# Econometrics assignment 5a

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The commands and output of all questions can be found in the log-file included below. (Many lines and thus not compatible to include within some questions)

II.

a. We find that the mean of the main outcome variable is equal to 10.29

### Command + output:

. 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 before week -5
- . sum residual\_weight if calendar\_week<-6</pre>

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

b. We find there are 65 garbage routes (unique values).

### Command + output:

. 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

c. In the dataset there are 52 calendar weeks of data (unique values).

# Command + output:

. 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

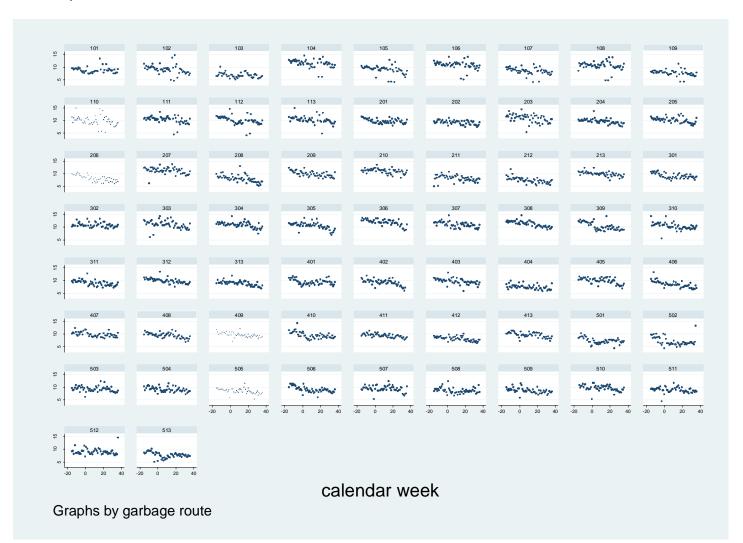
percentiles: 10% 25% 50% 75% 90% -10 -2.5 11 24 31

d. Scatter graph of the outcome variable per calendar week.

### Command:

graph twoway (scatter residual\_weight calendar\_week), by( route)

# Output:

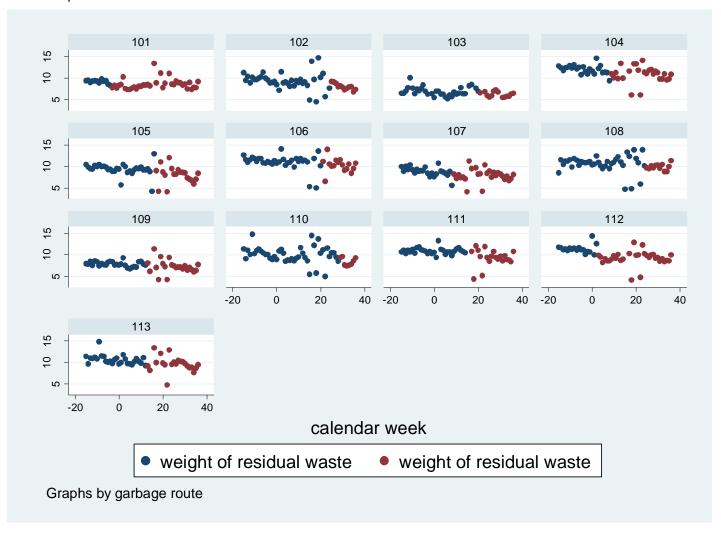


e. Scatter graph of the outcome variable per calendar week, pre- and post-treatment.

### Command:

graph twoway (scatter residual\_weight calendar\_week if
TreatmentOngoing==0&TreatmentCompleted==0) (scatter residual\_weight
calendar\_week if TreatmentOngoing==1| TreatmentCompleted==1) if route<200,
by( route)</pre>

# Output:



If the blue and red scattered dots are compared, we cannot clearly observe a difference. So, we do not clearly see a clear change in the weight of residual waste pre- and post-treatment. Thus, the raw data do not indicate that something is going on as of the date that the announcement letter was sent out.

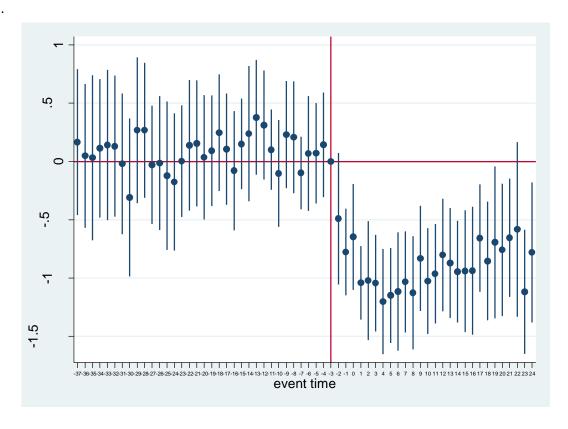
a. 
$$residual\_weight_{it} = \beta_0 + \sum_{\tau=-T}^{T} \alpha_{\tau} W_{\tau} + \lambda_i + \mu_t + \varepsilon_{it}$$

# b. Commands + output:

- . \*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

# c. See log-file below



IV.

- a) As we ignored the time variation in the treatment, we are likely to overestimate the treatment effect since the short run treatment effect is likely greater than the long run treatment effect as can be concluded from the graph above. This can be seen from the upward trend of the scatter plot after treatment towards the null hypothesis of no change. When we do not cluster by route we can see that the standard error LetterReceived is greater. The standard errors of other variables slightly change as well. All the coefficients remain the same. For instance, the clustering gives a better representation of the LetterReceived standard errors as not every unit of the sample contributes information. Only every route contributes new information, therefore clustering by routes gives a more precise value for the standard errors.

  The degree of serial correlation seems to be fairly large for the standard errors of the LetterReceived variable and other variables.
- b) To find the number of weeks, we divide the absolute value of the initial treatment effect (LetterReceived coefficient) by the linear decay. We find that the number of weeks until the initial treatment effect has completely disappeared is approximately 37 weeks. This seems in line with the graph shown under III(d).
- c) The long term effect is approximately 13.5 percent smaller than the short term effect. Based on the F test, we are not able to reject the null hypothesis of no difference at conventional levels of statistical significance (1%, 5% and 10%).

Statistics/Data Analysis

1 . log using "M:\Master\Methods Econometrics I\Log-file CA5a.smcl"

name: <unnamed>

log: M:\Master\Methods Econometrics I\Log-file CA5a.smcl

log type: smcl

opened on: 2 Oct 2017, 13:59:48

2 . do "C:\Users\u1266283\AppData\Local\Temp\STD00000000.tmp"

3 . \* Computer Assignment 5a

4 . \* I 5 . \* (a)

6 . use "C:\Users\u1266283\Downloads\ca5a\_bat\_2016.dta"

7 . xtset route calendar\_week

panel variable: route (unbalanced)
time variable: calendar\_week, -15 to 36, but with gaps
delta: 1 unit

8.

9 . \* II

10 . \* (a)

11 . sum calendar\_week if LetterReceived==1

calendar w~k	175	14.65714	8.259244	-5	28
Variable	Obs	Mean	Std. Dev.	Min	Max

12 . sum residual\_weight if calendar\_week<-6</pre>

residual w~t	579	10.28636	1.38393	5.1	14.8
Variable	Obs	Mean	Std. Dev.	Min	Max

13 . \* (b)

14 . codebook route

### route

type: numeric (float)

range: [101,513] units: 1

unique values: 65 missing .: 0/3,376

306.914 141.504 mean: std. dev:

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

15 . \* (c)

16 . codebook calendar\_week

### calendar\_week

type: numeric (float)

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

mean: 10.5142 std. dev: 15.0122

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

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- 18 . graph twoway (scatter residual\_weight calendar\_week), by(route)
- 19 . \* (e)
- 20 . graph twoway (scatter residual\_weight calendar\_week if TreatmentOngoing==0&TreatmentCompleted > ted==1) if route<200, by(route)</pre>
- 21 . 22 . \* III
- 23 . \* (b)
- 24 . sort route calendar\_week
- 25 . by route: gen sumTreatmentOngoing=sum(TreatmentOngoing)
- 26 . sort route calendar\_week
- 27 . by route: gen startweekTreatment\_t=calendar\_week if sumTreatmentOngoing==1 (3,311 missing values generated)
- 28 . sort route calendar\_week
- 29 . by route: egen startweekTreatment=mean(startweekTreatment\_t)
- 30 . drop  $startweekTreatment\_t$  sumTreatmentOngoing
- 31 . gen eventtime=calendar\_week-startweekTreatment
- 32 . drop startweekTreatment
- 33 . sum eventtime

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

- 34 . \* (c)
- 35 . tab calendar\_week, gen(w)

