Econometrics assignment 5b

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1)

a)

Variable	*Ambient temperature*	*Water temperature*
Average	10.48	12.30
Min	-3.9	5.7
Max	21.1	19.6

b) Average hour of sunset in December: 16
Average hour of sunset in July: 21

2)

a) $spot_{it} = \beta_0 + \sum_{\tau=-T}^{T} \alpha_\tau eventtime_\tau + \lambda_i + \mu_t + \varepsilon_{it}$

b)

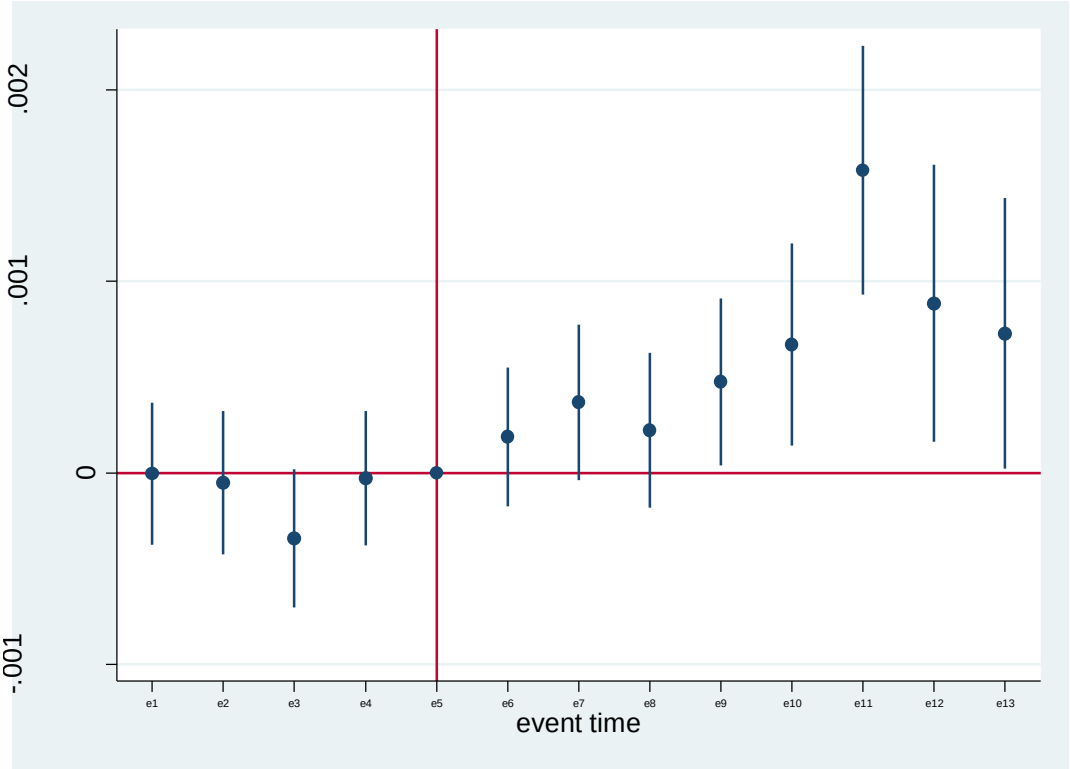
```
. xtreg spot e1-e4 e6-e13 e5 temp temp_sq watertemp watertemp_sq wind wind_sq y1 m2-m12,fe i(grid_id)
note: e5 omitted because of collinearity

Fixed-effects (within) regression               Number of obs     =    491,514
Group variable: grid_id                         Number of groups  =      2,387

R-sq:                                           Obs per group:
     within  = 0.0008                                         min =        101
     between = 0.0005                                         avg =      205.9
     overall = 0.0008                                         max =        572

                                                F(30,489097)      =      13.61
corr(u_i, Xb)  = -0.0007                        Prob > F          =     0.0000
```

