

Supporting Computer Program and Data for Farley Grubb, “Creating the U.S. Dollar Currency Union, 1748-1811: A Quest for Monetary Stability or a Usurpation of State Sovereignty for Personal Gain?”

The following data and programs are in standard SAS coding and reproduce the estimates reported in the paper. There are three separate data/program files included here that comprise the totality of the estimates reported in the paper.

The “DATA” name used with a program procedure refers to a particular estimate in the paper as follows: The DATA name starts with either T or FN, with T referring to estimates reported in a Table and FN referring to estimates reported in a footnote. The T or FN in the DATA name is followed by a number that refers to the particular Table or footnote in the paper where that estimate is reported. This number in the DATA name is followed by a two-letter state code, e.g. PA for Pennsylvania, that refers to state for which or under which that estimate is reported. Finally, after the two-letter state code, if necessary, one to three numbers may follow that refer to the specific regression under that state, e.g. 1 being the first regression and 3 being the third regression. Thus, for example, “DATA T1Va23” refers to the 2nd and 3rd regressions under Virginia in Table 1. And “DATA FN9SC” refers to the estimate in footnote 9 for South Carolina.

For all other information, consult the text, footnotes, and table notes in the paper.

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DATA VALUES;
INPUT YEAR 1-4 PBRIT 6-8 EXNY 10-15 PNY 17-21 EXPA 23-28 PPA 30-34 EXSC
36-41 PSC 43-47 EXVA 49-54 EXMD 56-61 EXMA 63-68 PVA 70-74 PMD 76-80
PMA 82-86 PMDD 88-92;
LABEL
YEAR = YEAR
PBRIT = price index for England
EXNY = pre-1776--sterling exchange rate for NY,
post-1792---sterling exchange rate for the U.S. Dollar
PNY = price index for NY
EXPA = pre-1791--sterling exchange rate for PA,
post-1794---an alternative U.S. dollar exchange rate
PPA = price index for PA
EXSC = pre-1776--sterling exchange rate for SC,
post-1792---an alternative U.S. dollar exchange rate
PSC = price index for SC
EXVA = sterling exchange rate for VA
EXMD = sterling exchange rate for MD
EXMA = sterling exchange rate for MA
PVA = price index for VA
PMD = price index for MD
PMDD = adams price index for MD
PMA = Rothenberg price index for MA;

LIST;
CARDS;
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1747	90	191.46	0.1	183.78	59.7	760.74	54.0	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1748	94	183.39	103.8	174.12	65.3	762.50	68.5	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1749	96	176.46	93.0	171.39	65.4	725.36	75.3	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1750	95	179.33	82.8	170.60	65.1	702.28	77.8	0.01	0.01	137.33
0.1	0.1	42.7	0.1							
1751	90	181.50	89.1	169.86	65.1	700.00	65.0	0.01	0.01	133.33
0.1	0.1	37.8	0.1							
1752	93	175.92	91.0	166.85	65.2	700.00	75.7	0.01	0.01	131.67
0.1	0.1	66.5	0.1							
1753	90	179.39	89.5	167.49	64.4	700.00	87.5	0.01	0.01	130.00
0.1	0.1	63.7	0.1							
1754	90	179.72	88.9	168.35	62.6	700.00	67.0	0.01	0.01	133.33
0.1	0.1	53.6	0.1							
1755	92	180.13	90.8	168.79	61.2	700.00	66.6	0.01	0.01	133.33
0.1	0.1	63.6	0.1							
1756	92	182.65	91.1	172.57	61.8	713.56	60.3	0.01	165.00	133.33
0.1	79.4	56.6	89.3							
1757	109	178.40	89.7	166.07	62.8	700.19	60.7	139.71	164.53	133.33
67.5	91.2	62.6	101.1							
1758	106	172.60	95.8	159.00	65.0	700.00	66.8	137.92	157.01	128.34
75.6	72.7	62.7	82.6							
1759	100	168.39	108.3	153.52	70.3	700.00	87.3	139.97	153.75	128.94
73.8	73.5	62.4	83.4							
1760	98	167.20	109.1	158.61	70.3	700.00	71.5	141.43	154.58	129.54
76.9	83.1	54.4	93.0							
1761	94	181.41	105.5	172.71	69.3	700.00	62.3	143.72	168.58	140.10
74.6	80.2	65.6	90.1							
1762	94	189.76	119.1	176.26	75.2	700.00	59.9	152.40	170.65	142.33
78.5	87.7	74.1	97.6							
1763	100	186.73	108.9	173.00	74.4	716.55	72.3	159.88	167.24	136.00
82.9	91.5	68.4	101.4							
1764	102	184.85	101.0	172.86	67.9	717.97	67.1	160.73	166.77	133.75
80.1	87.5	63.8	97.4							
1765	106	182.80	99.3	169.90	67.7	709.33	67.6	160.36	166.65	133.54
80.3	86.9	72.2	96.8							
1766	107	177.18	100.3	162.96	71.8	707.00	77.8	128.48	163.99	133.03
75.3	86.9	65.5	96.8							
1767	109	178.96	105.1	166.02	71.2	700.00	73.7	125.54	164.59	133.33
72.6	86.4	60.8	96.3							
1768	108	179.87	100.9	166.62	67.7	700.00	80.0	124.99	164.92	133.33
84.0	86.4	74.0	96.3							
1769	99	172.47	105.1	157.56	65.6	708.50	80.8	121.97	160.68	129.86
80.0	85.4	62.0	95.3							
1770	100	165.90	105.5	153.92	68.6	717.00	72.4	118.00	151.03	126.31
86.6	83.6	63.8	93.5							
1771	107	178.43	108.3	165.69	70.5	762.00	84.0	123.60	161.84	133.33
85.8	78.3	66.9	88.2							
1772	117	173.27	122.3	160.83	77.1	679.00	107.0	123.59	158.63	131.00
86.8	84.4	63.6	94.3							
1773	119	177.71	114.8	166.27	75.2	728.00	90.8	129.75	165.13	132.19
85.9	90.1	66.6	100.0							
1774	116	180.62	104.7	169.46	73.4	700.00	80.7	130.30	167.10	135.30
86.2	80.2	68.7	90.1							

1775	113	171.55	102.4	161.12	75.3	758.67	79.6	120.00	156.68	117.45
75.3	80.8	74.8	90.7							
1776	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1777	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1778	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1779	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1780	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1781	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1782	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1783	1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.01	0.01
0.1	0.1	0.1	0.1							
1784	126	0.01	0.1	173.88	99.4	0.01	109.6	0.01	0.01	0.01
129.3	96.2	74.5	0.1							
1785	120	0.01	126.4	176.40	89.9	0.01	100.5	0.01	0.01	0.01
124.3	98.0	82.3	0.1							
1786	119	0.01	122.7	177.46	81.5	0.01	107.8	0.01	0.01	0.01
134.8	103.7	72.7	0.1							
1787	117	0.01	123.5	175.86	78.6	0.01	107.8	0.01	0.01	0.01
110.4	101.6	79.9	0.1							
1788	121	0.01	114.0	174.13	73.4	0.01	97.3	0.01	0.01	0.01
101.2	100.9	79.1	0.1							
1789	117	0.01	118.3	171.75	74.8	0.01	87.6	0.01	0.01	0.01
91.6	96.6	73.9	0.1							
1790	124	0.01	123.3	163.55	84.3	0.01	96.9	0.01	0.01	0.01
100.0	100.0	78.4	0.1							
1791	121	0.01	115.8	458.40	80.3	0.01	92.1	0.01	0.01	0.01
89.2	92.7	75.7	0.1							
1792	122	0.01	0.1	462.06	83.3	0.01	0.1	0.01	0.01	0.01
97.9	97.0	75.0	0.1							
1793	129	0.01	139.7	456.88	92.0	0.01	0.1	0.01	0.01	0.01
116.7	111.5	92.3	0.1							
1794	136	0.01	148.1	466.63	99.7	0.01	0.1	0.01	0.01	0.01
99.2	110.4	106.8	0.1							
1795	147	0.01	180.2	471.32	137.0	0.01	0.1	0.01	0.01	0.01
102.1	118.5	103.9	0.1							
1796	154	428.63	202.4	476.36	154.4	433.74	144.7	0.01	0.01	0.01
153.7	152.4	98.6	0.1							
1797	148	456.46	172.3	469.05	139.8	456.73	122.2	0.01	0.01	0.01
162.5	153.5	99.0	0.1							
1798	148	444.14	167.2	474.53	128.2	441.73	129.3	0.01	0.01	0.01
159.7	152.5	94.8	0.1							
1799	160	443.05	172.3	479.10	123.3	444.38	133.0	0.01	0.01	0.01
152.4	159.2	98.7	0.1							
1800	212	510.34	176.8	477.27	129.4	504.31	122.8	0.01	0.01	0.01
140.5	129.1	109.1	0.1							
1801	228	508.03	194.6	470.57	138.0	502.37	136.2	0.01	0.01	0.01
149.0	140.5	88.4	0.1							
1802	174	494.29	160.5	464.49	118.9	486.02	105.6	0.01	0.01	0.01
116.2	124.9	97.1	0.1							

