FRED Investigation into Nonfarm jobs in Florida

Time Series Modeling and Forecasting

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Introduction

There are multiple factors that contribute to rises and declines in Nonfarm Employment in Florida. In that regard, this is an investigation on several factors and their proposed effects on the total number of nonfarm jobs in the Florida Job market. In this investigation, a list of variables from FRED (Federal Reserve Economic Database) will function as independent variables for the dependent variable of nonfarm jobs. These variables are: Civilian Labor Force in Florida (fl_lf), New Private Housing Units Authorized by Building Permits for Florida (fl_bp), US Employment Population Ratio: 25 - 54 years (us_epr25to54). All of these variables are monthly non-seasonally adjusted and require multiple modifications to build models that can actually display the significance in relationships between the variables.

Importing and Wrangling the data

Importing the data involves a number of functions that will be shown below. The *kable* library in R will be used to generate nice tables to show the regression outputs of the multiple models used in this investigation. All of the codebase will be in STATA.

```
clear
set more off
# Importing the data
cd "/Users/angelsarmiento/Documents/Graduate/First Year/Time Series/STATA/HW1"
import delimited "data.csv"
```

After importing the data a series of different date variables will be created for further use later. This involves the creation of a monthly time date.

```
rename date datestring
gen datec=date(datestring,"YMD")
gen mdate=mofd(datec)
format mdate %tm
tsset mdate
```

Converting all string values to Float ignoring NA values.

```
destring fl_lf, replace ignore("NA")
destring fl_bp, replace ignore("NA")
destring us_epr_25to54, replace ignore("NA")
```

Creating log versions of the variables

```
gen ln_fl_nonfarm = ln(fl_nonfarm)
gen ln_fl_lf = ln(fl_lf)
gen ln_fl_bp = ln(fl_bp)
gen ln_us_epr = ln(us_epr_25to54)
```

The Static Model

In the interest of hypothesizing the relationship between nonfarm jobs and the other variables, a static model is the first attempt to represent this relationship. The size of Florida's labor force is something that is most likely generally correlated with the number of nonfarm jobs. More people who can work, means more jobs that can and will be filled. The prime age employment to population ratio might be related to total nonfarm jobs in that a larger ratio means more jobs that can be filled and a higher workforce percentage of the population would be able to pursue jobs outside of the farming industries. The other variable, the amount of Florida Building permits would also be positively correlated in a long run sense. A higher amount of approved building permits would mean more more spaces for employment and more people needed to operate in the building. Inversely, a lower number of building permits implies less spaces for work and lower employment in nonfarm jobs.

Developing the static model without accounting for time trends and then following it with another model that accounts for the linear time trend and monthly seasonality. β_n is the coefficients, X_t is the variable at time t, δ_k is the coefficient of the month, $\hat{Y}$ is the nonfarm detrending with time, and $\hat{\beta}_n$ is the coefficients for the detrended series.

$$Y_{nonfarm} = \alpha_0 + \beta_1 logX_{lf} + \beta_2 logX_{bp} + \beta_3 logX_{epr}$$

```
reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr
eststo lnnonfarm1
```

$$\hat{Y}_{nonfarm} = \hat{\alpha}_0 + \Sigma\hat{\beta}_1 logX_{lf,t} + \Sigma\hat{\beta}_2 logX_{bp,t} + \Sigma\hat{\beta}_3 logX_{epr,t} + \delta_1 Feb_t + \delta_2 Mar_t + ...\delta_k month_t$$

where t = 0, 1, 2, 3… and k = 1, 2, 3… 11

```
gen monthly = month(datec)

reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr i.monthly datec
eststo lnnonfarm2
esttab lnnonfarm*
```

The regression output is shown below.

Table 1: Static Model Comparison

X1	ln_fl_nonfarm	ln_fl_nonfarm_1	=
ln_fl_lf	1.116***	0.916***	
	(120.72)	(25.93)	
ln_fl_bp	0.0441***	0.0351***	
	(13.92)	(18.41)	
ln_us_epr	0.784***	1.236***	
	(13.35)	(25.95)	
1.monthly		0	
		(.)	
2.monthly		0.00312	
		(1.00)	
3.monthly		-0.00323	
		(-1.04)	
4.monthly		-0.00939**	
		(-3.00)	
5.monthly		-0.0212***	
		(-6.77)	
6.monthly		-0.0436***	
		(-13.78)	
7.monthly		-0.0611***	
		(-19.10)	
8.monthly		-0.0443***	
		(-14.04)	
9.monthly		-0.0315***	
		(-10.01)	
10.monthly		-0.0278***	
		(-8.77)	
11.monthly		-0.00898**	
		(-2.80)	
12.monthly		0.000800	
		(0.25)	
datec		0.0000118***	
		(6.52)	
_cons	-12.56***	-11.32***	
	(-38.28)	(-26.18)	
N	383	383	
t statistics in parentheses			
="* p<0.05	** p<0.01	*** p<0.001"	

The non-seasonally, non-detrended model shows that every one of the variables is a significant predictor of the number of nonfarm jobs. Viewing the R-squared value shows that 97.9% of the residuals can be explained by each of variables. The seasonally adjusted, detrended model, shows a better picture of the significance.

It looks as though the first month and months 4 through 11 are the most significant. However, the all of the log variables have a perfect ($p << 0.05$) of significance which is questionable.

Static Model Results

While the regression output shows a promising relationship between the predictors (civilian labor force, Building permits, and prime age employment population ratio) and the response variables (total nonfarm labor), there is no way to tell from the data alone that these are the only variables that are significant. The model shows that every single one of the predictors is significant when a linear time trend and monthly indicators (seasonality) are factored in. There might however be a spurious correlation present as other factors are present in reality which could affect the total nonfarm employee numbers. One such factor is the existence of lags over time, in which the cumulative effects occur in a series over time. This could explain why every variable seems to be a significant predictor. One event occuring over time is the general increase in population. The increase in population can be a source for spurious correlations in the data. It would seem that a more dynamic model can help in this regard.

