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

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

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: SCBI\_qual.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 1792 to 2017 226 years

Continuous time span is 1792 to 2017 226 years

Portion with two or more series is 1796 to 2017 222 years

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

\*C\* Number of dated series 66 \*C\*

\*O\* Master series 1792 2017 226 yrs \*O\*

\*F\* Total rings in all series 7633 \*F\*

\*E\* Total dated rings checked 7629 \*E\*

\*C\* Series intercorrelation .485 \*C\*

\*H\* Average mean sensitivity .237 \*H\*

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

\*\*\* Mean length of series 115.7 \*\*\*

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

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

132177 1 absent rings: 1947

1 absent rings .013%

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

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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

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

. . . . . . . . . . . . . . . <====================> . 102271 1 1792 2009 218

. . . . . . . . . . . . . . . <====================> . 20835r 2 1796 2009 214

. . . . . . . . . . . . . . . <====================> . 122474 3 1797 2002 206

. . . . . . . . . . . . . . . <===================> . 90752 4 1806 2009 204

. . . . . . . . . . . . . . . . <================> . 62148 5 1839 2009 171

. . . . . . . . . . . . . . . . .<==============> . 32138A 6 1860 2015 156

. . . . . . . . . . . . . . . . .<=============> . 132206 7 1866 2009 144

. . . . . . . . . . . . . . . . .<=============> . 162397 8 1868 2009 142

. . . . . . . . . . . . . . . . .<=============> . 162398 9 1868 2009 142

. . . . . . . . . . . . . . . . .<=============> . 172036 10 1868 2009 142

. . . . . . . . . . . . . . . . . <============> . 60507 11 1870 2009 140

. . . . . . . . . . . . . . . . . <============> . 70069 12 1871 2009 139

. . . . . . . . . . . . . . . . . <============> . 100990 13 1871 2009 139

. . . . . . . . . . . . . . . . . <============> . 162295 14 1871 2009 139

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. . . . . . . . . . . . . . . . . <============> . 80745 16 1874 2009 136

. . . . . . . . . . . . . . . . . <============> . 50314 17 1875 2009 135

. . . . . . . . . . . . . . . . . <============> . 60121 18 1877 2009 133

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. . . . . . . . . . . . . . . . . <==========> . 70559 32 1895 2009 115

. . . . . . . . . . . . . . . . . <==========> . 80451 33 1895 2009 115

. . . . . . . . . . . . . . . . . <==========> . 142565 34 1895 2009 115

. . . . . . . . . . . . . . . . . <==========> . 52111 35 1896 2009 114

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. . . . . . . . . . . . . . . . . <==========> . 70536 38 1897 2009 113

. . . . . . . . . . . . . . . . . <==========> . 142539 39 1898 2009 112

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. . . . . . . . . . . . . . . . . <=========> . 172168 41 1906 2009 104

. . . . . . . . . . . . . . . . . <=========> . 110870 42 1907 2007 101

. . . . . . . . . . . . . . . . . .<========> . 60331 43 1910 2009 100

. . . . . . . . . . . . . . . . . .<========> . 70602 44 1914 2009 96

. . . . . . . . . . . . . . . . . .<=========> . 70601A 45 1916 2014 99

. . . . . . . . . . . . . . . . . .<========> . 192029 46 1916 2009 94

. . . . . . . . . . . . . . . . . .<========> . 50517r 47 1917 2009 93

. . . . . . . . . . . . . . . . . .<========> . 70535 48 1917 2009 93

. . . . . . . . . . . . . . . . . .<========> . 60210 49 1918 2009 92

. . . . . . . . . . . . . . . . . . <=======> . 50234 50 1921 2009 89

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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

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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

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. . . . . . . . . . . . . . . . . . <=======> . 80540 51 1921 2002 82

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. . . . . . . . . . . . . . . . . . <=======> . 132177 62 1936 2011 76

. . . . . . . . . . . . . . . . . . <=====> . 161573 63 1951 2017 67

. . . . . . . . . . . . . . . . . . <=====> . 111195 64 1953 2017 65

. . . . . . . . . . . . . . . . . . .<===> . 201332 65 1960 2005 46

. . . . . . . . . . . . . . . . . . .<===> . 142363 66 1969 2009 41

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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

