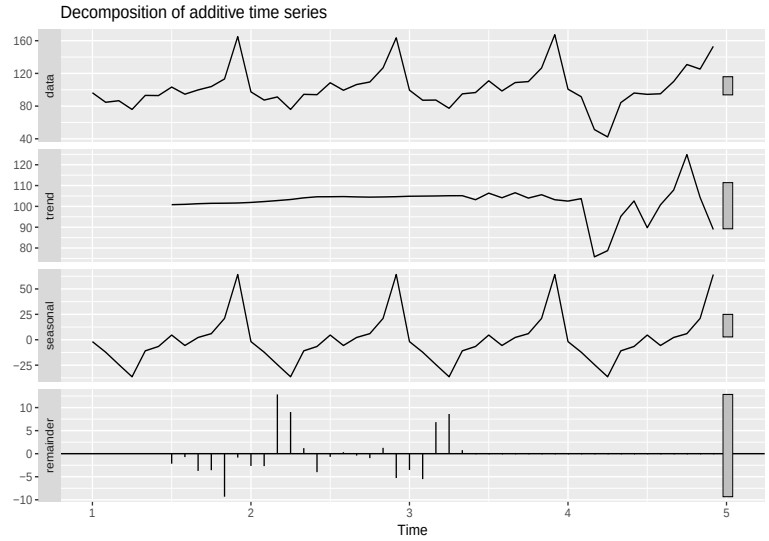


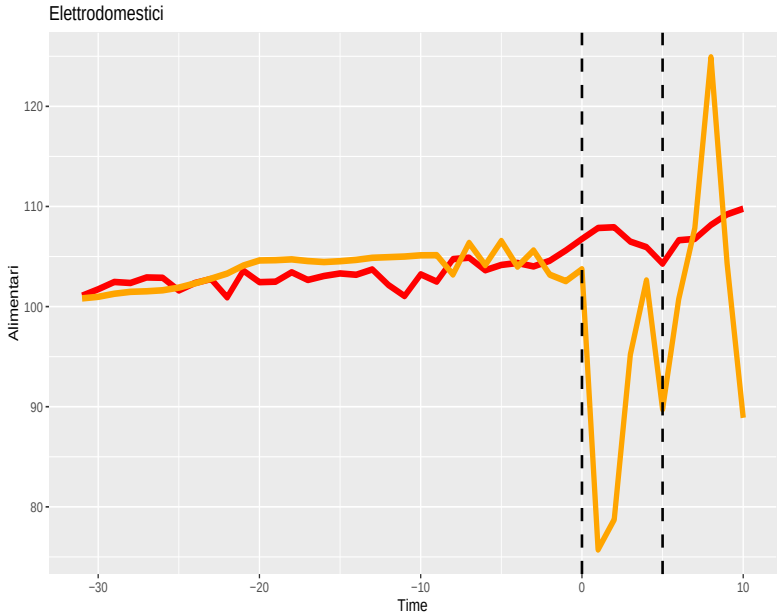


	Value	Error
δ Slope before T1	-0.22	0.08
δ_{T1}	-38.70	1.91
δ_{T2}	-63.21	2.47
δ_{T3}	-17.61	2.54
δ_{T4} (Plc T= -3)	15.10	13.95
δ_{T6} (Plc T= -1)	15.36	14.12

