[] Dendrochronology Program Library Run QUMO Program COF 10:46 Fri 04 Sep 2020 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 31295

------------------------------------------------------------------------------------------------------------------------------------

 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 File of DATED series: SCBI\_qumo.rwl

 CONTENTS:

 Part 1: Title page, options selected, summary, absent rings by series

 Part 2: Histogram of time spans

 Part 3: Master series with sample depth and absent rings by year

 Part 4: Bar plot of Master Dating Series

 Part 5: Correlation by segment of each series with Master

 Part 6: Potential problems: low correlation, divergent year-to-year changes, absent rings, outliers

 Part 7: Descriptive statistics

 RUN CONTROL OPTIONS SELECTED VALUE

 1 Cubic smoothing spline 50% wavelength cutoff for filtering

 32 years

 2 Segments examined are 50 years lagged successively by 25 years

 3 Autoregressive model applied A Residuals are used in master dating series and testing

 4 Series transformed to logarithms Y Each series log-transformed for master dating series and testing

 5 CORRELATION is Pearson (parametric, quantitative)

 Critical correlation, 99% confidence level .3281

 6 Master dating series saved N

 7 Ring measurements listed N

 8 Parts printed 1234567

 9 Absent rings are omitted from master series and segment correlations (Y)

 Time span of Master dating series is 1777 to 2017 241 years

 Continuous time span is 1777 to 2017 241 years

 Portion with two or more series is 1830 to 2016 187 years

 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 \*C\* Number of dated series 67 \*C\*

 \*O\* Master series 1777 2017 241 yrs \*O\*

 \*F\* Total rings in all series 6218 \*F\*

 \*E\* Total dated rings checked 6164 \*E\*

 \*C\* Series intercorrelation .446 \*C\*

 \*H\* Average mean sensitivity .227 \*H\*

 \*A\* Segments, possible problems 55 \*A\*

 \*\*\* Mean length of series 92.8 \*\*\*

 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 ABSENT RINGS listed by SERIES: (See Master Dating Series for absent rings listed by year)

 142583 1 absent rings: 1925

 192108 1 absent rings: 1947

 2 absent rings .032%

PART 2: TIME PLOT OF TREE-RING SERIES: 10:46 Fri 04 Sep 2020 Page 2

------------------------------------------------------------------------------------------------------------------------------------

 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050 Ident Seq Time-span Yrs

 : : : : : : : : : : : : : : : : : : : : : -------- --- ---- ---- ----

 . . . . . . . . . . . . . . . <======================> . 142602 1 1777 2009 233

 . . . . . . . . . . . . . . . . <================> . 192068 2 1830 2009 180

 . . . . . . . . . . . . . . . . <===============> . 22031 3 1848 2009 162

 . . . . . . . . . . . . . . . . . <============> . 22064 4 1870 2009 140

 . . . . . . . . . . . . . . . . . <============> . 42389 5 1875 2009 135

 . . . . . . . . . . . . . . . . . <============> . 60161 6 1877 2009 133

 . . . . . . . . . . . . . . . . . <============> . 202010 7 1880 2014 135

 . . . . . . . . . . . . . . . . . <===========> . 192070 8 1881 2009 129

 . . . . . . . . . . . . . . . . . <===========> . 10731 9 1882 2009 128

 . . . . . . . . . . . . . . . . . <===========> . 70083 10 1882 2009 128

 . . . . . . . . . . . . . . . . . <==========> . 60348 11 1890 2009 120

 . . . . . . . . . . . . . . . . . <==========> . 151120 12 1892 2009 118

 . . . . . . . . . . . . . . . . . <==========> . 142583 13 1893 2009 117

 . . . . . . . . . . . . . . . . . <==========> . 70444 14 1894 2009 116

 . . . . . . . . . . . . . . . . . <==========> . 111172 15 1896 2009 114

 . . . . . . . . . . . . . . . . . <==========> . 80458 16 1898 2009 112

 . . . . . . . . . . . . . . . . . <==========> . 40529 17 1899 2009 111

 . . . . . . . . . . . . . . . . . <=========> . 80230 18 1900 2009 110

 . . . . . . . . . . . . . . . . . <=========> . 90653 19 1900 2009 110

 . . . . . . . . . . . . . . . . . <=========> . 70198 20 1903 2009 107

 . . . . . . . . . . . . . . . . . <=========> . 202230 21 1903 2009 107

 . . . . . . . . . . . . . . . . . <=========> . 10726 22 1904 2009 106

 . . . . . . . . . . . . . . . . . <=========> . 52323 23 1906 2009 104

 . . . . . . . . . . . . . . . . . .<========> . 62373 24 1910 2009 100

 . . . . . . . . . . . . . . . . . .<=========> . 80437 25 1915 2012 98

 . . . . . . . . . . . . . . . . . .<========> . 60187 26 1916 2009 94

 . . . . . . . . . . . . . . . . . .<========> . 80465r 27 1916 2003 88

 . . . . . . . . . . . . . . . . . .<========> . 80402A 28 1917 2009 93

 . . . . . . . . . . . . . . . . . .<========> . 52462 29 1919 2009 91

 . . . . . . . . . . . . . . . . . .<=========> . 101075 30 1919 2011 93

 . . . . . . . . . . . . . . . . . . <=======> . 32381 31 1922 2009 88

 . . . . . . . . . . . . . . . . . . <=======> . 162030 32 1922 2009 88

 . . . . . . . . . . . . . . . . . . <=======> . 100942 33 1924 2009 86

 . . . . . . . . . . . . . . . . . . <=======> . 202135 34 1924 2009 86

 . . . . . . . . . . . . . . . . . . <=======> . 60333 35 1925 2009 85

 . . . . . . . . . . . . . . . . . . <=======> . 70308 36 1925 2009 85

 . . . . . . . . . . . . . . . . . . <=======> . 50367 37 1927 2009 83

 . . . . . . . . . . . . . . . . . . <======> . 50434 38 1930 2006 77

 . . . . . . . . . . . . . . . . . . <======> . 60023 39 1930 2002 73

 . . . . . . . . . . . . . . . . . . <======> . 70334 40 1930 2009 80

 . . . . . . . . . . . . . . . . . . <=======> . 111196 41 1930 2015 86

 . . . . . . . . . . . . . . . . . . <=======> . 32513A 42 1932 2016 85

 . . . . . . . . . . . . . . . . . . <=======> . 141031 43 1932 2010 79

 . . . . . . . . . . . . . . . . . . <======> . 162415 44 1933 2009 77

 . . . . . . . . . . . . . . . . . . <======> . 111240 45 1934 2009 76

 . . . . . . . . . . . . . . . . . . <======> . 140764 46 1935 2009 75

 . . . . . . . . . . . . . . . . . . <======> . 32032 47 1936 2002 67

 . . . . . . . . . . . . . . . . . . <=======> . 192108 48 1936 2010 75

 . . . . . . . . . . . . . . . . . . <======> . 40538 49 1938 2009 72

 . . . . . . . . . . . . . . . . . . <=======> . 111173 50 1938 2017 80

 : : : : : : : : : : : : : : : : : : : : :

 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050

PART 2: TIME PLOT OF TREE-RING SERIES: 10:46 Fri 04 Sep 2020 Page 3

------------------------------------------------------------------------------------------------------------------------------------

 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050 Ident Seq Time-span Yrs

 : : : : : : : : : : : : : : : : : : : : : -------- --- ---- ---- ----

 . . . . . . . . . . . . . . . . . . <=======> . 202324 51 1938 2012 75

 . . . . . . . . . . . . . . . . . . <======> . 192130 52 1939 2009 71

 . . . . . . . . . . . . . . . . . . <=====> . 101121 53 1940 2005 66

 . . . . . . . . . . . . . . . . . . <=====> . 50323 54 1943 2009 67

 . . . . . . . . . . . . . . . . . . <=====> . 70148 55 1943 2005 63

 . . . . . . . . . . . . . . . . . . <======> . 182056 56 1945 2016 72

 . . . . . . . . . . . . . . . . . . <=====> . 152069 57 1948 2009 62

 . . . . . . . . . . . . . . . . . . <=====> . 192083 58 1949 2002 54

 . . . . . . . . . . . . . . . . . . <====> . 192074 59 1952 2009 58

 . . . . . . . . . . . . . . . . . . <====> . 152044 60 1953 2009 57

 . . . . . . . . . . . . . . . . . . <====> . 172517 61 1955 2009 55

 . . . . . . . . . . . . . . . . . . <====> . 202103 62 1957 2009 53

 . . . . . . . . . . . . . . . . . . <====> . 162438 63 1958 2009 52

 . . . . . . . . . . . . . . . . . . <====> . 80663 64 1959 2006 48

 . . . . . . . . . . . . . . . . . . <=====> . 202029 65 1959 2016 58

 . . . . . . . . . . . . . . . . . . .<===> . 22600r 66 1963 2009 47

 . . . . . . . . . . . . . . . . . . . <===> . 72361A 67 1972 2016 45

 : : : : : : : : : : : : : : : : : : : : :

 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050

PART 3: Master Dating Series: 10:46 Fri 04 Sep 2020 Page 4

------------------------------------------------------------------------------------------------------------------------------------

 Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab

 ------------------ ------------------ ------------------ ------------------ ------------------ ------------------

