```
      name:  <unnamed>
       log:  C:\Users\u1265889\Desktop\Untitled.smcl
  log type:  smcl
 opened on:  28 Sep 2017, 17:31:29

. do "C:\Users\u1265889\AppData\Local\Temp\STD00000000.tmp"

. *Computer Assignment 5a 'Event time', Oct 2017
. use "C:\Users\u1265889\Downloads\ca5a_bat_2016.dta", clear

. xtset route calendar_week
       panel variable:  route (unbalanced)
        time variable:  calendar_week, -15 to 36, but with gaps
                delta:  1 unit

.
. *IIa
. sum calendar_week if LetterReceived==1

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
calendar_w~k |        175    14.65714    8.259244          -5         28

. *Minimum is week -5, we are looking for the mean of the outcome variable befo
> re week -5
. sum residual_weight if calendar_week<-6

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
residual_w~t |        579    10.28636     1.38393         5.1       14.8

.
. *IIb
. codebook route

-------------------------------------------------------------------------------
route                                                          garbage route
-------------------------------------------------------------------------------

                  type:  numeric (float)

                 range:  [101,513]                    units:  1
         unique values:  65                       missing .:  0/3,376

                  mean:   306.914
             std. dev:   141.504

           percentiles:        10%       25%       50%       75%       90%
                               107       204       307       410       507

.
. *IIc
. codebook calendar_week

-------------------------------------------------------------------------------
calendar_week                                                  calendar week
-------------------------------------------------------------------------------

                  type:  numeric (float)

                 range:  [-15,36]                     units:  1
         unique values:  52                       missing .:  0/3,376

                  mean:   10.5142
             std. dev:   15.0122

           percentiles:        10%       25%       50%       75%       90%
                               -10      -2.5        11        24        31
```

```
.
. *IId
. graph twoway (scatter residual_weight calendar_week), by( route)

.
. *IIe
. graph twoway (scatter residual_weight calendar_week if TreatmentOngoing==0&Tr
> eatmentCompleted==0) (scatter residual_weight calendar_week if TreatmentOngoi
> ng==1| TreatmentCompleted==1) if route<200, by( route)

.
. *IIIb
. sort route calendar_week

. by route: gen sumTreatmentOngoing=sum(TreatmentOngoing)

. sort route calendar_week

. by route: gen startweekTreatment_t=calendar_week if sumTreatmentOngoing==1
(3,311 missing values generated)

. sort route calendar_week

. by route: egen startweekTreatment=mean(startweekTreatment_t)

. drop startweekTreatment_t sumTreatmentOngoing

. gen eventtime=calendar_week-startweekTreatment

. drop startweekTreatment

. summ eventtime
```

Variable	Obs	Mean	Std. Dev.	Min	Max
eventtime	**3,376**	**-4.790284**	**17.43736**	**-44**	**39**

```
.
. *IIIc
. tab calendar_week, gen(w)
```

calendar week	Freq.	Percent	Cum.
-15	**65**	**1.93**	**1.93**
-14	**65**	**1.93**	**3.85**
-13	**65**	**1.93**	**5.78**
-12	**64**	**1.90**	**7.67**
-11	**65**	**1.93**	**9.60**
-10	**65**	**1.93**	**11.52**
-9	**65**	**1.93**	**13.45**
-8	**65**	**1.93**	**15.37**
-7	**65**	**1.93**	**17.30**
-6	**65**	**1.93**	**19.22**
-5	**65**	**1.93**	**21.15**
-4	**65**	**1.93**	**23.07**
-3	**65**	**1.93**	**25.00**
-2	**65**	**1.93**	**26.93**
-1	**65**	**1.93**	**28.85**
0	**65**	**1.93**	**30.78**
1	**63**	**1.87**	**32.64**
2	**65**	**1.93**	**34.57**
3	**65**	**1.93**	**36.49**
4	**64**	**1.90**	**38.39**
5	**65**	**1.93**	**40.31**
6	**65**	**1.93**	**42.24**
7	**65**	**1.93**	**44.16**
8	**65**	**1.93**	**46.09**
9	**65**	**1.93**	**48.02**
10	**65**	**1.93**	**49.94**
11	**65**	**1.93**	**51.87**
12	**65**	**1.93**	**53.79**

13	65	1.93	55.72
14	65	1.93	57.64
15	65	1.93	59.57
16	65	1.93	61.49
17	65	1.93	63.42
18	65	1.93	65.34
19	65	1.93	67.27
20	65	1.93	69.19
21	65	1.93	71.12
22	65	1.93	73.05
23	65	1.93	74.97
24	65	1.93	76.90
25	65	1.93	78.82
26	65	1.93	80.75
27	65	1.93	82.67
28	65	1.93	84.60
29	65	1.93	86.52
30	65	1.93	88.45
31	65	1.93	90.37
32	65	1.93	92.30
33	65	1.93	94.22
34	65	1.93	96.15
35	65	1.93	98.07
36	65	1.93	100.00
Total	3,376	100.00	

```
. tab eventtime, gen(e)
```

eventtime	Freq.	Percent	Cum.
-44	5	0.15	0.15
-43	5	0.15	0.30
-42	5	0.15	0.44
-41	5	0.15	0.59
-40	15	0.44	1.04
-39	15	0.44	1.48
-38	15	0.44	1.93
-37	15	0.44	2.37
-36	25	0.74	3.11
-35	25	0.74	3.85
-34	25	0.74	4.59
-33	25	0.74	5.33
-32	35	1.04	6.37
-31	35	1.04	7.41
-30	35	1.04	8.44
-29	35	1.04	9.48
-28	45	1.33	10.81
-27	45	1.33	12.14
-26	45	1.33	13.48
-25	43	1.27	14.75
-24	55	1.63	16.38
-23	55	1.63	18.01
-22	55	1.63	19.64
-21	55	1.63	21.27
-20	54	1.60	22.87
-19	55	1.63	24.50
-18	60	1.78	26.27
-17	60	1.78	28.05
-16	60	1.78	29.83
-15	60	1.78	31.61
-14	60	1.78	33.38
-13	60	1.78	35.16
-12	65	1.93	37.09
-11	65	1.93	39.01
-10	65	1.93	40.94
-9	65	1.93	42.86
-8	64	1.90	44.76
-7	65	1.93	46.68
-6	65	1.93	48.61
-5	65	1.93	50.53
-4	65	1.93	52.46

-3	**65**	**1.93**	**54.38**
-2	**65**	**1.93**	**56.31**
-1	**65**	**1.93**	**58.23**
0	**65**	**1.93**	**60.16**
1	**65**	**1.93**	**62.09**
2	**65**	**1.93**	**64.01**
3	**65**	**1.93**	**65.94**
4	**65**	**1.93**	**67.86**
5	**65**	**1.93**	**69.79**
6	**65**	**1.93**	**71.71**
7	**65**	**1.93**	**73.64**
8	**60**	**1.78**	**75.41**
9	**60**	**1.78**	**77.19**
10	**60**	**1.78**	**78.97**
11	**60**	**1.78**	**80.75**
12	**50**	**1.48**	**82.23**
13	**50**	**1.48**	**83.71**
14	**50**	**1.48**	**85.19**
15	**50**	**1.48**	**86.67**
16	**40**	**1.18**	**87.86**
17	**40**	**1.18**	**89.04**
18	**40**	**1.18**	**90.23**
19	**40**	**1.18**	**91.41**
20	**30**	**0.89**	**92.30**
21	**30**	**0.89**	**93.19**
22	**30**	**0.89**	**94.08**
23	**30**	**0.89**	**94.96**
24	**20**	**0.59**	**95.56**
25	**20**	**0.59**	**96.15**
26	**20**	**0.59**	**96.74**
27	**20**	**0.59**	**97.33**
28	**10**	**0.30**	**97.63**
29	**10**	**0.30**	**97.93**
30	**10**	**0.30**	**98.22**
31	**10**	**0.30**	**98.52**
32	**10**	**0.30**	**98.82**
33	**10**	**0.30**	**99.11**
34	**5**	**0.15**	**99.26**
35	**5**	**0.15**	**99.41**
36	**5**	**0.15**	**99.56**
37	**5**	**0.15**	**99.70**
38	**5**	**0.15**	**99.85**
39	**5**	**0.15**	**100.00**
Total	**3,376**	**100.00**	

```
. gen em37_m44=0

. replace em37_m44=1 if e1==1|e2==1|e3==1|e4==1|e5==1|e6==1|e7==1|e8==1
(80 real changes made)

. gen e24_39=0

. replace e24_39=1 if e69==1|e70==1|e71==1|e72==1|e73==1|e74==1|e75==1|e76==1|e
> 77==1|e78==1|e79==1|e80==1|e81==1|e82==1|e83==1|e84==1
(170 real changes made)

. xtreg residual_weight em37_m44 e9-e41 e43-e68 e24_39 w2-w52, fe i(route) clus
> ter(route)

Fixed-effects (within) regression               Number of obs      =       3,340
Group variable: route                           Number of groups   =          65

R-sq:                                           Obs per group:
     within  = 0.4528                                         min =          47
     between = 0.0561                                         avg =        51.4
     overall = 0.2643                                         max =          52

                                                F(64,64)           =           .
corr(u_i, Xb)  = 0.0202                         Prob > F           =           .
```