Elettrodomestici

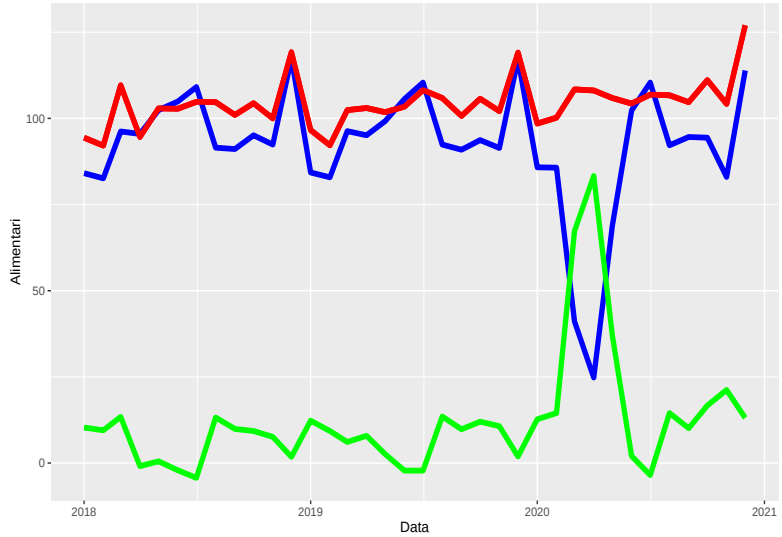


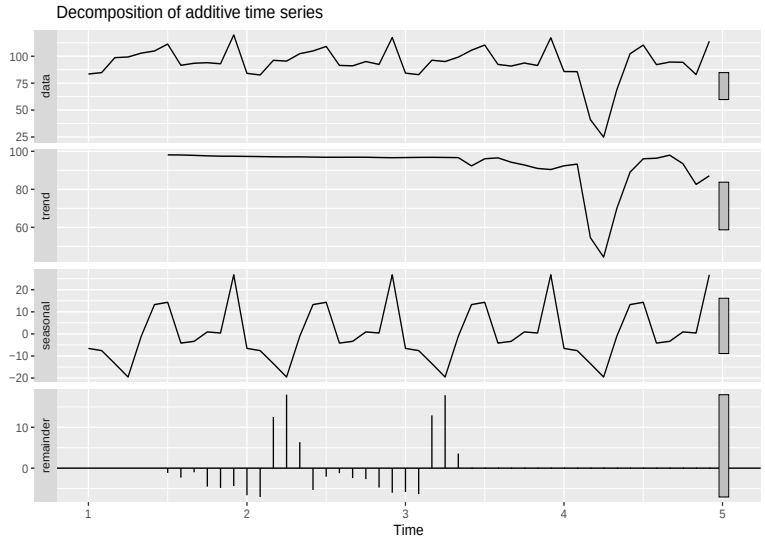


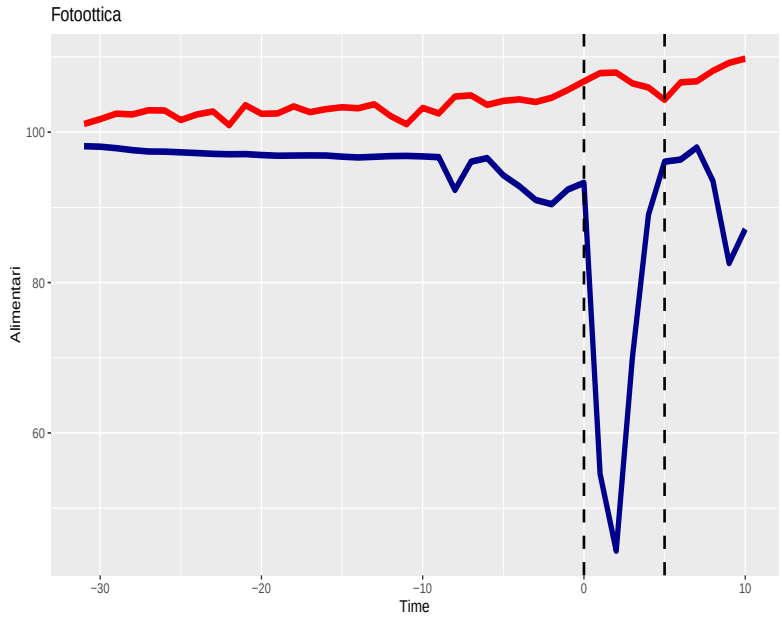


	Value	Error
δ Slope before T1	-0.12	0.14
δ_{T1}	-19.21	3.10
δ_{T2}	-26.23	4.00
δ_{T3}	-2.37	4.12
δ_{T4} (Plc T= -3)	8.80	7.57
δ_{T6} (Plc T= -1)	4.86	7.66

Fotoottica







	Value	Error
δ Slope before T1	-0.36	0.12
δ_{T1}	-29.94	2.73
δ_{T2}	-48.11	3.52
δ_{T3}	-2.93	3.63
δ_{T4} (Plc T= -3)	8.87	78.87
δ_{T6} (Plc T= -1)	11.65	12.12