Finite Distributed Lag Model

For a more dynamic model, a Finite Distributed lag model can work wonders to account for changes caused by lags in time. These changes over time can be cumulative and acount for the significantly low p-values that have been shown. The first model involves lags up to $h = 12$. The second model adjusts the lag model to accomodate a linear time trend and monthly seasonality. **All of the following models are concatenated into one table below**

```
#1st Model
reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr)
```

```
#2nd Model
reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly
```

Adding the monthly indicator and the time trend seems to function to show that past lags are not significant. The p values of all of the lags are very high but the time trend has a very low p-value. As does the intercept. In the original lag model, some of the lags had singificant p-values. The new lag model also shows that the significance that was found with the original models in Part 3 for each of the variables (other than the building permits) were not actually signicant. The new model shows that the most significant variables are the time trend, the intercept, the month of December, and the log of the florida Building Permits (denoted as ln_fl_bp). This is vastly different than before, where every one of the variables in the analysis was significant. Perhaps a more parsimonious model is necessary.

Models with More Parsimonious Lag Structure

This model is chosen because the lags past around lag 4 seem to be more and more insignificant.

```
#3rd Model
reg ln_fl_nonfarm l(0/3).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly
```

This model has much more significance in the months than previous models. The time trend is still significant, as is the intercept. The number of building permits also seems significant so that is going to be adjusted for the next model.

The next model is chosen because it may better demonstrate any real relationships between the variables. From the data below, lags past a certain point will make no difference. It may also be important to see if the significance in some vairables can be explained by the data being shortened to just the dates that all of the variables share. It may be that there is some form of bias toward the building permits data because it has a smaller number of data points than the other 3 variables.

```
#4th Model
reg ln_fl_nonfarm l(0/4, 8).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly
  if tin(1998m1, 2019m11)
```

Table 2: Static Model Comparison

X1	ln_fl_nonfarm	ln_fl_nonfarm_1	ln_fl_nonfarm_2	ln_fl_nonfarm_3	=
ln_fl_lf	0.239	0.399	0.677*	0.538*	
	(0.93)	(1.47)	(2.51)	(2.04)	
L.ln_fl_lf	-0.000633	-0.0604	0.0217	-0.0132	
	(-0.00)	(-0.17)	(0.06)	(-0.04)	
L2.ln_fl_lf	0.427	0.0361	0.0124	-0.0174	
	(1.25)	(0.10)	(0.03)	(-0.05)	
L3.ln_fl_lf	0.660	0.110	0.183	0.309	
	(1.93)	(0.30)	(0.67)	(0.83)	
L4.ln_fl_lf	-0.255	0.00885		0.0243	
	(-0.74)	(0.02)		(0.08)	
L5.ln_fl_lf	-0.531	0.0333			
	(-1.55)	(0.09)			
L6.ln_fl_lf	-0.102	0.146			
	(-0.30)	(0.39)			
L7.ln_fl_lf	0.209	0.174			
	(0.60)	(0.47)			
L8.ln_fl_lf	-0.153	-0.0242		-0.132	
	(-0.44)	(-0.06)		(-0.92)	
L9.ln_fl_lf	0.378	0.110			
	(1.10)	(0.29)			
L10.ln_fl_lf	-0.000297	0.157			
	(-0.00)	(0.41)			
L11.ln_fl_lf	0.0117	-0.231			
	(0.03)	(-0.61)			
L12.ln_fl_lf	0.264	0.0559			
	(1.02)	(0.20)			
ln_fl_bp	0.0200***	0.0179***	0.0220***	0.00998*	
	(4.25)	(4.11)	(5.03)	(2.42)	
L.ln_fl_bp	0.00910	0.00856	0.00999*	0.00831	
	(1.81)	(1.81)	(2.19)	(1.91)	
L2.ln_fl_bp	0.0121*	0.00629	0.00508	0.00386	
	(2.33)	(1.30)	(1.11)	(0.85)	
L3.ln_fl_bp	0.00308	0.00673	0.00385	0.00568	
	(0.57)	(1.36)	(0.86)	(1.27)	
L4.ln_fl_bp	0.00156	0.00414		0.00462	
	(0.29)	(0.84)		(1.06)	
L5.ln_fl_bp	0.00631	0.00388			
	(1.16)	(0.78)			
L6.ln_fl_bp	0.00648	0.00486			
	(1.18)	(0.97)			
L7.ln_fl_bp	0.00215	0.00471			
	(0.40)	(0.96)			

Table 3: Static Model Comparison (Cont.)

L8.ln_fl_bp	-0.000387	-0.00420	X4	0.0136***	=
	(-0.07)	(-0.85)		(3.63)	
L9.ln_fl_bp	0.00169	-0.000756			
	(0.31)	(-0.15)			
L10.ln_fl_bp	-0.00665	-0.000510			
	(-1.26)	(-0.11)			
L11.ln_fl_bp	-0.00371	-0.00598			
	(-0.71)	(-1.28)			
L12.ln_fl_bp	-0.00590	-0.00341			
	(-1.18)	(-0.77)			
ln_us_epr	0.777**	0.439	0.257	0.126	
	(2.76)	(1.26)	(0.76)	(0.36)	
L.ln_us_epr	-0.407	0.189	0.00601	0.319	
	(-1.03)	(0.41)	(0.01)	(0.68)	
L2.ln_us_epr	-0.370	-0.0716	-0.0172	0.149	
	(-0.94)	(-0.15)	(-0.04)	(0.31)	
L3.ln_us_epr	-0.428	0.185	0.961**	-0.119	
	(-1.10)	(0.39)	(2.84)	(-0.25)	
L4.ln_us_epr	0.244	0.157		0.185	
	(0.61)	(0.33)		(0.47)	
L5.ln_us_epr	1.049**	-0.0987			
	(2.62)	(-0.21)			
L6.ln_us_epr	0.868*	0.307			
	(2.18)	(0.65)			
L7.ln_us_epr	-0.212	0.0339			
	(-0.53)	(0.07)			
L8.ln_us_epr	0.500	0.0443		0.321	
	(1.24)	(0.09)		(1.93)	
L9.ln_us_epr	-0.181	-0.0254			
	(-0.46)	(-0.05)			
L10.ln_us_epr	-0.290	0.0140			
	(-0.75)	(0.03)			
L11.ln_us_epr	0.0899	0.489			
	(0.23)	(1.03)			
L12.ln_us_epr	-0.598*	-0.423			
	(-2.23)	(-1.21)			