spot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
e1	-5.58e-06	.0002259	-0.02	0.980	-.0004484	.0004372
e2	-.0000506	.0002273	-0.22	0.824	-.0004961	.000395
e3	-.0003426	.0002191	-1.56	0.118	-.000772	.0000868
e4	-.0000286	.0002139	-0.13	0.894	-.0004478	.0003906
e6	.0001874	.0002211	0.85	0.397	-.000246	.0006208
e7	.000368	.0002467	1.49	0.136	-.0001156	.0008515
e8	.0002219	.0002465	0.90	0.368	-.0002612	.000705
e9	.000475	.0002653	1.79	0.073	-.0000451	.000995
e10	.0006707	.0003206	2.09	0.036	.0000423	.0012991
e11	.00158	.0003944	4.01	0.000	.000807	.0023531
e12	.0008845	.0004394	2.01	0.044	.0000232	.0017458
e13	.0007274	.0004292	1.69	0.090	-.0001139	.0015686
e5	0	(omitted)				
temp	.0001748	.0000543	3.22	0.001	.0000683	.0002813
temp_sq	-4.19e-06	2.55e-06	-1.65	0.099	-9.18e-06	7.94e-07
watertemp	-.0003519	.0001856	-1.90	0.058	-.0007156	.0000119
watertemp_sq	3.06e-06	6.91e-06	0.44	0.658	-.0000105	.0000166
wind	-.0000425	6.51e-06	-6.53	0.000	-.0000553	-.0000298
wind_sq	1.17e-07	3.17e-08	3.69	0.000	5.48e-08	1.79e-07
y1	8.76e-06	.0001636	0.05	0.957	-.0003119	.0003295
m2	.0002843	.0002649	1.07	0.283	-.000235	.0008035
m3	.0003141	.0002797	1.12	0.261	-.0002342	.0008624
m4	.0015664	.0002506	6.25	0.000	.0010753	.0020575
m5	.0015326	.0004203	3.65	0.000	.0007088	.0023564
m6	.0021529	.0005141	4.19	0.000	.0011452	.0031605
m7	.0030219	.0007171	4.21	0.000	.0016164	.0044274
m8	.0019117	.0008042	2.38	0.017	.0003356	.0034879
m9	.002515	.000708	3.55	0.000	.0011273	.0039026
m10	.0014281	.0005864	2.44	0.015	.0002788	.0025774
m11	.001042	.0004612	2.26	0.024	.000138	.0019459
m12	.0007819	.000295	2.65	0.008	.0002036	.0013601
_cons	.004987	.0010737	4.64	0.000	.0028825	.0070915

sigma_u	.00385486	
sigma_e	.03699593	
rho	.01074037	(fraction of variance due to u_i)

```
F test that all u_i=0: F(2386, 489097) = 1.86                 Prob > F = 0.0000
```

c)



As can be concluded from the graph above, a positive average treatment effect is found. The immediate effect is not significant but the latest event times show statistically significant effects. The graph shows evidence of darkness having a small but positive treatment effect for most event time dummies on spot detection rates.

Copy of our Do-file

```
*CA5b Group 10

use "C:\Users\u1265889\Downloads\ca5b_northsea.dta", clear

*(1)
*(a)
sum temp
sum watertemp

*(b)
sum hour if eventtime==0 & month==12
sum hour if eventtime==0 & month==7

*(2)
*(b)
tab eventtime, gen(e)

tab year, gen(y)

tab month, gen(m)

forvalues i=1/13 {
label variable e`i' "`=`i'-7'"
}

xtreg spot e1-e4 e6-e13 e5 temp temp_sq watertemp watertemp_sq wind wind_sq
y1 m2-m12,fe i(grid_id)

*(c)
ssc install coefplot

coefplot, keep(e*) nolabels coeflabels(,labsize(tiny)) vertical xline(5)
levels(90) yline(0) ytitle(Difference in hourly spot detection rate)
xtitle(event time) omitted order(e1 e2 e3 e4 e5 e6 e7 e8 e9 e10 e11 e12 e13)
```