Contest Quiz 1
Question Sheet

In this quiz we will review concepts of Distributed Lag models covered in the first two lectures.

On January 10, 2007, President Bush announced that the number of U.S. troops deployed in Iraq would increase by approximately 30,000. The surge actually started on February 14, 2007, and troop levels increased steadily from 135,000 in February, 2007 to 162,000 in August, 2007. What have been the effects of the surge?

Question 1

In this question, you will examine the effect of the surge on Iraqi civilian fatalities. The data are daily from February 14, 2006 (one year before the surge) through July 17, 2007.

(i) The following table gives daily civilian fatalities in mid-July, 2007:

Date	Civilian fatalities
July 12, 2007	67
July 13, 2007	50
July 14, 2007	53
July 15, 2007	51
July 16, 2007	148
July 17, 2007	28

Use regression (1) in Table 1 to construct a 90% one-step-ahead forecast interval for civilian fatalities on July 18, 2007, and give the lower bound. Assume the regression errors are normally distributed and use the critical quantiles from the normal distribution.

(ii) What is the predicted value of civilian fatalities from regression (4), on April 28, 2007 (observation number 439)?

Consider regressions (2) and (3). Let D denote the effect of the surge on the number of civilian deaths, specifically, the difference between the actual total number of civilian deaths from Feb 15, 2007 (observation number 367) through July 17, 2007 (observation number 518), and what those deaths would have been had there not been the surge.

(iii) Use regression (2) to estimate the total effect of the surge on the number of civilian deaths, i.e., calculate the value of D. For this question only: round to the nearest integer.

(iv) Of the two regressions (2) and (3), which would you recommend for construction of a confidence interval for D?

(a) regression 2   (b) regression 3

(v) Using your preferred regression from the previous question, compute a 95% confidence interval for D and give the lower bound. Again, use the critical quantiles from the normal distribution.

Table 1: Time Series Models of Daily Civilian Fatalities in Iraq

| Regressors | Dependent variable: Civilian Fatalities$_t$ | | | |
	(1)	(2)	(3)	(4)
Civilian Fatalities$_{t-1}$	.034 (.021)			
Civilian Fatalities$_{t-2}$	.087** (.025)			
Surge		-14.51** (5.82)	-14.51* (6.67)	
Trend				.079* (.036)
Surge × (Trend-366)				-.362** (.087)
Constant	71.84** (5.54)	77.89** (5.17)	77.89** (5.93)	61.20** (10.83)
Type of standard errors:	HR	HR	HAC	HAC
R^2	0.0217	0.0023	0.0023	0.0105
Adjusted R^2	0.0197	0.0023	0.0023	0.0066
BIC	6259.21	6273.65	6273.65	6276.67
SER	41.42	42.98	42.98	42.76
No. of observations	513	519	519	519

Variable definitions:

Civilian Fatalities$_t$	number of Iraqi civilian fatalities on day t
Surge	1 if the date is after Feb 14, 2007, = 0 otherwise
Trend	observation number (linear time trend),
	Trend = 1 on Feb 14, 2006 (observation 1), so
	Trend = 366 on Feb 14, 2007, and
	Trend = 518 on July 17, 2007 (observation 518).
Trend-366	Trend - 366, so Trend - 366 = 0 on Feb 14, 2007.

Additional Notes:

All regressions are OLS. Regression 1 is estimated using daily data from Feb 20, 2006 to July 17, 2007, with earlier observations for initial values of lagged regressors. Regressions 2-4 are estimated using all observations (Feb 14, 2006 to July 17, 2007). Standard errors are in parentheses; "HR" denotes heteroskedasticity-robust standard errors, and "HAC" denotes heteroskedasticity and autocorrelation-consistent standard errors.
* significant at 5%; ** significant at 1% (using the standard errors in parentheses).

Question 2

In this question, you will examine the relation between oil prices and the surge and coalition (the U.S. and its allies) fatalities. The time scale in this part is trading days, that is, days the oil spot market is open – so weekends and holidays are dropped.

(i) Using regression (1) in Table 2 overleaf, calculate the second cumulative dynamic multiplier.

(ii) Can you reject the hypothesis, at the 5% significance level, that the dynamic effect on oil prices of coalition fatalities did not change after the surge initiation date of Feb 14, 2007?

(a) Yes   (b) No

(iii) Figure 1 plots the cumulative dynamic multipliers based on regression (1). In no more than 100 words, describe and interpret the results shown in Figure 1.

Table 2: Oil Markets, Coalition Fatalities, and the Surge

NOTE: regressions are run using oil spot market trading days only (dropping weekends and holidays), and t refers to trading days (the time scale is trading days)

| Regressors | Dependent variable: %ChgOilPrice $_t$ | |
	(1)	(2)
Coalition Fatalities $_{t-1}$	-.027 (.038)	-.027 (.059)
Coalition Fatalities $_{t-2}$	-.014 (.040)	.026 (.060)
Coalition Fatalities $_{t-3}$	-.051 (.044)	-.057 (.067)
Coalition Fatalities $_{t-4}$	-.041 (.039)	-.052 (.051)
...		
Coalition Fatalities $_{t-14}$	.003 (.032)	-.059 (.044)
Coalition Fatalities $_{t-1}$ × Surge $_t$		-.013 (.078)
Coalition Fatalities $_{t-2}$ × Surge $_t$		-.097 (.083)
Coalition Fatalities $_{t-3}$ × Surge $_t$		.014 (.086)
Coalition Fatalities $_{t-4}$ × Surge $_t$		.004 (.080)
...		
Coalition Fatalities $_{t-14}$ × Surge $_t$		.118 (.060)
Surge $_t$		-.732 (.846)
Constant	.233 (.300)	.667 (.373)
F-statistic (p-values) testing for all coefficients equaling zero on:		
Coalition Fatalities $_{t-1}$ × Surge $_t$,...		
..., Coalition Fatalities $_{t-14}$ × Surge $_t$, Surge $_t$		1.23 (0.253)
Adjusted R^2	0.012	0.0068
Regression root mean squared error	1.86	1.86
No. of observations	379	379

Variable definitions:

%ChgOilPrice $_t$ percent change in spot oil price from day $t-1$ to day t.
Coalition Fatalities $_t$ number of coalition (U.S. and allied troops) fatalities on day t
Surge   1 if the date is after Feb 14, 2007, $= 0$ otherwise

Additional Notes:

All regressions are OLS. Standard errors, which are given in parentheses, are HAC standard errors.
* significant at 5%; ** significant at 1% (using the standard errors in parentheses).

Figure 1: Cumulative impulse response (solid) and 95% confidence interval (dashed) based on Table 2, regression (1) (horizontal axis is lag in trading days)