Table 4: Static Model Comparison (Cont.)

datec	X2	0.0000121***	0.0000129***	0.0000170***	=
		(7.29)	(8.05)	(11.29)	
1.monthly		0	0	0	
		(.)	(.)	(.)	
2.monthly		0.00993	0.00804	0.00782	
		(1.41)	(1.47)	(1.48)	
3.monthly		0.0118	0.0113	0.0124	
		(1.53)	(1.82)	(1.89)	
4.monthly		0.0108	0.0200***	0.00909	
		(1.27)	(3.65)	(1.25)	
5.monthly		0.00556	0.00956*	0.00656	
		(0.91)	(2.07)	(1.29)	
6.monthly		-0.00774	-0.0102	-0.0121*	
		(-1.05)	(-1.91)	(-2.13)	
7.monthly		-0.0180*	-0.0294***	-0.0230***	
		(-2.48)	(-5.96)	(-4.51)	
8.monthly		-0.00841	-0.0226***	-0.0130**	
		(-1.09)	(-5.84)	(-2.93)	
9.monthly		-0.00722	-0.0213***	-0.00983*	
		(-1.18)	(-5.86)	(-2.48)	
10.monthly		-0.00457	-0.0179**	-0.00346	
		(-0.55)	(-3.13)	(-0.58)	
11.monthly		0.00947	0.00305	0.00655	
		(1.24)	(0.58)	(1.16)	
12.monthly		0.0199**	0.0158***	0.0135**	
		(2.72)	(3.87)	(2.92)	
_cons	-14.11***	-11.38***	-10.94***	-7.172***	
	(-67.53)	(-26.72)	(-27.77)	(-13.45)	
N	371	371	380	263	
t statistics in parentheses					
="* p<0.05	** p<0.01	*** p<0.001"			

Conclusion

Given the output of model 4, the hypothesis seems to be correct. The number of building permits is not as significant predictor of the total nonfarm jobs as was originally thought. Some of the months now show lower p-values and the civilian labor force in Florida is more significant in this model. The fourth model still shows that building permits is relatively significant but not as much as the first 3 models. This makes intuitive sense, as to this researcher, the increase in new building permits should not account for a very large amount of job increase.

There are several problems with this analysis however. First of all, some of the data imports have general formatting issues due to limitations of the software used. To be specific, certain columns are placed in tables when they should not be. Another issue is that all of the variables used in this analysis are variables that may be farcical in concluding meaningful hypotheses from the data. One might assume that any one of these variables might just accumulate naturally over time. The existence of this accumulation, even in completely randomly generated variables, is misleading in analysing correlation as any correlation perceived may be spurious.

Appendix A: Stata Code

```
clear
set more off

* Importing the data
*cd "/Users/angelsarmiento/Documents/Graduate/First Year/Time Series/STATA/HW1"

import delimited "data.csv"

*Creating monthly time date
rename date datestring
gen datec=date(datestring,"YMD")
gen mdate=mofd(datec)
format mdate %tm
tsset mdate

*Converting all string values to Float. Ignoring NA values.
* ALL OF THESE VARIABLES WERE RENAMED IN R
destring fl_lf, replace ignore("NA")
destring fl_bp, replace ignore("NA")
destring us_epr_25to54, replace ignore("NA")

* Creating log versions of the variables
gen ln_fl_nonfarm = ln(fl_nonfarm)
gen ln_fl_lf = ln(fl_lf)
gen ln_fl_bp = ln(fl_bp)
gen ln_us_epr = ln(us_epr_25to54)


*Creating plots of each of the static models
*twoway (tsline ln_fl_bp) (tsline ln_fl_nonfarm, yaxis(2)) , name(ln_fl_bp), replace
*twoway (tsline ln_fl_lf) (tsline ln_fl_nonfarm, yaxis(2)), name(ln_fl_lf), replace
*twoway (tsline ln_fl_lf) (tsline ln_fl_nonfarm, yaxis(2)), name(ln_us_epr), replace

* this is the regression outputs for all of the variables without
* accounting for the time trends
reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr
eststo lnnonfarm1
* this is the regression output for all of the variables using monthly
* dates and accounting for time trends
gen monthly = month(datec)


reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr i.monthly datec
eststo lnnonfarm2
esttab lnnonfarm*

esttab lnnonfarm* using "ln_fl_nonfarm_models.csv", replace


* Finite Distributed Lag Model
reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr)
```

```
eststo nonfarm_lag
esttab nonfarm_lag


reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly
eststo nonfarm_lag2
esttab nonfarm_lag2


*more parsimonious models

* This model is chosen because the lags past around lag 4
* seem to be more and more insignificant.
reg ln_fl_nonfarm l(0/3).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly
eststo nonfarm_lag3
esttab nonfarm_lag3

reg ln_fl_nonfarm l(0/4, 8).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly if tin(1998m1, 2019m11)
eststo nonfarm_lag4
esttab nonfarm_lag4



esttab nonfarm_lag* using "ln_fl_nonfarm_lag_models.csv", replace
```