DID estimation with deseasonalized data

- C dummy per il gruppo di controllo (Alimentari), $T1$,$T2$ e $T3$ dummy per i 3 livelli di lockdown: T1 per Marzo e Maggio (MEDIUM), T2 Aprile (HIGH) e T3 Giugno (LOW)
- DID a più tempi come già sviluppato con successo da Draca et. al in [1] and da Wooldridge in [2]

$$Y = C + T_1 + T_2 + T_3 + \delta_1(T_1 \times C) + \delta_2(T_2 \times C) + \delta_3(T_3 \times C) + \epsilon$$

	δ_1	σ_{δ_1}	δ_2	σ_{δ_2}	δ_3	σ_{δ_3}
Abbigliamento	-40.16	2.01	-60.07	2.77	-16.46	2.77
Calzature	-38.70	1.73	-65.78	2.39	-20.62	2.39
Elettrodomestici	-20.32	2.5	-27.34	3.45	-3.68	3.45
Fotoottica	-34.14	2.55	-52.32	3.52	-7.8	3.52

DID estimation with RAW data

- C dummy per il gruppo di controllo (Alimentari), $T1$,$T2$ e $T3$ dummy per i 3 livelli di lockdown: T1 per Marzo e Maggio (MEDIUM), T2 Aprile (HIGH) e T3 Giugno (LOW)
- Errore decisamente maggiore rispetto ai dati de-stagionalizzati

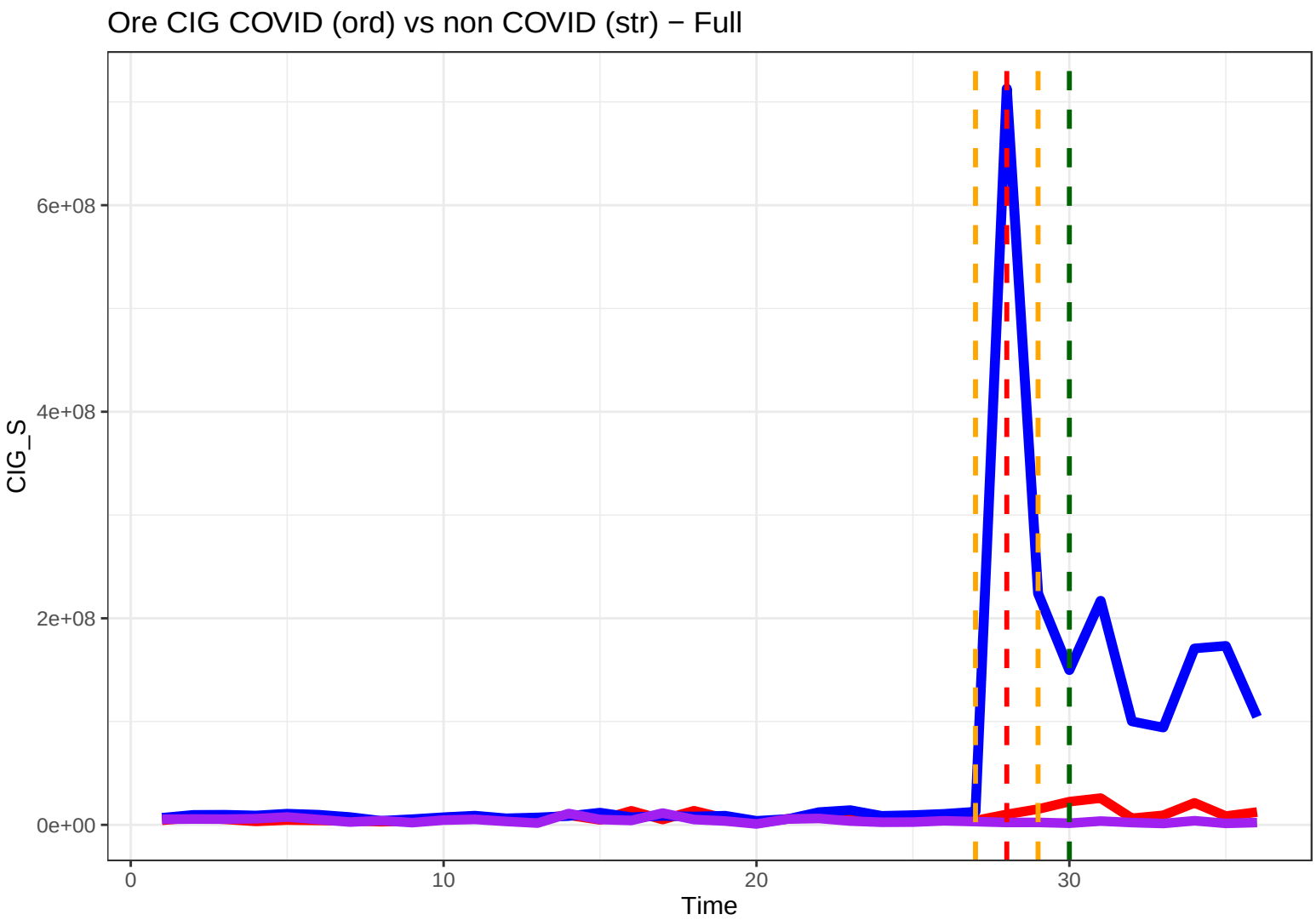
$$Y = C + T_1 + T_2 + T_3 + \delta_1(T_1 \times C) + \delta_2(T_2 \times C) + \delta_3(T_3 \times C) + \epsilon$$

