Econometrics Assignment 4b

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1.

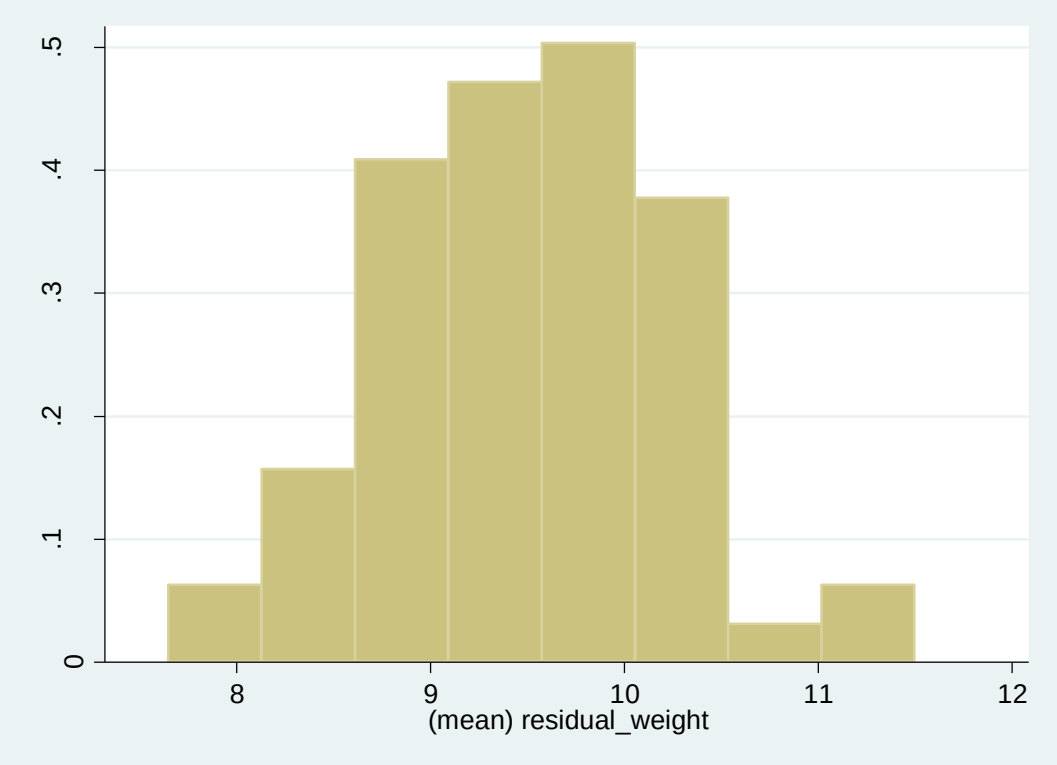
a)

We find that the average value of the outcome variable before starting the treatment equals to 9.7097 tons of residual waste per week and route. This means that an average household produces 0.00924735 tons of residual waste per week. This is the equivalent of approximately 9.2 kilogram.

Variable	Obs	Mean	Std. Dev.	Min	Max
residual_w~t	44	9.709718	.5828649	8.7	11.5

b)

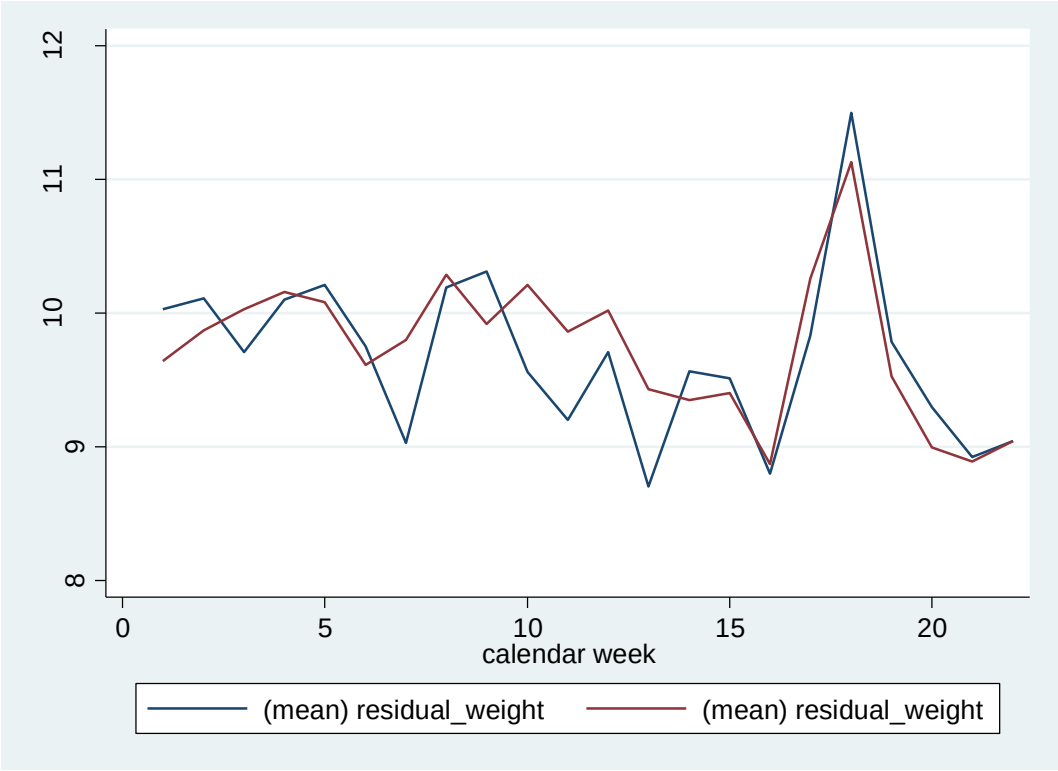
Looking at the distribution of the outcome variable using the histogram command, we can say that it is close to a normal distribution.