(Std. Err. adjusted for **65** clusters in route)

residual_w~t	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
em37_m44	.1660996	.3753856	0.44	0.660	-.5838194	.9160186
e9	.0492043	.3699015	0.13	0.895	-.689759	.7881676
e10	.0325016	.4244292	0.08	0.939	-.8153931	.8803963
e11	.1135185	.3565627	0.32	0.751	-.5987974	.8258343
e12	.1410174	.3864242	0.36	0.716	-.6309537	.9129885
e13	.1321758	.3620965	0.37	0.716	-.591195	.8555466
e14	-.0206161	.3614777	-0.06	0.955	-.7427507	.7015186
e15	-.3085103	.4056539	-0.76	0.450	-1.118897	.5018764
e16	.2679701	.3755905	0.71	0.478	-.4823582	1.018298
e17	.2686443	.3468229	0.77	0.441	-.4242141	.9615027
e18	-.0298329	.3042595	-0.10	0.922	-.6376612	.5779953
e19	-.0141994	.3446306	-0.04	0.967	-.7026782	.6742793
e20	-.1222256	.3819468	-0.32	0.750	-.8852521	.6408009
e21	-.1752506	.3529327	-0.50	0.621	-.8803148	.5298136
e22	.0026389	.2865432	0.01	0.993	-.569797	.5750748
e23	.1393598	.3354026	0.42	0.679	-.5306838	.8094035
e24	.1558172	.3236079	0.48	0.632	-.4906639	.8022982
e25	.036003	.3201239	0.11	0.911	-.6035179	.675524
e26	.09244	.2838208	0.33	0.746	-.4745573	.6594373
e27	.2462243	.300092	0.82	0.415	-.3532783	.8457269
e28	.1058485	.2857457	0.37	0.712	-.4649943	.6766912
e29	-.0788001	.3063948	-0.26	0.798	-.690894	.5332938
e30	.1507689	.2327261	0.65	0.519	-.314155	.6156928
e31	.2390666	.3474272	0.69	0.494	-.4549991	.9331322
e32	.378625	.2956212	1.28	0.205	-.2119463	.9691962
e33	.3127542	.280422	1.12	0.269	-.2474531	.8729615
e34	.1019633	.2060141	0.49	0.622	-.3095971	.5135237
e35	-.1026395	.2751331	-0.37	0.710	-.6522812	.4470021
e36	.2306286	.2759282	0.84	0.406	-.3206013	.7818585
e37	.2084093	.2877271	0.72	0.472	-.3663917	.7832102
e38	-.0977933	.1868086	-0.52	0.602	-.4709864	.2753998
e39	.0684474	.2956226	0.23	0.818	-.5221266	.6590214
e40	.0709874	.2585554	0.27	0.785	-.4455365	.5875112
e41	.1432294	.2690172	0.53	0.596	-.3941942	.680653
e43	-.490191	.3380811	-1.45	0.152	-1.165586	.1852036
e44	-.7773395	.2231218	-3.48	0.001	-1.223077	-.3316024
e45	-.646476	.2722476	-2.37	0.021	-1.190353	-.1025988
e46	-1.040911	.1893322	-5.50	0.000	-1.419146	-.6626769
e47	-1.022562	.3060556	-3.34	0.001	-1.633979	-.4111456
e48	-1.044916	.2484016	-4.21	0.000	-1.541156	-.548677
e49	-1.202347	.2702203	-4.45	0.000	-1.742175	-.6625202
e50	-1.148927	.2442134	-4.70	0.000	-1.6368	-.6610549
e51	-1.115251	.3040191	-3.67	0.000	-1.722599	-.5079033
e52	-1.032261	.2598243	-3.97	0.000	-1.551319	-.5132019
e53	-1.125932	.2912901	-3.87	0.000	-1.707851	-.5440129
e54	-.8318131	.271006	-3.07	0.003	-1.37321	-.2904163
e55	-1.027551	.2722047	-3.77	0.000	-1.571343	-.4837598
e56	-.9632684	.2550999	-3.78	0.000	-1.472889	-.4536477
e57	-.8023489	.2889262	-2.78	0.007	-1.379545	-.2251525
e58	-.8708884	.2833805	-3.07	0.003	-1.437006	-.3047708
e59	-.944821	.2618405	-3.61	0.001	-1.467907	-.4217345
e60	-.9410427	.3126982	-3.01	0.004	-1.565729	-.3163562
e61	-.9374029	.3286817	-2.85	0.006	-1.59402	-.2807857
e62	-.6575268	.2760276	-2.38	0.020	-1.208955	-.1060982
e63	-.8539899	.3046378	-2.80	0.007	-1.462574	-.245406
e64	-.6938821	.390759	-1.78	0.081	-1.474513	.0867487
e65	-.7584854	.3401587	-2.23	0.029	-1.438031	-.0789403
e66	-.6539317	.3040874	-2.15	0.035	-1.261416	-.0464473
e67	-.5839641	.4487894	-1.30	0.198	-1.480524	.3125958
e68	-1.118006	.3186791	-3.51	0.001	-1.75464	-.4813709
e24_39	-.7802495	.3602475	-2.17	0.034	-1.499927	-.0605724
w2	-.1458825	.2199268	-0.66	0.510	-.5852368	.2934718
w3	-.1952443	.1550219	-1.26	0.212	-.5049361	.1144475
w4	-.0463937	.2217447	-0.21	0.835	-.4893796	.3965923
w5	.0539994	.1778924	0.30	0.762	-.3013815	.4093803
w6	-.1000439	.228607	-0.44	0.663	-.5567389	.3566512
w7	-.2570051	.1667041	-1.54	0.128	-.5900348	.0760247