 1800 .724 1 1850 -1.968 3 1900 -.145 19 1950 -.227 58 2000 .001 67

 1801 -1.269 1 1851 -1.647 3 1901 .521 19 1951 -.239 58 2001 1.225 67

 1802 -3.613 1 1852 -.520 3 1902 -.257 19 1952 -.599 59 2002 .377 67

 1803 -.119 1 1853 .359 3 1903 1.091 21 1953 -.465 60 2003 .589 64

 1804 -1.540 1 1854 1.433 3 1904 .688 22 1954 -.161 60 2004 -.671 63

 1805 -.418 1 1855 2.191 3 1905 .172 22 1955 .557 61 2005 .075 63

 1806 -.028 1 1856 .794 3 1906 .304 23 1956 .845 61 2006 -.759 61

 1807 -.874 1 1857 .804 3 1907 -.321 23 1957 .941 62 2007 -.597 59

 1808 .491 1 1858 .163 3 1908 -.836 23 1958 1.527 63 2008 .168 59

 1809 -1.796 1 1859 .379 3 1909 -.633 23 1959 .250 65 2009 .834 59

 1810 .014 1 1860 .088 3 1910 -.619 24 1960 .198 65 2010 .825 12

 1811 .170 1 1861 -.218 3 1911 -2.144 24 1961 .291 65 2011 .939 10

 1812 -.313 1 1862 -.031 3 1912 -.939 24 1962 -.263 65 2012 .289 9

 1813 .584 1 1863 1.803 3 1913 -.560 24 1963 -.419 66 2013 -.420 7

 1814 2.506 1 1864 .089 3 1914 -1.061 24 1964 .229 66 2014 .087 7

 1815 2.447 1 1865 .459 3 1915 .657 25 1965 .009 66 2015 -.054 6

 1816 1.967 1 1866 .572 3 1916 1.131 27 1966 -.200 66 2016 -.169 5

 1817 .946 1 1867 -1.099 3 1917 .959 28 1967 .292 66 2017 1.567 1

 1818 -.505 1 1868 -1.600 3 1918 -.619 28 1968 .764 66

 1819 1.194 1 1869 -.758 3 1919 .369 30 1969 .352 66

 1820 1.305 1 1870 1.088 4 1920 -.125 30 1970 .623 66

 1821 .852 1 1871 -2.718 4 1921 .111 30 1971 .034 66

 1822 -.910 1 1872 .587 4 1922 .647 32 1972 -.167 67

 1823 -2.756 1 1873 -.928 4 1923 -.570 32 1973 -.188 67

 1824 -.480 1 1874 -2.158 4 1924 .821 34 1974 -.083 67

 1825 .040 1 1875 -.246 5 1925 -.711 36 1 1975 -.217 67

 1826 -1.760 1 1876 .778 5 1926 .570 36 1976 -.070 67

 1777 2.248 1 1827 -3.016 1 1877 -1.015 6 1927 1.086 37 1977 -2.157 67

 1778 .329 1 1828 .786 1 1878 1.365 6 1928 .325 37 1978 .154 67

 1779 -.424 1 1829 -.555 1 1879 -.230 6 1929 -.064 37 1979 -.493 67

 1780 1.829 1 1830 1.574 2 1880 -.389 7 1930 -.280 41 1980 -1.001 67

 1781 .207 1 1831 -1.462 2 1881 .043 8 1931 -.040 41 1981 -.472 67

 1782 -1.012 1 1832 -.340 2 1882 .696 10 1932 -.606 43 1982 .272 67

 1783 -1.896 1 1833 .773 2 1883 .340 10 1933 -.080 44 1983 .740 67

 1784 -.186 1 1834 .770 2 1884 .711 10 1934 -.053 45 1984 -.380 67

 1785 -3.655 1 1835 -.050 2 1885 -.878 10 1935 -.035 46 1985 -.170 67

 1786 -1.202 1 1836 .539 2 1886 .370 10 1936 .027 48 1986 .647 67

 1787 .244 1 1837 -.144 2 1887 -.447 10 1937 .960 48 1987 .081 67

 1788 1.450 1 1838 -.242 2 1888 -.945 10 1938 .768 51 1988 .680 67

 1789 .479 1 1839 -.185 2 1889 -.411 10 1939 -.204 52 1989 .618 67

 1790 .868 1 1840 .255 2 1890 .173 11 1940 .806 53 1990 1.020 67

 1791 -.433 1 1841 1.162 2 1891 1.209 11 1941 .562 53 1991 -.709 67

 1792 .006 1 1842 1.319 2 1892 .424 12 1942 .907 53 1992 -.240 67

 1793 .975 1 1843 -.740 2 1893 .120 13 1943 -.059 55 1993 .100 67

 1794 2.597 1 1844 -.075 2 1894 -.091 14 1944 -.232 55 1994 .118 67

 1795 2.014 1 1845 .095 2 1895 .524 14 1945 .424 56 1995 .715 67

 1796 -1.516 1 1846 .311 2 1896 1.163 15 1946 -.167 56 1996 -.534 67

 1797 -2.433 1 1847 -1.152 2 1897 .602 15 1947 -2.612 56 1 1997 -.736 67

 1798 .851 1 1848 -.614 3 1898 -.257 16 1948 -1.518 57 1998 .299 67

 1799 1.103 1 1849 -1.660 3 1899 -.874 17 1949 -.510 58 1999 -.925 67

------------------------------------------------------------------------------------------------------------------------------------

PART 4: Master Bar Plot: 10:46 Fri 04 Sep 2020 Page 5

------------------------------------------------------------------------------------------------------------------------------------

 Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value

 1800--------C 1850h 1900----a 1950---a 2000-----@

 1801-e 1851g 1901-------B 1951---a 2001---------E

 1802n 1852--b 1902---a 1952--b 2002-------B

 1803----@ 1853-------A 1903---------D 1953--b 2003--------B

 1804f 1854----------F 1904--------C 1954----a 2004--c

 1805--b 1855----------I 1905------A 1955-------B 2005-----@

 1806-----@ 1856--------C 1906------A 1956---------C 2006-c

 1807-c 1857--------C 1907---a 1957---------D 2007--b

 1808-------B 1858------A 1908-c 1958----------F 2008------A

 1809g 1859-------B 1909--c 1959------A 2009---------C

 1810-----@ 1860-----@ 1910--b 1960------A 2010--------C

 1811------A 1861---a 1911i 1961------A 2011---------D

 1812---a 1862-----@ 1912-d 1962---a 2012------A

 1813-------B 1863----------G 1913--b 1963--b 2013--b

 1814----------J 1864-----@ 1914-d 1964------A 2014-----@

 1815----------J 1865-------B 1915--------C 1965-----@ 2015-----@

 1816----------H 1866-------B 1916---------E 1966----a 2016----a

 1817---------D 1867-d 1917---------D 1967------A 2017----------F

 1818--b 1868f 1918--b 1968--------C

 1819---------E 1869-c 1919-------A 1969-------A

 1820----------E 1870---------D 1920----a 1970--------B

 1821---------C 1871k 1921-----@ 1971-----@

 1822-d 1872--------B 1922--------C 1972----a

 1823k 1873-d 1923--b 1973----a

 1824--b 1874i 1924--------C 1974----@

 1825-----@ 1875---a 1925--c 1975---a

 1826g 1876--------C 1926-------B 1976----@

 1777----------I 1827l 1877-d 1927---------D 1977i

 1778------A 1828--------C 1878----------E 1928------A 1978------A

 1779--b 1829--b 1879---a 1929----@ 1979--b

 1780----------G 1830----------F 1880---b 1930---a 1980-d

 1781------A 1831f 1881-----@ 1931-----@ 1981--b

 1782-d 1832---a 1882--------C 1932--b 1982------A

 1783h 1833--------C 1883------A 1933----@ 1983--------C

 1784----a 1834--------C 1884--------C 1934-----@ 1984---b

 1785o 1835-----@ 1885-d 1935-----@ 1985----a

 1786-e 1836-------B 1886-------A 1936-----@ 1986--------C

 1787------A 1837----a 1887--b 1937---------D 1987-----@

 1788----------F 1838---a 1888-d 1938--------C 1988--------C

 1789-------B 1839----a 1889--b 1939---a 1989--------B

 1790---------C 1840------A 1890------A 1940--------C 1990---------D

 1791--b 1841---------E 1891---------E 1941-------B 1991--c

 1792-----@ 1842----------E 1892-------B 1942---------D 1992---a

 1793---------D 1843-c 1893-----@ 1943----@ 1993-----@

 1794----------J 1844----@ 1894----@ 1944---a 1994-----@

 1795----------H 1845-----@ 1895-------B 1945-------B 1995--------C

 1796f 1846------A 1896---------E 1946----a 1996--b

 1797j 1847-e 1897--------B 1947j 1997-c

 1798---------C 1848--b 1898---a 1948f 1998------A

 1799---------D 1849g 1899-c 1949--b 1999-d

PART 5: CORRELATION OF SERIES BY SEGMENTS: 10:46 Fri 04 Sep 2020 Page 5

------------------------------------------------------------------------------------------------------------------------------------

 Correlations of 50-year dated segments, lagged 25 years

 Flags: A = correlation under .3281 but highest as dated; B = correlation higher at other than dated position