Appendix B: Log File

```
. * Importing the data
. *cd "/Users/angelsarmiento/Documents/Graduate/First Year/Time Series/STATA/HW1"
.
. import delimited "data.csv"
file data.csv not found
r(601);

end of do-file

r(601);

. cd "Z:\Documents\Graduate\First Year\Time Series\STATA\HW1"
Z:\Documents\Graduate\First Year\Time Series\STATA\HW1

. do "C:\Users\ANGELS~1\AppData\Local\Temp\STD00000000.tmp"

.
. clear

. set more off

.
. * Importing the data
. *cd "/Users/angelsarmiento/Documents/Graduate/First Year/Time Series/STATA/HW1"
.
. import delimited "data.csv"
(6 vars, 971 obs)
.
. *Creating monthly time date
. rename date datestring

. gen datec=date(datestring,"YMD")

. gen mdate=mofd(datec)

. format mdate %tm

. tsset mdate
        time variable:  mdate, 1939m1 to 2019m11
                delta:  1 month

.
. *Converting all string values to Float. Ignoring NA values.
. * ALL OF THESE VARIABLES WERE RENAMED IN R
. destring fl_lf, replace ignore("NA")
fl_lf: characters N A removed; replaced as long
(444 missing values generated)

. destring fl_bp, replace ignore("NA")
fl_bp: characters N A removed; replaced as int
(588 missing values generated)
```

```
. destring us_epr_25to54, replace ignore("NA")
us_epr_25to54: characters N A removed; replaced as double
(108 missing values generated)

.
. * Creating log versions of the variables
. gen ln_fl_nonfarm = ln(fl_nonfarm)

. gen ln_fl_lf = ln(fl_lf)
(444 missing values generated)

. gen ln_fl_bp = ln(fl_bp)
(588 missing values generated)

. gen ln_us_epr = ln(us_epr_25to54)
(108 missing values generated)

.
.
. *Creating plots of each of the static models
. *twoway (tsline ln_fl_bp) (tsline ln_fl_nonfarm, yaxis(2)) , name(ln_fl_bp), re
> place
. *twoway (tsline ln_fl_lf) (tsline ln_fl_nonfarm, yaxis(2)), name(ln_fl_lf), rep
> lace
. *twoway (tsline ln_fl_lf) (tsline ln_fl_nonfarm, yaxis(2)), name(ln_us_epr), re
> place
.
. *this is the regression outputs for all of the variables without accounting for
>  the time trends
. reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr

      Source |       SS       df       MS              Number of obs =     383
-------------+------------------------------           F(  3,   379) = 5929.08
       Model |  9.96299194     3  3.32099731           Prob > F      =  0.0000
    Residual |  .212285612   379   .00056012           R-squared     =  0.9791
-------------+------------------------------           Adj R-squared =  0.9790
       Total |  10.1752776   382  .026636852           Root MSE      =  .02367

------------------------------------------------------------------------------
ln_fl_nonf~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_fl_lf |   1.116008   .0092445   120.72   0.000     1.097831    1.134185
    ln_fl_bp |   .0441361   .0031709    13.92   0.000     .0379013     .050371
   ln_us_epr |   .7841122   .0587547    13.35   0.000     .6685861    .8996383
       _cons |  -12.55897   .3281169   -38.28   0.000    -13.20413   -11.91381
------------------------------------------------------------------------------

. eststo lnnonfarm1

. * this is the regression output for all of the variables using monthly dates an
> d accounting for time trends
. gen monthly = month(datec)
```

```
.
.
. reg ln_fl_nonfarm ln_fl_lf ln_fl_bp ln_us_epr i.monthly datec

      Source |       SS       df       MS              Number of obs =     383
-------------+------------------------------           F( 15,   367) = 4377.07
       Model |  10.1187166    15  .674581106           Prob > F      =  0.0000
    Residual |  .056560959   367  .000154117           R-squared     =  0.9944
-------------+------------------------------           Adj R-squared =  0.9942
       Total |  10.1752776   382  .026636852           Root MSE      =  .01241

------------------------------------------------------------------------------
ln_fl_nonf~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_fl_lf |   .9157156   .0353178    25.93   0.000      .846265    .9851663
    ln_fl_bp |   .0350855   .0019056    18.41   0.000     .0313382    .0388327
   ln_us_epr |   1.235839   .0476196    25.95   0.000     1.142197    1.329481
             |
     monthly |
          2  |    .003118   .0031088     1.00   0.317    -.0029954    .0092313
          3  |  -.0032324   .0031104    -1.04   0.299    -.0093489     .002884
          4  |   -.009392   .0031265    -3.00   0.003    -.0155401   -.0032439
          5  |  -.0212267   .0031366    -6.77   0.000    -.0273947   -.0150587
          6  |  -.0436098   .0031656   -13.78   0.000    -.0498347   -.0373848
          7  |  -.0610826   .0031985   -19.10   0.000    -.0673723   -.0547928
          8  |  -.0443029   .0031562   -14.04   0.000    -.0505094   -.0380965
          9  |  -.0314803   .0031454   -10.01   0.000    -.0376655   -.0252951
         10  |    -.02777   .0031675    -8.77   0.000    -.0339988   -.0215412
         11  |  -.0089755   .0032023    -2.80   0.005    -.0152727   -.0026784
         12  |      .0008     .00318     0.25   0.802    -.0054533    .0070532
             |
       datec |   .0000118   1.81e-06     6.52   0.000     8.24e-06    .0000154
       _cons |  -11.31772   .4323177   -26.18   0.000    -12.16785   -10.46759
------------------------------------------------------------------------------

. eststo lnnonfarm2

. esttab lnnonfarm*

--------------------------------------------
                      (1)             (2)   
             ln_fl_nonf~m    ln_fl_nonf~m   
--------------------------------------------
ln_fl_lf            1.116***        0.916***
                 (120.72)         (25.93)   

ln_fl_bp           0.0441***       0.0351***
                  (13.92)         (18.41)   

ln_us_epr           0.784***        1.236***
                  (13.35)         (25.95)   

1.monthly                               0   
                                      (.)   
```

```
2.monthly                          0.00312
                                    (1.00)

3.monthly                         -0.00323
                                   (-1.04)

4.monthly                         -0.00939**
                                   (-3.00)

5.monthly                          -0.0212***
                                   (-6.77)

6.monthly                          -0.0436***
                                  (-13.78)

7.monthly                          -0.0611***
                                  (-19.10)

8.monthly                          -0.0443***
                                  (-14.04)

9.monthly                          -0.0315***
                                  (-10.01)

10.monthly                         -0.0278***
                                   (-8.77)

11.monthly                        -0.00898**
                                   (-2.80)

12.monthly                        0.000800
                                    (0.25)

datec                            0.0000118***
                                    (6.52)

_cons                 -12.56***       -11.32***
                     (-38.28)        (-26.18)
--------------------------------------------
N                         383             383
--------------------------------------------
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

.
. esttab lnnonfarm* using "ln_fl_nonfarm_models.csv", replace
(output written to ln_fl_nonfarm_models.csv)

.
.
. * Finite Distributed Lag Model
. reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr)
```

Source	SS	df	MS
Model	8.92677921	39	.228891775
Residual	.041703887	331	.000125994
Total	8.9684831	370	.024239144