w8	.2224097	.2063382	1.08	0.285	-.1897983	.6346178
w9	.0248986	.1547786	0.16	0.873	-.2843072	.3341044
w10	-.1565313	.20897	-0.75	0.457	-.5739969	.2609342
w11	-.508969	.1652526	-3.08	0.003	-.8390991	-.1788389
w12	-.5429949	.2341053	-2.32	0.024	-1.010674	-.0753158
w13	-.987833	.2194342	-4.50	0.000	-1.426203	-.5494628
w14	-.655579	.2179479	-3.01	0.004	-1.09098	-.220178
w15	-.602797	.175084	-3.44	0.001	-.9525675	-.2530265
w16	-1.366639	.287685	-4.75	0.000	-1.941356	-.7919222
w17	-.303524	.1981473	-1.53	0.130	-.6993688	.0923207
w18	1.039669	.2564467	4.05	0.000	.5273582	1.55198
w19	-.5450746	.2069132	-2.63	0.011	-.9584312	-.1317181
w20	-1.006206	.2176251	-4.62	0.000	-1.440962	-.5714504
w21	-1.227681	.2078887	-5.91	0.000	-1.642986	-.8123752
w22	-1.148742	.2397597	-4.79	0.000	-1.627717	-.669767
w23	-.923712	.1977394	-4.67	0.000	-1.318742	-.5286821
w24	-1.576162	.2352405	-6.70	0.000	-2.046109	-1.106215
w25	-.7404319	.2260656	-3.28	0.002	-1.19205	-.2888139
w26	-.7657173	.240465	-3.18	0.002	-1.246101	-.2853333
w27	.2814851	.2357522	1.19	0.237	-.189484	.7524542
w28	-.4398417	.2488202	-1.77	0.082	-.9369172	.0572338
w29	-.7249511	.2523585	-2.87	0.006	-1.229095	-.220807
w30	-1.16397	.2700924	-4.31	0.000	-1.703542	-.6243989
w31	-.5716019	.3316393	-1.72	0.090	-1.234127	.0909237
w32	.8972927	.3064984	2.93	0.005	.2849918	1.509594
w33	-.020938	.2667222	-0.08	0.938	-.5537769	.5119009
w34	-1.838351	.3666304	-5.01	0.000	-2.570779	-1.105922
w35	.1474803	.3050389	0.48	0.630	-.461905	.7568656
w36	-.0131139	.2920986	-0.04	0.964	-.5966479	.5704202
w37	-.2790308	.2777571	-1.00	0.319	-.8339144	.2758528
w38	-1.300405	.3884478	-3.35	0.001	-2.076419	-.5243914
w39	.0520897	.3087953	0.17	0.867	-.5647998	.6689791
w40	-.2861638	.2877138	-0.99	0.324	-.8609381	.2886105
w41	-.5789986	.3057791	-1.89	0.063	-1.189863	.0318654
w42	-.6432762	.3395555	-1.89	0.063	-1.321616	.0350638
w43	-.1967645	.3108262	-0.63	0.529	-.8177111	.4241822
w44	-.5202993	.3014543	-1.73	0.089	-1.122524	.0819249
w45	-.3151835	.3380297	-0.93	0.355	-.9904755	.3601085
w46	-.6083392	.3616318	-1.68	0.097	-1.330782	.1141033
w47	-1.386059	.2835013	-4.89	0.000	-1.952418	-.8196997
w48	-1.137434	.3121758	-3.64	0.001	-1.761077	-.5137913
w49	-1.241023	.3526181	-3.52	0.001	-1.945458	-.5365871
w50	-1.607287	.3472863	-4.63	0.000	-2.301071	-.9135031
w51	-.9703762	.2893231	-3.35	0.001	-1.548366	-.3923868
w52	-.1587337	.3295077	-0.48	0.632	-.8170011	.4995337
_cons	10.27143	.3282694	31.29	0.000	9.615641	10.92723
sigma_u	1.1291756					
sigma_e	.9311568					
rho	.59523048	(fraction of variance due to u_i)				

```
.
. *IIId
. ssc install coefplot
checking coefplot consistency and verifying not already installed...
all files already exist and are up to date.

. xtreg residual_weight em37_m44 e9-e41 e43-e68 e24_39 e42 w2-w52, fe i(route)
> cluster(route)
note: e42 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       3,340
Group variable: route                           Number of groups   =          65

R-sq:                                           Obs per group:
     within  = 0.4528                                         min =          47
     between = 0.0561                                         avg =        51.4
     overall = 0.2643                                         max =          52
```

F(64,64) = .
corr(u_i, Xb) = **0.0202** Prob > F = .

(Std. Err. adjusted for **65** clusters in route)

residual_w~t	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
em37_m44	.1660996	.3753856	0.44	0.660	-.5838194	.9160186
e9	.0492043	.3699015	0.13	0.895	-.689759	.7881676
e10	.0325016	.4244292	0.08	0.939	-.8153931	.8803963
e11	.1135185	.3565627	0.32	0.751	-.5987974	.8258343
e12	.1410174	.3864242	0.36	0.716	-.6309537	.9129885
e13	.1321758	.3620965	0.37	0.716	-.591195	.8555466
e14	-.0206161	.3614777	-0.06	0.955	-.7427507	.7015186
e15	-.3085103	.4056539	-0.76	0.450	-1.118897	.5018764
e16	.2679701	.3755905	0.71	0.478	-.4823582	1.018298
e17	.2686443	.3468229	0.77	0.441	-.4242141	.9615027
e18	-.0298329	.3042595	-0.10	0.922	-.6376612	.5779953
e19	-.0141994	.3446306	-0.04	0.967	-.7026782	.6742793
e20	-.1222256	.3819468	-0.32	0.750	-.8852521	.6408009
e21	-.1752506	.3529327	-0.50	0.621	-.8803148	.5298136
e22	.0026389	.2865432	0.01	0.993	-.569797	.5750748
e23	.1393598	.3354026	0.42	0.679	-.5306838	.8094035
e24	.1558172	.3236079	0.48	0.632	-.4906639	.8022982
e25	.036003	.3201239	0.11	0.911	-.6035179	.675524
e26	.09244	.2838208	0.33	0.746	-.4745573	.6594373
e27	.2462243	.300092	0.82	0.415	-.3532783	.8457269
e28	.1058485	.2857457	0.37	0.712	-.4649943	.6766912
e29	-.0788001	.3063948	-0.26	0.798	-.690894	.5332938
e30	.1507689	.2327261	0.65	0.519	-.314155	.6156928
e31	.2390666	.3474272	0.69	0.494	-.4549991	.9331322
e32	.378625	.2956212	1.28	0.205	-.2119463	.9691962
e33	.3127542	.280422	1.12	0.269	-.2474531	.8729615
e34	.1019633	.2060141	0.49	0.622	-.3095971	.5135237
e35	-.1026395	.2751331	-0.37	0.710	-.6522812	.4470021
e36	.2306286	.2759282	0.84	0.406	-.3206013	.7818585
e37	.2084093	.2877271	0.72	0.472	-.3663917	.7832102
e38	-.0977933	.1868086	-0.52	0.602	-.4709864	.2753998
e39	.0684474	.2956226	0.23	0.818	-.5221266	.6590214
e40	.0709874	.2585554	0.27	0.785	-.4455365	.5875112
e41	.1432294	.2690172	0.53	0.596	-.3941942	.680653
e43	-.490191	.3380811	-1.45	0.152	-1.165586	.1852036
e44	-.7773395	.2231218	-3.48	0.001	-1.223077	-.3316024
e45	-.646476	.2722476	-2.37	0.021	-1.190353	-.1025988
e46	-1.040911	.1893322	-5.50	0.000	-1.419146	-.6626769
e47	-1.022562	.3060556	-3.34	0.001	-1.633979	-.4111456
e48	-1.044916	.2484016	-4.21	0.000	-1.541156	-.548677
e49	-1.202347	.2702203	-4.45	0.000	-1.742175	-.6625202
e50	-1.148927	.2442134	-4.70	0.000	-1.6368	-.6610549
e51	-1.115251	.3040191	-3.67	0.000	-1.722599	-.5079033
e52	-1.032261	.2598243	-3.97	0.000	-1.551319	-.5132019
e53	-1.125932	.2912901	-3.87	0.000	-1.707851	-.5440129
e54	-.8318131	.271006	-3.07	0.003	-1.37321	-.2904163
e55	-1.027551	.2722047	-3.77	0.000	-1.571343	-.4837598
e56	-.9632684	.2550999	-3.78	0.000	-1.472889	-.4536477
e57	-.8023489	.2889262	-2.78	0.007	-1.379545	-.2251525
e58	-.8708884	.2833805	-3.07	0.003	-1.437006	-.3047708
e59	-.944821	.2618405	-3.61	0.001	-1.467907	-.4217345
e60	-.9410427	.3126982	-3.01	0.004	-1.565729	-.3163562
e61	-.9374029	.3286817	-2.85	0.006	-1.59402	-.2807857
e62	-.6575268	.2760276	-2.38	0.020	-1.208955	-.1060982
e63	-.8539899	.3046378	-2.80	0.007	-1.462574	-.245406
e64	-.6938821	.390759	-1.78	0.081	-1.474513	.0867487
e65	-.7584854	.3401587	-2.23	0.029	-1.438031	-.0789403
e66	-.6539317	.3040874	-2.15	0.035	-1.261416	-.0464473
e67	-.5839641	.4487894	-1.30	0.198	-1.480524	.3125958
e68	-1.118006	.3186791	-3.51	0.001	-1.75464	-.4813709
e24_39	-.7802495	.3602475	-2.17	0.034	-1.499927	-.0605724
e42	0	(omitted)				
w2	-.1458825	.2199268	-0.66	0.510	-.5852368	.2934718
w3	-.1952443	.1550219	-1.26	0.212	-.5049361	.1144475