 Seq Series Time\_span 1825 1850 1875 1900 1925 1950 1975

 1874 1899 1924 1949 1974 1999 2024

 --- -------- --------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----

 1 142602 1777 2009 .57 .57 .68 .68 .39 .44 .52

 2 192068 1830 2009 .45 .48 .52 .69 .45 .15B .27A

 3 22031 1848 2009 .53 .54 .45 .33 .24B .42 .44

 4 22064 1870 2009 .26A .26A .47 .29A .33 .33A

 5 42389 1875 2009 .46 .61 .58 .58 .63

 6 60161 1877 2009 .49 .67 .59 .73 .67

 7 202010 1880 2014 .44 .59 .30A .30A .33

 8 192070 1881 2009 .52 .64 .53 .62 .59

 9 10731 1882 2009 .62 .56 .23A .40 .41

 10 70083 1882 2009 .23A .46 .49 .54 .53

 11 60348 1890 2009 .64 .72 .60 .51 .56

 12 151120 1892 2009 .29A .41 .56 .52 .46

 13 142583 1893 2009 .50 .53 .30A .50 .51

 14 70444 1894 2009 .29A .31A .36 .53 .37B

 15 111172 1896 2009 .44 .60 .73 .55 .56

 16 80458 1898 2009 .62 .61 .65 .53 .43

 17 40529 1899 2009 .49 .52 .53 .38 .35

 18 80230 1900 2009 .66 .43 .14B .29B

 19 90653 1900 2009 .35 .68 .68 .61

 20 70198 1903 2009 .49 .44 .77 .70

 21 202230 1903 2009 .67 .32A .41 .54

 22 10726 1904 2009 .54 .47 .42 .37B

 23 52323 1906 2009 .42 .45 .30A .31A

 24 62373 1910 2009 .46 .62 .39 .30A

 25 80437 1915 2012 .71 .78 .46 .47

 26 60187 1916 2009 .41 .39 .33A .12B

 27 80465r 1916 2003 .52 .43 .31A .32A

 28 80402A 1917 2009 .65 .66 .36B .42

 29 52462 1919 2009 .54 .53 .46 .57

 30 101075 1919 2011 .41 .48 .34 .34

 31 32381 1922 2009 .47 .46 .39 .39

 32 162030 1922 2009 .40 .41 .25B .34

 33 100942 1924 2009 .62 .64 .32B .34

 34 202135 1924 2009 .55 .54 .58 .56

 35 60333 1925 2009 .48 .50 .47

 36 70308 1925 2009 .59 .59 .59

 37 50367 1927 2009 .55 .39 .24A

 38 50434 1930 2006 .23A .32A .33

 39 60023 1930 2002 .25A .48 .49

 40 70334 1930 2009 .41 .23A .30A

 41 111196 1930 2015 .32A .60 .47

 42 32513A 1932 2016 .51 .49 .34

 43 141031 1932 2010 .51 .34 .35

 44 162415 1933 2009 .47 .51 .54

 45 111240 1934 2009 .38 .36 .24A

 46 140764 1935 2009 .31A .27B .31A

 47 32032 1936 2002 .42 .37 .34

 48 192108 1936 2010 .49 .34 .35

 49 40538 1938 2009 .52 .54 .56

 50 111173 1938 2017 .24A .29A .35

 51 202324 1938 2012 .44 .29B .25B

 52 192130 1939 2009 .48 .52 .54

 53 101121 1940 2005 .45 .39 .42

 54 50323 1943 2009 .46 .46 .48

 55 70148 1943 2005 .36 .24A .24B

 56 182056 1945 2016 .20A .30A .32A

 57 152069 1948 2009 .46 .56 .54

 58 192083 1949 2002 .53 .58 .55

 59 192074 1952 2009 .49 .43

 60 152044 1953 2009 .49 .56

 61 172517 1955 2009 .30A .35

 62 202103 1957 2009 .25A .32A

 63 162438 1958 2009 .46 .46

 64 80663 1959 2006 .30A

 65 202029 1959 2016 .48 .50

 66 22600r 1963 2009 .31A

 67 72361A 1972 2016 .44

 Av segment correlation .52 .46 .47 .54 .46 .42 .43

PART 6: POTENTIAL PROBLEMS: 10:46 Fri 04 Sep 2020 Page 6

------------------------------------------------------------------------------------------------------------------------------------

 For each series with potential problems the following diagnostics may appear:

 [A] Correlations with master dating series of flagged 50-year segments of series filtered with 32-year spline,

 at every point from ten years earlier (-10) to ten years later (+10) than dated

 [B] Effect of those data values which most lower or raise correlation with master series

 Symbol following year indicates value in series is greater (>) or lesser (<) than master series value

 [C] Year-to-year changes very different from the mean change in other series

 [D] Absent rings (zero values)

 [E] Values which are statistical outliers from mean for the year

====================================================================================================================================

 142602 1777 to 2009 233 years Series 1

 [\*] Early part of series cannot be checked from 1777 to 1829 -- not matched by another series

 [B] Entire series, effect on correlation ( .535) is:

 Lower 1889< -.018 1981< -.015 1954< -.011 1835> -.010 1849> -.009 1852< -.009 Higher 1911 .022 1871 .018

 [E] Outliers 4 3.0 SD above or -4.5 SD below mean for year

 1835 +3.1 SD; 1836 +3.3 SD; 1889 -4.7 SD; 1981 -4.9 SD

====================================================================================================================================

 192068 1830 to 2009 180 years Series 2

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 -6 -.05 -.06 -.07 -.01 .16\* .01 -.17 -.23 .07 -.04 .15|-.02 -.15 -.02 -.04 -.03 -.05 -.01 .00 .01 -.10

 1960 2009 0 -.09 .00 .07 .00 .14 -.01 -.09 -.14 .10 -.08 .27\*-.07 -.08 -.17 -.05 -.21 -.07 -.01 .04 - -

 [B] Entire series, effect on correlation ( .439) is:

 Lower 1977> -.017 1894< -.013 1855< -.012 1983< -.010 1999> -.010 1836< -.009 Higher 1871 .048 1947 .016

 1950 to 1999 segment:

 Lower 1977> -.073 1999> -.045 1983< -.045 1993< -.026 1968< -.024 1980> -.022 Higher 1997 .041 1990 .032

 1960 to 2009 segment:

 Lower 1977> -.087 1999> -.047 1983< -.047 1993< -.031 1968< -.025 1980> -.024 Higher 2001 .064 2004 .045

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1853 +4.1 SD; 1871 -4.7 SD; 1977 +3.0 SD

====================================================================================================================================

 22031 1848 to 2009 162 years Series 3

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1925 1974 -1 -.23 -.15 -.27 -.01 -.02 -.21 -.07 -.04 -.16 .36\* .24|-.02 .17 .15 .05 -.12 -.09 -.07 -.15 -.11 -.23

 [B] Entire series, effect on correlation ( .419) is:

 Lower 1911> -.029 1926< -.023 1982< -.020 1945< -.015 1869< -.014 2004> -.011 Higher 1871 .035 1977 .012

 1925 to 1974 segment:

 Lower 1926< -.091 1945< -.053 1952> -.030 1958< -.025 1943> -.018 1966< -.012 Higher 1947 .083 1948 .034

 [E] Outliers 4 3.0 SD above or -4.5 SD below mean for year

 1869 -4.6 SD; 1911 +3.4 SD; 1912 +3.1 SD; 1952 +3.2 SD

====================================================================================================================================

 22064 1870 to 2009 140 years Series 4

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1870 1919 0 .10 -.19 .22 -.21 .19 -.06 -.12 -.01 -.14 -.02 .26\*-.14 .09 -.06 -.19 -.07 .20 -.06 -.23 .13 -.19

 1875 1924 0 .08 -.14 .21 -.34 .16 -.02 -.15 -.19 -.09 -.14 .26\*-.07 .13 -.19 -.10 -.10 .15 .02 -.28 .18 -.16

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 1925 1974 0 -.13 -.15 .01 -.04 -.10 -.24 .19 .26 -.26 .22 .29\* .17 .17 .26 -.12 .08 -.23 -.28 -.17 -.07 -.17

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 1960 2009 0 -.04 .01 .04 .03 .04 -.35 -.10 -.23 -.13 .02 .33\* .10 -.12 .17 -.11 .31 -.17 .08 .12 - -

 [B] Entire series, effect on correlation ( .289) is:

 Lower 1893< -.034 1885> -.018 1880> -.015 1895< -.012 1872< -.010 1984> -.010 Higher 1911 .027 1874 .018

 1870 to 1919 segment:

 Lower 1893< -.081 1885> -.033 1880> -.027 1895< -.025 1872< -.018 1914> -.015 Higher 1911 .054 1874 .034

 1875 to 1924 segment:

 Lower 1893< -.078 1885> -.056 1880> -.042 1895< -.030 1914> -.025 1896< -.014 Higher 1911 .081 1878 .033

 1925 to 1974 segment:

 Lower 1925> -.035 1947> -.024 1950< -.018 1951< -.015 1926< -.014 1945< -.014 Higher 1937 .033 1927 .025

 1960 to 2009 segment:

 Lower 1984> -.042 1986< -.026 1980> -.026 2007> -.017 1998< -.016 2003< -.015 Higher 1999 .047 1991 .036

 [C] Year-to-year changes diverging by over 4.0 std deviations:

 1871 1872 -4.6 SD

 [E] Outliers 6 3.0 SD above or -4.5 SD below mean for year

 1871 +3.3 SD; 1880 +3.2 SD; 1885 +3.2 SD; 1914 +3.1 SD; 1915 +3.3 SD; 1984 +3.2 SD

====================================================================================================================================

 42389 1875 to 2009 135 years Series 5

 [B] Entire series, effect on correlation ( .545) is:

 Lower 1877> -.022 1911> -.014 1996> -.012 1903< -.012 1941< -.009 1999> -.008 Higher 1947 .072 1977 .047

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1877 +3.0 SD; 1947 -5.7 SD; 1977 -5.7 SD

====================================================================================================================================