-15	calendar week	Freq.	Percent	Cum.
-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       17.30         -6       65       1.93       21.15         -4       65       1.93       23.07         -3       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 <th>1.5</th> <th></th> <th>1 02</th> <th>1 02</th>	1.5		1 02	1 02
-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				
-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       49.94         11				
-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       34.57         3       65       1.93       34.57         3       65       1.93       40.31         6       65       1.93       42.24         7       65       1.93       42.24         7       65       1.93       44.16         8       65       1.93       49.94         11				
-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       45.09         9       65       1.93       49.94         11       65       1.93       53.79         13				
-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       48.02         10       65       1.93       49.94         11       65       1.93       53.79         13       65       1.93       55.72				
-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       34.57         3       65       1.93       34.57         3       65       1.93       34.57         3       65       1.93       34.57         3       65       1.93       40.31         6       65       1.93       42.24         7       65       1.93       44.16         8       65       1.93       45.09         9       65       1.93       49.94         11       65       1.93       53.79         13				
-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       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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
-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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
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       49.94         11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
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				
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       49.94         10       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
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				
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				
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				
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				
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				
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				
10     65     1.93     49.94       11     65     1.93     51.87       12     65     1.93     53.79       13     65     1.93     55.72				
11       65       1.93       51.87         12       65       1.93       53.79         13       65       1.93       55.72				
12 65 1.93 53.79 13 65 1.93 55.72	10		1.93	49.94
13 <b>65 1.93 55.72</b>	11			
	12			53.79
14 65 1.93 57.64	13			
	14			
15 <b>65</b> 1.93 59.57	15	65	1.93	59.57

16	65	1.93	61.49
17	65	1.93	63.42
	65	1.93	
18			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	

36 . 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	

- $37 \cdot gen em37_m44=0$
- 38 . 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)
- $39 \cdot gen e24_39=0$
- 40 . replace e24\_39=1 if e69==1|e70==1|e71==1|e72==1|e73==1|e74==1|e75==1|e76==1|e77==1|e78==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==1|e79==
- 41 . xtreg residual\_weight em37\_m44 e9-e41 e43-e68 e24\_39 w2-w52, fe i(route) cluster(route)

Fixed-effects (within) regression Group variable: route	Number of obs Number of groups		3,340 65
R-sq:     within = 0.4528     between = 0.0561     overall = 0.2643	Obs per group: min avg max	=	47 51.4 52
corr(u_i, Xb) = <b>0.0202</b>	F(64,64) Prob > F	= =	

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

		Robust				
residual_w~t	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval
am 27 m 4.4	.1660996	2752056	0.44	0.660	E020104	016010
em37_m44 e9	.0492043	.3753856 .3699015	0.44	0.895	5838194 689759	.916018 .788167
e10	.0325016	. 4244292	0.08	0.939	8153931	.880396
e11	.1135185	.3565627	0.32	0.751	5987974	.825834
e12	.1410174	.3864242	0.36	0.716	6309537	.912988
e13	.1321758	.3620965	0.37	0.716	591195	.855546
e14	0206161	.3614777	-0.06	0.955	7427507	.701518
e15	3085103	.4056539	-0.76	0.450	-1.118897	.501876
e16	.2679701	.3755905	0.71	0.478	4823582	1.01829
e17	.2686443	.3468229	0.77	0.441	4242141	.961502
e18	0298329	.3042595	-0.10	0.922	6376612	.577995
e19	0141994	.3446306	-0.04 -0.32	0.967 0.750	7026782	.674279
e20 e21	1222256 1752506	.3819468 .3529327	-0.32 -0.50	0.730	8852521 8803148	.640800 .529813
e21	.0026389	.2865432	0.01	0.021	569797	.575074
e23	.1393598	.3354026	0.42	0.679	5306838	.809403
e24	.1558172	.3236079	0.48	0.632	4906639	.802298
e25	.036003	.3201239	0.11	0.911	6035179	. 67552
e26	.09244	.2838208	0.33	0.746	4745573	. 659437
e27	.2462243	.300092	0.82	0.415	3532783	.845726
e28	.1058485	.2857457	0.37	0.712	4649943	.676691
e29	0788001	.3063948	-0.26	0.798	690894	. 533293
e30	.1507689	.2327261	0.65	0.519	314155	.615692
e31	.2390666	.3474272	0.69	0.494	4549991	. 933132
e32	.378625	.2956212	1.28	0.205	2119463	.969196
e33	.3127542	.280422	1.12	0.269	2474531	.872961
e34 e35	.1019633 1026395	.2060141 .2751331	0.49 -0.37	0.622 0.710	3095971 6522812	.513523 .447002
e36	.2306286	.2759282	0.84	0.406	3206013	.781858
e37	.2084093	.2877271	0.72	0.472	3663917	.783210
e38	0977933	.1868086	-0.52	0.602	4709864	.275399
e39	.0684474	.2956226	0.23	0.818	5221266	.659021
e40	.0709874	.2585554	0.27	0.785	4455365	.587511
e41	.1432294	.2690172	0.53	0.596	3941942	. 68065
e43	490191	.3380811	-1.45	0.152	-1.165586	.185203
e44	7773395	.2231218	-3.48	0.001	-1.223077	331602
e45	646476	.2722476	-2.37	0.021	-1.190353	102598
e46	-1.040911	.1893322	-5.50	0.000	-1.419146	662676
e47	-1.022562	.3060556	-3.34	0.001	-1.633979	411145
e48	-1.044916	.2484016	-4.21	0.000	-1.541156	54867
e49 e50	-1.202347 -1.148927	.2702203 .2442134	-4.45 -4.70	0.000 0.000	-1.742175 -1.6368	662520 661054
e51	-1.146927	.3040191	-3.67	0.000	-1.722599	507903
e52	-1.032261	.2598243	-3.07 -3.97	0.000	-1.551319	513201
e53	-1.125932	.2912901	-3.87	0.000	-1.707851	544012
e54	8318131	.271006	-3.07	0.003	-1.37321	290416
e55	-1.027551	.2722047	-3.77	0.000	-1.571343	483759
e56	9632684	.2550999	-3.78	0.000	-1.472889	453647
e57	8023489	.2889262	-2.78	0.007	-1.379545	225152
e58	8708884	.2833805	-3.07	0.003	-1.437006	304770
e59	944821	.2618405	-3.61	0.001	-1.467907	421734
e60	9410427	.3126982	-3.01	0.004	-1.565729	316356
e61	9374029	.3286817	-2.85	0.006	-1.59402	280785
e62	6575268	.2760276	-2.38	0.020	-1.208955	106098
e63	8539899	.3046378	-2.80	0.007	-1.462574	24540
e64 e65	6938821 7584854	.390759 .3401587	-1.78 -2.23	0.081 0.029	-1.474513 -1.438031	.086748
e66	6539317	.3040874	-2.23 -2.15	0.029	-1.261416	076940
e67	5839641	.4487894	-2.15 -1.30	0.033	-1.480524	.312595
e68	-1.118006	.3186791	-3.51	0.198	-1.75464	481370
e24_39	7802495	.3602475	-2.17	0.034	-1.499927	060572
w2	1458825	.2199268	-0.66	0.510	5852368	.293471
w3	1952443	.1550219	-1.26	0.212	5049361	.114447
w 4	0463937	.2217447	-0.21	0.835	4893796	.396592
w 5	.0539994	.1778924	0.30	0.762	3013815	.409380
				0 660		256651
w 6	1000439	.228607 .1667041	-0.44 -1.54	0.663 0.128	5567389 5900348	.356651 .076024

```
1.08 0.285 -.1897983
                   .2224097
                                    .2063382
                                                                                                         .6346178
        w 8
                    .0248986 .1547786
                                                        0.16 0.873 -.2843072
                                                                                                        .3341044
        w 9
                 -.1565313 .20897
-.508969 .1652526
-.5429949 .2341053
                                      .20897 -0.75 0.457 -.5739969
                                                                                                         .2609342
       w10
                                     .1652526 -3.08 0.003
.2341053 -2.32 0.024
       w11
                                                                                   -.8390991
                                                                                                       -.1788389
                                                                                                     -.1/552
       w12
                                                                                    -1.010674
                   -.987833 .2194342 -4.50 0.000 -1.426203 -.5494628
       w13

    -.655579
    .2179479
    -3.01
    0.004

    -.602797
    .175084
    -3.44
    0.001

    -1.366639
    .287685
    -4.75
    0.000

                                                                                     -1.09098
       w 1 4
                                                                                                       -.220178
                 .002/97 .175084
       w15
                                                                                    -.9525675
                                                                                                       -.2530265
                                                                                   -1.941356 -.7919222
       w16
                                                                                                        .0923207
                   -.303524 .1981473 -1.53 0.130 -.6993688
       w17
                                                                                     .5273582
                 1.039669 .2564467
-.5450746 .2069132
-1.006206 .2176251

      4.05
      0.000
      .5273582
      1.55198

      -2.63
      0.011
      -.9584312
      -.1317181

      -4.62
      0.000
      -1.440962
      -.5714504

       w18
       w19
       w 2.0
                  -1.227681 . 2078887 -5.91 0.000 -1.642986 -.8123752
       w21
                 -1.148742 .2397597
-.923712 .1977394
                                                       -4.79 0.000
-4.67 0.000
                                                                                   -1.627717
       w2.2
                                                                                                         -.669767
                 -.923712 .1977394 -4.67 0.000 -1.318742 -.5286821
-1.576162 .2352405 -6.70 0.000 -2.046109 -1.106215
       w23
       w 2.4

    -.7404319
    .2260656
    -3.28
    0.002
    -1.19205

    -.7657173
    .240465
    -3.18
    0.002
    -1.246101

    .2814851
    .2357522
    1.19
    0.237
    -.189484

       w2.5
                                                                                     -1.19205 -.2888139
                                                                                                     -.2853333
       w26
                                                                                                         .7524542
       w 2.7
                  -.4398417 .2488202
       w28
                                                        -1.77 0.082 -.9369172
                                                                                                         .0572338

    -.7249511
    .2523585
    -2.87
    0.006
    -1.229095

    -1.16397
    .2700924
    -4.31
    0.000
    -1.703542

    -.5716019
    .3316393
    -1.72
    0.090
    -1.234127

       w29
                                                                                                         -.220807
       w30
                                                                                                       -.6243989
                                                                                   -1.234127
       w.3.1
                                                                                                        .0909237
                 .8972927 .3064984 2.93 0.005 .2849918 1.509594

-.020938 .2667222 -0.08 0.938 -.5537769 .5119009

-1.838351 .3666304 -5.01 0.000 -2.570779 -1.105922

.1474803 .3050389 0.48 0.630 -.461905 .7568656
       w32
       w33
       w34
                                                                                     -.461905
       w35
                                                                                                        .5704202
                 -.0131139 .2920986
                                                        -0.04 0.964
                                                                                   -.5966479
       w36
                                                       -1.00 0.319 -.8339144
-3.35 0.001 -2.076419
                 -.2790308 .2777571
-1.300405 .3884478
                                                                                                         .2758528
       w37
                                                                                   -2.076419 -.5243914
       w38
                                                        0.17 0.867 -.5647998 .6689791
                   .0520897 .3087953
      w39

    -.2861638
    .2877138
    -0.99
    0.324
    -.8609381

    -.5789986
    .3057791
    -1.89
    0.063
    -1.189863

    -.6432762
    .3395555
    -1.89
    0.063
    -1.321616

                                                                                                        .2886105
       w 4 O
                                                                                                         .0318654
       w 4 1
                                                                                    -1.321616
                                                                                                         .0350638
       w 4 2
                  -.1967645 .3108262 -0.63 0.529 -.8177111
                                                                                                         .4241822
      w 4 3

      -.5202993
      .3014543
      -1.73
      0.089
      -1.122524

      -.3151835
      .3380297
      -0.93
      0.355
      -.9904755

      -.6083392
      .3616318
      -1.68
      0.097
      -1.330782

                                                                                                        .0819249
       w 4 4
                 -.3151835 .3380297
-.6083392 .3616318
                                                                                                        .3601085
       w 4 5
       w 4 6
                                                                                                         .1141033
       w 47
                  -1.386059 . 2835013 -4.89 0.000 -1.952418 -.8196997
                  -1.137434 .3121758 -3.64 0.001 -1.761077
-1.241023 .3526181 -3.52 0.001 -1.945458
                                                                                   -1.761077 -.5137913
-1.945458 -.5365871
       w 48
                 -1.241023 .3526181
-1.607287 .3472863
       w 49
                                                        -4.63 0.000 -2.301071 -.9135031
      w.5.0

      -.9703762
      .2893231
      -3.35
      0.001

      -.1587337
      .3295077
      -0.48
      0.632

      10.27143
      .3282694
      31.29
      0.000

       w51
                                                                                   -1.548366 -.3923868
                                                                                   -.8170011
                                                                                                         .4995337
      w 5 2
                                                                                   -.8170011
9.615641
                                                                                                        10.92723
  _cons
sigma_u | 1.1291756
sigma_e
                  .9311568
               .9311568
.59523048 (fraction of variance due to u_i)
    rho
```

```
42 . * (d)
```