w4	-.0463937	.2217447	-0.21	0.835	-.4893796	.3965923
w5	.0539994	.1778924	0.30	0.762	-.3013815	.4093803
w6	-.1000439	.228607	-0.44	0.663	-.5567389	.3566512
w7	-.2570051	.1667041	-1.54	0.128	-.5900348	.0760247
w8	.2224097	.2063382	1.08	0.285	-.1897983	.6346178
w9	.0248986	.1547786	0.16	0.873	-.2843072	.3341044
w10	-.1565313	.20897	-0.75	0.457	-.5739969	.2609342
w11	-.508969	.1652526	-3.08	0.003	-.8390991	-.1788389
w12	-.5429949	.2341053	-2.32	0.024	-1.010674	-.0753158
w13	-.987833	.2194342	-4.50	0.000	-1.426203	-.5494628
w14	-.655579	.2179479	-3.01	0.004	-1.09098	-.220178
w15	-.602797	.175084	-3.44	0.001	-.9525675	-.2530265
w16	-1.366639	.287685	-4.75	0.000	-1.941356	-.7919222
w17	-.303524	.1981473	-1.53	0.130	-.6993688	.0923207
w18	1.039669	.2564467	4.05	0.000	.5273582	1.55198
w19	-.5450746	.2069132	-2.63	0.011	-.9584312	-.1317181
w20	-1.006206	.2176251	-4.62	0.000	-1.440962	-.5714504
w21	-1.227681	.2078887	-5.91	0.000	-1.642986	-.8123752
w22	-1.148742	.2397597	-4.79	0.000	-1.627717	-.669767
w23	-.923712	.1977394	-4.67	0.000	-1.318742	-.5286821
w24	-1.576162	.2352405	-6.70	0.000	-2.046109	-1.106215
w25	-.7404319	.2260656	-3.28	0.002	-1.19205	-.2888139
w26	-.7657173	.240465	-3.18	0.002	-1.246101	-.2853333
w27	.2814851	.2357522	1.19	0.237	-.189484	.7524542
w28	-.4398417	.2488202	-1.77	0.082	-.9369172	.0572338
w29	-.7249511	.2523585	-2.87	0.006	-1.229095	-.220807
w30	-1.16397	.2700924	-4.31	0.000	-1.703542	-.6243989
w31	-.5716019	.3316393	-1.72	0.090	-1.234127	.0909237
w32	.8972927	.3064984	2.93	0.005	.2849918	1.509594
w33	-.020938	.2667222	-0.08	0.938	-.5537769	.5119009
w34	-1.838351	.3666304	-5.01	0.000	-2.570779	-1.105922
w35	.1474803	.3050389	0.48	0.630	-.461905	.7568656
w36	-.0131139	.2920986	-0.04	0.964	-.5966479	.5704202
w37	-.2790308	.2777571	-1.00	0.319	-.8339144	.2758528
w38	-1.300405	.3884478	-3.35	0.001	-2.076419	-.5243914
w39	.0520897	.3087953	0.17	0.867	-.5647998	.6689791
w40	-.2861638	.2877138	-0.99	0.324	-.8609381	.2886105
w41	-.5789986	.3057791	-1.89	0.063	-1.189863	.0318654
w42	-.6432762	.3395555	-1.89	0.063	-1.321616	.0350638
w43	-.1967645	.3108262	-0.63	0.529	-.8177111	.4241822
w44	-.5202993	.3014543	-1.73	0.089	-1.122524	.0819249
w45	-.3151835	.3380297	-0.93	0.355	-.9904755	.3601085
w46	-.6083392	.3616318	-1.68	0.097	-1.330782	.1141033
w47	-1.386059	.2835013	-4.89	0.000	-1.952418	-.8196997
w48	-1.137434	.3121758	-3.64	0.001	-1.761077	-.5137913
w49	-1.241023	.3526181	-3.52	0.001	-1.945458	-.5365871
w50	-1.607287	.3472863	-4.63	0.000	-2.301071	-.9135031
w51	-.9703762	.2893231	-3.35	0.001	-1.548366	-.3923868
w52	-.1587337	.3295077	-0.48	0.632	-.8170011	.4995337
_cons	10.27143	.3282694	31.29	0.000	9.615641	10.92723
sigma_u	1.1291756					
sigma_e	.9311568					
rho	.59523048	(fraction of variance due to u_i)				

```
. coefplot, keep(e*) nolabels coeflabels(,labsize(tiny)) vertical xline(35) lev
> els(90) yline(0) ytitle(difference in weekly residual waste/route) xtitle(eve
> nt time) omitted order(em37_m44 e9 e10 e11 e12 e13 e14 e15 e16 e17 e18 e19 e2
> 0 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39
>  e40 e41 e42 e43 e44 e45 e46 e47 e48 e49 e50 e51 e52 e53 e54 e55 e56 e57 e58
> e59 e60 e61 e62 e63 e64 e65 e66 e67 e68 e24_39)
```

```
.
. drop e1-e8

. ren em37_m44 e8

. drop e69-e84

. ren e24_39 e69

. forvalues i=8/69 {
  2. label variable e`i' "`=`i'-45'"
  3. }

. xtreg residual_weight e8 e9-e41 e43-e68 e69 e42 w2-w52, fe i(route) cluster(r
> oute)
note: e42 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       3,340
Group variable: route                           Number of groups   =          65

R-sq:                                           Obs per group:
     within  = 0.4528                                         min =          47
     between = 0.0561                                         avg =        51.4
     overall = 0.2643                                         max =          52

                                                F(64,64)           =           .
corr(u_i, Xb)  = 0.0202                         Prob > F           =           .

                                (Std. Err. adjusted for 65 clusters in route)
```

residual_w~t	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
e8	.1660996	.3753856	0.44	0.660	-.5838194	.9160186
e9	.0492043	.3699015	0.13	0.895	-.689759	.7881676
e10	.0325016	.4244292	0.08	0.939	-.8153931	.8803963
e11	.1135185	.3565627	0.32	0.751	-.5987974	.8258343
e12	.1410174	.3864242	0.36	0.716	-.6309537	.9129885
e13	.1321758	.3620965	0.37	0.716	-.591195	.8555466
e14	-.0206161	.3614777	-0.06	0.955	-.7427507	.7015186
e15	-.3085103	.4056539	-0.76	0.450	-1.118897	.5018764
e16	.2679701	.3755905	0.71	0.478	-.4823582	1.018298
e17	.2686443	.3468229	0.77	0.441	-.4242141	.9615027
e18	-.0298329	.3042595	-0.10	0.922	-.6376612	.5779953
e19	-.0141994	.3446306	-0.04	0.967	-.7026782	.6742793
e20	-.1222256	.3819468	-0.32	0.750	-.8852521	.6408009
e21	-.1752506	.3529327	-0.50	0.621	-.8803148	.5298136
e22	.0026389	.2865432	0.01	0.993	-.569797	.5750748
e23	.1393598	.3354026	0.42	0.679	-.5306838	.8094035
e24	.1558172	.3236079	0.48	0.632	-.4906639	.8022982
e25	.036003	.3201239	0.11	0.911	-.6035179	.675524
e26	.09244	.2838208	0.33	0.746	-.4745573	.6594373
e27	.2462243	.300092	0.82	0.415	-.3532783	.8457269
e28	.1058485	.2857457	0.37	0.712	-.4649943	.6766912
e29	-.0788001	.3063948	-0.26	0.798	-.690894	.5332938
e30	.1507689	.2327261	0.65	0.519	-.314155	.6156928
e31	.2390666	.3474272	0.69	0.494	-.4549991	.9331322
e32	.378625	.2956212	1.28	0.205	-.2119463	.9691962
e33	.3127542	.280422	1.12	0.269	-.2474531	.8729615
e34	.1019633	.2060141	0.49	0.622	-.3095971	.5135237
e35	-.1026395	.2751331	-0.37	0.710	-.6522812	.4470021
e36	.2306286	.2759282	0.84	0.406	-.3206013	.7818585
e37	.2084093	.2877271	0.72	0.472	-.3663917	.7832102
e38	-.0977933	.1868086	-0.52	0.602	-.4709864	.2753998
e39	.0684474	.2956226	0.23	0.818	-.5221266	.6590214
e40	.0709874	.2585554	0.27	0.785	-.4455365	.5875112
e41	.1432294	.2690172	0.53	0.596	-.3941942	.680653
e43	-.490191	.3380811	-1.45	0.152	-1.165586	.1852036
e44	-.7773395	.2231218	-3.48	0.001	-1.223077	-.3316024
e45	-.646476	.2722476	-2.37	0.021	-1.190353	-.1025988
e46	-1.040911	.1893322	-5.50	0.000	-1.419146	-.6626769
e47	-1.022562	.3060556	-3.34	0.001	-1.633979	-.4111456