 60161 1877 to 2009 133 years Series 6

 [B] Entire series, effect on correlation ( .583) is:

 Lower 1879> -.028 1885< -.028 1911> -.012 2003< -.011 1898> -.009 1961< -.009 Higher 1977 .041 1958 .008

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1885 -4.7 SD

====================================================================================================================================

 202010 1880 to 2014 135 years Series 7

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1925 1974 0 .00 .02 .07 -.17 -.16 -.30 .18 .04 -.23 .11 .30\*-.09 -.24 -.01 -.07 -.07 -.15 -.14 .09 -.12 .02

 1950 1999 0 -.08 .04 .02 -.06 -.25 -.29 .12 -.04 .08 .00 .30\*-.20 -.31 .17 .01 .02 .02 -.10 -.02 -.19 .00

 [B] Entire series, effect on correlation ( .345) is:

 Lower 2006> -.033 1963< -.029 1891< -.026 1956< -.019 1918> -.014 1997> -.013 Higher 1947 .040 1911 .028

 1925 to 1974 segment:

 Lower 1963< -.056 1956< -.048 1930> -.022 1925> -.021 1952> -.019 1962> -.013 Higher 1947 .124 1927 .019

 1950 to 1999 segment:

 Lower 1956< -.046 1963< -.040 1997> -.034 1993< -.021 1952> -.019 1962> -.013 Higher 1999 .043 1980 .028

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1930 +3.1 SD; 1963 -5.1 SD; 2006 +5.4 SD

====================================================================================================================================

 192070 1881 to 2009 129 years Series 8

 [B] Entire series, effect on correlation ( .553) is:

 Lower 1888< -.038 1999> -.017 1925> -.014 1908> -.013 1933< -.011 1898> -.010 Higher 1911 .045 1980 .010

====================================================================================================================================

 10731 1882 to 2009 128 years Series 9

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1925 1974 0 -.09 .12 .04 .17 -.23 -.10 -.18 .04 -.12 .14 .23\* .01 -.04 .10 .04 .12 -.16 -.11 -.12 .02 -.30

 [B] Entire series, effect on correlation ( .441) is:

 Lower 1960< -.040 1947> -.038 2000< -.019 1955< -.017 1884< -.015 2004> -.010 Higher 1911 .038 1999 .019

 1925 to 1974 segment:

 Lower 1947> -.080 1960< -.069 1955< -.039 1968< -.022 1929> -.014 1953> -.013 Higher 1958 .029 1948 .027

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1891 +4.0 SD; 1978 +3.2 SD

====================================================================================================================================

 70083 1882 to 2009 128 years Series 10

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1882 1931 0 .14 -.06 .14 .09 .08 .11 -.16 -.06 -.05 -.09 .23\*-.17 -.14 .01 -.24 -.28 .00 -.02 -.12 .06 -.03

 [B] Entire series, effect on correlation ( .425) is:

 Lower 1911> -.018 1891< -.017 1996> -.016 1977> -.012 1888> -.012 1890< -.011 Higher 1991 .026 1999 .019

 1882 to 1931 segment:

 Lower 1891< -.047 1890< -.034 1888> -.027 1919< -.023 1928> -.020 1896< -.018 Higher 1918 .043 1903 .032

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1978 +3.4 SD

====================================================================================================================================

 60348 1890 to 2009 120 years Series 11

 [B] Entire series, effect on correlation ( .642) is:

 Lower 1980> -.019 1925> -.018 1967< -.014 1948> -.012 1965> -.012 1991> -.011 Higher 1947 .069 1911 .018

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1965 +3.4 SD

====================================================================================================================================

 151120 1892 to 2009 118 years Series 12

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1892 1941 0 .07 .10 -.17 .16 -.04 -.10 .10 -.19 -.10 -.11 .29\*-.06 .13 .24 -.16 .06 -.12 .24 -.08 -.12 .02

 [B] Entire series, effect on correlation ( .438) is:

 Lower 1903< -.035 2004> -.024 1902> -.017 1905< -.017 1922< -.016 1997> -.016 Higher 1911 .045 1947 .042

 1892 to 1941 segment:

 Lower 1903< -.070 1902> -.036 1922< -.031 1923> -.026 1905< -.024 1893> -.021 Higher 1911 .140 1918 .074

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1902 +3.3 SD

====================================================================================================================================

 142583 1893 to 2009 117 years Series 13

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1925 1974 0 -.11 .02 -.24 -.20 .10 -.05 -.10 -.23 .24 .20 .30\* .17 .25 .20 .01 -.10 -.08 .15 -.26 -.32 -.19

 [B] Entire series, effect on correlation ( .487) is:

 Lower 1939> -.026 1925< -.015 1896< -.014 1977> -.013 1947> -.011 1970< -.010 Higher 1911 .021 2001 .017

 1925 to 1974 segment:

 Lower 1939> -.054 1947> -.045 1943> -.019 1970< -.017 1927< -.016 1945< -.012 Higher 1925 .080 1958 .019

 [D] 1 Absent rings: Year Master N series Absent

 1925 -.711 36 1

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1925 -7.0 SD; 1939 +3.6 SD

====================================================================================================================================

 70444 1894 to 2009 116 years Series 14

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1894 1943 0 -.17 .11 -.15 .01 -.31 -.24 .21 -.12 .02 -.03 .29\* .15 .07 -.02 .13 .01 .00 .06 -.19 .03 .03

 1900 1949 0 -.17 .10 -.13 .07 -.32 -.26 .16 -.14 .03 .03 .31\* .11 .04 .00 .20 .03 -.03 .06 -.26 -.05 -.02

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 1960 2009 -8 -.21 -.31 .44\*-.20 -.18 .14 -.19 .14 -.28 .20 .37|-.28 -.06 .09 .01 .13 -.02 .25 -.01 - -

 [B] Entire series, effect on correlation ( .357) is:

 Lower 1911> -.052 2006> -.029 1901< -.025 2001< -.019 1967< -.019 1984> -.012 Higher 1977 .043 1999 .024

 1894 to 1943 segment:

 Lower 1911> -.130 1901< -.052 1906< -.020 1925> -.018 1896< -.012 1929< -.011 Higher 1923 .029 1926 .023

 1900 to 1949 segment:

 Lower 1911> -.106 1901< -.051 1929< -.026 1906< -.021 1925> -.015 1928> -.008 Higher 1926 .023 1916 .023

 1960 to 2009 segment:

 Lower 2006> -.076 2001< -.049 1967< -.046 1984> -.032 1996> -.018 1970< -.017 Higher 1977 .108 1999 .063

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1911 +3.4 SD; 2006 +4.0 SD

====================================================================================================================================

 111172 1896 to 2009 114 years Series 15

 [B] Entire series, effect on correlation ( .598) is:

 Lower 1911> -.031 1924< -.017 1920< -.013 1928> -.010 1932> -.010 1977> -.008 Higher 1947 .093 2004 .013

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1947 -5.5 SD

====================================================================================================================================

 80458 1898 to 2009 112 years Series 16

 [B] Entire series, effect on correlation ( .553) is:

 Lower 1968< -.021 1923> -.017 2007> -.014 1991> -.013 1915< -.013 1999> -.011 Higher 1947 .107 1911 .032

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1947 -6.4 SD

====================================================================================================================================

 40529 1899 to 2009 111 years Series 17

 [B] Entire series, effect on correlation ( .447) is:

 Lower 1977> -.035 2007< -.028 1942< -.020 1916< -.013 1899> -.013 1991> -.010 Higher 1947 .025 1980 .015

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1977 +3.5 SD

====================================================================================================================================

 80230 1900 to 2009 110 years Series 18

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 -1 -.13 .00 -.03 -.14 -.22 .02 .14 -.13 -.03 .17\* .14| .13 .17 .04 .02 .05 .04 .07 -.19 -.12 .14

 1960 2009 -8 .07 -.17 .32\* .13 -.40 .12 -.05 -.28 -.05 .06 .29|-.07 .12 .01 -.09 -.01 .10 .01 -.05 - -

 [B] Entire series, effect on correlation ( .456) is:

 Lower 1999> -.022 1970< -.018 1926< -.016 1996> -.014 2007< -.012 1984> -.012 Higher 1911 .048 1977 .016

 1950 to 1999 segment:

 Lower 1999> -.056 1970< -.048 1996> -.033 1984> -.032 1997> -.028 1959> -.025 Higher 1977 .141 1983 .048

 1960 to 2009 segment:

 Lower 1999> -.047 1970< -.034 1996> -.028 1984> -.025 1997> -.022 1989< -.014 Higher 2004 .105 1977 .052

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1984 +3.2 SD

====================================================================================================================================

 90653 1900 to 2009 110 years Series 19

 [B] Entire series, effect on correlation ( .458) is:

 Lower 1934> -.028 1902> -.021 1917< -.019 1903< -.016 1908> -.015 1919< -.014 Higher 1947 .133 1958 .017

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1902 +3.2 SD; 1934 +4.9 SD; 1947 -4.9 SD

====================================================================================================================================

 70198 1903 to 2009 107 years Series 20

 [B] Entire series, effect on correlation ( .585) is:

 Lower 1947> -.038 1934< -.026 1904< -.025 2009< -.015 1927< -.011 2002> -.007 Higher 1977 .052 1991 .018

====================================================================================================================================

 202230 1903 to 2009 107 years Series 21

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1925 1974 0 .02 -.05 .10 .07 -.19 -.17 -.07 -.02 -.12 .09 .32\*-.13 -.13 -.08 -.14 -.26 -.05 -.15 -.02 -.04 -.12