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

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1800 2.933 3 1850 .137 5 1900 -.431 39 1950 .368 62 2000 -.025 66

1801 1.051 3 1851 1.304 5 1901 .805 40 1951 .225 63 2001 1.219 66

1802 .027 3 1852 .575 5 1902 -.077 40 1952 -.620 63 2002 .639 66

1803 -.466 3 1853 .470 5 1903 1.070 40 1953 -.704 64 2003 .388 64

1804 -.707 3 1854 -.133 5 1904 .420 40 1954 -.101 64 2004 -.324 64

1805 -3.408 3 1855 -1.217 5 1905 -.509 40 1955 1.059 64 2005 -.545 64

1806 -1.093 4 1856 -1.224 5 1906 -.207 41 1956 1.216 64 2006 -.535 63

1807 1.647 4 1857 -1.074 5 1907 -.318 42 1957 1.064 64 2007 -.077 63

1808 -.887 4 1858 -1.091 5 1908 -.727 42 1958 1.842 64 2008 .439 60

1809 -.090 4 1859 -1.323 5 1909 -.564 42 1959 -.222 64 2009 1.165 59

1810 -1.303 4 1860 -.743 6 1910 -.239 43 1960 .376 65 2010 -.765 5

1811 -.988 4 1861 -2.430 6 1911 -3.270 43 1961 .348 65 2011 .825 5

1812 .166 4 1862 -.393 6 1912 -1.566 43 1962 -.604 65 2012 -1.307 4

1813 .329 4 1863 .717 6 1913 -1.550 43 1963 -.645 65 2013 1.517 4

1814 .291 4 1864 .492 6 1914 -1.146 44 1964 -.365 65 2014 .388 4

1815 -.397 4 1865 1.456 6 1915 .684 44 1965 -.479 65 2015 -3.057 3

1816 .687 4 1866 1.054 7 1916 1.285 46 1966 -1.648 65 2016 2.285 2

1817 .230 4 1867 1.185 7 1917 1.167 48 1967 .639 65 2017 .706 2

1818 .807 4 1868 1.330 10 1918 -1.147 49 1968 .984 65

1819 -.259 4 1869 1.330 10 1919 .355 49 1969 .622 66

1820 -.588 4 1870 .428 11 1920 .455 49 1970 .815 66

1821 .417 4 1871 .503 14 1921 .626 51 1971 -.034 66

1822 .461 4 1872 .797 15 1922 .954 52 1972 .126 66

1823 .177 4 1873 .102 15 1923 -1.042 53 1973 -.539 66

1824 -1.384 4 1874 -.140 16 1924 .983 54 1974 -.696 66

1825 -.325 4 1875 .355 17 1925 -.846 56 1975 -.419 66

1826 -.197 4 1876 .099 17 1926 .301 56 1976 -.045 66

1827 .791 4 1877 -.808 18 1927 .885 57 1977 -2.337 66

1828 -1.788 4 1878 .620 20 1928 .464 57 1978 .725 66

1829 -.199 4 1879 -.193 20 1929 .480 57 1979 -.341 66

1830 1.115 4 1880 -1.243 21 1930 -.660 57 1980 -.684 66

1831 -.751 4 1881 -.269 22 1931 -.165 58 1981 .257 66

1832 .916 4 1882 -.150 24 1932 -.611 59 1982 .364 66

1833 .611 4 1883 -.470 24 1933 -.116 61 1983 .644 66

1834 -.079 4 1884 -.413 24 1934 -.132 61 1984 .511 66

1835 1.134 4 1885 -1.061 25 1935 -.105 61 1985 .606 66

1836 -1.628 4 1886 -.589 26 1936 .645 62 1986 .392 66

1837 .465 4 1887 -1.123 27 1937 1.018 62 1987 -1.004 66

1838 -2.136 4 1888 -2.036 27 1938 .576 62 1988 .235 66

1839 -1.968 5 1889 -.884 27 1939 -.920 62 1989 .274 66

1840 -1.045 5 1890 -.150 27 1940 -.042 62 1990 1.338 66

1841 .411 5 1891 1.359 28 1941 .968 62 1991 -1.192 66

1792 .700 1 1842 .917 5 1892 .947 28 1942 .762 62 1992 -.358 66

1793 2.762 1 1843 .038 5 1893 -.112 29 1943 -.317 62 1993 -.217 66

1794 -1.622 1 1844 1.890 5 1894 .125 29 1944 -.925 62 1994 .548 66

1795 .142 1 1845 .712 5 1895 1.384 34 1945 .336 62 1995 .849 66

1796 -.262 2 1846 .847 5 1896 1.502 36 1946 -.270 62 1996 -1.738 66

1797 .478 3 1847 1.196 5 1897 1.164 38 1947 -2.810 62 1 1997 -.655 66