e48	-1.044916	.2484016	-4.21	0.000	-1.541156	-.548677
e49	-1.202347	.2702203	-4.45	0.000	-1.742175	-.6625202
e50	-1.148927	.2442134	-4.70	0.000	-1.6368	-.6610549
e51	-1.115251	.3040191	-3.67	0.000	-1.722599	-.5079033
e52	-1.032261	.2598243	-3.97	0.000	-1.551319	-.5132019
e53	-1.125932	.2912901	-3.87	0.000	-1.707851	-.5440129
e54	-.8318131	.271006	-3.07	0.003	-1.37321	-.2904163
e55	-1.027551	.2722047	-3.77	0.000	-1.571343	-.4837598
e56	-.9632684	.2550999	-3.78	0.000	-1.472889	-.4536477
e57	-.8023489	.2889262	-2.78	0.007	-1.379545	-.2251525
e58	-.8708884	.2833805	-3.07	0.003	-1.437006	-.3047708
e59	-.944821	.2618405	-3.61	0.001	-1.467907	-.4217345
e60	-.9410427	.3126982	-3.01	0.004	-1.565729	-.3163562
e61	-.9374029	.3286817	-2.85	0.006	-1.59402	-.2807857
e62	-.6575268	.2760276	-2.38	0.020	-1.208955	-.1060982
e63	-.8539899	.3046378	-2.80	0.007	-1.462574	-.245406
e64	-.6938821	.390759	-1.78	0.081	-1.474513	.0867487
e65	-.7584854	.3401587	-2.23	0.029	-1.438031	-.0789403
e66	-.6539317	.3040874	-2.15	0.035	-1.261416	-.0464473
e67	-.5839641	.4487894	-1.30	0.198	-1.480524	.3125958
e68	-1.118006	.3186791	-3.51	0.001	-1.75464	-.4813709
e69	-.7802495	.3602475	-2.17	0.034	-1.499927	-.0605724
e42	0	(omitted)				
w2	-.1458825	.2199268	-0.66	0.510	-.5852368	.2934718
w3	-.1952443	.1550219	-1.26	0.212	-.5049361	.1144475
w4	-.0463937	.2217447	-0.21	0.835	-.4893796	.3965923
w5	.0539994	.1778924	0.30	0.762	-.3013815	.4093803
w6	-.1000439	.228607	-0.44	0.663	-.5567389	.3566512
w7	-.2570051	.1667041	-1.54	0.128	-.5900348	.0760247
w8	.2224097	.2063382	1.08	0.285	-.1897983	.6346178
w9	.0248986	.1547786	0.16	0.873	-.2843072	.3341044
w10	-.1565313	.20897	-0.75	0.457	-.5739969	.2609342
w11	-.508969	.1652526	-3.08	0.003	-.8390991	-.1788389
w12	-.5429949	.2341053	-2.32	0.024	-1.010674	-.0753158
w13	-.987833	.2194342	-4.50	0.000	-1.426203	-.5494628
w14	-.655579	.2179479	-3.01	0.004	-1.09098	-.220178
w15	-.602797	.175084	-3.44	0.001	-.9525675	-.2530265
w16	-1.366639	.287685	-4.75	0.000	-1.941356	-.7919222
w17	-.303524	.1981473	-1.53	0.130	-.6993688	.0923207
w18	1.039669	.2564467	4.05	0.000	.5273582	1.55198
w19	-.5450746	.2069132	-2.63	0.011	-.9584312	-.1317181
w20	-1.006206	.2176251	-4.62	0.000	-1.440962	-.5714504
w21	-1.227681	.2078887	-5.91	0.000	-1.642986	-.8123752
w22	-1.148742	.2397597	-4.79	0.000	-1.627717	-.669767
w23	-.923712	.1977394	-4.67	0.000	-1.318742	-.5286821
w24	-1.576162	.2352405	-6.70	0.000	-2.046109	-1.106215
w25	-.7404319	.2260656	-3.28	0.002	-1.19205	-.2888139
w26	-.7657173	.240465	-3.18	0.002	-1.246101	-.2853333
w27	.2814851	.2357522	1.19	0.237	-.189484	.7524542
w28	-.4398417	.2488202	-1.77	0.082	-.9369172	.0572338
w29	-.7249511	.2523585	-2.87	0.006	-1.229095	-.220807
w30	-1.16397	.2700924	-4.31	0.000	-1.703542	-.6243989
w31	-.5716019	.3316393	-1.72	0.090	-1.234127	.0909237
w32	.8972927	.3064984	2.93	0.005	.2849918	1.509594
w33	-.020938	.2667222	-0.08	0.938	-.5537769	.5119009
w34	-1.838351	.3666304	-5.01	0.000	-2.570779	-1.105922
w35	.1474803	.3050389	0.48	0.630	-.461905	.7568656
w36	-.0131139	.2920986	-0.04	0.964	-.5966479	.5704202
w37	-.2790308	.2777571	-1.00	0.319	-.8339144	.2758528
w38	-1.300405	.3884478	-3.35	0.001	-2.076419	-.5243914
w39	.0520897	.3087953	0.17	0.867	-.5647998	.6689791
w40	-.2861638	.2877138	-0.99	0.324	-.8609381	.2886105
w41	-.5789986	.3057791	-1.89	0.063	-1.189863	.0318654
w42	-.6432762	.3395555	-1.89	0.063	-1.321616	.0350638
w43	-.1967645	.3108262	-0.63	0.529	-.8177111	.4241822
w44	-.5202993	.3014543	-1.73	0.089	-1.122524	.0819249
w45	-.3151835	.3380297	-0.93	0.355	-.9904755	.3601085
w46	-.6083392	.3616318	-1.68	0.097	-1.330782	.1141033
w47	-1.386059	.2835013	-4.89	0.000	-1.952418	-.8196997
w48	-1.137434	.3121758	-3.64	0.001	-1.761077	-.5137913
w49	-1.241023	.3526181	-3.52	0.001	-1.945458	-.5365871
w50	-1.607287	.3472863	-4.63	0.000	-2.301071	-.9135031

w51	-.9703762	.2893231	-3.35	0.001	-1.548366	-.3923868
w52	-.1587337	.3295077	-0.48	0.632	-.8170011	.4995337
_cons	10.27143	.3282694	31.29	0.000	9.615641	10.92723
sigma_u	1.1291756					
sigma_e	.9311568					
rho	.59523048	(fraction of variance due to u_i)				

```
. coefplot, keep(e*) coeflabels(,labsize(tiny)) vertical xline(35) levels(90) y
> line(0) ytitle(difference in weekly residual waste/route) xtitle(event time)
> omitted order(e8 e9 e10 e11 e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e
> 24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e42 e4
> 3 e44 e45 e46 e47 e48 e49 e50 e51 e52 e53 e54 e55 e56 e57 e58 e59 e60 e61 e62
>  e63 e64 e65 e66 e67 e68 e69)

.
. *IIIe
. ssc install parmest
checking parmest consistency and verifying not already installed...
all files already exist and are up to date.

. parmest, label format(estimate) list(parm label estimate) saving("C:\Users\U1
> 265889\Downloads\et_coeff.dta")
```

	parm	label	estimate
1.	e8	-37	.16609963
2.	e9	-36	.04920431
3.	e10	-35	.03250159
4.	e11	-34	.11351847
5.	e12	-33	.1410174
6.	e13	-32	.13217581
7.	e14	-31	-.02061605
8.	e15	-30	-.30851032
9.	e16	-29	.2679701
10.	e17	-28	.26864431
11.	e18	-27	-.02983295
12.	e19	-26	-.01419944
13.	e20	-25	-.12222562
14.	e21	-24	-.17525061
15.	e22	-23	.00263891
16.	e23	-22	.13935983
17.	e24	-21	.15581716
18.	e25	-20	.03600303
19.	e26	-19	.09243998
20.	e27	-18	.24622429
21.	e28	-17	.10584846
22.	e29	-16	-.0788001
23.	e30	-15	.15076889
24.	e31	-14	.23906658
25.	e32	-13	.37862496
26.	e33	-12	.31275424
27.	e34	-11	.1019633
28.	e35	-10	-.10263955
29.	e36	-9	.23062855
30.	e37	-8	.20840926
31.	e38	-7	-.09779328
32.	e39	-6	.0684474
33.	e40	-5	.07098735
34.	e41	-4	.14322943
35.	e43	-2	-.49019101
36.	e44	-1	-.77733946
37.	e45	0	-.64647597