 [B] Entire series, effect on correlation ( .556) is:

 Lower 1977> -.034 1963< -.028 1955< -.021 1947> -.011 1972> -.009 1925> -.009 Higher 1911 .047 2004 .013

 1925 to 1974 segment:

 Lower 1955< -.046 1963< -.027 1972> -.020 1925> -.015 1933< -.011 1952> -.011 Higher 1947 .040 1937 .030

====================================================================================================================================

 10726 1904 to 2009 106 years Series 22

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1960 2009 7 -.12 -.08 .08 .29 .12 .06 .13 .22 -.04 -.32 .37|-.23 -.19 -.22 -.03 .11 -.08 .37\* .07 - -

 [B] Entire series, effect on correlation ( .470) is:

 Lower 2004> -.025 1925> -.021 1983< -.016 1921< -.015 1977> -.014 2009< -.013 Higher 1911 .021 1947 .016

 1960 to 2009 segment:

 Lower 2004> -.055 1983< -.037 2009< -.029 1977> -.027 1992< -.015 1968< -.015 Higher 1999 .045 2001 .037

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1964 +3.2 SD; 1978 +3.5 SD

====================================================================================================================================

 52323 1906 to 2009 104 years Series 23

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 0 .00 -.22 -.07 -.03 .03 .08 .00 -.19 -.02 -.11 .30\*-.01 .11 .12 -.18 .20 .22 -.04 .23 -.07 .04

 1960 2009 0 .02 -.08 .06 .02 -.02 -.16 -.16 -.29 .02 -.16 .31\*-.04 .05 .12 -.21 .19 .26 .03 .29 - -

 [B] Entire series, effect on correlation ( .396) is:

 Lower 1928< -.052 1980> -.039 1977> -.022 1940< -.022 1918> -.019 1945< -.016 Higher 1947 .113 1991 .027

 1950 to 1999 segment:

 Lower 1980> -.118 1977> -.051 1999> -.022 1996> -.013 1969< -.012 1984> -.011 Higher 1991 .114 1956 .029

 1960 to 2009 segment:

 Lower 1980> -.114 1977> -.046 1999> -.019 1969< -.014 2002> -.013 1974< -.012 Higher 1991 .103 2004 .038

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1980 +4.0 SD

====================================================================================================================================

 62373 1910 to 2009 100 years Series 24

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1960 2009 0 -.13 -.19 -.11 -.13 -.05 -.16 -.11 .09 .10 .01 .30\* .11 .10 -.05 .29 -.01 -.01 .12 .04 - -

 [B] Entire series, effect on correlation ( .397) is:

 Lower 1916< -.110 1998< -.020 1938< -.019 2004> -.015 1984> -.013 1910> -.013 Higher 1947 .095 1911 .038

 1960 to 2009 segment:

 Lower 1998< -.058 2004> -.035 1984> -.033 1990< -.027 1997> -.027 2006> -.025 Higher 1977 .150 2009 .038

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1910 +3.1 SD; 1916 -5.8 SD

====================================================================================================================================

 80437 1915 to 2012 98 years Series 25

 [B] Entire series, effect on correlation ( .597) is:

 Lower 1996> -.028 1995< -.026 1915< -.022 1984> -.017 2009< -.014 1930> -.014 Higher 1947 .102 2004 .016

====================================================================================================================================

 60187 1916 to 2009 94 years Series 26

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 0 .04 -.02 -.09 .06 -.20 -.15 .02 -.25 -.11 -.03 .33\*-.09 .01 .13 .01 .09 .20 .30 .20 -.20 .01

 1960 2009 -7 .05 -.07 -.16 .29\*-.04 -.30 .25 -.20 -.21 .04 .12| .07 -.12 .13 .03 .04 .07 .19 .11 - -

 [B] Entire series, effect on correlation ( .279) is:

 Lower 2003< -.061 2004> -.025 1980> -.018 1932> -.015 1926< -.011 1928< -.010 Higher 1947 .033 1948 .019

 1950 to 1999 segment:

 Lower 1980> -.044 1973< -.035 1956< -.026 1962> -.023 1989< -.018 1996> -.017 Higher 1958 .039 1997 .023

 1960 to 2009 segment:

 Lower 2003< -.109 2004> -.045 1980> -.032 1962> -.015 1996> -.013 2002> -.011 Higher 1995 .023 1968 .022

 [C] Year-to-year changes diverging by over 4.0 std deviations:

 2003 2004 4.8 SD

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 2003 -5.8 SD; 2004 +3.1 SD

====================================================================================================================================

 80465r 1916 to 2003 88 years Series 27

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 0 -.19 -.23 -.07 .06 .08 -.04 -.04 -.04 .21 .17 .31\* .24 .01 -.15 .13 -.11 .08 .12 .19 -.42 .11

 1954 2003 0 -.18 -.24 -.03 .01 .00 -.08 -.15 .00 .24 .09 .32\* .16 .07 -.17 .14 -.04 .10 .12 .23 -.40 .08

 [B] Entire series, effect on correlation ( .417) is:

 Lower 1934< -.053 1998< -.047 1984> -.022 1955< -.012 1946> -.012 1973< -.011 Higher 1947 .037 1977 .025

 1950 to 1999 segment:

 Lower 1998< -.093 1984> -.044 1955< -.024 1999> -.017 1973< -.017 1991> -.016 Higher 1977 .073 1958 .033

 1954 to 2003 segment:

 Lower 1998< -.086 1984> -.042 1955< -.023 1999> -.015 1973< -.014 1991> -.013 Higher 1977 .073 1958 .028

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1934 -4.9 SD; 1998 -4.9 SD

====================================================================================================================================

 80402A 1917 to 2009 93 years Series 28

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 8 .02 -.15 -.04 .19 .00 -.01 .06 -.03 .23 -.24 .36| .08 .00 .04 -.24 -.03 .25 -.12 .38\*-.06 -.09

 [B] Entire series, effect on correlation ( .536) is:

 Lower 1980> -.036 1977> -.035 1971< -.027 1923> -.025 1917< -.018 1978< -.011 Higher 1947 .120 2004 .019

 1950 to 1999 segment:

 Lower 1980> -.070 1977> -.059 1971< -.039 1978< -.022 1969< -.019 1995< -.014 Higher 1991 .048 1958 .045

====================================================================================================================================

 52462 1919 to 2009 91 years Series 29

 [B] Entire series, effect on correlation ( .574) is:

 Lower 1961< -.025 1980> -.016 1979> -.015 1934< -.013 1940< -.012 1941< -.011 Higher 1947 .115 1991 .022

====================================================================================================================================

 101075 1919 to 2011 93 years Series 30

 [B] Entire series, effect on correlation ( .376) is:

 Lower 1919< -.028 1998< -.016 1952> -.016 1953> -.015 2007> -.014 1920> -.012 Higher 1947 .148 1977 .070

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1953 +4.2 SD

====================================================================================================================================

 32381 1922 to 2009 88 years Series 31

 [B] Entire series, effect on correlation ( .428) is:

 Lower 1988< -.080 1962< -.019 1955< -.011 2009< -.010 2007> -.010 1956< -.010 Higher 1947 .025 1977 .016

====================================================================================================================================

 162030 1922 to 2009 88 years Series 32

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 -7 -.04 -.29 -.11 .37\* .21 -.01 -.10 .08 .00 -.01 .25| .30 -.02 -.32 .07 .08 .06 .09 .17 .11 -.28

 [B] Entire series, effect on correlation ( .388) is:

 Lower 1945< -.031 1927< -.028 1939> -.025 1948> -.022 1998< -.021 1963> -.018 Higher 1947 .185 1977 .020

 1950 to 1999 segment:

 Lower 1998< -.049 1963> -.041 1990< -.036 1995< -.023 1954< -.021 1978< -.021 Higher 1977 .094 1991 .021

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1954 -5.9 SD

====================================================================================================================================

 100942 1924 to 2009 86 years Series 33

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 3 -.14 -.09 .05 -.17 -.10 -.05 -.09 .12 -.24 .17 .32| .17 -.11 .36\*-.04 -.17 .23 -.16 .17 -.04 -.30

 [B] Entire series, effect on correlation ( .482) is:

 Lower 1990< -.025 1984> -.022 1988< -.021 1945< -.015 1926< -.014 1940< -.014 Higher 1947 .186 1958 .017

 1950 to 1999 segment:

 Lower 1990< -.053 1984> -.048 1988< -.046 1955< -.021 1960< -.016 1987> -.014 Higher 1958 .054 1996 .044

====================================================================================================================================

 202135 1924 to 2009 86 years Series 34

 [B] Entire series, effect on correlation ( .559) is:

 Lower 1930< -.037 1980> -.037 1947> -.025 1978< -.012 1994< -.011 1942< -.011 Higher 1977 .031 1991 .027

====================================================================================================================================

 60333 1925 to 2009 85 years Series 35

 [B] Entire series, effect on correlation ( .496) is:

 Lower 1977> -.027 1947> -.025 2002< -.016 1926< -.012 1983< -.011 1964< -.010 Higher 1980 .016 1937 .016

====================================================================================================================================

 70308 1925 to 2009 85 years Series 36

 [B] Entire series, effect on correlation ( .591) is:

 Lower 1977> -.056 1985< -.015 1984> -.008 1959> -.008 2004> -.008 1947> -.007 Higher 1991 .024 1999 .014

====================================================================================================================================

 50367 1927 to 2009 83 years Series 37

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1960 2009 0 .06 -.23 -.17 -.12 -.20 -.27 .06 .17 .21 -.01 .24\* .04 -.05 .23 .12 .18 -.15 -.18 -.02 - -