1798 .548 3 1848 .698 5 1898 .604 39 1948 -1.135 62 1998 .313 66

1799 1.029 3 1849 .727 5 1899 -.331 39 1949 -.706 62 1999 -.939 66

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

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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----------L 1850-----A 1900---b 1950------A 2000-----@

1801---------D 1851----------E 1901--------C 1951-----A 2001----------E

1802-----@ 1852-------B 1902----@ 1952--b 2002--------C

1803---b 1853-------B 1903---------D 1953--c 2003------B

1804--c 1854----a 1904------B 1954----@ 2004---a

1805n 1855-e 1905---b 1955---------D 2005--b

1806-d 1856-e 1906----a 1956----------E 2006---b

1807----------G 1857-d 1907---a 1957---------D 2007----@

1808-d 1858-d 1908--c 1958----------G 2008------B

1809----@ 1859-e 1909--b 1959----a 2009---------E

1810-e 1860--c 1910----a 1960------B 2010--c

1811-d 1861j 1911m 1961------A 2011--------C

1812-----A 1862---b 1912f 1962--b 2012-e

1813------A 1863--------C 1913f 1963--c 2013----------F

1814------A 1864-------B 1914-e 1964---a 2014------B

1815---b 1865----------F 1915--------C 1965---b 2015l

1816--------C 1866---------D 1916----------E 1966g 2016----------I

1817-----A 1867---------E 1917---------E 1967--------C 2017--------C

1818--------C 1868----------E 1918-e 1968---------D

1819----a 1869----------E 1919------A 1969-------B

1820--b 1870------B 1920------B 1970--------C

1821------B 1871-------B 1921-------C 1971----@

1822-------B 1872--------C 1922---------D 1972-----A

1823-----A 1873-----@ 1923-d 1973--b

1824-f 1874----a 1924---------D 1974--c

1825---a 1875------A 1925--c 1975---b

1826----a 1876-----@ 1926------A 1976----@

1827--------C 1877--c 1927---------D 1977i

1828g 1878-------B 1928-------B 1978--------C

1829----a 1879----a 1929-------B 1979---a

1830---------D 1880-e 1930--c 1980--c

1831--c 1881----a 1931----a 1981------A

1832---------D 1882----a 1932--b 1982------A

1833-------B 1883---b 1933----@ 1983--------C

1834----@ 1884---b 1934----a 1984-------B

1835---------E 1885-d 1935----@ 1985-------B

1836g 1886--b 1936--------C 1986------B

1837-------B 1887-d 1937---------D 1987-d

1838i 1888h 1938-------B 1988-----A

1839h 1889-d 1939-d 1989------A

1840-d 1890----a 1940----@ 1990----------E

1841------B 1891----------E 1941---------D 1991-e

1792--------C 1842---------D 1892---------D 1942--------C 1992---a

1793----------K 1843-----@ 1893----@ 1943---a 1993----a

1794f 1844----------H 1894-----A 1944-d 1994-------B

1795-----A 1845--------C 1895----------F 1945------A 1995--------C

1796----a 1846--------C 1896----------F 1946----a 1996g

1797-------B 1847---------E 1897---------E 1947k 1997--c

1798-------B 1848--------C 1898-------B 1948-e 1998------A

1799---------D 1849--------C 1899---a 1949--c 1999-d

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

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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 1775 1800 1825 1850 1875 1900 1925 1950 1975