Number of obs =	371
F(39, 331) =	1816.69
Prob > F =	0.0000
R-squared =	0.9953
Adj R-squared =	0.9948
Root MSE =	.01122

ln_fl_nonf~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_fl_lf						
--.	.2388547	.2570827	0.93	0.354	-.2668673	.7445768
L1.	-.000633	.3402865	-0.00	0.999	-.6700299	.668764
L2.	.4273622	.3427384	1.25	0.213	-.2468579	1.101582
L3.	.6595995	.3421484	1.93	0.055	-.01346	1.332659
L4.	-.2547691	.343541	-0.74	0.459	-.9305681	.42103
L5.	-.5306081	.3423735	-1.55	0.122	-1.20411	.1428942
L6.	-.1021488	.3428774	-0.30	0.766	-.7766423	.5723448
L7.	.2086955	.3449754	0.60	0.546	-.4699253	.8873163
L8.	-.1533024	.3506231	-0.44	0.662	-.8430331	.5364283
L9.	.3780145	.3450936	1.10	0.274	-.3008387	1.056868
L10.	-.0002975	.3424737	-0.00	0.999	-.6739969	.673402
L11.	.011717	.3429308	0.03	0.973	-.6628817	.6863157
L12.	.2640682	.2592787	1.02	0.309	-.2459737	.7741101
ln_fl_bp						
--.	.0200186	.0047081	4.25	0.000	.010757	.0292802
L1.	.009102	.0050417	1.81	0.072	-.0008158	.0190197
L2.	.0121479	.0052074	2.33	0.020	.0019041	.0223916
L3.	.0030827	.0053641	0.57	0.566	-.0074693	.0136347
L4.	.0015596	.0053643	0.29	0.771	-.0089929	.0121121
L5.	.0063135	.0054296	1.16	0.246	-.0043675	.0169944
L6.	.00648	.0054768	1.18	0.238	-.0042937	.0172536
L7.	.0021471	.0054253	0.40	0.693	-.0085254	.0128195
L8.	-.0003866	.0054727	-0.07	0.944	-.0111522	.010379
L9.	.0016925	.0054476	0.31	0.756	-.0090238	.0124088
L10.	-.0066535	.0052764	-1.26	0.208	-.0170329	.003726
L11.	-.0037053	.0052177	-0.71	0.478	-.0139693	.0065587
L12.	-.0058999	.0049853	-1.18	0.237	-.0157067	.003907
ln_us_epr						
--.	.776536	.2815287	2.76	0.006	.222725	1.330347
L1.	-.4071616	.3944698	-1.03	0.303	-1.183146	.3688224
L2.	-.3697759	.3917769	-0.94	0.346	-1.140463	.4009107
L3.	-.428252	.389415	-1.10	0.272	-1.194292	.3377884
L4.	.2437774	.3993805	0.61	0.542	-.5418668	1.029422
L5.	1.048525	.400493	2.62	0.009	.2606926	1.836358
L6.	.867988	.3981498	2.18	0.030	.0847649	1.651211
L7.	-.2119943	.3981801	-0.53	0.595	-.995277	.5712883
L8.	.5000648	.4018268	1.24	0.214	-.2903915	1.290521
L9.	-.1814755	.3932542	-0.46	0.645	-.9550683	.5921172
L10.	-.2895834	.3885568	-0.75	0.457	-1.053935	.4747687
L11.	.0899008	.3880226	0.23	0.817	-.6734004	.8532021
L12.	-.5984199	.2689136	-2.23	0.027	-1.127415	-.0694247

```
             |
       _cons |  -14.10868   .2089183   -67.53   0.000    -14.51966   -13.69771
------------------------------------------------------------------------------

. eststo nonfarm_lag

. esttab nonfarm_lag

----------------------------
                      (1)
             ln_fl_nonf~m
----------------------------
ln_fl_lf            0.239
                   (0.93)

L.ln_fl_lf      -0.000633
                  (-0.00)

L2.ln_fl_lf         0.427
                   (1.25)

L3.ln_fl_lf         0.660
                   (1.93)

L4.ln_fl_lf        -0.255
                  (-0.74)

L5.ln_fl_lf        -0.531
                  (-1.55)

L6.ln_fl_lf        -0.102
                  (-0.30)

L7.ln_fl_lf         0.209
                   (0.60)

L8.ln_fl_lf        -0.153
                  (-0.44)

L9.ln_fl_lf         0.378
                   (1.10)

L10.ln_fl_lf    -0.000297
                  (-0.00)

L11.ln_fl_lf       0.0117
                   (0.03)

L12.ln_fl_lf        0.264
                   (1.02)

ln_fl_bp           0.0200***
                   (4.25)
```