 [B] Entire series, effect on correlation ( .402) is:

 Lower 2001< -.029 1948> -.025 1984> -.018 2004> -.017 1928< -.016 1955< -.013 Higher 1947 .170 1958 .029

 1960 to 2009 segment:

 Lower 2001< -.063 1984> -.035 2004> -.026 1994< -.018 1997> -.017 1985> -.017 Higher 1999 .077 1977 .072

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1948 +3.1 SD

====================================================================================================================================

 50434 1930 to 2006 77 years Series 38

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1930 1979 0 .02 -.22 -.20 -.12 .03 -.08 -.02 .06 .04 .03 .23\* .21 .04 .22 .17 -.13 -.08 .11 .03 -.05 -.33

 1950 1999 0 .06 -.04 .05 -.22 -.02 .07 -.01 .14 -.05 -.07 .32\* .01 .17 .11 .12 .05 .00 -.22 -.04 -.17 .00

 [B] Entire series, effect on correlation ( .232) is:

 Lower 1947> -.047 1940< -.026 1999> -.014 1985< -.012 1935< -.012 1983< -.012 Higher 1977 .050 2001 .037

 1930 to 1979 segment:

 Lower 1947> -.083 1940< -.045 1935< -.023 1936< -.021 1958< -.016 1930> -.015 Higher 1977 .091 1942 .026

 1950 to 1999 segment:

 Lower 1985< -.033 1999> -.029 1983< -.024 1958< -.023 1984> -.021 1997> -.021 Higher 1977 .086 1996 .038

 [C] Year-to-year changes diverging by over 4.0 std deviations:

 1946 1947 4.4 SD

====================================================================================================================================

 60023 1930 to 2002 73 years Series 39

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1930 1979 0 -.03 -.04 -.11 -.15 -.34 -.07 -.08 -.07 .05 .03 .25\*-.02 .22 .22 .16 .08 -.09 .15 -.05 -.11 -.01

 [B] Entire series, effect on correlation ( .364) is:

 Lower 1947> -.034 1937< -.025 1983< -.022 1953> -.021 1945< -.018 1939> -.017 Higher 1999 .043 1977 .042

 1930 to 1979 segment:

 Lower 1937< -.044 1953> -.035 1945< -.033 1939> -.027 1968< -.015 1930> -.012 Higher 1977 .113 1948 .029

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1953 +3.8 SD

====================================================================================================================================

 70334 1930 to 2009 80 years Series 40

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 0 .08 -.08 -.02 .05 .08 .04 .11 -.05 -.19 -.09 .23\*-.17 .11 .07 -.26 .05 .11 .10 .15 .08 .15

 1960 2009 0 .04 -.15 .18 .16 .15 -.02 -.13 -.17 -.22 -.17 .30\*-.15 .14 -.06 -.27 .09 .09 .17 .26 - -

 [B] Entire series, effect on correlation ( .396) is:

 Lower 1980> -.039 1967< -.019 1999> -.019 1971< -.018 1977> -.017 1939> -.014 Higher 1947 .145 1991 .016

 1950 to 1999 segment:

 Lower 1980> -.065 1999> -.030 1967< -.026 1956< -.019 1959> -.018 1977> -.016 Higher 1997 .042 1991 .037

 1960 to 2009 segment:

 Lower 1980> -.063 1999> -.030 1967< -.030 1971< -.022 1977> -.022 1996> -.014 Higher 1991 .032 1984 .025

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1980 +3.7 SD; 1981 +3.3 SD

====================================================================================================================================

 111196 1930 to 2015 86 years Series 41

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1930 1979 0 -.10 .02 -.25 -.13 .10 .11 .17 -.06 .07 .20 .32\* .06 -.14 .09 .07 .04 -.08 -.22 .05 -.02 .01

 [B] Entire series, effect on correlation ( .323) is:

 Lower 1947> -.113 2001< -.050 1996> -.026 1932> -.021 2006> -.011 1969< -.008 Higher 1977 .086 1958 .025

 1930 to 1979 segment:

 Lower 1947> -.214 1932> -.035 1969< -.012 1942< -.010 1938< -.010 1976< -.010 Higher 1977 .148 1958 .044

 [C] Year-to-year changes diverging by over 4.0 std deviations:

 1947 1948 -4.1 SD

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1932 +3.4 SD; 1947 +4.6 SD

====================================================================================================================================

 32513A 1932 to 2016 85 years Series 42

 [B] Entire series, effect on correlation ( .295) is:

 Lower 1947> -.048 1989< -.031 1996> -.020 2004> -.019 1999> -.019 1991> -.013 Higher 1977 .188 1980 .024

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1974 +3.7 SD; 1977 -6.0 SD

====================================================================================================================================

 141031 1932 to 2010 79 years Series 43

 [B] Entire series, effect on correlation ( .375) is:

 Lower 1999> -.032 1996> -.029 1979> -.020 1946> -.018 1935> -.017 1997> -.016 Higher 1977 .121 1947 .107

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1935 +4.4 SD; 1979 +3.7 SD

====================================================================================================================================

 162415 1933 to 2009 77 years Series 44

 [B] Entire series, effect on correlation ( .542) is:

 Lower 1980< -.036 1941< -.034 1993< -.012 1991> -.012 1972> -.011 1934> -.010 Higher 2001 .020 1996 .012

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1980 -7.5 SD

====================================================================================================================================

 111240 1934 to 2009 76 years Series 45

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1960 2009 0 .03 -.27 .08 .19 -.10 .05 -.06 .08 -.31 -.05 .24\*-.02 .04 .02 .05 -.05 .17 -.07 .08 - -

 [B] Entire series, effect on correlation ( .319) is:

 Lower 2003< -.039 1999> -.036 2009< -.028 1978< -.028 1997> -.021 1935< -.019 Higher 1991 .055 1977 .033

 1960 to 2009 segment:

 Lower 1999> -.058 2003< -.056 2009< -.042 1978< -.041 1997> -.033 1963> -.016 Higher 1991 .106 1977 .061

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1981 +3.5 SD; 1999 +3.3 SD

====================================================================================================================================

 140764 1935 to 2009 75 years Series 46

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1935 1984 0 -.18 -.23 -.11 -.10 -.21 -.11 .12 -.08 .05 .00 .31\* .29 .04 .08 .12 .02 -.07 .11 .02 -.03 -.08

 1950 1999 1 -.17 -.17 -.19 .00 -.16 -.07 .05 -.16 .07 -.17 .27| .34\* .01 .05 -.02 -.06 .22 .08 .09 .05 -.09

 1960 2009 0 -.05 -.05 -.14 .20 -.14 -.18 .00 -.24 .10 -.25 .31\* .20 -.03 -.12 -.03 -.09 .19 .16 .13 - -

 [B] Entire series, effect on correlation ( .375) is:

 Lower 1970< -.061 1980> -.030 1997> -.027 1998< -.018 1962> -.013 1981> -.012 Higher 1991 .039 2001 .030

 1935 to 1984 segment:

 Lower 1970< -.092 1980> -.041 1962> -.017 1981> -.015 1976< -.012 1935> -.010 Higher 1958 .024 1937 .020

 1950 to 1999 segment:

 Lower 1970< -.091 1980> -.049 1997> -.043 1998< -.027 1962> -.020 1981> -.016 Higher 1991 .084 1958 .029

 1960 to 2009 segment:

 Lower 1970< -.082 1980> -.045 1997> -.039 1998< -.025 1962> -.018 1981> -.014 Higher 1991 .067 2001 .055

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1981 +3.5 SD

====================================================================================================================================

 32032 1936 to 2002 67 years Series 47

 [B] Entire series, effect on correlation ( .362) is:

 Lower 1991> -.040 2002< -.029 1980> -.015 1964< -.014 1949> -.012 1942< -.011 Higher 1977 .068 1947 .048

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1949 +3.9 SD; 2002 -5.5 SD

====================================================================================================================================

 192108 1936 to 2010 75 years Series 48

 [B] Entire series, effect on correlation ( .542) is:

 Lower 1991> -.029 1989< -.026 1992< -.022 2003< -.012 1959> -.011 1950< -.011 Higher 1947 .178 1977 .021

 [D] 1 Absent rings: Year Master N series Absent

 1947 -2.612 56 1

====================================================================================================================================

 40538 1938 to 2009 72 years Series 49

 [B] Entire series, effect on correlation ( .578) is:

 Lower 1943< -.056 1983< -.038 1982< -.011 1964< -.008 1956< -.007 1976> -.006 Higher 1947 .031 1958 .015

====================================================================================================================================

 111173 1938 to 2017 80 years Series 50

 [\*] Later part of series cannot be checked from 2017 to 2017 -- not matched by another series

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1938 1987 0 -.03 -.10 .19 .17 .12 .11 .12 .05 .19 -.10 .24\* .02 -.06 .04 -.09 -.08 -.14 .13 -.10 -.36 -.03

 1950 1999 0 -.12 .01 .16 .17 .05 .16 .19 -.01 .04 -.12 .29\*-.02 -.10 .24 .02 -.21 -.18 .04 .10 -.24 -.09

 [B] Entire series, effect on correlation ( .200) is:

 Lower 2011< -.059 1939> -.028 1991> -.027 1988< -.020 1948> -.019 1999> -.016 Higher 1977 .170 2004 .042

 1938 to 1987 segment:

 Lower 1939> -.051 1948> -.034 1940< -.020 1963> -.020 1956< -.019 1962> -.018 Higher 1977 .304 1947 .030