38.	e46		1	-1.0409113
39.	e47		2	-1.0225621
40.	e48		3	-1.0449163
41.	e49		4	-1.2023474
42.	e50		5	-1.1489273
43.	e51		6	-1.1152513
44.	e52		7	-1.0322607
45.	e53		8	-1.1259318
46.	e54		9	-.83181309
47.	e55		10	-1.0275513
48.	e56		11	-.96326838
49.	e57		12	-.80234893
50.	e58		13	-.87088841
51.	e59		14	-.94482096
52.	e60		15	-.94104272
53.	e61		16	-.93740293
54.	e62		17	-.65752678
55.	e63		18	-.85398989
56.	e64		19	-.6938821
57.	e65		20	-.7584854
58.	e66		21	-.65393174
59.	e67		22	-.58396413
60.	e68		23	-1.1180057
61.	e69		24	-.78024946
62.	o.e42		-3	0
63.	w2	calendar_week==	-14.0000	-.1458825
64.	w3	calendar_week==	-13.0000	-.19524427
65.	w4	calendar_week==	-12.0000	-.04639365
66.	w5	calendar_week==	-11.0000	.05399941
67.	w6	calendar_week==	-10.0000	-.10004385
68.	w7	calendar_week==	-9.0000	-.25700508
69.	w8	calendar_week==	-8.0000	.22240974
70.	w9	calendar_week==	-7.0000	.0248986
71.	w10	calendar_week==	-6.0000	-.15653134
72.	w11	calendar_week==	-5.0000	-.50896902
73.	w12	calendar_week==	-4.0000	-.54299488
74.	w13	calendar_week==	-3.0000	-.98783298
75.	w14	calendar_week==	-2.0000	-.65557895
76.	w15	calendar_week==	-1.0000	-.60279701
77.	w16	calendar_week==	0.0000	-1.366639
78.	w17	calendar_week==	1.0000	-.30352404
79.	w18	calendar_week==	2.0000	1.0396693
80.	w19	calendar_week==	3.0000	-.54507463
81.	w20	calendar_week==	4.0000	-1.0062064
82.	w21	calendar_week==	5.0000	-1.2276806
83.	w22	calendar_week==	6.0000	-1.1487421
84.	w23	calendar_week==	7.0000	-.92371202
85.	w24	calendar_week==	8.0000	-1.5761616
86.	w25	calendar_week==	9.0000	-.74043195
87.	w26	calendar_week==	10.0000	-.76571734
88.	w27	calendar_week==	11.0000	.28148514
89.	w28	calendar_week==	12.0000	-.43984169
90.	w29	calendar_week==	13.0000	-.72495107
91.	w30	calendar_week==	14.0000	-1.1639705
92.	w31	calendar_week==	15.0000	-.57160186
93.	w32	calendar_week==	16.0000	.89729273
94.	w33	calendar_week==	17.0000	-.02093801
95.	w34	calendar_week==	18.0000	-1.8383506
96.	w35	calendar_week==	19.0000	.14748028
97.	w36	calendar_week==	20.0000	-.01311388

98.	w37	calendar_week==	21.0000	-.27903078
99.	w38	calendar_week==	22.0000	-1.300405
100.	w39	calendar_week==	23.0000	.05208967
101.	w40	calendar_week==	24.0000	-.28616384
102.	w41	calendar_week==	25.0000	-.57899858
103.	w42	calendar_week==	26.0000	-.64327618
104.	w43	calendar_week==	27.0000	-.19676449
105.	w44	calendar_week==	28.0000	-.52029933
106.	w45	calendar_week==	29.0000	-.31518353
107.	w46	calendar_week==	30.0000	-.60833922
108.	w47	calendar_week==	31.0000	-1.3860587
109.	w48	calendar_week==	32.0000	-1.1374342
110.	w49	calendar_week==	33.0000	-1.2410228
111.	w50	calendar_week==	34.0000	-1.6072873
112.	w51	calendar_week==	35.0000	-.9703762
113.	w52	calendar_week==	36.0000	-.15873368
114.	_cons		Constant	10.271434