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1803 156 493.18 161.4 469.05 123.5 493.46 111.6    0.01    0.01    0.01
117.3 144.1   91.1    0.1
1804 161 488.89 172.4 469.05 130.6 485.30 114.4    0.01    0.01    0.01
166.9 167.5 107.3    0.1
1805 187 468.63 192.7 480.62 136.0 467.69 125.9    0.01    0.01    0.01
146.1 180.4 111.2    0.1
1806 184 488.45 182.9 472.40 125.3 486.11 109.4    0.01    0.01    0.01
137.2 151.3 116.4    0.1
1807 186 485.14 177.7 469.66 119.2 478.64 106.8    0.01    0.01    0.01
155.7 166.5 110.6    0.1
1808 204 495.71 158.1 489.45 108.9 501.38   86.8    0.01    0.01    0.01
100.4 123.4   98.6    0.1
1809 212 502.26 177.4 485.79 123.6 500.74   90.0    0.01    0.01    0.01
127.8 131.7 110.1    0.1
1810 207 489.03 179.4 480.01 131.8 483.69   96.3    0.01    0.01    0.01
133.6 145.5 111.8    0.1
1811 206 461.99 172.5 472.70 132.7 460.04   96.3    0.01    0.01    0.01
147.1 137.2 112.5    0.1
DATA A; SET VALUES;
IF PBRIT>1 THEN LPBRIT = log(PBRIT); ELSE LPBRIT=.;
IF EXNY>1 THEN LEXNY = log(EXNY); ELSE LEXNY=.;
IF PNY>1 THEN LPNY = log(PNY); ELSE LPNY=.;
IF EXPA>1 THEN LEXPA = log(EXPA); ELSE LEXPA=.;
IF PPA>1 THEN LPPA = log(PPA); ELSE LPPA=.;
IF EXSC>1 THEN LEXSC = log(EXSC); ELSE LEXSC=.;
IF PSC>1 THEN LPSC = log(PSC); ELSE LPSC=.;
IF EXVA>1 THEN LEXVA = log(EXVA); ELSE LEXVA=.;
IF EXMD>1 THEN LEXMD = log(EXMD); ELSE LEXMD=.;
IF EXMA>1 THEN LEXMA = log(EXMA); ELSE LEXMA=.;
IF PVA>1 THEN LPVA = log(PVA); ELSE LPVA=.;
IF PMD>1 THEN LPMD = log(PMD); ELSE LPMD=.;
IF PMDD>1 THEN LPMDD = log(PMDD); ELSE LPMDD=.;
IF PMA>1 THEN LPMA = log(PMA); ELSE LPMA=.;
IF EXNY>1 and PNY>1 THEN RNY = log((PBRIT*EXNY)/PNY); ELSE RNY=.;
IF EXPA>1 and PPA>1 THEN RPA = log((PBRIT*EXPA)/PPA); ELSE RPA=.;
IF EXSC>1 and PSC>1 THEN RSC = log((PBRIT*EXSC)/PSC); ELSE RSC=.;
IF EXVA>1 and PVA>1 THEN RVA = log((PBRIT*EXVA)/PVA); ELSE RVA=.;
IF EXMD>1 and PMDD>1 THEN RMDD = log((PBRIT*EXMD)/PMDD); ELSE RMDD=.;
IF EXMD>1 and PMD>1 THEN RMD = log((PBRIT*EXMD)/PMD); ELSE RMD=.;
IF EXMA>1 and PMA>1 THEN RMA = log((PBRIT*EXMA)/PMA); ELSE RMA=.;
IF EXNY>1 and PMA>1 THEN R3MA = log((PBRIT*EXNY)/PMA); ELSE R3MA=.;
IF EXNY>1 and PNY>1 THEN R3NY = log((PBRIT*EXNY)/PNY); ELSE R3NY=.;
IF EXNY>1 and PPA>1 THEN R3PA = log((PBRIT*EXNY)/PPA); ELSE R3PA=.;
IF EXNY>1 and PMD>1 THEN R3MD = log((PBRIT*EXNY)/PMD); ELSE R3MD=.;
IF EXNY>1 and PVA>1 THEN R3VA = log((PBRIT*EXNY)/PVA); ELSE R3VA=.;
IF EXNY>1 and PSC>1 THEN R3SC = log((PBRIT*EXNY)/PSC); ELSE R3SC=.;
LPBRL = lag1(LPBRIT);
LPBRLL = lag2(LPBRIT);
LPBRLLL = lag3(LPBRIT);
LPBRL4 = lag4(LPBRIT);
BRP = LPBRIT - LPBRL;
BRPP = LPBRL - LPBRLL;
BRPPP = LPBRLL - LPBRLLL;
BRP4P = LPBRLLL - LPBRL4;
LEXNYL = lag1(LEXNY);
LEXNYLL = lag2(LEXNY);
LEXNYLLL = lag3(LEXNY);

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NYX = LEXNY - LEXNYL;
NYXX = LEXNYL - LEXNYLL;
NYXXX = LEXNYLL - LEXNYLLL;
LPNYL = lag1(LPNY);
LPNYLL = lag2(LPNY);
LPNYLLL = lag3(LPNY);
LPNYL4 = lag4(LPNY);
NYP = LPNY - LPNYL;
NYPP = LPNYL - LPNYLL;
NYPPP = LPNYLL - LPNYLLL;
NYP4 = LPNYLLL - LPNYL4;
RNYL = lag1(RNY);
RNYLL = lag2(RNY);
RNYLLL = lag3(RNY);
RNYR = RNY - RNYL;
RNYRR = RNYL - RNYLL;
RNYRRR = RNYLL - RNYLLL;
R3NYL = lag1(R3NY);
R3NYLL = lag2(R3NY);
R3NYLLL = lag3(R3NY);
R3NYR = R3NY - R3NYL;
R3NYRR = R3NYL - R3NYLL;
R3NYRRR = R3NYLL - R3NYLLL;
LEXPAL = lag1(LEXPAL);
LEXPALL = lag2(LEXPAL);
LEXPALLL = lag3(LEXPAL);
LEXPAL4 = lag4(LEXPAL);
PAX = LEXPA - LEXPAL;
PAXX = LEXPAL - LEXPALL;
PAXXX = LEXPALL - LEXPALLL;
PAX4 = LEXPALLL - LEXPAL4;
LPPAL = lag1(LPPA);
LPPALL = lag2(LPPA);
LPPALLL = lag3(LPPA);
LPPAL4 = lag4(LPPA);
PAP = LPPA - LPPAL;
PAPP = LPPAL - LPPALL;
PAPPP = LPPALL - LPPALLL;
PAP4 = LPPALLL - LPPAL4;
RPAL = lag1(RPA);
RPALL = lag2(RPA);
RPALLL = lag3(RPA);
RPAL4 = lag4(RPA);
RPAR = RPA - RPAL;
RPARR = RPAL - RPALL;
RPARRR = RPALL - RPALLL;
RPAR4 = RPALLL - RPAL4;
R3PAL = lag1(R3PA);
R3PALL = lag2(R3PA);
R3PALLL = lag3(R3PA);
R3PAR = R3PA - R3PAL;
R3PARR = R3PAL - R3PALL;
R3PARRR = R3PALL - R3PALLL;
LEXSCL = lag1(LEXSC);
LEXSCLL = lag2(LEXSC);
LEXSCLLL = lag3(LEXSC);
SCX = LEXSC - LEXSCL;