L.ln_fl_bp	0.00910
	(1.81)
L2.ln_fl_bp	0.0121*
	(2.33)
L3.ln_fl_bp	0.00308
	(0.57)
L4.ln_fl_bp	0.00156
	(0.29)
L5.ln_fl_bp	0.00631
	(1.16)
L6.ln_fl_bp	0.00648
	(1.18)
L7.ln_fl_bp	0.00215
	(0.40)
L8.ln_fl_bp	-0.000387
	(-0.07)
L9.ln_fl_bp	0.00169
	(0.31)
L10.ln_fl_bp	-0.00665
	(-1.26)
L11.ln_fl_bp	-0.00371
	(-0.71)
L12.ln_fl_bp	-0.00590
	(-1.18)
ln_us_epr	0.777**
	(2.76)
L.ln_us_epr	-0.407
	(-1.03)
L2.ln_us_epr	-0.370
	(-0.94)
L3.ln_us_epr	-0.428
	(-1.10)
L4.ln_us_epr	0.244
	(0.61)
L5.ln_us_epr	1.049**
	(2.62)

```
L6.ln_us_epr        0.868*
                   (2.18)

L7.ln_us_epr       -0.212
                  (-0.53)

L8.ln_us_epr        0.500
                   (1.24)

L9.ln_us_epr       -0.181
                  (-0.46)

L10.ln_us_~r       -0.290
                  (-0.75)

L11.ln_us_~r       0.0899
                   (0.23)

L12.ln_us_~r       -0.598*
                  (-2.23)

_cons              -14.11***
                 (-67.53)
----------------------------
N                     371
----------------------------
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

.
.
. reg ln_fl_nonfarm l(0/12).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly

      Source |       SS       df       MS              Number of obs =     371
-------------+------------------------------           F( 51,   319) = 1857.33
       Model |  8.93838142    51  .175262381           Prob > F      =  0.0000
    Residual |  .030101677   319  .000094363           R-squared     =  0.9966
-------------+------------------------------           Adj R-squared =  0.9961
       Total |   8.9684831   370  .024239144           Root MSE      =  .00971

------------------------------------------------------------------------------
ln_fl_nonf~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_fl_lf |
         --. |    .398954   .2718706     1.47   0.143    -.1359319    .9338399
         L1. |   -.060362   .3610206    -0.17   0.867    -.7706442    .6499203
         L2. |   .0361034   .3684202     0.10   0.922    -.6887369    .7609438
         L3. |   .1096959   .3681739     0.30   0.766      -.61466    .8340518
         L4. |   .0088468   .3718929     0.02   0.981    -.7228259    .7405194
         L5. |   .0332763   .3701282     0.09   0.928    -.6949245     .761477
         L6. |   .1460054   .3698971     0.39   0.693    -.5817407    .8737516
         L7. |   .1735757   .3700134     0.47   0.639    -.5543992    .9015506
         L8. |  -.0241833   .3737599    -0.06   0.948    -.7595291    .7111624
         L9. |   .1097723   .3755356     0.29   0.770    -.6290671    .8486118
```

```
        L10. |   .1565286   .3791518     0.41   0.680    -.5894254    .9024825
        L11. |  -.2308017   .3789415    -0.61   0.543     -.976342    .5147385
        L12. |   .0558725   .2862178     0.20   0.845    -.5072406    .6189855
             |
    ln_fl_bp |
         --. |    .017885   .0043544     4.11   0.000     .0093181    .0264519
         L1. |   .0085614   .0047291     1.81   0.071    -.0007428    .0178656
         L2. |   .0062937   .0048413     1.30   0.195    -.0032312    .0158187
         L3. |   .0067312   .0049499     1.36   0.175    -.0030075    .0164698
         L4. |   .0041435   .0049514     0.84   0.403     -.005598     .013885
         L5. |   .0038795   .0049423     0.78   0.433    -.0058442    .0136031
         L6. |   .0048602    .005011     0.97   0.333    -.0049986    .0147191
         L7. |   .0047119   .0049165     0.96   0.339     -.004961    .0143849
         L8. |  -.0042013   .0049678    -0.85   0.398    -.0139751    .0055724
         L9. |  -.0007556   .0049059    -0.15   0.878    -.0104076    .0088964
        L10. |  -.0005096   .0047748    -0.11   0.915    -.0099036    .0088845
        L11. |   -.005979   .0046848    -1.28   0.203    -.0151961     .003238
        L12. |  -.0034119   .0044434    -0.77   0.443     -.012154    .0053301
             |
   ln_us_epr |
         --. |   .4387865   .3485176     1.26   0.209    -.2468968     1.12447
         L1. |   .1889491   .4625007     0.41   0.683    -.7209879    1.098886
         L2. |  -.0715753   .4712786    -0.15   0.879    -.9987823    .8556317
         L3. |   .1848134   .4702766     0.39   0.695    -.7404222    1.110049
         L4. |   .1573845   .4727168     0.33   0.739     -.772652    1.087421
         L5. |  -.0987211   .4729464    -0.21   0.835    -1.029209     .831767
         L6. |   .3065322   .4732293     0.65   0.518    -.6245127    1.237577
         L7. |   .0339463   .4718891     0.07   0.943    -.8944618    .9623543
         L8. |   .0443145   .4771704     0.09   0.926    -.8944842    .9831131
         L9. |  -.0253721   .4757604    -0.05   0.958    -.9613966    .9106524
        L10. |   .0140092   .4772669     0.03   0.977    -.9249793    .9529977
        L11. |    .488974   .4739077     1.03   0.303    -.4434054    1.421353
        L12. |  -.4229569   .3492525    -1.21   0.227    -1.110086    .2641724
             |
       datec |   .0000121   1.65e-06     7.29   0.000     8.80e-06    .0000153
             |
     monthly |
          2  |     .00993   .0070268     1.41   0.159    -.0038948    .0237548
          3  |   .0117641    .007671     1.53   0.126     -.003328    .0268563
          4  |   .0108275   .0084946     1.27   0.203    -.0058851    .0275401
          5  |   .0055635   .0060854     0.91   0.361    -.0064092    .0175361
          6  |  -.0077413   .0074067    -1.05   0.297    -.0223134    .0068308
          7  |  -.0179781   .0072575    -2.48   0.014    -.0322567   -.0036995
          8  |  -.0084088   .0076984    -1.09   0.276    -.0235549    .0067373
          9  |  -.0072233   .0061222    -1.18   0.239    -.0192684    .0048217
         10  |  -.0045728   .0083469    -0.55   0.584    -.0209947    .0118492
         11  |   .0094729   .0076324     1.24   0.215    -.0055433    .0244891
         12  |   .0198697   .0072919     2.72   0.007     .0055234     .034216
             |
       _cons |  -11.38017   .4259794   -26.72   0.000    -12.21825   -10.54209
------------------------------------------------------------------------------

. eststo nonfarm_lag2
```

```
. esttab nonfarm_lag2

----------------------------
                      (1)   
             ln_fl_nonf~m   
----------------------------
ln_fl_lf            0.399   
                   (1.47)   

L.ln_fl_lf        -0.0604   
                  (-0.17)   

L2.ln_fl_lf        0.0361   
                   (0.10)   

L3.ln_fl_lf         0.110   
                   (0.30)   

L4.ln_fl_lf       0.00885   
                   (0.02)   

L5.ln_fl_lf        0.0333   
                   (0.09)   

L6.ln_fl_lf         0.146   
                   (0.39)   

L7.ln_fl_lf         0.174   
                   (0.47)   

L8.ln_fl_lf       -0.0242   
                  (-0.06)   

L9.ln_fl_lf         0.110   
                   (0.29)   

L10.ln_fl_lf        0.157   
                   (0.41)   

L11.ln_fl_lf       -0.231   
                  (-0.61)   

L12.ln_fl_lf       0.0559   
                   (0.20)   

ln_fl_bp           0.0179***
                   (4.11)   

L.ln_fl_bp        0.00856   
                   (1.81)   

L2.ln_fl_bp       0.00629   
                   (1.30)   
```