44 . 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

```
Number of obs = 3,340
Number of groups = 65
Fixed-effects (within) regression
Group variable: route
R-sq:
                                             Obs per group:
    within = 0.4528
                                                                       47
                                                          min =
                                                         avg = max =
                                                                   51.4
    between = 0.0561
                                                                     52
    overall = 0.2643
                                            F(64,64)
                                            Prob > F =
corr(u_i, Xb) = 0.0202
```

<sup>43 .</sup> ssc install coefplot checking **coefplot** consistency and verifying not already installed... all files already exist and are up to date.

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

e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1660996 .0492043 .0325016 .1135185 .1410174 .1321758 .0206161 -3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3753856 .3699015 .4244292 .3565627 .3864242 .3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.44 0.13 0.08 0.32 0.36 0.37 -0.06 -0.76 0.71 0.77 -0.10 -0.04 -0.32	0.660 0.895 0.939 0.751 0.716 0.716 0.955 0.450 0.478 0.441 0.922	[95% Conf. 5838194 689759 8153931 5987974 6309537 591195 7427507 -1.118897 4823582 4242141 6376612	.916018 .788167 .880396 .825834 .912988 .855546 .701518 .501876 1.01829
e9 e10 e11 e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.0492043 .0325016 .1135185 .1410174 .1321758 0206161 3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3699015 .4244292 .3565627 .3864242 .3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.13 0.08 0.32 0.36 0.37 -0.06 -0.76 0.71 0.77 -0.10	0.895 0.939 0.751 0.716 0.716 0.955 0.450 0.478 0.441	6897598153931598797463095375911957427507 -1.11889748235824242141	.788167 .880396 .825834 .912988 .855546 .701518 .501876
e10 e11 e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.0325016 .1135185 .1410174 .1321758 0206161 3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.4244292 .3565627 .3864242 .3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327	0.08 0.32 0.36 0.37 -0.06 -0.76 0.71 0.77 -0.10	0.939 0.751 0.716 0.716 0.955 0.450 0.478 0.441	8153931 5987974 6309537 591195 7427507 -1.118897 4823582 4242141	.880396 .825834 .912988 .855546 .701518 .501876
e11 e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1135185 .1410174 .1321758 0206161 3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3565627 .3864242 .3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.32 0.36 0.37 -0.06 -0.76 0.71 0.77 -0.10	0.751 0.716 0.716 0.955 0.450 0.478 0.441	5987974 6309537 591195 7427507 -1.118897 4823582 4242141	.825834 .912988 .855546 .701518 .501876
e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1410174 .1321758 0206161 3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3864242 .3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.36 0.37 -0.06 -0.76 0.71 0.77 -0.10	0.716 0.716 0.955 0.450 0.478 0.441	6309537 591195 7427507 -1.118897 4823582 4242141	.912988 .855546 .701518 .501876
e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.132175802061613085103 .2679701 .26864430298329014199412222561752506 .0026389 .1393598 .1558172 .036003	.3620965 .3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.37 -0.06 -0.76 0.71 0.77 -0.10 -0.04	0.716 0.955 0.450 0.478 0.441 0.922	591195 7427507 -1.118897 4823582 4242141	.855546 .701518 .501876 1.01829
e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	0206161 3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3614777 .4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	-0.06 -0.76 0.71 0.77 -0.10 -0.04	0.955 0.450 0.478 0.441 0.922	7427507 -1.118897 4823582 4242141	.701518 .501876 1.01829
e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	3085103 .2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	-0.76 0.71 0.77 -0.10 -0.04	0.450 0.478 0.441 0.922	-1.118897 4823582 4242141	.501876 1.01829
e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.2679701 .2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.4056539 .3755905 .3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.71 0.77 -0.10 -0.04	0.478 0.441 0.922	4823582 4242141	1.01829
e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.2686443 0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3468229 .3042595 .3446306 .3819468 .3529327 .2865432	0.77 -0.10 -0.04	0.441 0.922	4242141	
e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	0298329 0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3042595 .3446306 .3819468 .3529327 .2865432	-0.10 -0.04	0.922		.961502
e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	0141994 1222256 1752506 .0026389 .1393598 .1558172 .036003	.3446306 .3819468 .3529327 .2865432	-0.04		6376612	
e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	1222256 1752506 .0026389 .1393598 .1558172 .036003	.3819468 .3529327 .2865432		0 067		.577995
e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1752506 .0026389 .1393598 .1558172 .036003	.3529327 .2865432	-0.32	0.967	7026782	.674279
e22 e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.0026389 .1393598 .1558172 .036003	.2865432		0.750	8852521	.640800
e23 e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1393598 .1558172 .036003		-0.50	0.621	8803148	.529813
e24 e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1558172 .036003	2254666	0.01	0.993	569797	.575074
e25 e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.036003	.3354026	0.42	0.679	5306838	.809403
e26 e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46		.3236079	0.48	0.632	4906639	.802298
e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46		.3201239	0.11	0.911	6035179	. 67552
e27 e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.09244	.2838208	0.33	0.746	4745573	. 659437
e28 e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.2462243	.300092	0.82	0.415	3532783	.845726
e29 e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1058485	.2857457	0.37	0.712	4649943	. 676691
e30 e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	0788001	.3063948	-0.26	0.798	690894	.533293
e31 e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1507689	.2327261	0.65	0.519	314155	. 615692
e32 e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.2390666	.3474272	0.69	0.494	4549991	. 933132
e33 e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.378625	.2956212	1.28	0.205	2119463	.96919
e34 e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.3127542	.280422	1.12	0.269	2474531	.872961
e35 e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	.1019633	.2060141	0.49	0.622	3095971	.513523
e36 e37 e38 e39 e40 e41 e43 e44 e45 e46	1026395	.2751331	-0.37	0.710	6522812	. 447002
e37 e38 e39 e40 e41 e43 e44 e45 e46	.2306286	.2759282	0.84	0.406	3206013	.781858
e38 e39 e40 e41 e43 e44 e45 e46	.2084093	.2877271	0.72	0.472	3663917	.78321
e39 e40 e41 e43 e44 e45 e46	0977933	.1868086	-0.52	0.602	4709864	.275399
e 4 0 e 4 1 e 4 3 e 4 4 e 4 5 e 4 6	.0684474	.2956226	0.23	0.818	5221266	. 659021
e 4 1 e 4 3 e 4 4 e 4 5 e 4 6	.0709874	.2585554	0.27	0.785	4455365	.58751
e43 e44 e45 e46	.1432294	.2690172	0.53	0.705	3941942	. 6806!
e44 e45 e46 -	490191	.3380811	-1.45	0.152	-1.165586	.18520
e45 e46	7773395	.2231218	-3.48	0.132	-1.223077	331602
e46 -	646476	.2722476	-2.37	0.021	-1.190353	102598
	-1.040911	.1893322	-5.50	0.021	-1.419146	66267
	-1.040311	.3060556	-3.34	0.000	-1.633979	41114
	-1.022362	.2484016	-3.34 -4.21	0.001	-1.541156	5486
	-1.202347	.2702203	-4.21 -4.45	0.000	-1.742175	66252
			-4.45 -4.70	0.000		
	1.148927	.2442134			-1.6368	66105
	-1.115251	.3040191	-3.67	0.000	-1.722599	50790
	-1.032261	.2598243	-3.97	0.000	-1.551319	51320
	-1.125932	.2912901	-3.87	0.000	-1.707851	54401
	8318131	.271006	-3.07	0.003	-1.37321	29041
	-1.027551	.2722047	-3.77	0.000	-1.571343	48375
	9632684	.2550999	-3.78	0.000	-1.472889	45364
	8023489	.2889262	-2.78	0.007	-1.379545	22515
	8708884	. 2833805	-3.07	0.003	-1.437006	30477
e59	944821	.2618405	-3.61	0.001	-1.467907	42173
	9410427	.3126982	-3.01	0.004	-1.565729	31635
	9374029	.3286817	-2.85	0.006	-1.59402	28078
	6575268	.2760276	-2.38	0.020	-1.208955	10609
	8539899	.3046378	-2.80	0.007	-1.462574	2454
	6938821	.390759	-1.78	0.081	-1.474513	.08674
	7584854	.3401587	-2.23	0.029	-1.438031	07894
	6539317	.3040874	-2.15	0.035	-1.261416	04644
	5839641	.4487894	-1.30	0.198	-1.480524	.31259
e68 <b>-</b>	-1.118006	.3186791	-3.51	0.001	-1.75464	48137
e24_39 -	7802495	.3602475	-2.17	0.034	-1.499927	06057
e42	0	(omitted)				
w2 -	1458825	.2199268	-0.66	0.510	5852368	.29347
	.1952443	.1550219	-1.26	0.212	5049361	.11444
	0463937	.2217447	-0.21	0.835	4893796	. 396592
w5	.0539994	.1778924	0.30	0.762	3013815	. 409380
w 6 -		.228607	-0.44	0.663	5567389	. 356651