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SCXX = LEXSCL - LEXSCLL;
SCXXX = LEXSCLL - LEXSCLLL;
LPSC = lag1(LPSC);
LPSCLL = lag2(LPSC);
LPSCLLL = lag3(LPSC);
LPSC4 = lag4(LPSC);
SCP = LPSC - LPSCLL;
SCPP = LPSC - LPSCLL;
SCPPP = LPSCLL - LPSCLLL;
SCP4 = LPSCLLL - LPSC4;
RSC = lag1(RSC);
RSCLL = lag2(RSC);
RSCLLL = lag3(RSC);
RSCR = RSC - RSCLL;
RSCRR = RSC - RSCLL;
RSCRRR = RSCLL - RSCLLL;
R3SC = lag1(R3SC);
R3SCLL = lag2(R3SC);
R3SCLLL = lag3(R3SC);
R3SCR = R3SC - R3SCL;
R3SCRR = R3SCL - R3SCLL;
R3SCRRR = R3SCLL - R3SCLLL;
LEXVA = lag1(LEXVA);
LEXVALL = lag2(LEXVA);
LEXVALLL = lag3(LEXVA);
VAX = LEXVA - LEXVAL;
VAXX = LEXVAL - LEXVALL;
VAXXX = LEXVALL - LEXVALLL;
LPVA = lag1(LPVA);
LPVALL = lag2(LPVA);
LPVALLL = lag3(LPVA);
LPVAL4 = lag4(LPVA);
VAP = LPVA - LPVAL;
VAPP = LPVAL - LPVALL;
VAPPP = LPVALL - LPVALLL;
VAP4 = LPVALLL - LPVAL4;
RVA = lag1(RVA);
RVALL = lag2(RVA);
RVALLL = lag3(RVA);
RVAR = RVA - RVALL;
RVARR = RVALL - RVALLL;
RVARRR = RVALL - RVALLL;
R3VA = lag1(R3VA);
R3VALL = lag2(R3VA);
R3VALLL = lag3(R3VA);
R3VAR = R3VA - R3VAL;
R3VARR = R3VAL - R3VALL;
R3VARRR = R3VALL - R3VALLL;
LEXMD = lag1(LEXMD);
LEXMDL = lag2(LEXMD);
LEXMDLL = lag3(LEXMD);
MDX = LEXMD - LEXMDL;
MDXX = LEXMDL - LEXMDLL;
MDXXX = LEXMDLL - LEXMDLLL;
LPM = lag1(LPM);
LPMDL = lag2(LPM);
LPMDLL = lag3(LPM);

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LPMDL4 = lag4(LPMD);
MDP = LPMD - LPMDL;
MDPP = LPMDL - LPMDLL;
MDPPP = LPMDLL - LPMDLLL;
MDP4 = LPMDLLL - LPMDL4;
LMDDL = lag1(LPMDD);
LMDDL = lag2(LPMDD);
LMDDL = lag3(LPMDD);
MDDP = LPMDD - LMDDL;
MDDPP = LMDDL - LMDDL;
MDDPPP = LMDDL - LMDDL;
RMDL = lag1(RMD);
RMDLL = lag2(RMD);
RMDLLL = lag3(RMD);
RMDR = RMD - RMDL;
RMDRR = RMDL - RMDLL;
RMDRRR = RMDLL - RMDLLL;
RMDDL = lag1(RMDD);
RMDDL = lag2(RMDD);
RMDDL = lag3(RMDD);
RMDDR = RMDD - RMDDL;
RMDDRR = RMDDL - RMDDL;
RMDDRRR = RMDDL - RMDDL;
R3MDL = lag1(R3MD);
R3MDLL = lag2(R3MD);
R3MDLLL = lag3(R3MD);
R3MDR = R3MD - R3MDL;
R3MDRR = R3MDL - R3MDLL;
R3MDRRR = R3MDLL - R3MDLLL;
LEXMAL = lag1(LEXMA);
LEXMALL = lag2(LEXMA);
LEXMALLL = lag3(LEXMA);
MAX = LEXMA - LEXMAL;
MAXX = LEXMAL - LEXMALL;
MAXXX = LEXMALL - LEXMALLL;
LPMAL = lag1(LPMA);
LPMALL = lag2(LPMA);
LPMALLL = lag3(LPMA);
LPMAL4 = lag4(LPMA);
MAP = LPMA - LPMAL;
MAPP = LPMAL - LPMALL;
MAPPP = LPMALL - LPMALLL;
MAP4 = LPMALLL - LPMAL4;
RMAL = lag1(RMA);
RMALL = lag2(RMA);
RMALLL = lag3(RMA);
RMAR = RMA - RMAL;
RMARR = RMAL - RMALL;
RMARRR = RMALL - RMALLL;
R3MAL = lag1(R3MA);
R3MALL = lag2(R3MA);
R3MALLL = lag3(R3MA);
R3MAR = R3MA - R3MAL;
R3MARR = R3MAL - R3MALL;
R3MARRR = R3MALL - R3MALLL;
RUN;
DATA T1MA1; SET A;

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IF 1750<YEAR<1776;
TIME = YEAR - 1751;
PROC AUTOREG DATA=T1MA1;
MODEL MAP = LPMAL TIME;
RUN;
DATA T1MA2; SET A;
IF 1750<YEAR<1793;
TIME = YEAR - 1751;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T1MA2;
MODEL MAP = LPMAL TIME D;
RUN;
DATA T1NY1; SET A;
IF 1748<YEAR<1776;
TIME = YEAR - 1749;
PROC AUTOREG DATA=T1NY1;
MODEL NYP = LPNYL TIME;
RUN;
DATA T1NY2; SET A;
IF 1748<YEAR<1792;
TIME = YEAR - 1749;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T1NY2;
MODEL NYP = LPNYL TIME D;
RUN;
DATA T1PA1; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T1PA1;
MODEL PAP = LPPAL TIME PAPP;
RUN;
DATA T1PA23; SET A;
IF 1747<YEAR<1795;
TIME = YEAR - 1748;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
TIME2 = D*TIME;
TIME4 = TIME2*TIME2;
PROC AUTOREG DATA=T1PA23;
MODEL PAP = LPPAL TIME D PAPP;
RUN;
PROC AUTOREG DATA=T1PA23;
MODEL PAP = LPPAL TIME D TIME2 TIME4;
RUN;
DATA T1MD1; SET A;
IF 1756<YEAR<1776;
TIME = YEAR - 1757;
PROC AUTOREG DATA=T1MD1;
MODEL MDP = LPMDL TIME;
RUN;
DATA T1MD2; SET A;
IF 1756<YEAR<1796;
TIME = YEAR - 1757;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T1MD2;
MODEL MDP = LPMDL TIME D;
RUN;
DATA T1VA1; SET A;

```

```

IF 1757<YEAR<1776;
TIME = YEAR - 1758;
PROC AUTOREG DATA=T1VA1;
MODEL VAP = LPVAL;
RUN;
DATA T1VA23; SET A;
IF 1757<YEAR<1796;
TIME = YEAR - 1758;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
TIME2 = D*TIME;
TIME4 = TIME2*TIME2;
PROC AUTOREG DATA=T1VA23;
MODEL VAP = LPVAL TIME D;
RUN;
PROC AUTOREG DATA=T1VA23;
MODEL VAP = LPVAL TIME D TIME2 TIME4;
RUN;
DATA T1SC1; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T1SC1;
MODEL SCP = LPSCL TIME;
RUN;
DATA T1SC2; SET A;
IF 1747<YEAR<1792;
TIME = YEAR - 1748;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T1SC2;
MODEL SCP = LPSCL TIME D;
RUN;
DATA T1UK123; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T1UK123;
MODEL BRP = LPBRL TIME;
RUN;
PROC AUTOREG DATA=T1UK123;
MODEL BRP = LPBRL TIME BRPP BRPPP;
RUN;
PROC AUTOREG DATA=T1UK123;
MODEL BRP = LPBRL TIME BRPP BRPPP BRP4P;
RUN;
DATA T1UK345; SET A;
IF 1747<YEAR<1795;
TIME = YEAR - 1748;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T1UK345;
MODEL BRP = LPBRL TIME D;
RUN;
PROC AUTOREG DATA=T1UK345;
MODEL BRP = LPBRL TIME D BRPP BRPPP;
RUN;
PROC AUTOREG DATA=T1UK345;
MODEL BRP = LPBRL TIME D BRPP BRPPP BRP4P;
RUN;
DATA FN9MA; SET A;
IF 1750<YEAR<1776;

```