L3.ln_fl_bp	0.00673
	(1.36)
L4.ln_fl_bp	0.00414
	(0.84)
L5.ln_fl_bp	0.00388
	(0.78)
L6.ln_fl_bp	0.00486
	(0.97)
L7.ln_fl_bp	0.00471
	(0.96)
L8.ln_fl_bp	-0.00420
	(-0.85)
L9.ln_fl_bp	-0.000756
	(-0.15)
L10.ln_fl_bp	-0.000510
	(-0.11)
L11.ln_fl_bp	-0.00598
	(-1.28)
L12.ln_fl_bp	-0.00341
	(-0.77)
ln_us_epr	0.439
	(1.26)
L.ln_us_epr	0.189
	(0.41)
L2.ln_us_epr	-0.0716
	(-0.15)
L3.ln_us_epr	0.185
	(0.39)
L4.ln_us_epr	0.157
	(0.33)
L5.ln_us_epr	-0.0987
	(-0.21)
L6.ln_us_epr	0.307
	(0.65)
L7.ln_us_epr	0.0339
	(0.07)

L8.ln_us_epr	0.0443
	(0.09)
L9.ln_us_epr	-0.0254
	(-0.05)
L10.ln_us_~r	0.0140
	(0.03)
L11.ln_us_~r	0.489
	(1.03)
L12.ln_us_~r	-0.423
	(-1.21)
datec	0.0000121***
	(7.29)
1.monthly	0
	(.)
2.monthly	0.00993
	(1.41)
3.monthly	0.0118
	(1.53)
4.monthly	0.0108
	(1.27)
5.monthly	0.00556
	(0.91)
6.monthly	-0.00774
	(-1.05)
7.monthly	-0.0180*
	(-2.48)
8.monthly	-0.00841
	(-1.09)
9.monthly	-0.00722
	(-1.18)
10.monthly	-0.00457
	(-0.55)
11.monthly	0.00947
	(1.24)
12.monthly	0.0199**
	(2.72)

```
_cons              -11.38***
                  (-26.72)
----------------------------
N                      371
----------------------------
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

.
.
. *more parsimonious models
.
. *This model is chosen because the lags past around lag 4 seem to be more and mo
> re insignificant.
. reg ln_fl_nonfarm l(0/3).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly

      Source |       SS       df       MS              Number of obs =     380
-------------+------------------------------           F( 24,   355) = 3727.27
       Model |  9.81947902    24  .409144959           Prob > F      =  0.0000
    Residual |  .038968607   355  .000109771           R-squared     =  0.9960
-------------+------------------------------           Adj R-squared =  0.9958
       Total |  9.85844762   379  .026011735           Root MSE      =  .01048

------------------------------------------------------------------------------
ln_fl_nonf~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_fl_lf |
         --. |   .6766356   .2696997     2.51   0.013     .1462256    1.207046
         L1. |   .0216692   .3740476     0.06   0.954    -.7139585     .757297
         L2. |   .0124476   .3802703     0.03   0.974    -.7354181    .7603133
         L3. |   .1834343   .2750336     0.67   0.505    -.3574657    .7243343
             |
    ln_fl_bp |
         --. |   .0219692   .0043693     5.03   0.000     .0133762    .0305622
         L1. |   .0099885   .0045519     2.19   0.029     .0010365    .0189406
         L2. |    .005084   .0045734     1.11   0.267    -.0039104    .0140784
         L3. |   .0038514    .004499     0.86   0.393    -.0049966    .0126995
             |
   ln_us_epr |
         --. |    .257017    .338193     0.76   0.448    -.4080967    .9221307
         L1. |   .0060073    .468909     0.01   0.990    -.9161815    .9281961
         L2. |  -.0172199   .4738445    -0.04   0.971    -.9491152    .9146753
         L3. |   .9607057   .3379591     2.84   0.005      .296052    1.625359
             |
       datec |   .0000129   1.60e-06     8.05   0.000     9.74e-06     .000016
             |
     monthly |
          2  |   .0080382   .0054825     1.47   0.143     -.002744    .0188204
          3  |   .0112847   .0061912     1.82   0.069    -.0008914    .0234608
          4  |   .0200366   .0054906     3.65   0.000     .0092384    .0308349
          5  |   .0095576   .0046154     2.07   0.039     .0004807    .0186345
          6  |  -.0102312   .0053478    -1.91   0.057    -.0207486    .0002862
          7  |  -.0293823   .0049313    -5.96   0.000    -.0390805   -.0196841
          8  |  -.0225581   .0038641    -5.84   0.000    -.0301576   -.0149587
```

```
           9  |  -.0212664   .0036314    -5.86   0.000    -.0284081   -.0141246
          10  |  -.0178821   .0057128    -3.13   0.002    -.0291172    -.006647
          11  |   .0030458   .0052768     0.58   0.564    -.0073319    .0134235
          12  |    .015797     .00408     3.87   0.000      .007773     .023821
              |
        _cons |  -10.94204   .3940918   -27.77   0.000    -11.71709     -10.167
------------------------------------------------------------------------------

. eststo nonfarm_lag3

. esttab nonfarm_lag3

----------------------------
                      (1)
             ln_fl_nonf~m
----------------------------
ln_fl_lf            0.677*
                   (2.51)

L.ln_fl_lf         0.0217
                   (0.06)

L2.ln_fl_lf        0.0124
                   (0.03)

L3.ln_fl_lf         0.183
                   (0.67)

ln_fl_bp           0.0220***
                   (5.03)

L.ln_fl_bp        0.00999*
                   (2.19)

L2.ln_fl_bp       0.00508
                   (1.11)

L3.ln_fl_bp       0.00385
                   (0.86)

ln_us_epr           0.257
                   (0.76)

L.ln_us_epr       0.00601
                   (0.01)

L2.ln_us_epr      -0.0172
                  (-0.04)

L3.ln_us_epr        0.961**
                   (2.84)

datec           0.0000129***
                   (8.05)
```

```
1.monthly                0
                       (.)

2.monthly          0.00804
                    (1.47)

3.monthly           0.0113
                    (1.82)

4.monthly           0.0200***
                    (3.65)

5.monthly          0.00956*
                    (2.07)

6.monthly          -0.0102
                   (-1.91)

7.monthly          -0.0294***
                   (-5.96)

8.monthly          -0.0226***
                   (-5.84)

9.monthly          -0.0213***
                   (-5.86)

10.monthly         -0.0179**
                   (-3.13)

11.monthly         0.00305
                    (0.58)

12.monthly          0.0158***
                    (3.87)

_cons               -10.94***
                  (-27.77)
----------------------------
N                      380
----------------------------
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

.
. reg ln_fl_nonfarm l(0/4, 8).(ln_fl_lf ln_fl_bp ln_us_epr) datec i.monthly if ti
> n(1998m1, 2019m11)

      Source |       SS       df       MS              Number of obs =     263
-------------+------------------------------           F( 30,   232) =  842.21
       Model |  1.67773399    30  .055924466           Prob > F      =  0.0000
    Residual |  .015405278   232  .000066402           R-squared     =  0.9909
-------------+------------------------------           Adj R-squared =  0.9897
```

```
       Total |  1.69313927   262  .006462364           Root MSE      =  .00815

------------------------------------------------------------------------------
ln_fl_nonf~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_fl_lf |
         --. |   .5379549   .2640614     2.04   0.043     .0176901     1.05822
         L1. |  -.0131634   .3620392    -0.04   0.971    -.7264682    .7001414
         L2. |  -.0173824   .3718019    -0.05   0.963    -.7499222    .7151574
         L3. |   .3094965   .3713038     0.83   0.405    -.4220618    1.041055
         L4. |   .0242732    .305861     0.08   0.937     -.578347    .6268934
         L8. |  -.1324231   .1442353    -0.92   0.360    -.4166015    .1517554
             |
    ln_fl_bp |
         --. |   .0099823   .0041221     2.42   0.016     .0018607    .0181038
         L1. |   .0083077   .0043457     1.91   0.057    -.0002544    .0168699
         L2. |    .003858   .0045149     0.85   0.394    -.0050375    .0127535
         L3. |   .0056752   .0044789     1.27   0.206    -.0031493    .0144997
         L4. |    .004619    .004368     1.06   0.291     -.003987    .0132249
         L8. |   .0135956   .0037495     3.63   0.000     .0062082     .020983
             |
   ln_us_epr |
         --. |    .126399   .3483614     0.36   0.717    -.5599572    .8127552
         L1. |   .3191415   .4681803     0.68   0.496    -.6032871     1.24157
         L2. |   .1489425   .4809766     0.31   0.757    -.7986978    1.096583
         L3. |   -.118788   .4807789    -0.25   0.805    -1.066039    .8284627
         L4. |   .1851347   .3952589     0.47   0.640    -.5936211    .9638904
         L8. |   .3211695   .1668264     1.93   0.055    -.0075189    .6498579
             |
       datec |    .000017   1.50e-06    11.29   0.000      .000014    .0000199
             |
     monthly |
          2  |   .0078204   .0052919     1.48   0.141    -.0026059    .0182467
          3  |   .0124008   .0065538     1.89   0.060    -.0005117    .0253133
          4  |   .0090886   .0072926     1.25   0.214    -.0052797    .0234568
          5  |   .0065625   .0051037     1.29   0.200     -.003493    .0166181
          6  |  -.0121185   .0056892    -2.13   0.034    -.0233277   -.0009094
          7  |  -.0230236   .0051011    -4.51   0.000    -.0330741   -.0129731
          8  |  -.0130314   .0044426    -2.93   0.004    -.0217844   -.0042784
          9  |  -.0098293   .0039674    -2.48   0.014    -.0176461   -.0020125
         10  |  -.0034589   .0059354    -0.58   0.561    -.0151531    .0082354
         11  |   .0065546   .0056717     1.16   0.249      -.00462    .0177292
         12  |   .0135055   .0046267     2.92   0.004     .0043899    .0226211
             |
       _cons |  -7.172393   .5334589   -13.45   0.000    -8.223437    -6.12135
------------------------------------------------------------------------------

. eststo nonfarm_lag4

. esttab nonfarm_lag4

----------------------------
                      (1)
             ln_fl_nonf~m
```