	δ_1	σ_{δ_1}	δ_2	σ_{δ_2}	δ_3	σ_{δ_3}
Abbigliamento	-60.70	13.32	-90.89	13.32	-15.69	13.32
Calzature	-57.37	14.95	-95.97	20.76	-11.70	8.67
Elettrodomestici	-41.81	16.47	-68.26	22.88	3.24	9.56
Fotoottica	-45.33	9.22	-76.48	12.80	-3.77	5.35

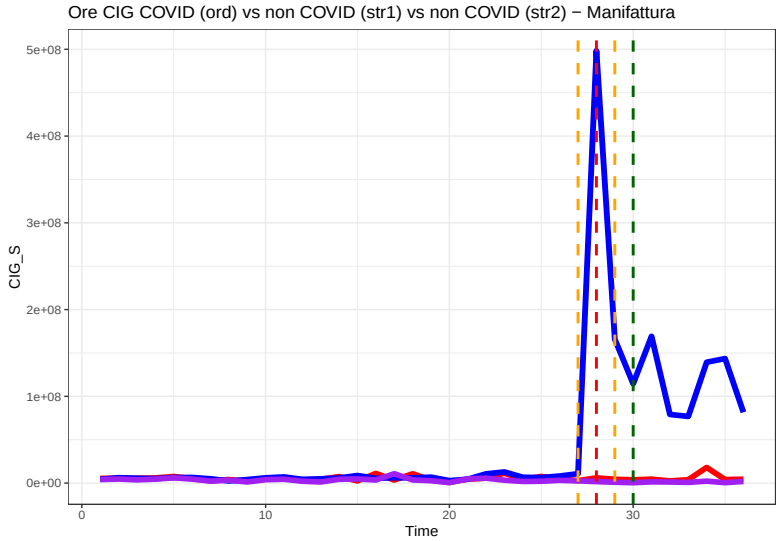
DID estimation - placebo (deseasonalized data)

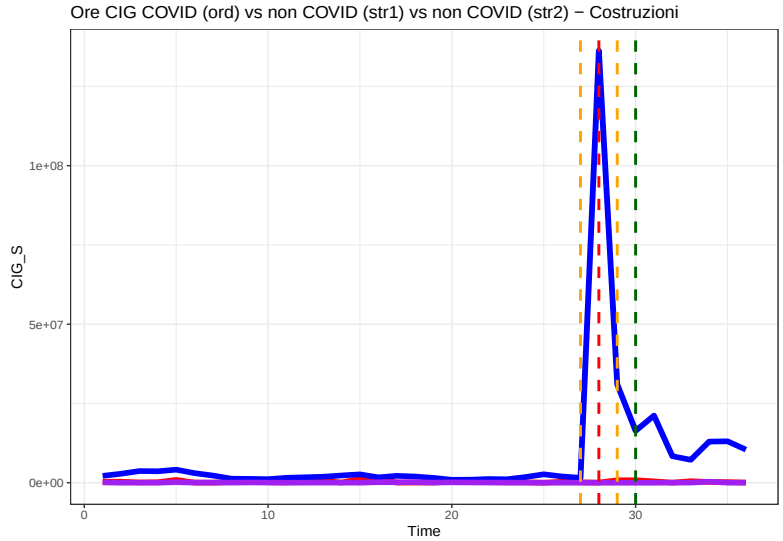
	δ_4	σ_{δ_4}	δ_5	σ_{δ_5}	δ_6	σ_{δ_6}
Abbigliamento	3.94	12.65	4.87	17.47	0.70	17.47
Calzature	5.04	13.14	5.31	18.15	2.00	18.16
Elettrodomestici	1.13	6.26	4.63	8.65	-0.81	8.65
Fotoottica	0.84	10.98	1.71	15.18	0.69	15.18