2570051 .2224097	.1667041	-1.54	0.128		
	2062202	1 00		5900348	.0760247
	.2063382	1.08	0.285	1897983	.6346178
.0248986	.1547786	0.16	0.873	2843072	.3341044
					.2609342
					1788389
					0753158
					5494628
					220178
					2530265
					7919222
					.0923207
					1.55198
					1317181
					5714504
					8123752
					669767
					5286821
					-1.106215
					2888139
					2853333
					.7524542
					.0572338
7249511	. 2523585			-1.229095	220807
					6243989
				-1.234127	.0909237
				.2849918	1.509594
					.5119009
					-1.105922
.1474803				461905	.7568656
					.5704202
	.2777571			8339144	. 2758528
	.3884478			-2.076419	5243914
.0520897	.3087953	0.17	0.867	5647998	. 6689791
2861638	.2877138	-0.99	0.324	8609381	.2886105
5789986	.3057791	-1.89	0.063	-1.189863	.0318654
6432762	. 3395555	-1.89	0.063	-1.321616	.0350638
1967645	.3108262	-0.63	0.529	8177111	.4241822
5202993	.3014543	-1.73	0.089	-1.122524	.0819249
3151835	.3380297	-0.93	0.355	9904755	.3601085
6083392	.3616318	-1.68	0.097	-1.330782	.1141033
-1.386059	.2835013	-4.89	0.000	-1.952418	8196997
-1.137434	.3121758	-3.64	0.001	-1.761077	5137913
-1.241023	.3526181	-3.52	0.001	-1.945458	5365871
-1.607287	.3472863	-4.63	0.000	-2.301071	9135031
9703762	.2893231	-3.35	0.001	-1.548366	3923868
1587337	.3295077	-0.48	0.632	8170011	. 4995337
10.27143	.3282694	31.29	0.000	9.615641	10.92723
1.1291756					
.9311568					
.59523048	(fraction	of varia	nce due t	o u_i)	
	15653135089695429949987833655579602797 -1.366639303524 1.0396695450746 -1.006206 -1.227681 -1.148742923712 -1.57616274043197657173281485143984177249511 -1.163975716019 .8972927020938 -1.838351147480301311392790308 -1.300405 .05208972861638578998664327621967645520299331518356083392 -1.386059 -1.137434 -1.241023 -1.6072879703762158733797037621587337970376215873379703762158733797037621587337970376215873379703762158733797037621587337970376215873379703762	1565313 .20897508969 .16525265429949 .2341053987833 .2194342655579 .2179479602797 .175084 -1.366639 .287685303524 .1981473 1.039669 .25644675450746 .2069132 -1.006206 .2176251 -1.227681 .2078887 -1.148742 .2397597923712 .1977394 -1.576162 .23524057404319 .22606567657173 .240465 .2814851 .23575224398417 .24882027249511 .2523585 -1.16397 .27009245716019 .3316393 .8972927 .3064984020938 .2667222 -1.838351 .3666304 .1474803 .30503890131139 .29209862790308 .2777571 -1.300405 .3884478 .0520897 .30879532861638 .28771385789986 .30577916432762 .33955551967645 .31082625202993 .30145433151835 .33802976083392 .3616318 -1.386059 .2835013 -1.137434 .3121758 -1.241023 .3526181 -1.607287 .34728639703762 .28932311587337 .3295077 10.27143 .3282694	1565313	1565313	1565313

<sup>45 .</sup> coefplot, keep(e\*) nolabels coeflabels(,labsize(tiny)) vertical xline(35) levels(90) yline(0) > (em37\_m44 e9 e10 e11 e12 e13 e14 e15 e16 e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 > e51 e52 e53 e54 e55 e56 e57 e58 e59 e60 e61 e62 e63 e64 e65 e66 e67 e68 e24\_39)

<sup>46.</sup> 

<sup>47 .</sup> drop e1-e8

```
Monday October 2 14:00:56 2017 Page 9
48 . ren em37_m44 e8
49 . drop e69-e84
50 . ren e24_39 e69
51 . forvalues i=8/69 {
     2. label variable e`i' "`=`i'-45'"
     3. }
52 .
53 . xtreg residual_weight e8 e9-e41 e43-e68 e69 e42 w2-w52, fe i(route) cluster(route)
  note: e42 omitted because of collinearity
                                                    Number of obs = 3,340
Number of groups = 65
  Fixed-effects (within) regression
  Group variable: route
  R-sq:
                                                    Obs per group:
       within = 0.4528
between = 0.0561
                                                                         47
51.4
                                                                  min =
                                                                  avg =
       overall = 0.2643
                                                                  max =
                                                                                52
                                                    F(64,64)
   corr(u_i, Xb) = 0.0202
                                                    Prob > F
                                     (Std. Err. adjusted for 65 clusters in route)
```

		Robust				
residual_w~t	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
e8	.1660996	.3753856	0.44	0.660	5838194	.9160186
e 9	.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	0.32	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	0.32	0.818	5221266	.6590214
e40	.0709874	.2585554	0.23	0.785	4455365	.5875112
e41	.1432294	.2690172	0.53	0.703	3941942	.680653
e43	490191	.3380811	-1.45	0.152	-1.165586	.1852036
e44	7773395	.2231218	-3.48	0.132	-1.223077	3316024
e45	646476	.2722476	-3.46 -2.37	0.001	-1.223077	1025988
e45 e46	-1.040911	.1893322	-2.37 -5.50	0.021	-1.190353	6626769
	-1.040911	.3060556	-3.34	0.000	-1.419146	4111456
e47			-3.34 -4.21			
e48	-1.044916	.2484016		0.000	-1.541156 -1.742175	548677
e49	-1.202347	.2702203	-4.45	0.000	-1.742175	6625202
e50	-1.148927	.2442134	-4.70	0.000	-1.6368	6610549

