Handout seminar 9, ECON4150

Herman Kruse

April 25, 2013

```
gen lbnpcap =ln(bnpcap)
gen lbnpcap_1=lbnpcap[_n-1]

gen dlbnpcap = lbnpcap-lbnpcap_1
gen bnpcapgrowth = (bnpcap/bnpcap[_n-1] -1)

reg lbnpcap trend if inrange(year, 1947, 2010)
```

```
      Source |       SS       df       MS              Number of obs =      64
-------------+------------------------------           F(  1,    62) = 4775.61
       Model |  20.3683761     1  20.3683761           Prob > F      =  0.0000
    Residual |  .264435223    62  .004265084           R-squared     =  0.9872
-------------+------------------------------           Adj R-squared =  0.9870
       Total |  20.6328113    63  .327504941           Root MSE      =  .06531

------------------------------------------------------------------------------
     lbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trend |   .0305388   .0004419    69.11    2.2e-60     .0296554    .0314222
       _cons |   7.471852   .0665685   112.24    2.5e-73     7.338784    7.604921
------------------------------------------------------------------------------
```

```
predict ehat, residuals
gen ehat_1 = ehat[_n-1]
reg ehat trend ehat_1 if inrange(year, 1948, 2010)
```

```
      Source |       SS       df       MS              Number of obs =      63
-------------+------------------------------           F(  2,    60) =  439.03
       Model |  .242169869     2  .121084935           Prob > F      =  0.0000
    Residual |  .016548031    60  .000275801           R-squared     =  0.9360
-------------+------------------------------           Adj R-squared =  0.9339
       Total |    .2587179    62  .004172869           Root MSE      =  .01661

------------------------------------------------------------------------------
        ehat |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trend |  -.0004653   .0001157    -4.02    1.6e-04    -.0006967   -.0002339
      ehat_1 |   1.060145   .0357973    29.62    1.6e-37     .9885393    1.13175
       _cons |   .0673668   .0174639     3.86    2.8e-04     .0324338    .1022997
------------------------------------------------------------------------------
```

```
drop ehat ehat_1
gen trend_1 = trend[_n-1]
gen dtrend = trend-trend_1
reg dlbnpcap dtrend if inrange(year, 1947, 2010), nocons
```

```
      Source |       SS       df       MS              Number of obs =      64
-------------+------------------------------           F(  1,    63) =  124.33
       Model |   .05621726     1   .05621726           Prob > F      =  0.0000
    Residual |  .028486275    63  .000452163           R-squared     =  0.6637
-------------+------------------------------           Adj R-squared =  0.6584
       Total |  .084703535    64  .001323493           Root MSE      =  .02126

------------------------------------------------------------------------------
    dlbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |   .0296377    .002658    11.15    1.5e-16     .0243261    .0349493
------------------------------------------------------------------------------
```

```
predict ehat, residuals
gen ehat_1 = ehat[_n-1]
reg ehat dtrend ehat_1 if inrange(year, 1948, 2010), nocons
```

```
      Source |       SS       df       MS              Number of obs =      63
-------------+------------------------------           F(  2,    61) =    8.41
       Model |  .004663651     2  .002331825           Prob > F      =  0.0006
    Residual |  .016905926    61  .000277146           R-squared     =  0.2162
-------------+------------------------------           Adj R-squared =  0.1905
       Total |  .021569577    63  .000342374           Root MSE      =  .01665

------------------------------------------------------------------------------
        ehat |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |  -.0015635   .0020983    -0.75    4.6e-01    -.0057593    .0026323
      ehat_1 |   .4101784     .10119     4.05    1.5e-04     .2078365    .6125202
------------------------------------------------------------------------------
```

```
drop ehat ehat_1
reg dlbnpcap dtrend if inrange(year, 1905, 1946), nocons
```

```
      Source |       SS       df       MS              Number of obs =      42
