Wilcox and the LC/PI Hypothesis

TABLE 1

SHORT CHRONOLOGY OF STATUTORY AND AUTOMATIC INCREASES IN PRIMARY INSURANCE BENEFITS UNDER OASI

Date of First Benefit Payment Reflecting Increase	Size of Increase (%)	Newspaper Announcement Date
October 1, 1965	7.0	July 31, 1965
March 1, 1968	13.0	January 3, 1968
April 1, 1970	15.0	December 31, 1969
June 1, 1971	10.0	March 18, 1971
October 1, 1972	20.0	July 2, 1972
July 1, 1974*	5.6	July 2, 1973
April 1, 1974	7.0	January 4, 1974
July 1, 1974	4.0	January 4, 1974
July 1, 1975	8.0	May 16, 1975
July 1, 1976	6.4	April 22, 1976
July 1, 1977	5.9	April 22, 1977
July 1, 1978	6.5	April 29, 1978
July 1, 1979	9.9	April 27, 1979
July 1, 1980	14.3	April 23, 1980
July 1, 1981	11.2	April 24, 1981
July 1, 1982	7.4	May 19, 1982
January 1, 1984	3.5	April 23, 1983
January 1, 1985	3.5	October 25, 1984

* Never took effect. It was superseded by the next two increases of 7.0 and 4.0 percent.

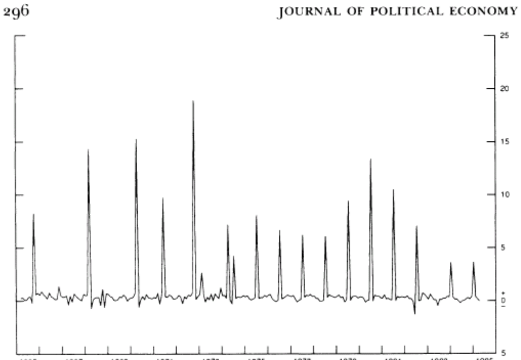
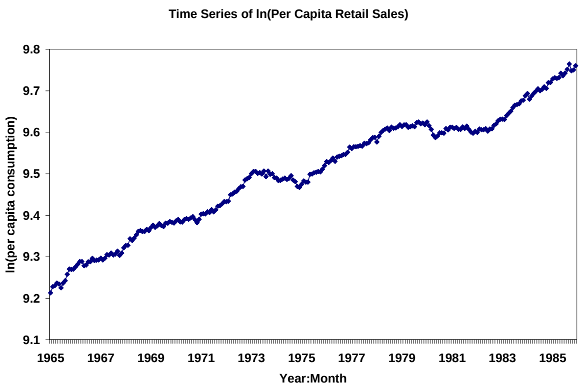


FIG. 1.—Benefits in current payment status: OASI trust fund (percentage change in per capita benefits).

on information available as of $t - 1$. If Z_{t-1} is any variable in the information set at $t - 1$ and it is not included in the specification of the optimal predictor, then Z_{t-1} should not increase the explanatory power of the equation. The formal statement of the test is

$$\Delta \log(X_{jt}) = \alpha_j + \beta(L)\Delta \log(\mathbf{X}_{t-1}) + \gamma_1 Z_{t-1} + e_{jt}. \quad (2)$$

Under the null hypothesis, $\gamma_1 = 0$.



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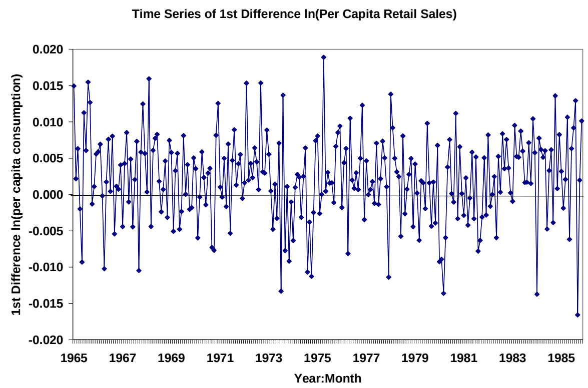

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* run regression to test for random walk w/out trend
reg d_ln_retail_sales ln_retail_sales_1

* run dickey fuller test w/out trend
dfuller ln_retail_sales


* run regression to test for random walk w/ trend
reg d_ln_retail_sales time ln_retail_sales_1

* run dickey fuller test w/ trend
dfuller ln_retail_sales, trend
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.
. * run regression to test for random walk w/out trend
. reg d_ln_retail_sales ln_retail_sales_1

      Source |       SS       df       MS              Number of obs =     251
-------------+------------------------------           F(  1,   249) =    3.53
       Model |  .000614331     1  .000614331           Prob > F      =  0.0614
    Residual |  .043312475   249  .000173946           R-squared     =  0.0140
-------------+------------------------------           Adj R-squared =  0.0100
       Total |  .043926806   250  .000175707           Root MSE      =  .01319