```

TIME = YEAR - 1751;
PROC AUTOREG DATA=FN9MA;
MODEL LPMA = TIME / nlag=2 method=ml;
RUN;
DATA FN9NY; SET A;
IF 1748<YEAR<1776;
TIME = YEAR - 1749;
PROC AUTOREG DATA=FN9NY;
MODEL LPNY = TIME / nlag=1 method=ml;
RUN;
DATA FN9PA; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=FN9PA;
MODEL LPPA = TIME / nlag=2 method=ml;
RUN;
DATA FN9MD; SET A;
IF 1756<YEAR<1776;
TIME = YEAR - 1757;
PROC AUTOREG DATA=FN9MD;
MODEL LPMD = TIME / nlag=1 method=ml;
RUN;
DATA FN9VA; SET A;
IF 1757<YEAR<1776;
TIME = YEAR - 1758;
PROC AUTOREG DATA=FN9VA;
MODEL LPVA = TIME / nlag=1 method=ml;
RUN;
DATA FN9SC; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=FN9SC;
MODEL LPSC = TIME / nlag=1 method=ml;
RUN;
DATA FN9UK; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=FN9UK;
MODEL LPBRIT = TIME / nlag=2 method=ml;
RUN;
DATA T2MA; SET A;
IF 1750<YEAR<1776;
TIME = YEAR - 1751;
PROC AUTOREG DATA=T2MA;
MODEL MAX = LEXMAL;
RUN;
PROC AUTOREG DATA=T2MA;
MODEL RMAR = RMAL;
RUN;
PROC AUTOREG DATA=T2MA;
MODEL RMAR = RMAL RMARR;
RUN;
DATA T2NY1; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T2NY1;
MODEL NYX = LEXNYL;

```

```

RUN;
DATA T2NY2; SET A;
IF 1748<YEAR<1776;
TIME = YEAR - 1749;
PROC AUTOREG DATA=T2NY2;
MODEL RNYR = RNYL;
RUN;
DATA T2PA13; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T2PA13;
MODEL PAX = LEXPAL;
RUN;
PROC AUTOREG DATA=T2PA13;
MODEL RPAR = RPAL;
RUN;
DATA T2PA24; SET A;
IF 1747<YEAR<1791;
TIME = YEAR - 1748;
IF YEAR>1781 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T2PA24;
MODEL PAX = LEXPAL D;
RUN;
PROC AUTOREG DATA=T2PA24;
MODEL RPAR = RPAL D RPARR;
RUN;
DATA T2MD; SET A;
IF 1756<YEAR<1776;
TIME = YEAR - 1757;
PROC AUTOREG DATA=T2MD;
MODEL MDX = LEXMDL;
RUN;
PROC AUTOREG DATA=T2MD;
MODEL RMDR = RMDL;
RUN;
DATA T2VA; SET A;
IF 1757<YEAR<1776;
TIME = YEAR - 1758;
IF YEAR>1765 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T2VA;
MODEL VAX = LEXVAL;
RUN;
PROC AUTOREG DATA=T2VA;
MODEL VAX = LEXVAL D;
RUN;
PROC AUTOREG DATA=T2VA;
MODEL RVAR = RVAL;
RUN;
PROC AUTOREG DATA=T2VA;
MODEL RVAR = RVAL D;
RUN;
DATA T2SC; SET A;
IF 1747<YEAR<1776;
TIME = YEAR - 1748;
PROC AUTOREG DATA=T2SC;
MODEL SCX = LEXSCL;
RUN;

```

```

PROC AUTOREG DATA=T2SC;
MODEL RSCR = RSCL;
RUN;
DATA T3MA1; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1792 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T3MA1;
MODEL MAP = LPMAL TIME D;
RUN;
DATA T3NY12; SET A;
IF 1785<YEAR<1812;
TIME = YEAR - 1786;
IF YEAR>1794 THEN D = 1; ELSE D = 0;
TIME2 = TIME*D;
PROC AUTOREG DATA=T3NY12;
MODEL NYP = LPNYL TIME D TIME2;
RUN;
PROC AUTOREG DATA=T3NY12;
MODEL NYP = LPNYL TIME D NYPP NYPPP;
RUN;
DATA T3PA1; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1794 THEN D = 1; ELSE D = 0;
TIME2 = TIME*D;
PROC AUTOREG DATA=T3PA1;
MODEL PAP = LPPAL TIME D TIME2 PAPP;
RUN;
DATA T3MD12; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1795 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T3MD12;
MODEL MDP = LPMDL TIME D;
RUN;
PROC AUTOREG DATA=T3MD12;
MODEL MDP = LPMDL TIME D MDPP MDPPP MDP4;
RUN;
DATA T3VA12; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1795 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T3VA12;
MODEL VAP = LPVAL TIME D;
RUN;
PROC AUTOREG DATA=T3VA12;
MODEL VAP = LPVAL TIME D VAPP VAPPP VAP4;
RUN;
DATA T3SC12; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1795 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T3SC12;
MODEL SCP = LPSCL TIME D;
RUN;
PROC AUTOREG DATA=T3SC12;

```

```

MODEL SCP = LPSCL TIME D SCPP SCPPP;
RUN;
DATA T3UK12; SET A;
IF 1784<YEAR<1812;
TIME = YEAR - 1785;
IF YEAR>1798 THEN D = 1; ELSE D = 0;
PROC AUTOREG DATA=T3UK12;
MODEL BRP = LPBRL TIME BRPP;
RUN;
PROC AUTOREG DATA=T3UK12;
MODEL BRP = LPBRL TIME D BRPP;
RUN;
DATA T4MA1; SET A;
IF 1750<YEAR<1776;
PROC MEANS DATA=T4MA1;
VAR MAP;
RUN;
%let n=25;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MA1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4NY1; SET A;
IF 1749<YEAR<1776;
PROC MEANS DATA=T4NY1;
VAR NYP;
RUN;
%let n=26;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4NY1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR NYP;
by sample;

```

```

output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4PA1; SET A;
IF 1749<YEAR<1776;
PROC MEANS DATA=T4PA1;
VAR PAP;
RUN;
%let n=26;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4PA1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR PAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4MD1; SET A;
IF 1756<YEAR<1776;
PROC MEANS DATA=T4MD1;
VAR MDP;
RUN;
%let n=19;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MD1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MDP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4VA1; SET A;
IF 1757<YEAR<1776;

```

```

PROC MEANS DATA=T4VA1;
VAR VAP;
RUN;
%let n=18;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4VA1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR VAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4SC1; SET A;
IF 1749<YEAR<1776;
PROC MEANS DATA=T4SC1;
VAR SCP;
RUN;
%let n=26;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4SC1 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR SCP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4MA2; SET A;
IF 1784<YEAR<1793;
PROC MEANS DATA=T4MA2;
VAR MAP;
RUN;
%let n=8;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;

```

```

do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MA2 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4NY2; SET A;
IF 1785<YEAR<1792;
PROC MEANS DATA=T4NY2;
VAR NYP;
RUN;
%let n=6;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4NY2 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR NYP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4PA2; SET A;
IF 1784<YEAR<1793;
PROC MEANS DATA=T4PA2;
VAR PAP;
RUN;
%let n=8;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4PA2 point=obs;
output;
end;
end;
stop;

```

```

run;
PROC MEANS noprint;
VAR PAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4MD2; SET A;
IF 1784<YEAR<1793;
PROC MEANS DATA=T4MD2;
VAR MDP;
RUN;
%let n=8;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MD2 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MDP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4VA2; SET A;
IF 1784<YEAR<1793;
PROC MEANS DATA=T4VA2;
VAR VAP;
RUN;
%let n=8;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4VA2 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR VAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;

```

```

var u sd r v;
RUN;
DATA T4SC2; SET A;
IF 1784<YEAR<1792;
PROC MEANS DATA=T4SC2;
VAR SCP;
RUN;
%let n=7;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4SC2 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR SCP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4MA3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4MA3;
VAR MAP;
RUN;
%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MA3 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4NY3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4NY3;
VAR NYP;
RUN;

```

```

%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4NY3 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR NYP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4PA3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4PA3;
VAR PAP;
RUN;
%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4PA3 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR PAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4MD3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4MD3;
VAR MDP;
RUN;
%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4MD3 point=obs;

```