-------------+------------------------------           F(  1,    41) =    6.05
       Model |  .016614365     1  .016614365           Prob > F      =  0.0182
    Residual |  .112582602    41  .002745917           R-squared     =  0.1286
-------------+------------------------------           Adj R-squared =  0.1073
       Total |  .129196966    42  .003076118           Root MSE      =   .0524

------------------------------------------------------------------------------
    dlbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |   .0198892   .0080857     2.46    1.8e-02     .0035597    .0362187
------------------------------------------------------------------------------
```

```
reg dlbnpcap dtrend if inrange(year, 1947, 2010), nocons
```

```
      Source |       SS       df       MS              Number of obs =      64
-------------+------------------------------           F(  1,    63) =  124.33
       Model |   .05621726     1   .05621726           Prob > F      =  0.0000
    Residual |  .028486275    63  .000452163           R-squared     =  0.6637
-------------+------------------------------           Adj R-squared =  0.6584
       Total |  .084703535    64  .001323493           Root MSE      =  .02126

------------------------------------------------------------------------------
    dlbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |   .0296377    .002658    11.15    1.5e-16     .0243261    .0349493
------------------------------------------------------------------------------
```

```
reg dlbnpcap dtrend if inrange(year, 1905, 2010), nocons
```

```
      Source |       SS       df       MS              Number of obs =     106
-------------+------------------------------           F(  1,   105) =   51.54
       Model |  .070421711     1  .070421711           Prob > F      =  0.0000
    Residual |  .143478791   105  .001366465           R-squared     =  0.3292
-------------+------------------------------           Adj R-squared =  0.3228
       Total |  .213900502   106  .002017929           Root MSE      =  .03697

------------------------------------------------------------------------------
    dlbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |   .0257751   .0035904     7.18    1.0e-10     .0186559    .0328943
------------------------------------------------------------------------------
```

```
gen dumWWII = 0
replace dumWWII = 1 if inrange(year, 1947, 2010)
gen dumWWIItrend = dumWWII*trend
reg lbnpcap trend dumWWIItrend if inrange(year, 1905, 2010)
```

```
      Source |       SS       df       MS              Number of obs =     106
-------------+------------------------------           F(  2,   103) = 5089.04
       Model |  81.3344015     2  40.6672007           Prob > F      =  0.0000
    Residual |  .823086275   103  .007991129           R-squared     =  0.9900
-------------+------------------------------           Adj R-squared =  0.9898
       Total |  82.1574877   105  .782452264           Root MSE      =  .08939

------------------------------------------------------------------------------
     lbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trend |   .0271661   .0007315    37.14    1.9e-61     .0257153    .0286169
dumWWIItrend |   .0006483   .0003004     2.16    3.3e-02     .0000525     .001244
       _cons |   7.885372   .0703467   112.09    2.e-109     7.745855    8.024888
------------------------------------------------------------------------------
```

```
reg dlbnpcap dtrend dumWWII if inrange(year, 1905, 2010), nocons
```

```
      Source |       SS       df       MS              Number of obs =     106
-------------+------------------------------           F(  2,   104) =   26.85
       Model |  .072831625     2  .036415812           Prob > F      =  0.0000
    Residual |  .141068877   104  .001356432           R-squared     =  0.3405
-------------+------------------------------           Adj R-squared =  0.3278
       Total |  .213900502   106  .002017929           Root MSE      =  .03683

------------------------------------------------------------------------------
    dlbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      dtrend |   .0198892    .005683     3.50    6.9e-04     .0086197    .0311587