 1950 to 1999 segment:

 Lower 1991> -.062 1999> -.039 1988< -.038 1963> -.025 1962> -.022 1956< -.022 Higher 1977 .355 1996 .035

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1939 +3.0 SD

====================================================================================================================================

 202324 1938 to 2012 75 years Series 51

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 -6 -.05 -.18 .01 -.15 .37\* .12 .04 .09 -.09 .25 .29|-.15 .25 -.11 -.19 .02 -.05 .08 -.10 .27 -.08

 1963 2012 -1 .17 -.20 -.06 -.16 .23 -.02 -.05 .09 -.08 .26\* .25|-.17 .21 -.09 -.14 .06 - - - - -

 [B] Entire series, effect on correlation ( .328) is:

 Lower 1999> -.038 1997< -.024 1984> -.023 2009< -.022 1996> -.022 1968< -.017 Higher 1977 .049 1991 .031

 1950 to 1999 segment:

 Lower 1999> -.062 1984> -.037 1996> -.036 1968< -.024 1978< -.020 1982< -.018 Higher 1977 .078 1991 .050

 1963 to 2012 segment:

 Lower 1999> -.055 1984> -.032 1996> -.031 2009< -.029 1968< -.022 1978< -.019 Higher 1977 .078 1991 .048

====================================================================================================================================

 192130 1939 to 2009 71 years Series 52

 [B] Entire series, effect on correlation ( .505) is:

 Lower 1947> -.045 1993< -.035 1999> -.022 1971< -.021 1939> -.015 1972< -.009 Higher 1991 .024 1977 .017

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1972 -5.0 SD; 1991 -4.6 SD

====================================================================================================================================

 101121 1940 to 2005 66 years Series 53

 [B] Entire series, effect on correlation ( .436) is:

 Lower 2004> -.027 1993< -.020 1955< -.017 1988< -.016 1956< -.015 1979> -.010 Higher 2001 .031 1977 .025

====================================================================================================================================

 50323 1943 to 2009 67 years Series 54

 [B] Entire series, effect on correlation ( .484) is:

 Lower 1977> -.043 2009< -.037 1943> -.022 1955< -.019 2006> -.017 1965< -.017 Higher 1947 .056 2001 .024

====================================================================================================================================

 70148 1943 to 2005 63 years Series 55

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1950 1999 0 -.16 -.23 .20 -.01 -.10 -.07 -.17 .08 -.02 .06 .24\*-.05 -.05 -.02 .02 .19 .14 .09 .15 -.09 -.11

 1956 2005 -8 -.10 -.30 .33\*-.05 -.26 .04 -.24 .02 .05 -.10 .24|-.08 -.01 .01 .05 .25 .11 .09 .13 -.07 -.09

 [B] Entire series, effect on correlation ( .367) is:

 Lower 1997> -.029 2001< -.027 1984> -.026 1977> -.022 1989< -.021 1959> -.012 Higher 1947 .104 1999 .043

 1950 to 1999 segment:

 Lower 1997> -.044 1984> -.039 1977> -.026 1989< -.025 1959> -.018 1979> -.014 Higher 1999 .141 1957 .022

 1956 to 2005 segment:

 Lower 1997> -.039 1984> -.034 2001< -.032 1989< -.023 1977> -.019 1959> -.016 Higher 1999 .122 2004 .031

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1984 +3.1 SD; 1997 +3.1 SD

====================================================================================================================================

 182056 1945 to 2016 72 years Series 56

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1945 1994 0 .12 -.10 -.04 .17 .04 .14 -.03 -.04 .09 -.13 .20\*-.10 -.06 .14 -.09 .08 .03 -.07 .05 -.12 -.14

 1950 1999 0 .02 -.08 -.10 .13 .04 .23 -.08 -.08 .00 -.38 .30\*-.07 -.01 .27 -.18 -.07 .12 -.03 .25 -.11 .01

 1967 2016 0 -.07 -.09 .08 .10 .10 .13 -.10 -.09 .00 -.41 .32\*-.02 - - - - - - - - -

 [B] Entire series, effect on correlation ( .243) is:

 Lower 1947> -.064 2010< -.041 1957< -.031 1980> -.026 1963> -.015 1988< -.012 Higher 1977 .043 1996 .037

 1945 to 1994 segment:

 Lower 1947> -.082 1957< -.050 1980> -.036 1963> -.021 1988< -.019 1983< -.018 Higher 1977 .080 1948 .031

 1950 to 1999 segment:

 Lower 1957< -.051 1980> -.047 1963> -.026 1988< -.020 1983< -.019 1962> -.017 Higher 1996 .060 1977 .060

 1967 to 2016 segment:

 Lower 2010< -.066 1980> -.047 2004> -.019 1988< -.018 1983< -.017 1982< -.016 Higher 1977 .055 1996 .050

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1947 +3.3 SD

====================================================================================================================================

 152069 1948 to 2009 62 years Series 57

 [B] Entire series, effect on correlation ( .465) is:

 Lower 1948> -.057 1956< -.036 2006> -.016 2000< -.012 1974> -.010 1997< -.009 Higher 1977 .047 1999 .022

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1948 +4.8 SD; 1974 +3.0 SD

====================================================================================================================================

 192083 1949 to 2002 54 years Series 58

 [B] Entire series, effect on correlation ( .544) is:

 Lower 1991> -.046 1980> -.025 1961< -.025 2001< -.023 1969< -.018 1997> -.012 Higher 1977 .161 1999 .046

====================================================================================================================================

 192074 1952 to 2009 58 years Series 59

 [B] Entire series, effect on correlation ( .459) is:

 Lower 1980> -.053 1990< -.036 2003< -.035 1984> -.032 2002> -.026 1965< -.017 Higher 1977 .141 1991 .034

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2002 +3.3 SD

====================================================================================================================================

 152044 1953 to 2009 57 years Series 60

 [B] Entire series, effect on correlation ( .464) is:

 Lower 1958< -.044 1991> -.034 2004> -.031 1980> -.024 1956< -.024 1983< -.019 Higher 1977 .236 1999 .029

====================================================================================================================================

 172517 1955 to 2009 55 years Series 61

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1955 2004 0 -.22 .02 -.07 .16 -.12 -.02 .01 -.02 .10 .19 .30\*-.02 -.03 .20 -.11 -.22 .14 .07 -.16 -.04 -.22

 [B] Entire series, effect on correlation ( .301) is:

 Lower 1978< -.116 1956< -.061 1991> -.051 1993< -.029 1962> -.022 1958< -.013 Higher 1977 .050 2004 .033

 1955 to 2004 segment:

 Lower 1978< -.119 1956< -.063 1991> -.055 1993< -.030 1962> -.023 1958< -.013 Higher 1977 .050 2004 .034

====================================================================================================================================

 202103 1957 to 2009 53 years Series 62

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1957 2006 0 -.03 -.01 -.06 -.01 -.16 .20 .09 .10 .12 -.04 .25\*-.19 .23 .12 -.03 -.08 -.11 -.15 .12 -.13 -.05

 1960 2009 0 -.22 -.09 -.03 .03 -.15 .16 .04 .05 .10 -.05 .32\*-.09 .24 .15 -.01 -.12 -.13 -.13 .13 - -

 [B] Entire series, effect on correlation ( .268) is:

 Lower 1957< -.048 1997> -.039 1977> -.021 1962> -.021 1982< -.016 2005< -.015 Higher 2004 .092 1990 .023

 1957 to 2006 segment:

 Lower 1957< -.049 1997> -.040 1977> -.021 1962> -.021 1982< -.017 2005< -.016 Higher 2004 .096 1990 .025

 1960 to 2009 segment:

 Lower 1997> -.043 1977> -.031 1962> -.022 1982< -.020 2005< -.019 1999> -.016 Higher 2004 .087 1990 .024

====================================================================================================================================

 162438 1958 to 2009 52 years Series 63

 [B] Entire series, effect on correlation ( .467) is:

 Lower 1962< -.043 1959> -.020 1963> -.020 1978< -.020 2007> -.017 1971> -.017 Higher 1991 .049 2004 .048

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1962 -4.9 SD

====================================================================================================================================

 80663 1959 to 2006 48 years Series 64

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1959 2006 0 -.06 .03 -.12 -.10 -.03 -.26 .07 .11 -.17 .18 .30\*-.02 .01 .08 .20 .06 -.11 .12 .16 -.13 -.30

 [B] Entire series, effect on correlation ( .302) is:

 Lower 2000< -.059 2004> -.049 2006> -.045 2005< -.035 1959> -.017 1995< -.015 Higher 1991 .095 1977 .077

 1959 to 2006 segment:

 Lower 2000< -.059 2004> -.049 2006> -.045 2005< -.035 1959> -.017 1995< -.015 Higher 1991 .095 1977 .077

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2006 +3.2 SD

====================================================================================================================================

 202029 1959 to 2016 58 years Series 65

 [B] Entire series, effect on correlation ( .433) is:

 Lower 1999> -.046 1963> -.039 1996> -.030 2011< -.028 1978< -.019 1970< -.013 Higher 1977 .121 2004 .041

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1963 +3.3 SD

====================================================================================================================================

 22600r 1963 to 2009 47 years Series 66

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1963 2009 0 -.17 -.23 .22 .14 -.26 .17 .04 -.32 .14 -.04 .31\* .11 .06 .20 .03 -.14 -.12 .08 -.07 - -

 [B] Entire series, effect on correlation ( .306) is:

 Lower 1963> -.045 1964< -.033 1991> -.023 1997> -.023 2003< -.018 1993< -.013 Higher 2004 .109 1999 .032