- F 1	1 115051	2040101	2 67	0 000	1 722500	E070022
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
		.271006	-3.07	0.003		
e54	8318131				-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
		.3046378	-2.80		-1.462574	
e63	8539899			0.007		245406
e 6 4	6938821	.390759	-1.78	0.081	-1.474513	.0867487
e65	7584854	.3401587	-2.23	0.029	-1.438031	0789403
	6539317	.3040874	-2.15	0.035	-1.261416	0464473
e66						
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
			-2.17	0.034	-1.499927	0003724
e42	0	(omitted)				
w2	1458825	.2199268	-0.66	0.510	5852368	.2934718
w3	1952443	.1550219	-1.26	0.212	5049361	.1144475
w 4	0463937	.2217447	-0.21	0.835	4893796	.3965923
w 5	.0539994	.1778924	0.30	0.762	3013815	.4093803
w 6	1000439	.228607	-0.44	0.663	5567389	.3566512
w 7	2570051	.1667041	-1.54	0.128	5900348	.0760247
w 8	.2224097	.2063382	1.08	0.285	1897983	.6346178
w 9	.0248986	.1547786	0.16	0.873	2843072	.3341044
			-0.75			
w10	1565313	.20897		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
	923712	.1977394	-4.67	0.000	-1.318742	5286821
w23						
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
					-2.570779	
w34	-1.838351	.3666304	-5.01	0.000		-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
w 4 0	2861638	.2877138	-0.99	0.324	8609381	.2886105
w 4 1	5789986	.3057791	-1.89	0.063	-1.189863	.0318654
w 4 2	6432762	.3395555	-1.89	0.063	-1.321616	.0350638
w43	1967645	.3108262	-0.63	0.529	8177111	.4241822
			-1.73			
w 4 4	5202993	.3014543		0.089	-1.122524	.0819249
w 4 5	3151835	.3380297	-0.93	0.355	9904755	.3601085
w 4 6	6083392	.3616318	-1.68	0.097	-1.330782	.1141033
w 4 7	-1.386059	.2835013	-4.89	0.000	-1.952418	8196997
w 48	-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
					2.320011	5

sigma_u sigma_e rho	1.1291756 .9311568 .59523048	(fraction of variance due to u i)
0111	.59523046	(Ifaction of variance due to u_i)

55 . \* (e)

56 . ssc install parmest

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

57 . parmest, label format(estimate) list(parm label estimate) saving("C:\Users\u1266283\Downloads

	parm	label	estimate
1.	e8	-37	.16609963
2.	e9	-36	.04920431
3.	e10	-35	.03250159
4.	e11 e12	-34 -33	.11351847 .1410174
5.	eiz		.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
				65752678
54.	e62		17	
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
00.				
61.	e69		24	78024946
	o.e42		-3	
62.			_	1450005
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.	w 6	calendar_week==	-10.0000	10004385
68.	w7	calendar_week==	-9.0000	25700508
	w / w 8	calendar_week==	-8.0000	.22240974
69.	1			
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
	w10	<del>-</del>	1.0000	30352404
78.		calendar_week==		
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
	w25	calendar_week==	10.0000	76571734
87.				
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
,,,	W 3-12			
0.6	25	anlandam	10 0000	1 47 40000
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
	w39	calendar_week==	23.0000	.05208967
100.				
100.			24.0000	28616384
	w40	calendar week==		
101.	w40 w41	calendar_week==		
101. 102.	w41	calendar_week==	25.0000	57899858
101.				

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105.	w44	calendar_week==	28.0000	52029933
106. 107. 108. 109.	w45 w46 w47 w48 w49	calendar_week== calendar_week== calendar_week== calendar_week== calendar_week==	29.0000 30.0000 31.0000 32.0000 33.0000	31518353 60833922 -1.3860587 -1.1374342 -1.2410228
111. 112. 113. 114.	w50 w51 w52 _cons	calendar_week== calendar_week== calendar_week==	34.0000 35.0000 36.0000 Constant	-1.6072873 9703762 15873368 10.271434

file C:\Users\u1266283\Downloads\et\_coeff.dta saved

58 . export excel using "C:\Users\u1266283\Downloads\eventtime.xls", firstrow(variables) file C:\Users\u1266283\Downloads\eventtime.xls saved

59 . 60 . \* IV 61 . \* (a)

62 . xtreg residual\_weight LetterReceived TreatmentOngoing TreatmentCompleted w2-w52, fe i(route)

Fixed-effects (within) regression Group variable: route	Number of obs Number of groups		3,340 65
R-sq:	Obs per group:		
within = <b>0.4391</b>	mir	1 =	47
between = 0.0594	avo	g =	51.4
overall = <b>0.2618</b>	max	=	52
	F( <b>54,64</b> )	=	401.46
$corr(u_i, Xb) = 0.0173$	Prob > F	=	0.0000