     dumWWII |   .0097485   .0073137     1.33    1.9e-01    -.0047548    .0242519
------------------------------------------------------------------------------
```

```
gen trendsq = trend^2
gen D47 = 0
replace D47 = 1 if year == 1947
gen D58 = 0
replace D58 = 1 if year == 1958
gen D82 = 0
replace D82 = 1 if year == 1982
gen D88 = 0
replace D88 = 1 if year == 1988
gen D09 = 0
replace D09 = 1 if year == 2009
```

```
reg lbnpcap lbnpcap_1 trend trendsq D* if inrange(year, 1947, 2010)
```

```
      Source |       SS       df       MS              Number of obs =      64
-------------+------------------------------           F(  8,    55) =15834.70
       Model |   20.623857     8  2.57798212           Prob > F      =  0.0000
    Residual |  .008954321    55  .000162806           R-squared     =  0.9996
-------------+------------------------------           Adj R-squared =  0.9995
       Total |  20.6328113    63  .327504941           Root MSE      =  .01276

------------------------------------------------------------------------------
     lbnpcap |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   lbnpcap_1 |   .9599643   .0526567    18.23    5.6e-25     .8544379    1.065491
       trend |   .0077264    .004453     1.74    8.8e-02    -.0011977    .0166505
     trendsq |   -.000023   .0000101    -2.29    2.6e-02    -.0000432   -2.89e-06
         D47 |   .0782757   .0139028     5.63    6.3e-07     .0504139    .1061376
         D58 |  -.0537578   .0130342    -4.12    1.3e-04    -.0798788   -.0276367
         D82 |  -.0360362   .0131204    -2.75    8.1e-03      -.06233   -.0097424
         D88 |  -.0366377   .0131902    -2.78    7.5e-03    -.0630715    -.010204
         D09 |  -.0377651   .0137735    -2.74    8.2e-03    -.0653678   -.0101624
       _cons |  -.1203576   .2415579    -0.50    6.2e-01    -.6044504    .3637353
------------------------------------------------------------------------------
```

```
predict ehat, residuals
test lbnpcap_1 trendsq D47 D58 D82 D88 D09
```

```
 ( 1)  lbnpcap_1 = 0
 ( 2)  trendsq = 0
 ( 3)  D47 = 0
 ( 4)  D58 = 0
 ( 5)  D82 = 0
 ( 6)  D88 = 0
 ( 7)  D09 = 0

       F(  7,    55) =  224.18
            Prob > F =    0.0000
```

```
test (lbnpcap_1=1)(trend=0)(trendsq=0)
foreach v of  var D* {
test `v' = 0, accum
}
```

```
 ( 1)  lbnpcap_1 = 1
 ( 2)  trend = 0
 ( 3)  trendsq = 0
 ( 4)  D47 = 0
 ( 5)  D58 = 0
 ( 6)  D82 = 0
 ( 7)  D88 = 0
 ( 8)  D09 = 0

       F(  8,    55) =   15.00
            Prob > F =    0.0000
```

```
gen ehat_1 = ehat[_n-1]
reg ehat lbnpcap_1 trend trendsq D* ehat_1 if inrange(year, 1948, 2010)
```

```
      Source |       SS       df       MS              Number of obs =      63
-------------+------------------------------           F(  8,    54) =    0.00
       Model |  1.1372e-06     8  1.4216e-07           Prob > F      =  1.0000
    Residual |  .008953184    54    .0001658           R-squared     =  0.0001
-------------+------------------------------           Adj R-squared = -0.1480
       Total |  .008954321    62  .000144425           Root MSE      =  .01288

------------------------------------------------------------------------------
        ehat |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   lbnpcap_1 |  -.0016744   .0568546    -0.03    9.8e-01     -.115661    .1123123
       trend |   .0001404   .0048031     0.03    9.8e-01    -.0094891      .00977
     trendsq |  -2.98e-07   .0000108    -0.03    9.8e-01    -.0000219    .0000213
         D47 |           0  (omitted)
         D58 |   .0001742   .0133205     0.01    9.9e-01    -.0265319    .0268803
         D82 |    .000354   .0139132     0.03    9.8e-01    -.0275403    .0282483
         D88 |   .0003061   .0138146     0.02    9.8e-01    -.0273905    .0280028
         D09 |   .0001915   .0140907     0.01    9.9e-01    -.0280585    .0284416
      ehat_1 |   .0133843   .1616068     0.08    9.3e-01    -.3106178    .3373863
       _cons |   .0058549   .2538127     0.02    9.8e-01    -.5030088    .5147186
------------------------------------------------------------------------------
```

```
di invttail(38, 0.4/2)
```

```
.85118276
```