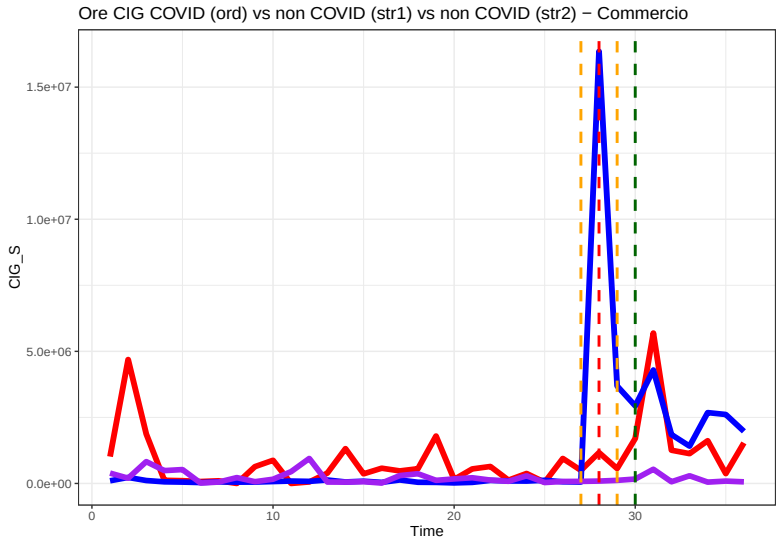
DID - Cassa integrazione

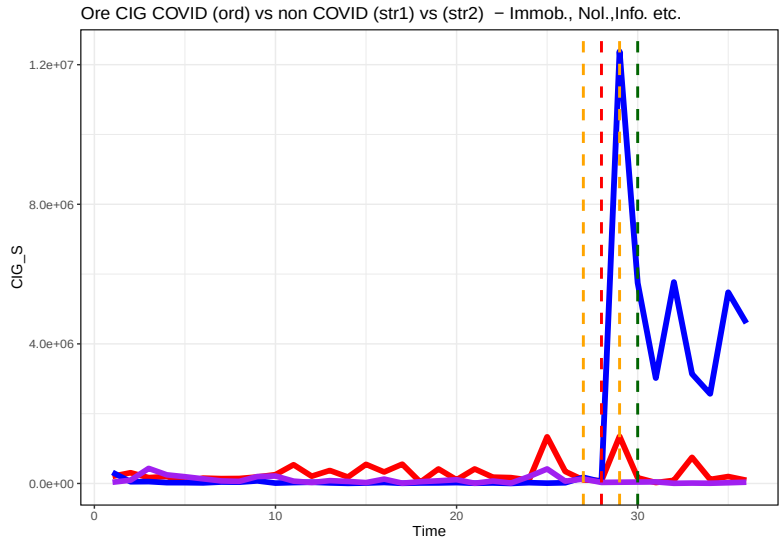


DID - Cassa integrazione









References

[1] Mirko Draca, Stephen Machin, and Robert Witt. "Panic on the streets of London: Police, crime, and the July 2005 terror attacks". In: *American Economic Review* 101.5 (2011), pp. 2157–81.

[2] Jeffrey M Wooldridge. "Introductory econometrics: a modern approach (upper level economics titles)". In: *Southwestern College Publishing, Nashville, T TN* 41 (2012), pp. 673–690.