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

TreatmentOngoing TreatmentCompleted			(Sta.	Err. ac	ijusted io	r 65 clusters	in route)
LetterReceived TreatmentOngoing TreatmentCompleted TreatmentCompleted -1.239756							
TreatmentOngoing	residual_weight	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
TreatmentCompleted	LetterReceived	7014392	.0665634	-10.54	0.000	8344149	5684636
W2        2159022         .1341608         -1.61         0.112        4839192         .0521146           W3        3035945         .1286503         -2.36         0.021        5606031        046586           W4        0282265         .1514613         -0.19         0.853        3308053         .2743522           W5         .0237206         .160677         0.15         0.883        2972685         .3447098           W6        1759366         .1590902         -1.11         0.273        4937559         .1418826           W7        3097484         .1705192         -1.82         0.074        6503997         .030902           W8         .2115351         .1235137         1.71         0.092        0352119         .458282           W9        0620561         .1416223         -0.44         0.663        3449791         .2208669           W10        22821         .1603455         -1.42         0.160        548537         .092117           W11        5434838         .1737616         -3.13         0.001         -8719939         -221127           W13        9971414         .2047268         -4.87         0.000         -1.4	TreatmentOngoing	-1.183891	.0768031	-15.41	0.000	-1.337323	-1.030459
w3      3035945       .1286503       -2.36       0.021      5606031      046586         w4      0282265       .1514613       -0.19       0.8853      3308053       .2743523         w5       .0237206       .160677       0.15       0.883      2972685       .3447098         w6      1759366       .1590902       -1.11       0.273      4937559       .1418826         w7      3097484       .1705192       -1.82       0.074      6503997       .0309025         w8       .2115351       .1235137       1.71       0.092      0352119       .458282         w10      0620561       .1416223       -0.44       0.663      3449791       .2208666         w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5463507       .1629015       -3.36       0.001       -8719939      2211278         w13      9971414       .2047268       -4.87       0.000       -1.012837       -4139412         w14      7133892       .1498941       -4.	TreatmentCompleted	-1.239756	.0879275	-14.10	0.000	-1.415411	-1.0641
w4      0282265       .1514613       -0.19       0.853      3308053       .2743523         w5       .0237206       .160677       0.15       0.883      2972685       .3447098         w6      1759366       .1590902       -1.11       0.273      4937559       .1418826         w7      3097484       .1705192       -1.82       0.074      6503997       .0309029         w8       .2115351       .1235137       1.71       0.092      0352119       .458282         w9      0620561       .1416223       -0.44       0.663      3449791       .2208665         w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.012837       -4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10	w2	2159022	.1341608	-1.61	0.112	4839192	.0521148
w5         .0237206         .160677         0.15         0.883        2972685         .3447098           w6        1759366         .1590902         -1.11         0.273        49375559         .1418826           w7        3097484         .1705192         -1.82         0.074        6503997         .0309028           w8         .2115351         .1235137         1.71         0.092        0352119         .458262           w9        0620561         .1416223         -0.44         0.663        3449791         .2208666           w10        22821         .1603455         -1.42         0.160        548537         .092117           w11        5434838         .1737616         -3.13         0.003        8906125        196353           w12        5465607         .1629015         -3.36         0.001        8719939        2211278           w13        9971414         .2047268         -4.87         0.000         -1.40613        5881527           w14        7133892         .1498941         -4.76         0.000         -1.782859        9931406           w15        6435026         .1509808         -4.26         0.000	w3	3035945	.1286503	-2.36	0.021	5606031	046586
w6      1759366       .1590902       -1.11       0.273      4937559       .1418826         w7      3097484       .1705192       -1.82       0.074      6503997       .0309028         w8       .2115351       .1235137       1.71       0.092      0352119       .458282         w9      0620561       .1416223       -0.44       0.663      3449791       .2208669         w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000       -1.782859       -9.031404         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443 <t< th=""><td>w 4</td><td>0282265</td><td>.1514613</td><td>-0.19</td><td>0.853</td><td>3308053</td><td>.2743523</td></t<>	w 4	0282265	.1514613	-0.19	0.853	3308053	.2743523
w7        3097484         .1705192         -1.82         0.074        6503997         .0309029           w8         .2115351         .1235137         1.71         0.092        0352119         .458282           w9        0620561         .1416223         -0.44         0.663        3449791         .2208666           w10        22821         .1603455         -1.42         0.160        548537         .092117           w11        5434838         .1737616         -3.13         0.003        8906125        1963555           w12        5465607         .1629015         -3.36         0.001        8719939        2211275           w13        9971414         .2047268         -4.87         0.000         -1.40613        5881527           w14        7133892         .1498941         -4.76         0.000         -1.012837         -4139412           w15        6435026         .1509808         -4.26         0.000         -1.782859         -9031406           w17        3448169         .199291         -1.73         0.088        7429465         .0533126           w18         .9502438         .1780443         5.34         0.000	w 5	.0237206	.160677	0.15	0.883	2972685	.3447098
w8       .2115351       .1235137       1.71       0.092      0352119       .458282         w9      0620561       .1416223       -0.44       0.663      3449791       .2208666         w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837       -4139412         w15      6435026       .1509808       -4.26       0.000       -9451213       -3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859       -9931406         w17       -3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      9622339       .1476884       -6.52	w 6	1759366	.1590902	-1.11	0.273	4937559	.1418826
w9      0620561       .1416223       -0.44       0.663      3449791       .2208666         w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17       -3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       -5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884 <td< th=""><td>w 7</td><td>3097484</td><td>.1705192</td><td>-1.82</td><td>0.074</td><td>6503997</td><td>.0309029</td></td<>	w 7	3097484	.1705192	-1.82	0.074	6503997	.0309029
w10      22821       .1603455       -1.42       0.160      548537       .092117         w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275       -6671924         w21       -1.242957       .1359566       <	w8	.2115351	.1235137	1.71	0.092	0352119	.458282
w11      5434838       .1737616       -3.13       0.003      8906125      1963551         w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362	w 9	0620561	.1416223	-0.44	0.663	3449791	.2208669
w12      5465607       .1629015       -3.36       0.001      8719939      2211275         w13      9971414       .2047268       -4.87       0.000       -1.40613      5881527         w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17       -3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.484929      8958533         w22       -1.190391       .1474362       -8.07       0.000       -1.235763      6005763         w23      9181696       .1589771	w10	22821	.1603455	-1.42	0.160	548537	.092117
W13	w11	5434838	.1737616	-3.13	0.003	8906125	1963551
w14      7133892       .1498941       -4.76       0.000       -1.012837      4139412         w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.235763      6005763         w23      9181696       .1589771       -5.78       0.000       -1.877075       -1.228802         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403	w12	5465607	.1629015	-3.36	0.001	8719939	2211275
w15      6435026       .1509808       -4.26       0.000      9451213      3418838         w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.235763      6005763         w23      9181696       .1589771       -5.78       0.000       -1.877075       -1.228803         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228803         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462	w13	9971414	.2047268	-4.87	0.000	-1.40613	5881527
w16       -1.343       .2201796       -6.10       0.000       -1.782859      9031406         w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w28      3849659       .1678932	w14	7133892	.1498941	-4.76	0.000	-1.012837	4139412
w17      3448169       .199291       -1.73       0.088      7429465       .0533126         w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524 <td>w15</td> <td>6435026</td> <td>.1509808</td> <td>-4.26</td> <td>0.000</td> <td>9451213</td> <td>3418838</td>	w15	6435026	.1509808	-4.26	0.000	9451213	3418838
w18       .9502438       .1780443       5.34       0.000       .5945595       1.305928         w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524	w16	-1.343	.2201796	-6.10	0.000	-1.782859	9031406
w19      526391       .15153       -3.47       0.001      8291069      2236751         w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017<	w17	3448169	.199291	-1.73	0.088	7429465	.0533126
w20      9622339       .1476884       -6.52       0.000       -1.257275      6671924         w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017       -6.76       0.000       -1.378219      7493267	w18	.9502438	.1780443	5.34	0.000	.5945595	1.305928
w21       -1.242957       .1359566       -9.14       0.000       -1.514562      9713526         w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017       -6.76       0.000       -1.378219      7493267	w19	526391	.15153	-3.47	0.001	8291069	2236751
w22       -1.190391       .1474362       -8.07       0.000       -1.484929      8958533         w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017       -6.76       0.000       -1.378219      7493267	w20	9622339	.1476884	-6.52	0.000	-1.257275	6671924
w23      9181696       .1589771       -5.78       0.000       -1.235763      6005763         w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017       -6.76       0.000       -1.378219      7493267	w21	-1.242957	.1359566	-9.14	0.000	-1.514562	9713526
w24       -1.552939       .1622523       -9.57       0.000       -1.877075       -1.228802         w25      6436489       .1407403       -4.57       0.000      9248099      3624878         w26      6825044       .1487462       -4.59       0.000      9796591      3853497         w27       .2987264       .1669554       1.79       0.078      0348054       .6322582         w28      3849659       .1678932       -2.29       0.025      7203711      0495607         w29      631358       .1420524       -4.44       0.000      9151402      3475758         w30       -1.063773       .1574017       -6.76       0.000       -1.378219      7493267	w22	-1.190391	.1474362	-8.07	0.000	-1.484929	8958533
w25    6436489     .1407403     -4.57     0.000    9248099    3624878       w26    6825044     .1487462     -4.59     0.000    9796591    3853497       w27     .2987264     .1669554     1.79     0.078    0348054     .6322582       w28    3849659     .1678932     -2.29     0.025    7203711    0495607       w29    631358     .1420524     -4.44     0.000    9151402    3475758       w30     -1.063773     .1574017     -6.76     0.000     -1.378219    7493267	w23	9181696	.1589771	-5.78	0.000	-1.235763	6005763
w26    6825044     .1487462     -4.59     0.000    9796591    3853497       w27     .2987264     .1669554     1.79     0.078    0348054     .6322582       w28    3849659     .1678932     -2.29     0.025    7203711    0495607       w29    631358     .1420524     -4.44     0.000    9151402    3475758       w30     -1.063773     .1574017     -6.76     0.000     -1.378219    7493267	w24	-1.552939	.1622523	-9.57	0.000	-1.877075	-1.228802
w27     .2987264     .1669554     1.79     0.078    0348054     .6322582       w28    3849659     .1678932     -2.29     0.025    7203711    0495607       w29    631358     .1420524     -4.44     0.000    9151402    3475758       w30     -1.063773     .1574017     -6.76     0.000     -1.378219    7493267	w25	6436489	.1407403	-4.57	0.000	9248099	3624878
w28    3849659     .1678932     -2.29     0.025    7203711    0495607       w29    631358     .1420524     -4.44     0.000    9151402    3475758       w30     -1.063773     .1574017     -6.76     0.000     -1.378219    7493267	w26	6825044	.1487462	-4.59	0.000	9796591	3853497
w29631358 .1420524 -4.44 0.00091514023475758 w30 -1.063773 .1574017 -6.76 0.000 -1.3782197493267	w27	.2987264	.1669554	1.79	0.078	0348054	.6322582
w30 -1.063773 .1574017 -6.76 0.000 -1.3782197493267	w28	3849659	.1678932	-2.29	0.025	7203711	0495607
	w29	631358	.1420524	-4.44	0.000	9151402	3475758
w315455158 .2876466 -1.90 0.062 -1.120156 .0291243	w30	-1.063773	.1574017	-6.76	0.000	-1.378219	7493267
	w31	5455158	.2876466	-1.90	0.062	-1.120156	.0291243

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.9667174	.2005766	4.82	0.000	.5660197	1.367415
.1008913	.1616351	0.62	0.535	2220118	.4237945
-1.702747	.2594483	-6.56	0.000	-2.221055	-1.18444
.2109589	.2162868	0.98	0.333	2211236	.6430414
.031882	.1992953	0.16	0.873	3662562	.4300202
1246847	.1638486	-0.76	0.449	4520099	.2026405
-1.08726	.271895	-4.00	0.000	-1.630433	5440876
.1616259	.2137974	0.76	0.452	2654834	.5887352
1921555	.1563673	-1.23	0.224	5045351	.120224
3844146	.1505625	-2.55	0.013	6851978	0836314
4215346	.1689156	-2.50	0.015	7589824	0840869
0504577	.1644837	-0.31	0.760	3790517	.2781363
3516888	.158951	-2.21	0.031	6692299	0341478
1148578	.1801346	-0.64	0.526	474718	.2450025
3374235	.1684991	-2.00	0.049	6740392	0008078
-1.167521	.1679936	-6.95	0.000	-1.503126	8319148
9549053	.1874077	-5.10	0.000	-1.329295	5805153
-1.013377	.1657462	-6.11	0.000	-1.344493	6822612
-1.281685	.1735803	-7.38	0.000	-1.628451	9349184
7012489	.1959474	-3.58	0.001	-1.092699	309799
.072039	.1898849	0.38	0.706	3072997	.4513778
10.39345	.1270781	81.79	0.000	10.13958	10.64731
1.1231946					
.93419248					
.59109632	(fraction	of varia	nce due t	o u_i)	
	.1008913 -1.702747 .2109589 .0318821246847 -1.08726 .16162591921555384414642153460504577351688811485783374235 -1.1675219549053 -1.013377 -1.2816857012489 .072039 10.39345	.1008913 .1616351 -1.702747 .2594483 .2109589 .2162868 .031882 .19929531246847 .1638486 -1.08726 .271895 .1616259 .21379741921555 .15636733844146 .15056254215346 .16891560504577 .16448373516888 .1589511148578 .18013463374235 .1684991 -1.167521 .16799369549053 .1874077 -1.013377 .1657462 -1.281685 .17358037012489 .1959474 .072039 .1898849 10.39345 .1270781	.1008913	.1008913	.1008913       .1616351       0.62       0.535      2220118         -1.702747       .2594483       -6.56       0.000       -2.221055         .2109589       .2162868       0.98       0.333      2211236         .031882       .1992953       0.16       0.873      3662562        1246847       .1638486       -0.76       0.449      4520099         -1.08726       .271895       -4.00       0.000       -1.630433         .1616259       .2137974       0.76       0.452      2654834        1921555       .1563673       -1.23       0.224      5045351        3844146       .1505625       -2.55       0.013      6851978        4215346       .1689156       -2.50       0.015      7589824        0504577       .1644837       -0.31       0.760      3790517        3516888       .158951       -2.21       0.031      6692299        1148578       .1684991       -2.00       0.049      6740392         -1.167521       .1679936       -6.95       0.000       -1.503126        9549053       .1874077       -5.10       0.000       -1.329295         -1