 1963 to 2009 segment:

 Lower 1963> -.045 1964< -.033 1991> -.023 1997> -.023 2003< -.018 1993< -.013 Higher 2004 .109 1999 .032

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1963 +3.4 SD; 2004 -6.6 SD

====================================================================================================================================

 72361A 1972 to 2016 45 years Series 67

 [B] Entire series, effect on correlation ( .442) is:

 Lower 2001< -.059 2014< -.037 2013> -.027 1995< -.025 1984> -.021 2016> -.018 Higher 2004 .062 1996 .029

====================================================================================================================================

PART 7: DESCRIPTIVE STATISTICS: 10:46 Fri 04 Sep 2020 Page 7

------------------------------------------------------------------------------------------------------------------------------------

 Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

 No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

 Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 1 142602 1777 2009 233 7 0 .535 1.05 2.50 .492 .862 .209 2.65 .426 -.015 1

 2 192068 1830 2009 180 7 2 .439 1.29 3.20 .538 .799 .203 2.63 .345 -.043 1

 3 22031 1848 2009 162 7 1 .419 2.05 5.33 .946 .778 .205 2.81 .461 -.058 1

 4 22064 1870 2009 140 6 4 .289 1.62 3.47 .504 .696 .192 2.69 .430 -.036 1

 5 42389 1875 2009 135 5 0 .545 .98 3.94 .813 .822 .305 2.52 .309 -.041 2

 6 60161 1877 2009 133 5 0 .583 1.67 3.31 .547 .769 .168 2.46 .367 -.032 1

 7 202010 1880 2014 135 5 2 .345 1.50 5.32 1.090 .937 .163 2.72 .341 .003 1

 8 192070 1881 2009 129 5 0 .553 1.63 3.61 .571 .771 .186 2.62 .405 -.040 1

 9 10731 1882 2009 128 5 1 .441 1.88 8.90 1.162 .791 .182 3.04 .468 .059 1

 10 70083 1882 2009 128 5 1 .425 1.56 4.37 .948 .834 .229 2.68 .359 -.079 1

 11 60348 1890 2009 120 5 0 .642 1.51 3.52 .532 .763 .186 2.62 .413 -.051 1

 12 151120 1892 2009 118 5 1 .438 1.99 3.55 .686 .808 .166 2.63 .420 .015 1

 13 142583 1893 2009 117 5 1 .487 1.47 4.77 .890 .849 .238 2.61 .300 -.072 1

 14 70444 1894 2009 116 5 3 .357 .96 3.27 .582 .776 .308 2.85 .529 -.054 2

 15 111172 1896 2009 114 5 0 .598 1.42 3.57 .689 .858 .258 2.45 .352 .000 1

 16 80458 1898 2009 112 5 0 .553 2.46 3.95 .712 .644 .221 2.47 .352 .099 1

 17 40529 1899 2009 111 5 0 .447 1.68 3.10 .681 .901 .158 2.59 .374 -.042 1

 18 80230 1900 2009 110 4 2 .456 1.21 3.41 .703 .880 .220 2.68 .391 -.031 1

 19 90653 1900 2009 110 4 0 .458 1.36 4.23 .683 .799 .197 2.98 .352 -.018 1

 20 70198 1903 2009 107 4 0 .585 1.24 2.74 .504 .708 .242 2.59 .466 -.097 1

 21 202230 1903 2009 107 4 1 .556 1.76 4.62 .683 .818 .180 2.60 .477 .031 1

 22 10726 1904 2009 106 4 1 .470 2.01 6.70 .874 .829 .176 2.79 .507 .046 1

 23 52323 1906 2009 104 4 2 .396 1.65 4.46 .741 .797 .201 2.66 .417 -.098 1

 24 62373 1910 2009 100 4 1 .397 1.08 2.83 .600 .805 .271 2.82 .479 -.076 1

 25 80437 1915 2012 98 4 0 .597 .95 2.90 .636 .825 .324 2.46 .415 .009 1

 26 60187 1916 2009 94 4 2 .279 2.24 5.00 .560 .458 .193 2.50 .452 -.020 1

 27 80465r 1916 2003 88 4 2 .417 .47 1.04 .232 .721 .280 2.62 .449 .039 2

 28 80402A 1917 2009 93 4 1 .536 .96 1.88 .317 .693 .216 2.58 .423 -.004 1

 29 52462 1919 2009 91 4 0 .574 1.63 3.58 .525 .691 .179 2.45 .425 -.065 1

 30 101075 1919 2011 93 4 0 .376 1.36 4.43 .944 .914 .229 2.74 .457 -.042 1

 31 32381 1922 2009 88 4 0 .428 2.31 3.48 .415 .385 .145 2.68 .504 .038 1

 32 162030 1922 2009 88 4 1 .388 .43 1.25 .251 .743 .353 2.53 .393 -.077 2

 33 100942 1924 2009 86 4 1 .482 1.25 3.10 .793 .925 .193 2.46 .351 -.053 1

 34 202135 1924 2009 86 4 0 .559 1.70 4.30 .901 .796 .242 2.80 .519 .022 1

 35 60333 1925 2009 85 3 0 .496 1.85 3.31 .643 .778 .191 2.97 .526 .041 1

 36 70308 1925 2009 85 3 0 .591 2.28 4.64 .700 .788 .158 2.65 .541 -.010 1

 37 50367 1927 2009 83 3 1 .402 1.15 3.78 .550 .649 .259 2.84 .444 -.098 1

 38 50434 1930 2006 77 3 2 .232 .53 1.52 .322 .778 .327 2.98 .581 -.019 1

 39 60023 1930 2002 73 3 1 .364 .79 1.97 .322 .645 .261 2.68 .380 -.061 1

 40 70334 1930 2009 80 3 2 .396 2.61 3.93 .584 .661 .151 2.57 .514 .019 1

 41 111196 1930 2015 86 3 1 .323 1.43 2.61 .538 .830 .187 2.71 .515 -.060 1

 42 32513A 1932 2016 85 3 0 .295 2.01 3.63 .740 .783 .196 2.64 .335 -.036 1

 43 141031 1932 2010 79 3 0 .375 1.51 6.78 1.338 .921 .161 2.80 .463 -.001 1

 44 162415 1933 2009 77 3 0 .542 1.86 4.02 .724 .770 .239 2.56 .352 -.030 1

 45 111240 1934 2009 76 3 1 .319 1.33 2.46 .461 .747 .179 2.78 .564 -.036 1

 46 140764 1935 2009 75 3 3 .375 1.16 3.01 .621 .792 .268 3.03 .596 -.086 1

 47 32032 1936 2002 67 3 0 .362 .53 1.85 .337 .558 .415 2.84 .514 .003 1

 48 192108 1936 2010 75 3 0 .542 .50 1.84 .399 .849 .433 2.58 .384 -.029 2

PART 7: DESCRIPTIVE STATISTICS: 10:46 Fri 04 Sep 2020 Page 8

------------------------------------------------------------------------------------------------------------------------------------

 Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

 No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

 Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 49 40538 1938 2009 72 3 0 .578 2.40 3.97 .616 .686 .147 2.52 .456 -.047 1

 50 111173 1938 2017 80 3 2 .200 1.10 3.99 .803 .838 .289 2.65 .428 -.043 1

 51 202324 1938 2012 75 3 2 .328 .55 2.08 .521 .926 .268 2.51 .348 -.100 1

 52 192130 1939 2009 71 3 0 .505 1.94 4.48 .802 .790 .209 2.45 .395 -.066 1

 53 101121 1940 2005 66 3 0 .436 .51 1.12 .243 .685 .287 2.72 .412 -.015 1

 54 50323 1943 2009 67 3 0 .484 2.20 4.92 .867 .694 .235 2.70 .491 -.050 1

 55 70148 1943 2005 63 3 2 .367 .47 1.52 .319 .760 .378 2.58 .420 -.044 2

 56 182056 1945 2016 72 3 3 .243 2.26 5.39 1.019 .743 .225 2.69 .490 -.090 1

 57 152069 1948 2009 62 3 0 .465 1.85 4.19 .788 .831 .173 2.69 .460 -.011 1

 58 192083 1949 2002 54 3 0 .544 .73 3.91 .789 .947 .286 2.45 .493 -.074 1

 59 192074 1952 2009 58 2 0 .459 2.53 4.59 .843 .785 .175 2.74 .542 .051 1

 60 152044 1953 2009 57 2 0 .464 2.06 3.42 .650 .814 .175 2.44 .366 -.072 1

 61 172517 1955 2009 55 2 1 .301 1.30 4.18 .654 .547 .285 2.59 .553 -.012 5

 62 202103 1957 2009 53 2 2 .268 .65 2.37 .533 .846 .263 2.72 .524 -.018 1

 63 162438 1958 2009 52 2 0 .467 .85 1.95 .425 .747 .263 2.67 .502 -.075 2

 64 80663 1959 2006 48 1 1 .302 .85 2.46 .587 .907 .292 2.80 .599 -.067 3

 65 202029 1959 2016 58 2 0 .433 .71 1.82 .425 .824 .282 2.91 .633 -.074 1

 66 22600r 1963 2009 47 1 1 .306 .79 2.62 .709 .939 .276 2.68 .410 .034 1

 67 72361A 1972 2016 45 1 0 .442 2.28 5.99 1.531 .887 .264 2.63 .546 -.006 1

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 Total or mean: 6218 247 55 .446 1.45 8.90 .663 .782 .227 3.04 .435 -.028

 - = [ COFECHA QUMO COF ] = -