2.

a)

According to the figure below, we assume that the common trend assumption holds. The trend for both the treatment and the control group are almost similar.

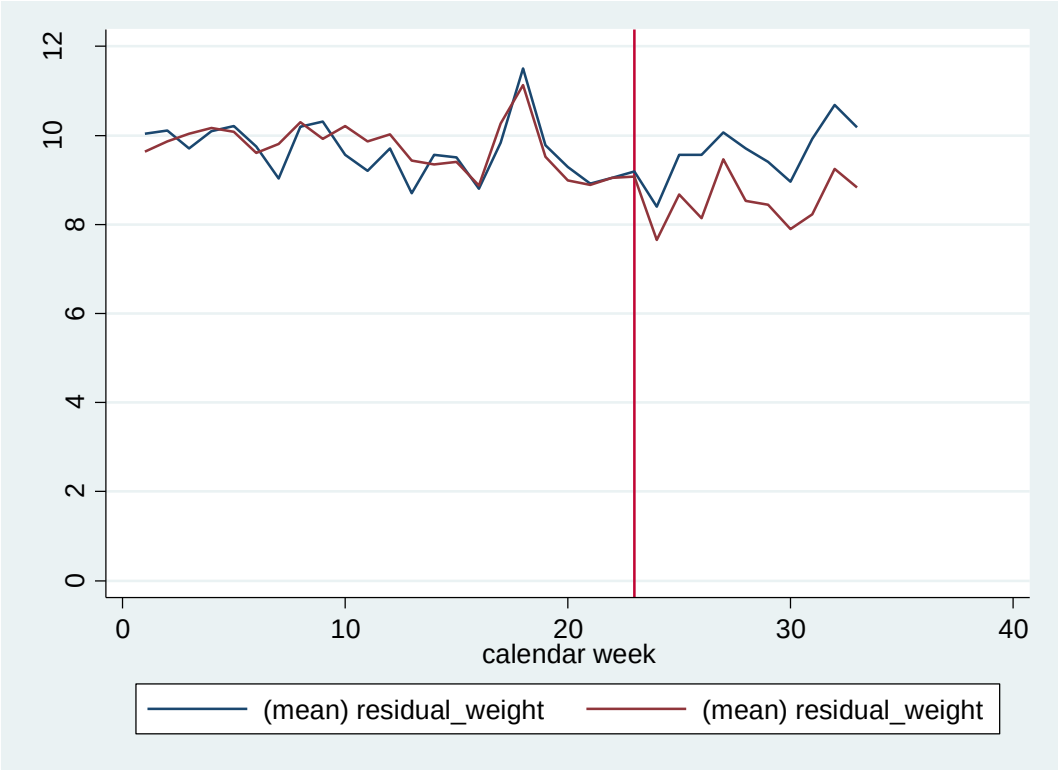


b)

	Before	After	Difference
Treatment group	9.7445	8.5619	-1.1826
Control group	9.6750	9.6020	-0.0730
		Treatment effect	-1.1096

In percentage terms, the treatment effect equals $\frac{-1.1096}{9.7445} \cdot 100\% = -11.39\%$.

c)



Under b we found that the treatment effect is negative and equal to -11.39%. This induces that the line corresponding to the treatment group (red line) drops below the line of the control group (blue line) after the treatment is implemented. That is what can be seen in the figure above. Therefore the plot is in line with the results under b.