file C:\Users\U1265889\Downloads\et_coeff.dta saved

```
. export excel using "C:\Users\U1265889\Downloads\eventtime.xls",firstrow(varia
> bles)
file C:\Users\U1265889\Downloads\eventtime.xls saved

.
. *IVa
. xtreg residual_weight LetterReceived TreatmentOngoing TreatmentCompleted w2-w
> 52, fe i(route) cluster(route)

Fixed-effects (within) regression               Number of obs     =      3,340
Group variable: route                           Number of groups  =         65

R-sq:                                           Obs per group:
     within  = 0.4391                                         min =         47
     between = 0.0594                                         avg =       51.4
     overall = 0.2618                                         max =         52

                                                F(54,64)          =     401.46
corr(u_i, Xb)  = 0.0173                         Prob > F          =     0.0000

                                    (Std. Err. adjusted for 65 clusters in r
> oute)
------------------------------------------------------------------------------
> ------
>              |               Robust
>   residual_weight |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Inte
> rval]
-------------------------------------------------------------------------------
> ------
>    LetterReceived |  -.7014392   .0665634   -10.54   0.000    -.8344149   -.56
> 84636
>  TreatmentOngoing |  -1.183891   .0768031   -15.41   0.000    -1.337323   -1.0
> 30459
> TreatmentCompleted |  -1.239756   .0879275   -14.10   0.000    -1.415411     -1
> .0641
>              w2 |  -.2159022   .1341608    -1.61   0.112    -.4839192    .05
> 21148
>              w3 |  -.3035945   .1286503    -2.36   0.021    -.5606031    -.0
> 46586
>              w4 |  -.0282265   .1514613    -0.19   0.853    -.3308053    .27
> 43523
>              w5 |   .0237206    .160677     0.15   0.883    -.2972685    .34
> 47098
>              w6 |  -.1759366   .1590902    -1.11   0.273    -.4937559    .14
> 18826
>              w7 |  -.3097484   .1705192    -1.82   0.074    -.6503997    .03
> 09029
>              w8 |   .2115351   .1235137     1.71   0.092    -.0352119     .4
> 58282
```

```
          w9 |  -.0620561   .1416223    -0.44   0.663    -.3449791    .22
> 08669
         w10 |    -.22821   .1603455    -1.42   0.160     -.548537     .0
> 92117
         w11 |  -.5434838   .1737616    -3.13   0.003    -.8906125   -.19
> 63551
         w12 |  -.5465607   .1629015    -3.36   0.001    -.8719939   -.22
> 11275
         w13 |  -.9971414   .2047268    -4.87   0.000     -1.40613   -.58
> 81527
         w14 |  -.7133892   .1498941    -4.76   0.000    -1.012837   -.41
> 39412
         w15 |  -.6435026   .1509808    -4.26   0.000    -.9451213   -.34
> 18838
         w16 |     -1.343   .2201796    -6.10   0.000    -1.782859   -.90
> 31406
         w17 |  -.3448169    .199291    -1.73   0.088    -.7429465    .05
> 33126
         w18 |   .9502438   .1780443     5.34   0.000     .5945595    1.3
> 05928
         w19 |   -.526391    .15153    -3.47   0.001    -.8291069   -.22
> 36751
         w20 |  -.9622339   .1476884    -6.52   0.000    -1.257275   -.66
> 71924
         w21 |  -1.242957   .1359566    -9.14   0.000    -1.514562   -.97
> 13526
         w22 |  -1.190391   .1474362    -8.07   0.000    -1.484929   -.89
> 58533
         w23 |  -.9181696   .1589771    -5.78   0.000    -1.235763   -.60
> 05763
         w24 |  -1.552939   .1622523    -9.57   0.000    -1.877075   -1.2
> 28802
         w25 |  -.6436489   .1407403    -4.57   0.000    -.9248099   -.36
> 24878
         w26 |  -.6825044   .1487462    -4.59   0.000    -.9796591   -.38
> 53497
         w27 |   .2987264   .1669554     1.79   0.078    -.0348054    .63
> 22582
         w28 |  -.3849659   .1678932    -2.29   0.025    -.7203711   -.04
> 95607
         w29 |   -.631358   .1420524    -4.44   0.000    -.9151402   -.34
> 75758
         w30 |  -1.063773   .1574017    -6.76   0.000    -1.378219   -.74
> 93267
         w31 |  -.5455158   .2876466    -1.90   0.062    -1.120156    .02
> 91243
         w32 |   .9667174   .2005766     4.82   0.000     .5660197    1.3
> 67415
         w33 |   .1008913   .1616351     0.62   0.535    -.2220118    .42
> 37945
         w34 |  -1.702747   .2594483    -6.56   0.000    -2.221055    -1.
> 18444
         w35 |   .2109589   .2162868     0.98   0.333    -.2211236    .64
> 30414
         w36 |    .031882   .1992953     0.16   0.873    -.3662562    .43
> 00202
         w37 |  -.1246847   .1638486    -0.76   0.449    -.4520099    .20
> 26405
         w38 |   -1.08726    .271895    -4.00   0.000    -1.630433   -.54
> 40876
         w39 |   .1616259   .2137974     0.76   0.452    -.2654834    .58
> 87352
         w40 |  -.1921555   .1563673    -1.23   0.224    -.5045351     .1
> 20224
         w41 |  -.3844146   .1505625    -2.55   0.013    -.6851978   -.08
> 36314
         w42 |  -.4215346   .1689156    -2.50   0.015    -.7589824   -.08
> 40869
         w43 |  -.0504577   .1644837    -0.31   0.760    -.3790517    .27
> 81363
         w44 |  -.3516888    .158951    -2.21   0.031    -.6692299   -.03
> 41478
```

```
                w45 |  -.1148578   .1801346    -0.64   0.526     -.474718    .24
> 50025
                w46 |  -.3374235   .1684991    -2.00   0.049    -.6740392   -.00
> 08078
                w47 |  -1.167521   .1679936    -6.95   0.000    -1.503126   -.83
> 19148
                w48 |  -.9549053   .1874077    -5.10   0.000    -1.329295   -.58
> 05153
                w49 |  -1.013377   .1657462    -6.11   0.000    -1.344493   -.68
> 22612
                w50 |  -1.281685   .1735803    -7.38   0.000    -1.628451   -.93
> 49184
                w51 |  -.7012489   .1959474    -3.58   0.001    -1.092699    -.3
> 09799
                w52 |    .072039   .1898849     0.38   0.706    -.3072997    .45
> 13778
              _cons |   10.39345   .1270781    81.79   0.000     10.13958    10.
> 64731
------------------------------------------------------------------------------
> ------
            sigma_u |  1.1231946
            sigma_e |  .93419248
                rho |  .59109632   (fraction of variance due to u_i)
------------------------------------------------------------------------------
> ------

. *EXPLANATION
.
. *IVb
. sort route calendar_week

. by route: gen time=sum(TreatmentCompleted)

. gen linear_decay=TreatmentCompleted*time

. xtreg residual_weight LetterReceived TreatmentOngoing TreatmentCompleted line
> ar_decay w2-w52, fe i(route) cluster(route)

Fixed-effects (within) regression               Number of obs      =       3,340
Group variable: route                           Number of groups   =          65

R-sq:                                           Obs per group:
     within  = 0.4409                                         min =          47
     between = 0.0553                                         avg =        51.4
     overall = 0.2578                                         max =          52

                                                F(55,64)           =      415.48
corr(u_i, Xb)  = 0.0201                         Prob > F           =      0.0000

                                          (Std. Err. adjusted for 65 clusters in r
> oute)
------------------------------------------------------------------------------
> ------
             |               Robust
  residual_weight |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Inte
> rval]
-------------+----------------------------------------------------------------
> ------
  LetterReceived |  -.6352303   .0676226    -9.39   0.000    -.7703219   -.50
> 01387
TreatmentOngoing |  -1.091562   .0877292   -12.44   0.000    -1.266821   -.91
> 63029
TreatmentCompleted |  -1.231588   .0867933   -14.19   0.000    -1.404978   -1.0
> 58198
     linear_decay |   .0172106   .0085055     2.02   0.047     .0002189    .03
> 42024
               w2 |  -.2167488   .1341129    -1.62   0.111    -.4846701    .05
> 11725
               w3 |  -.3044411   .1287398    -2.36   0.021    -.5616285   -.04
> 72538
               w4 |  -.0291743   .1514873    -0.19   0.848     -.331805    .27
> 34564
```

w5	.0240519	.1607289	0.15	0.882	-.2970409	.34
> 51447						
w6	-.177248	.1590402	-1.11	0.269	-.4949674	.14
> 04713						
w7	-.310595	.1705452	-1.82	0.073	-.6512982	.03
> 01082						
w8	.2102236	.1235667	1.70	0.094	-.0366293	.45
> 70766						
w9	-.0629027	.1415815	-0.44	0.658	-.3457442	.21
> 99389						
w10	-.2290566	.1604871	-1.43	0.158	-.5496664	.09
> 15532						
w11	-.5494234	.1737961	-3.16	0.002	-.896621	-.20
> 22257						
w12	-.5525003	.1638619	-3.37	0.001	-.8798521	-.22
> 51485						
w13	-1.00509	.2045274	-4.91	0.000	-1.413681	-.59
> 64997						
w14	-.7203517	.1500463	-4.80	0.000	-1.020104	-.42
> 05998						
w15	-.6520294	.1514267	-4.31	0.000	-.9545391	-.34
> 95197						
w16	-1.350447	.2207998	-6.12	0.000	-1.791545	-.90
> 93486						
w17	-.358101	.1991705	-1.80	0.077	-.7559898	.03
> 97877						
w18	.9378715	.1790823	5.24	0.000	.5801135	1.
> 29563						
w19	-.536292	.1517182	-3.53	0.001	-.8393839	-.23
> 32001						
w20	-.9726304	.1481477	-6.57	0.000	-1.268589	-.67
> 66714						
w21	-1.254699	.1361757	-9.21	0.000	-1.526741	-.98
> 26565						
w22	-1.204264	.1478074	-8.15	0.000	-1.499543	-.90
> 89845						
w23	-.9435522	.1583525	-5.96	0.000	-1.259898	-.62
> 72067						
w24	-1.579645	.1630294	-9.69	0.000	-1.905334	-1.2
> 53957						
w25	-.6705476	.1391681	-4.82	0.000	-.948568	-.39
> 25273						
w26	-.722237	.1494931	-4.83	0.000	-1.020884	-.42
> 35901						
w27	.256346	.1659083	1.55	0.127	-.0750938	.58
> 77859						
w28	-.4299941	.1721253	-2.50	0.015	-.7738539	-.08
> 61342						
w29	-.6830524	.1417839	-4.82	0.000	-.9662982	-.39
> 98066						
w30	-1.118001	.1602825	-6.98	0.000	-1.438202	-.79
> 77997						
w31	-.6041914	.2874424	-2.10	0.039	-1.178424	-.02
> 99593						
w32	.9013793	.2027583	4.45	0.000	.4963231	1.3
> 06435						
w33	.0370581	.1694133	0.22	0.828	-.3013839	.37
> 55001						
w34	-1.784217	.2585969	-6.90	0.000	-2.300824	-1.
> 26761						
w35	.1210529	.2264699	0.53	0.595	-.3313727	.57
> 34786						
w36	-.0659674	.2096238	-0.31	0.754	-.4847391	.35
> 28044						
w37	-.2241958	.1773175	-1.26	0.211	-.5784282	.13
> 00366						
w38	-1.205804	.2762552	-4.36	0.000	-1.757687	-.65
> 39203						
w39	.030576	.2314562	0.13	0.895	-.4318109	.49
> 29628						
w40	-.3336261	.181905	-1.83	0.071	-.697023	.02
> 97708						

```
                w41 |  -.5301947   .1722794    -3.08   0.003    -.8743625    -.1
> 86027
                w42 |  -.5856467   .1894898    -3.09   0.003    -.9641961   -.20
> 70973
                w43 |  -.2278087   .1895902    -1.20   0.234    -.6065587    .15
> 09413
                w44 |  -.5426792   .1975844    -2.75   0.008    -.9373995   -.14
> 79589
                w45 |     -.3088   .2187594    -1.41   0.163     -.745822    .12
> 82221
                w46 |  -.5507841   .2168139    -2.54   0.014    -.9839197   -.11
> 76486
                w47 |  -1.394832   .2183428    -6.39   0.000    -1.831022   -.95
> 86423
                w48 |  -1.198104   .2424701    -4.94   0.000    -1.682493   -.71
> 37138
                w49 |  -1.267312   .2323032    -5.46   0.000    -1.731391   -.80
> 32334
                w50 |  -1.552831   .2421773    -6.41   0.000    -2.036635   -1.0
> 69026
                w51 |  -.9913244   .2534334    -3.91   0.000    -1.497616   -.48
> 50331
                w52 |  -.2346062   .2643906    -0.89   0.378    -.7627871    .29
> 35747
              _cons |   10.39428   .1272633    81.68   0.000     10.14004    10.
> 64852
------------------------------------------------------------------------------
> ------
            sigma_u |  1.1293476
            sigma_e |  .93284337
                rho |  .59443161   (fraction of variance due to u_i)
------------------------------------------------------------------------------
> ------

. *EXPLANATION
.
. *IVc
. gen shortterm=(time<=15)

. gen effect_st=TreatmentCompleted*shortterm

. gen effect_lt=TreatmentCompleted*(1-shortterm)

. xtreg residual_weight LetterReceived TreatmentOngoing effect_st effect_lt w2-
> w52, fe i(route) cluster(route)

Fixed-effects (within) regression               Number of obs     =      3,340
Group variable: route                           Number of groups  =         65

R-sq:                                           Obs per group:
     within  = 0.4398                                         min =         47
     between = 0.0578                                         avg =       51.4
     overall = 0.2602                                         max =         52

                                                F(55,64)          =     394.82
corr(u_i, Xb)  = 0.0193                         Prob > F          =     0.0000

                                    (Std. Err. adjusted for 65 clusters in rou
> te)
------------------------------------------------------------------------------
> ---
             |               Robust
 residual_weight |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interv
> al]
-------------+----------------------------------------------------------------
> ---
  LetterReceived |  -.6736646   .0652972   -10.32   0.000    -.8041107   -.5432
> 185
TreatmentOngoing |  -1.143992   .0796629   -14.36   0.000    -1.303137   -.9848
> 465
       effect_st |   -1.19496   .1010259   -11.83   0.000    -1.396783   -.9931
> 378
```