# 63 . xtreg residual\_weight LetterReceived TreatmentOngoing TreatmentCompleted w2-w52, fe i(route)

Fixed-effects (within) regression Group variable: route	Number of obs Number of groups		3,340 65
R-sq:	Obs per group:		
within = <b>0.4391</b>	min	=	47
between = <b>0.0594</b>	avg	=	51.4
overall = <b>0.2618</b>	max	=	52
	F ( <b>54,3221</b> )	=	46.70
corr(u i, Xb) = 0.0173	Prob > F	=	0.0000

residual_weight	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
LetterReceived	7014392	.0857314	-8.18	0.000	8695329	5333456
TreatmentOngoing	-1.183891	.073862	-16.03	0.000	-1.328712	-1.03907
TreatmentCompleted	-1.239756	.0823884	-15.05	0.000	-1.401295	-1.078217
w2	2159022	.1645197	-1.31	0.190	5384762	.1066718
w3	3035945	.1645197	-1.85	0.065	6261685	.0189794
w 4	0282265	.165169	-0.17	0.864	3520735	.2956206
w 5	.0237206	.1658362	0.14	0.886	3014345	.3488757
w 6	1759366	.1651692	-1.07	0.287	499784	.1479108
w 7	3097484	.1645197	-1.88	0.060	6323224	.0128256
w 8	.2115351	.1651692	1.28	0.200	1123123	.5353825
w 9	0620561	.1645197	-0.38	0.706	3846301	.2605179
w10	22821	.1645197	-1.39	0.165	5507839	.094364
w11	5434838	.1646556	-3.30	0.001	8663242	2206434
w12	5465607	.1646556	-3.32	0.001	8694011	2237203
w13	9971414	.1646227	-6.06	0.000	-1.319917	6743655
w14	7133892	.1659398	-4.30	0.000	-1.038748	3880309
w15	6435026	.1652782	-3.89	0.000	9675637	3194415
w16	-1.343	.1652717	-8.13	0.000	-1.667048	-1.018952
w17	3448169	.1661687	-2.08	0.038	6706241	0190098
w18	.9502438	.1654835	5.74	0.000	.6257803	1.274707
w19	526391	.1648808	-3.19	0.001	8496729	2031092
w20	9622339	.1655196	-5.81	0.000	-1.286768	6376994
w21	-1.242957	.1655196	-7.51	0.000	-1.567492	9184227
w22	-1.190391	.1648808	-7.22	0.000	-1.513673	8671091
w23	9181696	.1657817	-5.54	0.000	-1.243218	5931212
w 2 4	-1.552939	.1657817	-9.37	0.000	-1.877987	-1.22789
w25	6436489	.1659314	-3.88	0.000	9689908	318307
w26	6825044	.1671904	-4.08	0.000	-1.010315	3546942

```
1.79 0.074
   w27
           .2987264
                     .1671904
                                                -.0290839
                                                            .6265366
                               -2.30 0.021 -.7127762
          -.3849659
                     .1671904
                                                           -.0571557
   w2.8
   w29
          -.631358 .1676048 -3.77 0.000
                                                 -.959981 -.3027351
                    .1695609
                                -6.27 0.000
-3.13 0.002
          -1.063773
                                                -1.396231
                                                           -.7313145
   w30
   w31
          -.5455158
                     .1741101
                                                -.8868936
                                                           -.2041381
          .9667174
   w32
                     .1720614
                                5.62 0.000
                                                 .6293564
                                                            1.304078
                    .1707789
   w33
           .1008913
                                0.59 0.555
                                                -.2339551
                                                            .4357377
                                -9.72 0.000
1.22 0.222
   w34
          -1.702747
                      .175175
                                -9.72
                                                -2.046213
                                                           -1.359281
          .2109589
                                                            .5498285
.3707516
   w35
                     .1728309
                                                -.1279107
                                0.18 0.854
                                               -.3069876
   w36
           .031882 .1728309
                                                -.4669016
                      .174538
         -.1246847
                                -0.71 0.475
                                                             .2175321
   w37
   w38
           -1.08726
                     .1782783
                                -6.10
                                       0.000
                                                -1.436811
                                                           -.7377099
                                0.91 0.363
                     .1775553
                                                -.1865069
                                                            .5097587
           .1616259
   w 39
                    .1769504
          -.1921555
                                -1.09 0.278
                                                -.5391023
                                                            .1547912
   w 4 0
                    .1791171
                                -2.15 0.032
-2.34 0.020
         -.3844146
                                                -.7356096
   w 4 1
                                                           -.0332196
                     .1803741
          -.4215346
                                                -.7751942
                                                            -.067875
   w 4 2
                     .1803741
                                -0.28 0.780
                                                            .3032019
          -.0504577
                                                -.4041173
   w 4 3
                                                            .0030084
   w 4 4
          -.3516888 .1809033
                               -1.94 0.052 -.7063861
                    .1835085
                                -0.63 0.531
-1.84 0.067
                                                            .2449475
   w 4 5
          -.1148578
                                                 -.474663
                                               -.6979051
                                                            .0230582
   w 4 6
          -.3374235
                     .1838535
   w 47
         -1.167521
                     .1828186
                                -6.39 0.000
                                                -1.525973 -.8090682
   w 48
          -.9549053
                    .1828186
                                -5.22 0.000
                                                -1.313358 -.5964528
                    .1841013
                                -5.50 0.000
-6.96 0.000
   w49
         -1.013377
                                                -1.374345
                                                           -.6524098
                                                -1.642652
                     .1841013
                                                           -.9207175
         -1.281685
   w 5 0
          -.7012489
                    .1845748
                               -3.80 0.000
                                                           -.3393528
   w 5 1
                                                -1.063145
                    .1852012
                                       0.697
                                                            .4351632
            072039
                                 0.39
                                                -.2910851
   w 5 2
 _cons
          10.39345
                     .116792
                               88.99 0.000
                                                10.16445
                                                           10.62244
         1.1231946
sigma_u
          .93419248
sigma_e
         .59109632 (fraction of variance due to u_i)
```

F test that all  $u_i=0$ : F(64, 3221) = 73.02

Prob > F = 0.0000

64 . \* (b)

65 . sort route calendar\_week

66 . by route: gen time=sum(TreatmentCompleted)

67 . gen linear\_decay=TreatmentCompleted\*time

68 . xtreg residual\_weight LetterReceived TreatmentOngoing TreatmentCompleted linear\_decay w2-w52,

```
Number of obs =
Fixed-effects (within) regression
                                                                       3.340
                                              Number of groups =
Group variable: route
                                                                         65
R-sq:
                                              Obs per group:
     within = 0.4409
                                                                         47
                                                            min =
     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 route)

residual_weight	Coef.	Robust Std. Err.	t	P> t	[95% Conf.	Interval]
LetterReceived TreatmentOngoing TreatmentCompleted linear_decay w2 w3 w4 w5	6352303 -1.091562 -1.231588 .0172106 2167488 3044411 0291743 .0240519 177248	.0676226 .0877292 .0867933 .0085055 .1341129 .1287398 .1514873 .1607289	-9.39 -12.44 -14.19 2.02 -1.62 -2.36 -0.19 0.15 -1.11	0.000 0.000 0.000 0.047 0.111 0.021 0.848 0.882 0.269	7703219 -1.266821 -1.404978 .00021894846701561628533180529704094949674	5001387 9163029 -1.058198 .0342024 .0511725 0472538 .2734564 .3451447 .1404713
w7 w8 w9 w10	310595 .2102236 0629027 2290566	.1705452 .1235667 .1415815 .1604871	-1.82 1.70 -0.44 -1.43	0.073 0.094 0.658 0.158	6512982 0366293 3457442 5496664	.0301082 .4570766 .2199389 .0915532