```

output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR MDP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4VA3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4VA3;
VAR VAP;
RUN;
%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4VA3 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR VAP;
by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;
DATA T4SC3; SET A;
IF 1796<YEAR<1812;
PROC MEANS DATA=T4SC3;
VAR SCP;
RUN;
%let n=15;
%let reps=5000;
data samples (drop=n);
do sample=1 to &reps;
do n=1 to &n;
obs=ceil(&n*uniform(0));
set T4SC3 point=obs;
output;
end;
end;
stop;
run;
PROC MEANS noprint;
VAR SCP;

```

```

by sample;
output out=stats mean=u std=sd stderr=r var=v;
run;
PROC MEANS n mean std stderr var data=stats;
var u sd r v;
RUN;

```

```

DATA USVALUE;
INPUT YEAR 1-4 PBRIT 6-8 EXNY 10-15 PNY 17-21 EXPA 23-28 PPA 30-34 EXSC
36-41 PSC 43-47 EXVA 49-54 EXMD 56-61 EXMA 63-68 PVA 70-74 PMD 76-80
PMA 82-86 PMDD 88-92;
LABEL
YEAR = YEAR
PBRIT = price index for England
EXNY = sterling exchange rate for the U.S. Dollar
PNY = price index for NY
EXPA = an alternative U.S. dollar exchange rate
PPA = price index for PA
EXSC = an alternative U.S. dollar exchange rate
PSC = price index for SC
EXVA = sterling exchange rate for VA
EXMD = sterling exchange rate for MD
EXMA = sterling exchange rate for MA
PVA = price index for VA
PMD = price index for MD
PMDD = adams price index for MD
PMA = Rothenberg price index for MA;

LIST;
CARDS;
1793 1 0.01 0.1 0.01 0.1 0.01 0.1 0.01 0.01 0.01
0.1 0.1 92.3 0.1
1794 1 0.01 0.1 0.01 0.1 0.01 0.1 0.01 0.01 0.01
0.1 0.1 106.8 0.1
1795 147 0.01 180.2 471.32 137.0 0.01 0.1 0.01 0.01 0.01
102.1 118.5 103.9 0.1
1796 154 428.63 202.4 476.36 154.4 433.74 144.7 0.01 0.01 0.01
153.7 152.4 98.6 0.1
1797 148 456.46 172.3 469.05 139.8 456.73 122.2 0.01 0.01 0.01
162.5 153.5 99.0 0.1
1798 148 444.14 167.2 474.53 128.2 441.73 129.3 0.01 0.01 0.01
159.7 152.5 94.8 0.1
1799 160 443.05 172.3 479.10 123.3 444.38 133.0 0.01 0.01 0.01
152.4 159.2 98.7 0.1
1800 212 510.34 176.8 477.27 129.4 504.31 122.8 0.01 0.01 0.01
140.5 129.1 109.1 0.1
1801 228 508.03 194.6 470.57 138.0 502.37 136.2 0.01 0.01 0.01
149.0 140.5 88.4 0.1
1802 174 494.29 160.5 464.49 118.9 486.02 105.6 0.01 0.01 0.01
116.2 124.9 97.1 0.1
1803 156 493.18 161.4 469.05 123.5 493.46 111.6 0.01 0.01 0.01
117.3 144.1 91.1 0.1
1804 161 488.89 172.4 469.05 130.6 485.30 114.4 0.01 0.01 0.01
166.9 167.5 107.3 0.1

```

1805	187	468.63	192.7	480.62	136.0	467.69	125.9	0.01	0.01	0.01
146.1	180.4	111.2	0.1							
1806	184	488.45	182.9	472.40	125.3	486.11	109.4	0.01	0.01	0.01
137.2	151.3	116.4	0.1							
1807	186	485.14	177.7	469.66	119.2	478.64	106.8	0.01	0.01	0.01
155.7	166.5	110.6	0.1							
1808	204	495.71	158.1	489.45	108.9	501.38	86.8	0.01	0.01	0.01
100.4	123.4	98.6	0.1							
1809	212	502.26	177.4	485.79	123.6	500.74	90.0	0.01	0.01	0.01
127.8	131.7	110.1	0.1							
1810	207	489.03	179.4	480.01	131.8	483.69	96.3	0.01	0.01	0.01
133.6	145.5	111.8	0.1							
1811	206	461.99	172.5	472.70	132.7	460.04	96.3	0.01	0.01	0.01
147.1	137.2	112.5	0.1							

```

DATA B; SET USVALUE;
IF PBRIT>1 THEN LPBRIT = log(PBRIT); ELSE LPBRIT=.;
IF EXNY>1 THEN LEXNY = log(EXNY); ELSE LEXNY=.;
IF PNY>1 THEN LPNY = log(PNY); ELSE LPNY=.;
IF EXPA>1 THEN LEXPA = log(EXPA); ELSE LEXPA=.;
IF PPA>1 THEN LPPA = log(PPA); ELSE LPPA=.;
IF EXSC>1 THEN LEXSC = log(EXSC); ELSE LEXSC=.;
IF PSC>1 THEN LPSC = log(PSC); ELSE LPSC=.;
IF EXVA>1 THEN LEXVA = log(EXVA); ELSE LEXVA=.;
IF EXMD>1 THEN LEXMD = log(EXMD); ELSE LEXMD=.;
IF EXMA>1 THEN LEXMA = log(EXMA); ELSE LEXMA=.;
IF PVA>1 THEN LPVA = log(PVA); ELSE LPVA=.;
IF PMD>1 THEN LPMD = log(PMD); ELSE LPMD=.;
IF PMDD>1 THEN LPMDD = log(PMDD); ELSE LPMDD=.;
IF PMA>1 THEN LPMA = log(PMA); ELSE LPMA=.;
IF EXNY>1 and PNY>1 THEN RNY = log((PBRIT*EXNY)/PNY); ELSE RNY=.;
IF EXPA>1 and PPA>1 THEN RPA = log((PBRIT*EXPA)/PPA); ELSE RPA=.;
IF EXSC>1 and PSC>1 THEN RSC = log((PBRIT*EXSC)/PSC); ELSE RSC=.;
IF EXVA>1 and PVA>1 THEN RVA = log((PBRIT*EXVA)/PVA); ELSE RVA=.;
IF EXMD>1 and PMDD>1 THEN RMDD = log((PBRIT*EXMD)/PMDD); ELSE RMDD=.;
IF EXMD>1 and PMD>1 THEN RMD = log((PBRIT*EXMD)/PMD); ELSE RMD=.;
IF EXMA>1 and PMA>1 THEN RMA = log((PBRIT*EXMA)/PMA); ELSE RMA=.;
IF EXNY>1 and PMA>1 THEN R3MA = log((PBRIT*EXNY)/PMA); ELSE R3MA=.;
IF EXNY>1 and PNY>1 THEN R3NY = log((PBRIT*EXNY)/PNY); ELSE R3NY=.;
IF EXNY>1 and PPA>1 THEN R3PA = log((PBRIT*EXNY)/PPA); ELSE R3PA=.;
IF EXNY>1 and PMD>1 THEN R3MD = log((PBRIT*EXNY)/PMD); ELSE R3MD=.;
IF EXNY>1 and PVA>1 THEN R3VA = log((PBRIT*EXNY)/PVA); ELSE R3VA=.;
IF EXNY>1 and PSC>1 THEN R3SC = log((PBRIT*EXNY)/PSC); ELSE R3SC=.;
LPBRL = lag1(LPBRIT);
LPBRLL = lag2(LPBRIT);
LPBRLLL = lag3(LPBRIT);
LPBRL4 = lag4(LPBRIT);
BRP = LPBRIT - LPBRL;
BRPP = LPBRL - LPBRLL;
BRPPP = LPBRLL - LPBRLLL;
BRP4P = LPBRLLL - LPBRL4;
LEXNYL = lag1(LEXNY);
LEXNYLL = lag2(LEXNY);
LEXNYLLL = lag3(LEXNY);
NYX = LEXNY - LEXNYL;
NYXX = LEXNYL - LEXNYLL;
NYXXX = LEXNYLL - LEXNYLLL;
LPNYL = lag1(LPNY);