effect_lt	-1.033796	.1913199	-5.40	0.000	-1.416001	-.6515907
w2	-.2162588	.1341564	-1.61	0.112	-.484267	.0517493
w3	-.3039512	.1287232	-2.36	0.021	-.5611053	-.0467971
w4	-.0286382	.1514752	-0.19	0.851	-.3312446	.2739683
w5	.0239327	.1607079	0.15	0.882	-.2971183	.3449837
w6	-.1765414	.1591155	-1.11	0.271	-.4944112	.1413284
w7	-.310105	.1705615	-1.82	0.074	-.6508408	.0306308
w8	.2109303	.1235804	1.71	0.093	-.03595	.4578106
w9	-.0624127	.1416356	-0.44	0.661	-.3453623	.2205369
w10	-.2285666	.1604324	-1.42	0.159	-.5490671	.0919339
w11	-.5459769	.1737958	-3.14	0.003	-.8931738	-.19878
w12	-.5490538	.1634921	-3.36	0.001	-.8756668	-.2224409
w13	-1.000567	.2047552	-4.89	0.000	-1.409613	-.5915217
w14	-.716318	.1501016	-4.77	0.000	-1.01618	-.4164555
w15	-.6472255	.1511129	-4.28	0.000	-.9491082	-.3453427
w16	-1.346173	.2206423	-6.10	0.000	-1.786957	-.9053893
w17	-.3504934	.1992384	-1.76	0.083	-.7485179	.0475311
w18	.9449625	.1788459	5.28	0.000	.5876768	1.302248
w19	-.5332626	.1519896	-3.51	0.001	-.8368967	-.2296285
w20	-.9687978	.1482096	-6.54	0.000	-1.264881	-.672715
w21	-1.249521	.1362503	-9.17	0.000	-1.521712	-.9773297
w22	-1.197263	.1478917	-8.10	0.000	-1.49271	-.9018149
w23	-.9293142	.1589645	-5.85	0.000	-1.246882	-.611746
w24	-1.564083	.1630965	-9.59	0.000	-1.889906	-1.238261
w25	-.6570355	.1402301	-4.69	0.000	-.9371774	-.3768935
w26	-.700164	.1492646	-4.69	0.000	-.9983543	-.4019737
w27	.2810668	.1674226	1.68	0.098	-.0533982	.6155318
w28	-.4026255	.170206	-2.37	0.021	-.742651	-.0626001
w29	-.6508829	.1418178	-4.59	0.000	-.9341965	-.3675694
w30	-1.088324	.1590002	-6.84	0.000	-1.405963	-.7706845
w31	-.5702525	.2886003	-1.98	0.052	-1.146798	.0062928
w32	.9421711	.2032533	4.64	0.000	.5361259	1.348216
w33	.0737215	.166175	0.44	0.659	-.2582511	.4056942
w34	-1.74507	.2614544	-6.67	0.000	-2.267385	-1.222755
w35	.1671188	.2227324	0.75	0.456	-.2778402	.6120779
w36	-.0119581	.2070831	-0.06	0.954	-.4256541	.4017379

```
             w37 |  -.1711434   .1715644    -1.00   0.322    -.5138826    .1715
> 959
             w38 |  -1.136288   .2745143    -4.14   0.000    -1.684694    -.587
> 883
             w39 |   .1108907   .2223637     0.50   0.620    -.3333319    .5551
> 132
             w40 |  -.2552845   .1693843    -1.51   0.137    -.5936686    .0830
> 996
             w41 |  -.4501621   .1639766    -2.75   0.008     -.777743   -.1225
> 813
             w42 |  -.4894187   .1782906    -2.75   0.008    -.8455951   -.1332
> 422
             w43 |  -.1183418   .1739296    -0.68   0.499    -.4658061    .2291
> 226
             w44 |  -.4197377   .1738633    -2.41   0.019    -.7670695    -.072
> 406
             w45 |  -.2080141   .1988859    -1.05   0.300    -.6053344    .1893
> 062
             w46 |  -.4327558   .1920203    -2.25   0.028    -.8163605   -.0491
> 511
             w47 |  -1.261885   .1887789    -6.68   0.000    -1.639014    -.884
> 756
             w48 |  -1.074064   .2213235    -4.85   0.000    -1.516209   -.6319
> 197
             w49 |  -1.132913   .2055017    -5.51   0.000     -1.54345    -.722
> 376
             w50 |  -1.401221   .2079462    -6.74   0.000    -1.816641   -.9858
> 003
             w51 |  -.8216377   .2113406    -3.89   0.000    -1.243839   -.3994
> 364
             w52 |  -.0726042   .2239054    -0.32   0.747    -.5199066    .3746
> 981
           _cons |    10.3938   .1271387    81.75   0.000     10.13981    10.64
> 779
-------------------+------------------------------------------------------------
> ------
         sigma_u |  1.1256578
         sigma_e |  .93375411
             rho |  .59238156   (fraction of variance due to u_i)
------------------------------------------------------------------------------
> ------

. *EXPLANATION
. test effect_st==effect_lt

 ( 1)  effect_st - effect_lt = 0

       F(  1,    64) =    2.02
            Prob > F =    0.1599

. *EXPLANATION
.
.
.
end of do-file

. log close
      name:  <unnamed>
       log:  C:\Users\u1265889\Desktop\Untitled.smcl
  log type:  smcl
 closed on:  28 Sep 2017, 17:32:35
-------------------------------------------------------------------------------
```