```
-.5494234
                      .1737961
                                  -3.16
                                         0.002
                                                   -.896621
                                                               -.2022257
   w11
          -.5525003
                      .1638619
                                 -3.37 0.001
                                                  -.8798521
                                                              -.2251485
   w12
           -1.00509
                     .2045274
                                  -4.91 0.000
                                                  -1.413681
                                                              -.5964997
    w13
                      .1500463
          -.7203517
                                  -4.80
                                         0.000
                                                  -1.020104
                                                               -.4205998
   w14
   w15
          -.6520294
                      .1514267
                                  -4.31
                                         0.000
                                                   -.9545391
                                                               -.3495197
   w16
          -1.350447
                      .2207998
                                  -6.12
                                         0.000
                                                   -1.791545
                                                               -.9093486
                                                               .0397877
                      .1991705
   w17
           -.358101
                                 -1.80
                                         0.077
                                                  -.7559898
   w18
           .9378715
                      .1790823
                                   5.24
                                         0.000
                                                    .5801135
                                                                1.29563
                                         0.001
                                                   -.8393839
   w19
           -.536292
                      .1517182
                                  -3.53
                                                               -.2332001
          -.9726304
   w20
                      .1481477
                                  -6.57
                                         0.000
                                                  -1.268589
                                                               -.6766714
                      .1361757
                                         0.000
   w21
          -1.254699
                                  -9.21
                                                  -1.526741
                                                              -.9826565
   w22
          -1.204264
                      .1478074
                                  -8.15
                                          0.000
                                                   -1.499543
                                                               -.9089845
          -.9435522
                      .1583525
                                  -5.96
                                         0.000
                                                               -.6272067
   w 2 3
                                                   -1.259898
                      .1630294
          -1.579645
                                  -9.69
                                         0.000
                                                  -1.905334
                                                               -1.253957
   w 24
                      .1391681
                                  -4.82
                                         0.000
                                                    -.948568
   w 2.5
          -.6705476
                                                               -.3925273
           -.722237
                      .1494931
                                  -4.83
                                         0.000
                                                   -1.020884
                                                               -.4235901
   w26
                      .1659083
   w 2.7
            .256346
                                  1.55
                                         0.127
                                                   -.0750938
                                                                .5877859
   w28
          -.4299941
                      .1721253
                                  -2.50
                                         0.015
                                                   -.7738539
                                                               -.0861342
   w29
          -.6830524
                      .1417839
                                  -4.82
                                          0.000
                                                   -.9662982
                                                               -.3998066
                      .1602825
   w30
          -1.118001
                                  -6.98
                                         0.000
                                                   -1.438202
                                                               -.7977997
   w31
          -.6041914
                      .2874424
                                  -2.10
                                         0.039
                                                   -1.178424
                                                               -.0299593
                      .2027583
   w32
           .9013793
                                   4.45
                                         0.000
                                                    .4963231
                                                               1.306435
   w33
           .0370581
                      .1694133
                                   0.22
                                         0.828
                                                   -.3013839
                                                                .3755001
                      .2585969
                                         0.000
          -1.784217
                                                  -2.300824
   w34
                                  -6.90
                                                                -1.26761
                                                                .5734786
   w35
           .1210529
                      .2264699
                                  0.53
                                         0.595
                                                   -.3313727
                      .2096238
          -.0659674
                                  -0.31
                                         0.754
                                                                .3528044
   w36
                                                   -.4847391
   w37
          -.2241958
                      .1773175
                                  -1.26
                                          0.211
                                                   -.5784282
                                                                .1300366
          -1.205804
                      .2762552
                                  -4.36
                                         0.000
                                                  -1.757687
                                                               -.6539203
   w38
            .030576
                     .2314562
                                  0.13
                                         0.895
                                                   -.4318109
                                                               .4929628
   w39
          -.3336261
                       .181905
                                  -1.83
                                         0.071
                                                   -.697023
                                                                .0297708
   w40
   w41
          -.5301947
                      .1722794
                                  -3.08
                                         0.003
                                                   -.8743625
                                                                -.186027
   w 42
          -.5856467
                      .1894898
                                  -3.09
                                         0.003
                                                  -.9641961
                                                               -.2070973
                                                                .1509413
   w 4 3
          -.2278087
                      .1895902
                                  -1.20
                                         0.234
                                                   -.6065587
   w 4 4
          -.5426792
                      .1975844
                                  -2.75
                                         0.008
                                                  -.9373995
                                                               -.1479589
   w 4.5
             -.3088
                      .2187594
                                  -1.41
                                         0.163
                                                    -.745822
                                                                .1282221
   w 4 6
          -.5507841
                      .2168139
                                  -2.54
                                         0.014
                                                   -.9839197
                                                               -.1176486
                      .2183428
   w 47
          -1.394832
                                 -6.39
                                         0.000
                                                  -1.831022
                                                               -.9586423
   w48
          -1.198104
                      .2424701
                                  -4.94
                                         0.000
                                                   -1.682493
                                                               -.7137138
          -1.267312
                                  -5.46
                                         0.000
                                                  -1.731391
                                                               -.8032334
   w 49
                      .2323032
                                  -6.41
   w50
          -1.552831
                      .2421773
                                         0.000
                                                   -2.036635
                                                               -1.069026
                                                   -1.497616
                                                               -.4850331
          -.9913244
                      .2534334
                                  -3.91
                                          0.000
   w 5 1
   w52
          -.2346062
                      .2643906
                                  -0.89
                                          0.378
                                                   -.7627871
                                                                .2935747
           10.39428
                      .1272633
                                  81.68
                                         0.000
                                                    10.14004
                                                               10.64852
 _cons
          1.1293476
sigma_u
           .93284337
sigma_e
   rho
          .59443161
                     (fraction of variance due to u_i)
```

69 . display .6352303/.0172106 36.909248

70.\*(c)

71 . gen shortterm=(time<=15)

72 . gen effect st=TreatmentCompleted\*shortterm

73 . gen effect\_lt=TreatmentCompleted\*(1-shortterm)

74 . xtreg residual\_weight LetterReceived TreatmentOngoing effect\_st effect\_lt w2-w52, fe i(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
                                                                          51.4
                                                              avg =
     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 route)

	_	Robust					
residual_weight	Coef.	Std. Err.	t	P> t	[95% Conf.	Interva	
LetterReceived	6736646	.0652972	-10.32	0.000	8041107	54321	
reatmentOngoing	-1.143992	.0796629	-14.36	0.000	-1.303137	98484	
effect_st	-1.19496	.1010259	-11.83	0.000	-1.396783	99313	
effect_lt	-1.033796	.1913199	-5.40	0.000	-1.416001	65159	
w2	2162588	.1341564	-1.61	0.112	484267	.05174	
w3	3039512	.1287232	-2.36	0.021	5611053	04679	
w 4	0286382	.1514752	-0.19	0.851	3312446	.27396	
w5	.0239327	.1607079	0.15	0.882	2971183	.34498	
w 6	1765414	.1591155	-1.11	0.271	4944112	.14132	
w 7	310105	.1705615	-1.82	0.074	6508408	.03063	
w 7 w 8	.2109303	.1235804	1.71	0.074	03595	. 45781	
w 9	0624127	.1416356	-0.44	0.661	3453623	.22053	
w10	2285666	.1604324	-1.42	0.001	5490671	.09193	
		.1737958	-3.14	0.139	8931738		
w11	5459769					198	
w12	5490538	.1634921	-3.36	0.001	8756668	22244	
w13	-1.000567	.2047552	-4.89	0.000	-1.409613	59152	
w14	716318	.1501016	-4.77	0.000	-1.01618	41645	
w15	6472255	.1511129	-4.28	0.000	9491082	34534	
w16	-1.346173	.2206423	-6.10	0.000	-1.786957	90538	
w17	3504934	.1992384	-1.76	0.083	7485179	.04753	
w18	.9449625	.1788459	5.28	0.000	.5876768	1.3022	
w19	5332626	.1519896	-3.51	0.001	8368967	22962	
w20	9687978	.1482096	-6.54	0.000	-1.264881	672	
w21	-1.249521	.1362503	-9.17	0.000	-1.521712	97732	
w22	-1.197263	.1478917	-8.10	0.000	-1.49271	90181	
w23	9293142	.1589645	-5.85	0.000	-1.246882	611	
w 2 4	-1.564083	.1630965	-9.59	0.000	-1.889906	-1.2382	
w25	6570355	.1402301	-4.69	0.000	9371774	37689	
w26	700164	.1492646	-4.69	0.000	9983543	40197	
w27	.2810668	.1674226	1.68	0.098	0533982	. 61553	
w28	4026255	.170206	-2.37	0.021	742651	06260	
w29	6508829	.1418178	-4.59	0.000	9341965	3675	
w30	-1.088324	.1590002	-6.84	0.000	-1.405963	77068	
w31	5702525	.2886003	-1.98	0.052	-1.146798	.00629	
w31	.9421711	.2032533	4.64	0.000	.5361259	1.3482	
w32	.0737215	.166175	0.44	0.659	2582511	. 40569	
w34	-1.74507	.2614544	-6.67	0.000	-2.267385	-1.222	
	.1671188	.2227324	0.75	0.456	2778402	.6120	
w35		.2070831	-0.06				
w36	0119581 1711434			0.954	4256541 5138826	.4017	
w37		.1715644	-1.00	0.322		.1715	
w38	-1.136288	.2745143	-4.14	0.000	-1.684694	5878	
w39	.1108907	.2223637	0.50	0.620	3333319	.55511	
w 4 0	2552845	.1693843	-1.51	0.137	5936686	.08309	
w 4 1	4501621	.1639766	-2.75	0.008	777743	12258	
w 4 2	4894187	.1782906	-2.75	0.008	8455951	13324	
w43	1183418	.1739296	-0.68	0.499	4658061	.22912	
w 4 4	4197377	.1738633	-2.41	0.019	7670695	0724	
w 4 5	2080141	.1988859	-1.05	0.300	6053344	.18930	
w 4 6	4327558	.1920203	-2.25	0.028	8163605	0491	
w 4 7	-1.261885	.1887789	-6.68	0.000	-1.639014	8847	
w48	-1.074064	.2213235	-4.85	0.000	-1.516209	63191	
w 4 9	-1.132913	.2055017	-5.51	0.000	-1.54345	7223	
w 5 0	-1.401221	.2079462	-6.74	0.000	-1.816641	98580	
w51	8216377	.2113406	-3.89	0.000	-1.243839	39943	
w52	0726042	.2239054	-0.32	0.747	5199066	.37469	
_cons	10.3938	.1271387	81.75	0.000	10.13981	10.647	
	1 105055						
sigma_u	1.1256578 .93375411						
sigma_e							
rho	.59238156	(fraction	0 f ++0	~ ~ ~ ~ ±	· 0 11 i \		

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75 . display (-1.033796--1.19496)/(-1.19496) -.13486979

76 . test effect\_st==effect\_lt

( 1) effect\_st - effect\_lt = 0

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

77 . end of do-file

78 .