------------------------------------------------------------------------------
d_ln_retai~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ln_retail_~1 |  -.0255487   .0135949    -1.88   0.061    -.0523243    .0012269
       _cons |   .1547736   .0820123     1.89   0.060    -.0067526    .3162998
------------------------------------------------------------------------------

.
. * run dickey fuller test w/out trend
. dfuller ln_retail_sales

Dickey-Fuller test for unit root                   Number of obs   =       251

                               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -1.879            -3.460            -2.880            -2.570
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.3419
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. * run regression to test for random walk w/ trend
. reg d_ln_retail_sales time ln_retail_sales_1

      Source |       SS       df       MS              Number of obs =     251
-------------+------------------------------           F(  2,   248) =    2.35
       Model |  .000815716     2  .000407858           Prob > F      =  0.0979
    Residual |   .04311109   248  .000173835           R-squared     =  0.0186
-------------+------------------------------           Adj R-squared =  0.0107
       Total |  .043926806   250  .000175707           Root MSE      =  .01318

------------------------------------------------------------------------------
d_ln_retai~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        time |   .0000152   .0000141     1.08   0.283    -.0000126    .0000429
ln_retail_~1 |  -.0359228   .0166614    -2.16   0.032    -.0687386   -.003107
       _cons |   .2154282   .0994858     2.17   0.031     .0194834    .4113731
------------------------------------------------------------------------------

. * run dickey fuller test w/ trend
. dfuller ln_retail_sales, trend

Dickey-Fuller test for unit root                   Number of obs   =       251

               ---------- Interpolated Dickey-Fuller ---------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)             -2.156            -3.990            -3.430            -3.130
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.5146
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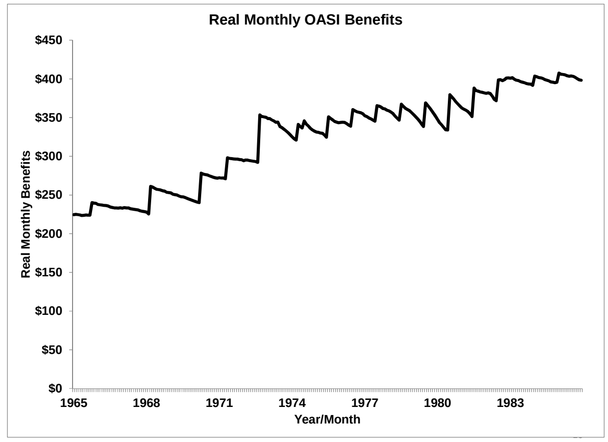

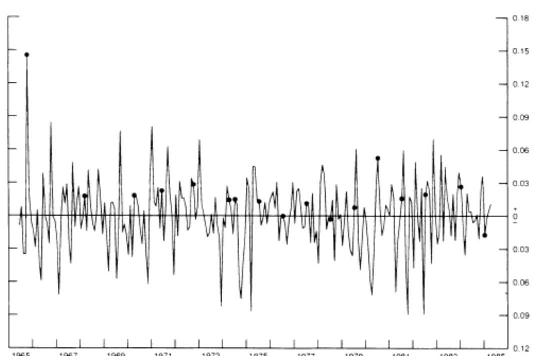

FIG. 2.—Seasonally adjusted log changes in real per capita durables expenditures, with months indicated when a benefit increase occurred.

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TABLE 2

DOES EXPENDITURE INCREASE WHEN BENEFITS INCREASE? EQUATIONS IN THE LOG CHANGE IN REAL PER CAPITA RETAIL SALES

$$\Delta \log(X_{jt}) = \alpha_j + \gamma(L)\Delta \log(\text{OASI}_t) + \beta(L)\Delta \log(\mathbf{X}_{t-1}) + e_{jt}$$

	Total Retail Sales	Nondurable Goods Stores	Durable Goods Stores
$\Delta \log(\text{OASI}_t)$	.143	.061	.296
	(.051)	(.036)	(.106)
$\Delta \log(\text{OASI}_{t-1})$	.082	.033	.142
	(.042)	(.038)	(.072)
Total:			
$\Delta \log(\mathbf{X}_{t-1})$	−.088	. . .	. . .
	(.063)		
$\Delta \log(\mathbf{X}_{t-2})$	−.130	. . .	. . .
	(.057)		
$\Delta \log(\mathbf{X}_{t-3})$	.023	. . .	. . .
	(.046)		
$\Delta \log(\mathbf{X}_{t-4})$	−.026	. . .	. . .
	(.051)		

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