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LPNYLL = lag2(LPNY);
LPNYLLL = lag3(LPNY);
LPNYL4 = lag4(LPNY);
NYP = LPNY - LPNYL;
NYPP = LPNYL - LPNYLL;
NYPPP = LPNYLL - LPNYLLL;
NYP4 = LPNYLLL - LPNYL4;
RNYL = lag1(RNY);
RNYLL = lag2(RNY);
RNYLLL = lag3(RNY);
RNYR = RNY - RNYL;
RNYRR = RNYL - RNYLL;
RNYRRR = RNYLL - RNYLLL;
R3NYL = lag1(R3NY);
R3NYLL = lag2(R3NY);
R3NYLLL = lag3(R3NY);
R3NYR = R3NY - R3NYL;
R3NYRR = R3NYL - R3NYLL;
R3NYRRR = R3NYLL - R3NYLLL;
LEXPAL = lag1(LEXPAL);
LEXPALL = lag2(LEXPAL);
LEXPALLL = lag3(LEXPAL);
LEXPAL4 = lag4(LEXPAL);
PAX = LEXPA - LEXPAL;
PAXX = LEXPAL - LEXPALL;
PAXXX = LEXPALL - LEXPALLL;
PAX4 = LEXPALLL - LEXPAL4;
LPPAL = lag1(LPPA);
LPPALL = lag2(LPPA);
LPPALLL = lag3(LPPA);
LPPAL4 = lag4(LPPA);
PAP = LPPA - LPPAL;
PAPP = LPPAL - LPPALL;
PAPPP = LPPALL - LPPALLL;
PAP4 = LPPALLL - LPPAL4;
RPAL = lag1(RPA);
RPALL = lag2(RPA);
RPALLL = lag3(RPA);
RPAL4 = lag4(RPA);
RPAR = RPA - RPAL;
RPARR = RPAL - RPALL;
RPARRR = RPALL - RPALLL;
RPAR4 = RPALLL - RPAL4;
R3PAL = lag1(R3PA);
R3PALL = lag2(R3PA);
R3PALLL = lag3(R3PA);
R3PAR = R3PA - R3PAL;
R3PARR = R3PAL - R3PALL;
R3PARRR = R3PALL - R3PALLL;
LEXSCL = lag1(LEXSC);
LEXSCLL = lag2(LEXSC);
LEXSCLLL = lag3(LEXSC);
SCX = LEXSC - LEXSCL;
SCXX = LEXSCL - LEXSCLL;
SCXXX = LEXSCLL - LEXSCLLL;
LPSC = lag1(LPSC);
LPSCLL = lag2(LPSC);

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```

LPSCLLL = lag3(LPSC);
LPSC4 = lag4(LPSC);
SCP = LPSC - LPSC;
SCPP = LPSC - LPSCLL;
SCPPP = LPSCLL - LPSCLLL;
SCP4 = LPSCLLL - LPSC4;
RSCL = lag1(RSC);
RSCLL = lag2(RSC);
RSCLLL = lag3(RSC);
RSCR = RSC - RSCL;
RSCRR = RSCL - RSCLL;
RSCRRR = RSCLL - RSCLLL;
R3SCL = lag1(R3SC);
R3SCLL = lag2(R3SC);
R3SCLLL = lag3(R3SC);
R3SCR = R3SC - R3SCL;
R3SCRR = R3SCL - R3SCLL;
R3SCRRR = R3SCLL - R3SCLLL;
LEXVAL = lag1(LEXVA);
LEXVALL = lag2(LEXVA);
LEXVALLL = lag3(LEXVA);
VAX = LEXVA - LEXVAL;
VAXX = LEXVAL - LEXVALL;
VAXXX = LEXVALL - LEXVALLL;
LPVAL = lag1(LPVA);
LPVALL = lag2(LPVA);
LPVALLL = lag3(LPVA);
LPVAL4 = lag4(LPVA);
VAP = LPVA - LPVAL;
VAPP = LPVAL - LPVALL;
VAPPP = LPVALL - LPVALLL;
VAP4 = LPVALLL - LPVAL4;
RVAL = lag1(RVA);
RVALL = lag2(RVA);
RVALLL = lag3(RVA);
RVAR = RVA - RVAL;
RVARR = RVAL - RVALL;
RVARRR = RVALL - RVALLL;
R3VAL = lag1(R3VA);
R3VALL = lag2(R3VA);
R3VALLL = lag3(R3VA);
R3VAR = R3VA - R3VAL;
R3VARR = R3VAL - R3VALL;
R3VARRR = R3VALL - R3VALLL;
LEXMDL = lag1(LEXMD);
LEXMDLL = lag2(LEXMD);
LEXMDLLL = lag3(LEXMD);
MDX = LEXMD - LEXMDL;
MDXX = LEXMDL - LEXMDLL;
MDXXX = LEXMDLL - LEXMDLLL;
LPMDL = lag1(LPMD);
LPMDLL = lag2(LPMD);
LPMDLLL = lag3(LPMD);
LPMDL4 = lag4(LPMD);
MDP = LPMD - LPMDL;
MDPP = LPMDL - LPMDLL;
MDPPP = LPMDLL - LPMDLLL;

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MDP4 = LPMDDL - LPMDDL4;
LMDDL = lag1(LPMDD);
LMDDL = lag2(LPMDD);
LMDDL = lag3(LPMDD);
MDDP = LPMDD - LMDDL;
MDDPP = LMDDL - LMDDL;
MDDPPP = LMDDL - LMDDL;
RMDL = lag1(RMD);
RMDL = lag2(RMD);
RMDL = lag3(RMD);
RMDR = RMD - RMDL;
RMDRR = RMDL - RMDL;
RMDRRR = RMDL - RMDL;
RMDDL = lag1(RMDD);
RMDDL = lag2(RMDD);
RMDDL = lag3(RMDD);
RMDDR = RMDD - RMDDL;
RMDDRR = RMDDL - RMDDL;
RMDDRRR = RMDDL - RMDDL;
R3MDL = lag1(R3MD);
R3MDL = lag2(R3MD);
R3MDL = lag3(R3MD);
R3MDR = R3MD - R3MDL;
R3MDRR = R3MDL - R3MDL;
R3MDRRR = R3MDL - R3MDL;
LEXMAL = lag1(LEXMA);
LEXMAL = lag2(LEXMA);
LEXMAL = lag3(LEXMA);
MAX = LEXMA - LEXMAL;
MAXX = LEXMAL - LEXMAL;
MAXXX = LEXMAL - LEXMAL;
LPMAL = lag1(LPMA);
LPMAL = lag2(LPMA);
LPMAL = lag3(LPMA);
LPMAL4 = lag4(LPMA);
MAP = LPMA - LPMAL;
MAPP = LPMAL - LPMAL;
MAPPP = LPMAL - LPMAL;
MAP4 = LPMAL - LPMAL4;
RMAL = lag1(RMA);
RMAL = lag2(RMA);
RMAL = lag3(RMA);
RMAR = RMA - RMAL;
RMARR = RMAL - RMAL;
RMARRR = RMAL - RMAL;
R3MAL = lag1(R3MA);
R3MAL = lag2(R3MA);
R3MAL = lag3(R3MA);
R3MAR = R3MA - R3MAL;
R3MARR = R3MAL - R3MAL;
R3MARRR = R3MAL - R3MAL;
RUN;
DATA T3MA2; SET B;
IF 1793<YEAR<1812;
TIME = YEAR - 1794;
PROC AUTOREG DATA=T3MA2;
MODEL MAP = LPMAL TIME;

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RUN;
DATA T3NY34; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=T3NY34;
MODEL NYP = LPNYL TIME;
RUN;
PROC AUTOREG DATA=T3NY34;
MODEL NYP = LPNYL TIME NYPP NYPPP;
RUN;
DATA T3PA2; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=T3PA2;
MODEL PAP = LPPAL TIME PAPP;
RUN;
DATA T3UK3; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=T3UK3;
MODEL BRP = LPBRL TIME BRPP;
RUN;
DATA FN20MA; SET B;
IF 1793<YEAR<1812;
TIME = YEAR - 1794;
PROC AUTOREG DATA=FN20MA;
MODEL LPMA = TIME / nlag=1 method=ml;
RUN;
DATA FN20NY; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=FN20NY;
MODEL LPNY = TIME / nlag=3 method=ml;
RUN;
DATA FN20PA; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=FN20PA;
MODEL LPPA = TIME / nlag=3 method=ml;
RUN;
DATA FN20UK; SET B;
IF 1795<YEAR<1812;
TIME = YEAR - 1796;
PROC AUTOREG DATA=FN20UK;
MODEL LPBRIT = TIME / nlag=2 method=ml;
RUN;

```