ln_fl_lf	0.538*
	(2.04)
L.ln_fl_lf	-0.0132
	(-0.04)
L2.ln_fl_lf	-0.0174
	(-0.05)
L3.ln_fl_lf	0.309
	(0.83)
L4.ln_fl_lf	0.0243
	(0.08)
L8.ln_fl_lf	-0.132
	(-0.92)
ln_fl_bp	0.00998*
	(2.42)
L.ln_fl_bp	0.00831
	(1.91)
L2.ln_fl_bp	0.00386
	(0.85)
L3.ln_fl_bp	0.00568
	(1.27)
L4.ln_fl_bp	0.00462
	(1.06)
L8.ln_fl_bp	0.0136***
	(3.63)
ln_us_epr	0.126
	(0.36)
L.ln_us_epr	0.319
	(0.68)
L2.ln_us_epr	0.149
	(0.31)
L3.ln_us_epr	-0.119
	(-0.25)
L4.ln_us_epr	0.185
	(0.47)
L8.ln_us_epr	0.321
	(1.93)

datec	0.0000170***
	(11.29)
1.monthly	0
	(.)
2.monthly	0.00782
	(1.48)
3.monthly	0.0124
	(1.89)
4.monthly	0.00909
	(1.25)
5.monthly	0.00656
	(1.29)
6.monthly	-0.0121*
	(-2.13)
7.monthly	-0.0230***
	(-4.51)
8.monthly	-0.0130**
	(-2.93)
9.monthly	-0.00983*
	(-2.48)
10.monthly	-0.00346
	(-0.58)
11.monthly	0.00655
	(1.16)
12.monthly	0.0135**
	(2.92)
_cons	-7.172***
	(-13.45)
N	263

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001