

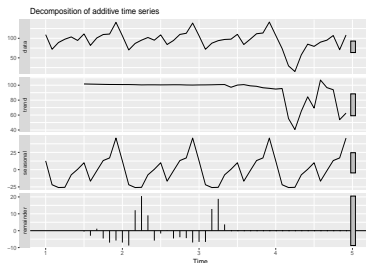
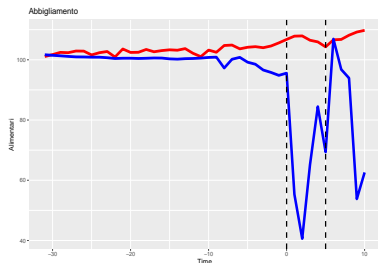
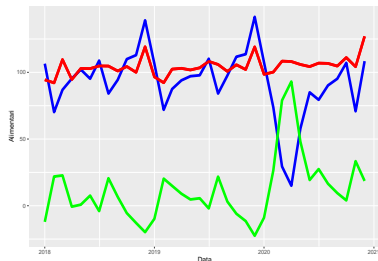
# Destagionalizzazione e DID

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- ▶  $T$  Variabile temporale:  $n$  numero di mesi prima di Febbraio (ultimo mese senza lock-down)
- ▶  $T_1, T_2$  e  $T_3$  dummy per i 3 livelli di lockdown:  $T_1$  per Marzo e Maggio (MEDIUM),  $T_2$  Aprile (HIGH) e  $T_3$  Giugno (LOW). Nei grafici questo periodo è segnato dalle barre tratteggiate.
- ▶  $Y_x$  volume di vendite per il settore  $x$

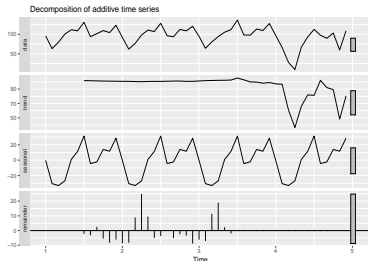
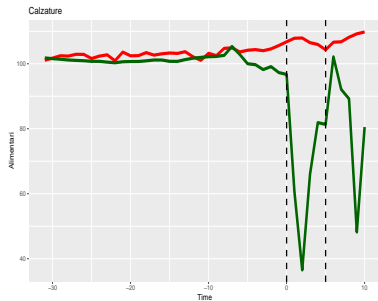
$$Y_x - Y_{Alimentare} = \alpha + \delta_{beforeT_1}T + \delta_{T_1}T_1 + \delta_{T_2}T_2 + \delta_{T_3}T_3 + \epsilon \quad (1)$$

# Abbigliamento



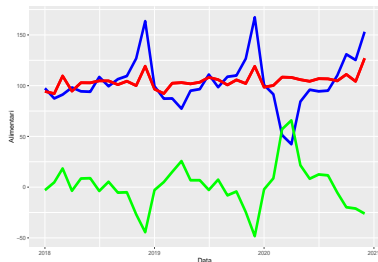
	Value	Error
$\delta$ Slope before T1	-0.33	0.09
$\delta_{T1}$	-36.33	2.15
$\delta_{T2}$	-56.23	2.77
$\delta_{T3}$	-11.95	2.86
$\delta_{T4}$ (Plc T= -3)	14.55	13.14
$\delta_{T6}$ (Plc T= -1)	13.90	13.30

# Calzature



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

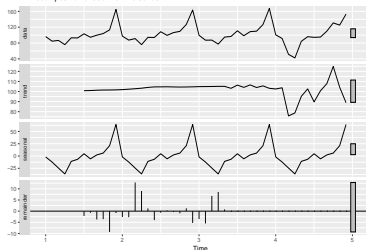
# Elettrodomestici



Elettrodomestici

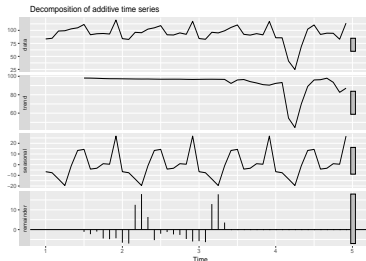
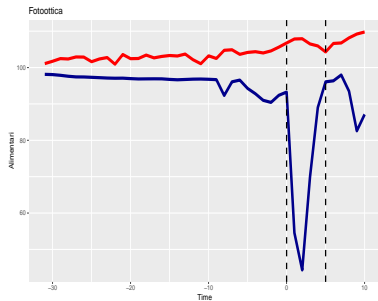
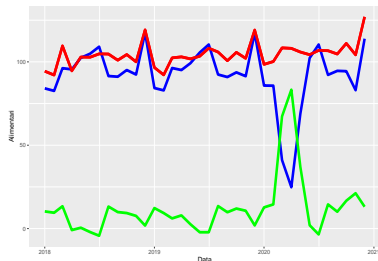


Decomposition of additive time series



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

# Fotoottica



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

# DID estimation with deseasonalized data

- ▶ C dummy per il gruppo di controllo (Alimentari),  $T_1, T_2$  e  $T_3$  dummy per i 3 livelli di lockdown:  $T_1$  per Marzo e Maggio (MEDIUM),  $T_2$  Aprile (HIGH) e  $T_3$  Giugno (LOW)

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

	$\delta_1$	$\sigma_{\delta_1}$	$\delta_2$	$\sigma_{\delta_2}$	$\delta_3$	$\sigma_{\delta_3}$
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),  $T_1, T_2$  e  $T_3$  dummy per i 3 livelli di lockdown:  $T_1$  per Marzo e Maggio (MEDIUM),  $T_2$  Aprile (HIGH) e  $T_3$  Giugno (LOW)
- ▶ Errore decisamente maggiore rispetto ai dati de-stagionalizzati

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

	$\delta_1$	$\sigma_{\delta_1}$	$\delta_2$	$\sigma_{\delta_2}$	$\delta_3$	$\sigma_{\delta_3}$
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)

	$\delta_4$	$\sigma_{\delta_4}$	$\delta_5$	$\sigma_{\delta_5}$	$\delta_6$	$\sigma_{\delta_6}$
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