3.

a)

The d-i-d regression for this field experiment is as follows:

$$\text{residual\_weight}_{it} = \alpha + \beta \cdot (\text{treatment\_group}_i \cdot \text{treatment\_period}_i) + \delta \cdot \text{treatment\_group}_i + \gamma_t + \varepsilon_{it}$$

Where $treatment\_group_i \cdot treatment\_period_i$ is the treatment dummy, $\delta \cdot treatment\_group_i$ controls for the fixed differences between the two groups and γ_t controls for the time-fixed effects.

b)

```
. reg residual_weight treatment_dummy treatment_group i.calendar_week
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Source	SS	df	MS	Number of obs	=	66
				F(34, 31)	=	11.20
Model	30.9169123	34	.909320951	Prob > F	=	0.0000
Residual	2.51600518	31	.081161457	R-squared	=	0.9247
				Adj R-squared	=	0.8422
Total	33.4329175	65	.514352577	Root MSE	=	.28489

residual_weight	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
treatment_dummy	-1.109553	.1487782	-7.46	0.000	-1.412988	-.806118
treatment_group	.0694723	.0858971	0.81	0.425	-.1057161	.2446606
calendar_week						
2	.1549997	.2848885	0.54	0.590	-.4260342	.7360337
3	.0349998	.2848885	0.12	0.903	-.5460341	.6160338
4	.2950001	.2848885	1.04	0.308	-.2860338	.876034
5	.3099999	.2848885	1.09	0.285	-.271034	.8910339
6	-.1544447	.2848885	-0.54	0.592	-.7354786	.4265892
7	-.4200001	.2848885	-1.47	0.150	-1.001034	.1610338
8	.4044447	.2848885	1.42	0.166	-.1765892	.9854786
9	.2800002	.2848885	0.98	0.333	-.3010337	.8610341
10	.0499997	.2848885	0.18	0.862	-.5310342	.6310336
11	-.3050003	.2848885	-1.07	0.293	-.8860342	.2760336
12	.0300002	.2848885	0.11	0.917	-.5510337	.6110341
13	-.77	.2848885	-2.70	0.011	-1.351034	-.1889661
14	-.3787503	.2848885	-1.33	0.193	-.9597843	.2022836
15	-.3800001	.2848885	-1.33	0.192	-.961034	.2010338
16	-1	.2848885	-3.51	0.001	-1.581034	-.4189661
17	.2105556	.2848885	0.74	0.465	-.3704784	.7915895
18	1.479	.2848885	5.19	0.000	.8979662	2.060034
19	-.1820002	.2848885	-0.64	0.528	-.7630341	.3990338
20	-.6919999	.2848885	-2.43	0.021	-1.273034	-.110966
21	-.9299998	.2848885	-3.26	0.003	-1.511034	-.3489659
22	-.7930002	.2848885	-2.78	0.009	-1.374034	-.2119663
23	-.1472236	.2944405	-0.50	0.621	-.7477389	.4532917
24	-1.255223	.2944405	-4.26	0.000	-1.855739	-.6547081
25	-.1652237	.2944405	-0.56	0.579	-.765739	.4352916
26	-.4292236	.2944405	-1.46	0.155	-1.029739	.1712917
27	.4847764	.2944405	1.65	0.110	-.1157389	1.085292
28	-.1652232	.2944405	-0.56	0.579	-.7657385	.4352921
29	-.3572231	.2944405	-1.21	0.234	-.9577384	.2432922
30	-.8482238	.2944405	-2.88	0.007	-1.448739	-.2477085
31	-.2080012	.2944405	-0.71	0.485	-.8085166	.3925141
32	.6831097	.2944405	2.32	0.027	.0825943	1.283625
33	.2267765	.2944405	0.77	0.447	-.3737388	.8272918
_cons	9.800264	.205974	47.58	0.000	9.380177	10.22035

The estimated effect is negative and equal to -1.1096 significant at the 1%-level. The treatment effect in percentage terms is equal to -11.74%.

Copy of our Do-file

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* Computer Assignment 4b

use "C:\Users\u1266283\Downloads\bat_did_2017.dta"

* 1
xtset treatment_group calendar_week
* (a)
sum residual_weight if treatment_period==0
display 9.709718/1050
* (b)
histogram residual_weight

*2
* (a)
graph twoway (line residual_weight calendar_week if treatment_group==0)(line
residual_weight calendar_week if treatment_group==1) if treatment_period~=1
* (b)
sum residual_weight if treatment_period==0 & treatment_group==1
sum residual_weight if treatment_period==0 & treatment_group==0
sum residual_weight if treatment_period==1 & treatment_group==1
sum residual_weight if treatment_period==1 & treatment_group==0
display (-1.1096)/9.7445
* (c)
graph twoway (line residual_weight calendar_week if treatment_group==0)(line
residual_weight calendar_week if treatment_group==1), xline(23)
yscale(range(0)) ylabel(0(2)12)
graph twoway (line residual_weight calendar_week if treatment_group==0),
xline(23) yscale(range(0)) ylabel(0(2)12)


*3
* (b)
gen treatment_dummy= treatment_group*treatment_period
reg residual_weight treatment_dummy treatment_group i.calendar_week
margins, eydx(treatment_dummy)
```