```

DATA USPPP;
INPUT YEAR 1-4 PBRIT 6-8 EXNY 10-15 PNY 17-21 EXPA 23-28 PPA 30-34 EXSC
36-41 PSC 43-47 EXVA 49-54 EXMD 56-61 EXMA 63-68 PVA 70-74 PMD 76-80
PMA 82-86 PMDD 88-92;
LABEL
YEAR = YEAR
PBRIT = price index for England
EXNY = sterling exchange rate for the U.S. dollar

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PNY = price index for NY
 EXPA = an alternative U.S. dollar exchange rate
 PPA = price index for PA
 EXSC = an alternative U.S. dollar exchange rate
 PSC = price index for SC
 EXVA = sterling exchange rate for VA
 EXMD = sterling exchange rate for MD
 EXMA = sterling exchange rate for MA
 PVA = price index for VA
 PMD = price index for MD
 PMDD = adams price index for MD
 PMA = Rothenberg price index for MA;

LIST;

CARDS;

1796	154	428.63	202.4	476.36	154.4	433.74	144.7	0.01	0.01	0.01
153.7	152.4	98.6	0.1							
1797	148	456.46	172.3	469.05	139.8	456.73	122.2	0.01	0.01	0.01
162.5	153.5	99.0	0.1							
1798	148	444.14	167.2	474.53	128.2	441.73	129.3	0.01	0.01	0.01
159.7	152.5	94.8	0.1							
1799	160	443.05	172.3	479.10	123.3	444.38	133.0	0.01	0.01	0.01
152.4	159.2	98.7	0.1							
1800	212	510.34	176.8	477.27	129.4	504.31	122.8	0.01	0.01	0.01
140.5	129.1	109.1	0.1							
1801	228	508.03	194.6	470.57	138.0	502.37	136.2	0.01	0.01	0.01
149.0	140.5	88.4	0.1							
1802	174	494.29	160.5	464.49	118.9	486.02	105.6	0.01	0.01	0.01
116.2	124.9	97.1	0.1							
1803	156	493.18	161.4	469.05	123.5	493.46	111.6	0.01	0.01	0.01
117.3	144.1	91.1	0.1							
1804	161	488.89	172.4	469.05	130.6	485.30	114.4	0.01	0.01	0.01
166.9	167.5	107.3	0.1							
1805	187	468.63	192.7	480.62	136.0	467.69	125.9	0.01	0.01	0.01
146.1	180.4	111.2	0.1							
1806	184	488.45	182.9	472.40	125.3	486.11	109.4	0.01	0.01	0.01
137.2	151.3	116.4	0.1							
1807	186	485.14	177.7	469.66	119.2	478.64	106.8	0.01	0.01	0.01
155.7	166.5	110.6	0.1							
1808	204	495.71	158.1	489.45	108.9	501.38	86.8	0.01	0.01	0.01
100.4	123.4	98.6	0.1							
1809	212	502.26	177.4	485.79	123.6	500.74	90.0	0.01	0.01	0.01
127.8	131.7	110.1	0.1							
1810	207	489.03	179.4	480.01	131.8	483.69	96.3	0.01	0.01	0.01
133.6	145.5	111.8	0.1							
1811	206	461.99	172.5	472.70	132.7	460.04	96.3	0.01	0.01	0.01
147.1	137.2	112.5	0.1							

DATA C; SET USPPP;

IF PBRIT>1 THEN LPBRIT = log(PBRIT); ELSE LPBRIT=.;
 IF EXNY>1 THEN LEXNY = log(EXNY); ELSE LEXNY=.;
 IF PNY>1 THEN LPNY = log(PNY); ELSE LPNY=.;
 IF EXPA>1 THEN LEXPA = log(EXPA); ELSE LEXPA=.;
 IF PPA>1 THEN LPPA = log(PPA); ELSE LPPA=.;
 IF EXSC>1 THEN LEXSC = log(EXSC); ELSE LEXSC=.;
 IF PSC>1 THEN LPSC = log(PSC); ELSE LPSC=.;
 IF EXVA>1 THEN LEXVA = log(EXVA); ELSE LEXVA=.;
 IF EXMD>1 THEN LEXMD = log(EXMD); ELSE LEXMD=.;

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IF EXMA>1 THEN LEXMA = log(EXMA); ELSE LEXMA=.;
IF PVA>1 THEN LPVA = log(PVA); ELSE LPVA=.;
IF PMD>1 THEN LPMD = log(PMD); ELSE LPMD=.;
IF PMDD>1 THEN LPMDD = log(PMDD); ELSE LPMDD=.;
IF PMA>1 THEN LPMA = log(PMA); ELSE LPMA=.;
IF EXNY>1 and PNY>1 THEN RNY = log((PBRIT*EXNY)/PNY); ELSE RNY=.;
IF EXPA>1 and PPA>1 THEN RPA = log((PBRIT*EXPA)/PPA); ELSE RPA=.;
IF EXSC>1 and PSC>1 THEN RSC = log((PBRIT*EXSC)/PSC); ELSE RSC=.;
IF EXVA>1 and PVA>1 THEN RVA = log((PBRIT*EXVA)/PVA); ELSE RVA=.;
IF EXMD>1 and PMDD>1 THEN RMDD = log((PBRIT*EXMD)/PMDD); ELSE RMDD=.;
IF EXMD>1 and PMD>1 THEN RMD = log((PBRIT*EXMD)/PMD); ELSE RMD=.;
IF EXMA>1 and PMA>1 THEN RMA = log((PBRIT*EXMA)/PMA); ELSE RMA=.;
IF EXNY>1 and PPA>1 THEN R3PA = log((PBRIT*EXNY)/PPA); ELSE R3PA=.;
IF EXNY>1 and PNY>1 THEN R3NY = log((PBRIT*EXNY)/PNY); ELSE R3NY=.;
IF EXNY>1 and PSC>1 THEN R3SC = log((PBRIT*EXNY)/PSC); ELSE R3SC=.;
IF EXNY>1 and PVA>1 THEN R3VA = log((PBRIT*EXNY)/PVA); ELSE R3VA=.;
IF EXNY>1 and PMD>1 THEN R3MD = log((PBRIT*EXNY)/PMD); ELSE R3MD=.;
IF EXNY>1 and PMA>1 THEN R3MA = log((PBRIT*EXNY)/PMA); ELSE R3MA=.;
LPBRL = lag1(LPBRIT);
LPBRLL = lag2(LPBRIT);
LPBRLLL = lag3(LPBRIT);
BRP = LPBRIT - LPBRL;
BRPP = LPBRL - LPBRLL;
BRPPP = LPBRLL - LPBRLLL;
LEXNYL = lag1(LEXNY);
LEXNYLL = lag2(LEXNY);
LEXNYLLL = lag3(LEXNY);
NYX = LEXNY - LEXNYL;
NYXX = LEXNYL - LEXNYLL;
NYXXX = LEXNYLL - LEXNYLLL;
LPNYL = lag1(LPNY);
LPNYLL = lag2(LPNY);
LPNYLLL = lag3(LPNY);
LPNYL4 = lag4(LPNY);
NYP = LPNY - LPNYL;
NYPP = LPNYL - LPNYLL;
NYPPP = LPNYLL - LPNYLLL;
NYP4 = LPNYLLL - LPNYL4;
RNYL = lag1(RNY);
RNYLL = lag2(RNY);
RNYLLL = lag3(RNY);
RNYR = RNY - RNYL;
RNYRR = RNYL - RNYLL;
RNYRRR = RNYLL - RNYLLL;
R3MAL = lag1(R3MA);
R3MALL = lag2(R3MA);
R3MALLLL = lag3(R3MA);
R3MAL4 = lag4(R3MA);
R3MAR = R3MA - R3MAL;
R3MARR = R3MAL - R3MALL;
R3MARRR = R3MALL - R3MALLLL;
R3MA4R = R3MALLLL - R3MAL4;
R3NYL = lag1(R3NY);
R3NYLL = lag2(R3NY);
R3NYLLL = lag3(R3NY);
R3NYL4 = lag4(R3NY);
R3NYR = R3NY - R3NYL;

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R3NYRR = R3NYL - R3NYLL;
R3NYRRR = R3NYLL - R3NYLLL;
R3NY4R = R3NYLLL - R3NYL4;
R3MDL = lag1(R3MD);
R3MDLL = lag2(R3MD);
R3MDLLL = lag3(R3MD);
R3MDL4 = lag4(R3MD);
R3MDR = R3MD - R3MDL;
R3MDRR = R3MDL - R3MDLL;
R3MDRRR = R3MDLL - R3MDLLL;
R3MD4R = R3MDLLL - R3MDL4;
R3VAL = lag1(R3VA);
R3VALL = lag2(R3VA);
R3VALLL = lag3(R3VA);
R3VAL4 = lag4(R3VA);
R3VAR = R3VA - R3VAL;
R3VARR = R3VAL - R3VALL;
R3VARRR = R3VALL - R3VALLL;
R3VA4R = R3VALLL - R3VAL4;
R3SCL = lag1(R3SC);
R3SCLL = lag2(R3SC);
R3SCLLL = lag3(R3SC);
R3SCL4 = lag4(R3SC);
R3SCR = R3SC - R3SCL;
R3SCRR = R3SCL - R3SCLL;
R3SCRRR = R3SCLL - R3SCLLL;
R3SC4R = R3SCLLL - R3SCL4;
LEXPAL = lag1(LEXP);
LEXPALL = lag2(LEXP);
LEXPALLL = lag3(LEXP);
LEXPAL4 = lag4(LEXP);
PAX = LEXPA - LEXPAL;
PAXX = LEXPAL - LEXPALL;
PAXXX = LEXPALL - LEXPALLL;
PAX4 = LEXPALLL - LEXPAL4;
LPPAL = lag1(LPPA);
LPPALL = lag2(LPPA);
LPPALLL = lag3(LPPA);
LPPAL4 = lag4(LPPA);
PAP = LPPA - LPPAL;
PAPP = LPPAL - LPPALL;
PAPPP = LPPALL - LPPALLL;
PAP4 = LPPALLL - LPPAL4;
RPAL = lag1(RPA);
RPALL = lag2(RPA);
RPALLL = lag3(RPA);
RPAL4 = lag4(RPA);
RPAR = RPA - RPAL;
RPARR = RPAL - RPALL;
RPARRR = RPALL - RPALLL;
RPAR4 = RPALLL - RPAL4;
R3PAL = lag1(R3PA);
R3PALL = lag2(R3PA);
R3PALLL = lag3(R3PA);
R3PAL4 = lag4(R3PA);
R3PAR = R3PA - R3PAL;
R3PARR = R3PAL - R3PALL;

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R3PARRR = R3PALL - R3PALLL;
R3PA4R = R3PALLL - R3PAL4;
LEXSCL = lag1(LEXSC);
LEXSCLL = lag2(LEXSC);
LEXSCLLL = lag3(LEXSC);
SCX = LEXSC - LEXSCL;
SCXX = LEXSCL - LEXSCLL;
SCXXX = LEXSCLL - LEXSCLLL;
LPSC = lag1(LPSC);
LPSCLL = lag2(LPSC);
LPSCLLL = lag3(LPSC);
LPSC4 = lag4(LPSC);
SCP = LPSC - LPSC;
SCPP = LPSC - LPSCLL;
SCPPP = LPSCLL - LPSCLLL;
SCP4 = LPSCLLL - LPSC4;
RSCL = lag1(RSC);
RSCLL = lag2(RSC);
RSCLLL = lag3(RSC);
RSCR = RSC - RSCL;
RSCRR = RSCL - RSCLL;
RSCRRR = RSCLL - RSCLLL;
LEXVAL = lag1(LEXVA);
LEXVALL = lag2(LEXVA);
LEXVALLL = lag3(LEXVA);
VAX = LEXVA - LEXVAL;
VAXX = LEXVAL - LEXVALL;
VAXXX = LEXVALL - LEXVALLL;
LPVAL = lag1(LPVA);
LPVALL = lag2(LPVA);
LPVALLL = lag3(LPVA);
LPVAL4 = lag4(LPVA);
VAP = LPVA - LPVAL;
VAPP = LPVAL - LPVALL;
VAPPP = LPVALL - LPVALLL;
VAP4 = LPVALLL - LPVAL4;
RVAL = lag1(RVA);
RVALL = lag2(RVA);
RVALLL = lag3(RVA);
RVAR = RVA - RVAL;
RVARR = RVAL - RVALL;
RVARRR = RVALL - RVALLL;
LEXMDL = lag1(LEXMD);
LEXMDLL = lag2(LEXMD);
LEXMDLLL = lag3(LEXMD);
MDX = LEXMD - LEXMDL;
MDXX = LEXMDL - LEXMDLL;
MDXXX = LEXMDLL - LEXMDLLL;
LPMDL = lag1(LPMD);
LPMDLL = lag2(LPMD);
LPMDLLL = lag3(LPMD);
LPMDL4 = lag4(LPMD);
MDP = LPMD - LPMDL;
MDPP = LPMDL - LPMDLL;
MDPPP = LPMDLL - LPMDLLL;
MDP4 = LPMDLLL - LPMDL4;
LMDDL = lag1(LPMDD);

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LMDDL = lag2(LPMDD);
LMDDL = lag3(LPMDD);
MDDP = LPMDD - LMDDL;
MDDPP = LMDDL - LMDDL;
MDDPPP = LMDDL - LMDDL;
RMDL = lag1(RMD);
RMDL = lag2(RMD);
RMDL = lag3(RMD);
RMDR = RMD - RMDL;
RMDRR = RMDL - RMDL;
RMDRRR = RMDL - RMDL;
RMDL = lag1(RMDD);
RMDL = lag2(RMDD);
RMDL = lag3(RMDD);
RMDR = RMDD - RMDL;
RMDRR = RMDL - RMDL;
RMDRRR = RMDL - RMDL;
LEXMAL = lag1(LEXMA);
LEXMAL = lag2(LEXMA);
LEXMAL = lag3(LEXMA);
MAX = LEXMA - LEXMAL;
MAXX = LEXMAL - LEXMAL;
MAXXX = LEXMAL - LEXMAL;
LPMAL = lag1(LPMA);
LPMAL = lag2(LPMA);
LPMAL = lag3(LPMA);
LPMAL4 = lag4(LPMA);
MAP = LPMA - LPMAL;
MAPP = LPMAL - LPMAL;
MAPPP = LPMAL - LPMAL;
MAP4 = LPMAL - LPMAL4;
RMAL = lag1(RMA);
RMAL = lag2(RMA);
RMAL = lag3(RMA);
RMAR = RMA - RMAL;
RMARR = RMAL - RMAL;
RMARRR = RMAL - RMAL;
RUN;
DATA T3MD34; SET C;
IF 1796<YEAR<1812;
TIME = YEAR - 1797;
PROC AUTOREG DATA=T3MD34;
MODEL MDP = LPMDL TIME;
RUN;
PROC AUTOREG DATA=T3MD34;
MODEL MDP = LPMDL TIME MDPP MDPPP MDP4;
RUN;
DATA T3VA3; SET C;
IF 1796<YEAR<1812;
TIME = YEAR - 1797;
PROC AUTOREG DATA=T3VA3;
MODEL VAP = LPVAL TIME;
RUN;
DATA T3SC3; SET C;
IF 1796<YEAR<1812;
TIME = YEAR - 1797;
PROC AUTOREG DATA=T3SC3;

```

```

MODEL SCP = LPSC TIME;
RUN;
DATA FN20MDVASC; SET C;
IF 1796<YEAR<1812;
TIME = YEAR - 1797;
PROC AUTOREG DATA=FN20MDVASC;
MODEL LPMD = TIME / nlag=1 method=ml;
RUN;
PROC AUTOREG DATA=FN20MDVASC;
MODEL LPVA = TIME / nlag=1 method=ml;
RUN;
PROC AUTOREG DATA=FN20MDVASC;
MODEL LPSC = TIME / nlag=3 method=ml;
RUN;
DATA T5; SET C;
IF 1796<YEAR<1812;
PROC AUTOREG DATA=T5;
MODEL R3MAR = R3MAL;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3MAR = R3MAL R3MARR R3MARRR R3MA4R;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3NYR = R3NYL;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3NYR = R3NYL R3NYRR R3NYRRR R3NY4R;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3PAR = R3PAL;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3PAR = R3PAL R3PARR R3PARRR R3PA4R;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3MDR = R3MDL;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3MDR = R3MDL R3MDRR R3MDRRR R3MD4R;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3VAR = R3VAL;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3VAR = R3VAL R3VARR R3VARRR R3VA4R;
RUN;
PROC AUTOREG DATA=T5;
MODEL R3SCR = R3SCL;
RUN;
PROC AUTOREG DATA=T5;
MODEL NYX = LEXNYL;
RUN;

```

END