1824 1849 1874 1899 1924 1949 1974 1999 2024

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

1 102271 1792 2009 .34 .41 .38 .55 .72 .69 .58 .41 .41

2 20835r 1796 2009 .33A .33B .30B .48 .78 .70 .45 .51 .54

3 122474 1797 2002 .38 .35 .45 .33 .33 .40 .54 .76 .76

4 90752 1806 2009 .45 .33A .30A .31A .34 .47 .43 .32A

5 62148 1839 2009 .28A .09B .34 .54 .35B .33 .32A

6 32138A 1860 2015 .64 .77 .62 .35 .54 .40

7 132206 1866 2009 .66 .78 .72 .59 .63 .62

8 162397 1868 2009 .60 .74 .62 .36 .58 .62

9 162398 1868 2009 .77 .76 .71 .57 .61 .60

10 172036 1868 2009 .52 .64 .60 .38 .35 .33

11 60507 1870 2009 .32A .39 .33 .35 .47 .37

12 70069 1871 2009 .58 .55 .51 .48 .61 .66

13 100990 1871 2009 .53 .45 .45 .56 .54 .49

14 162295 1871 2009 .79 .83 .73 .40 .48 .58

15 122404 1872 2009 .46 .52 .64 .71 .53 .44B

16 80745 1874 2009 .63 .67 .64 .45 .57 .50

17 50314 1875 2009 .26A .32A .37 .45 .40

18 60121 1877 2009 .36 .50 .63 .78 .77

19 70471 1878 2009 .67 .66 .49 .64 .53

20 102371 1878 2009 .82 .58 .42 .46 .42

21 180996 1880 2009 .66 .57 .50 .40 .29A

22 50322 1881 2009 .27A .30A .62 .74 .69

23 80089 1882 2009 .32A .53 .63 .50 .62

24 112142 1882 2008 .59 .66 .61 .42 .33

25 92046 1885 2009 .71 .73 .70 .56 .61

26 60078 1886 2009 .27A .51 .49 .63 .64

27 90558 1887 2009 .80 .69 .45 .29A .29A

28 101212 1891 2009 .58 .56 .43 .31A .28A

29 72232 1893 2009 .68 .77 .63 .46 .41

30 60377 1895 2009 .26B .37 .40 .33 .44

31 70519 1895 2009 .43 .42 .42 .64 .63

32 70559 1895 2009 .27A .27A .35 .53 .55

33 80451 1895 2009 .48 .58 .80 .55 .43

34 142565 1895 2009 .56 .65 .46 .23A .23B

35 52111 1896 2009 .62 .73 .43 .37 .38

36 112336 1896 2009 .33 .35 .53 .51 .52

37 70371 1897 2009 .53 .65 .77 .83 .80

38 70536 1897 2009 .56 .61 .48 .60 .60

39 142539 1898 2009 .68 .68 .42 .41 .45

40 90546 1901 2009 .63 .69 .69 .68

41 172168 1906 2009 .49 .39 .61 .55

42 110870 1907 2007 .50 .41 .57 .53

43 60331 1910 2009 .22A .27A .65 .62

44 70602 1914 2009 .58 .64 .70 .60

45 70601A 1916 2014 .38 .47 .39 .41

46 192029 1916 2009 .76 .70 .46 .41

47 50517r 1917 2009 .61 .45 .23B .22A

48 70535 1917 2009 .23B .36 .34 .24A

49 60210 1918 2009 .55 .36 .41 .27A

50 50234 1921 2009 .27A .16B .32A .33A

51 80540 1921 2002 .37 .42 .25B .22B

52 90273 1922 2007 .38 .32A .39 .36

53 60016 1923 2009 .42 .35 .28A .24B

54 50455 1924 2009 .30A .27A .25A .21A

55 80371 1925 2009 .34 .60 .48

56 90283 1925 2009 .58 .41 .49

57 90130 1927 2009 .54 .19A .13B

58 60060 1931 2007 .49 .50 .39

59 60315 1932 2009 .64 .53 .53

60 82058 1933 2009 .54 .61 .52

61 122211 1933 2009 .70 .64 .56

62 132177 1936 2011 .35 .48 .47

63 161573 1951 2017 .25A .19B

64 111195 1953 2017 .33A .43

65 201332 1960 2005 .25A

66 142363 1969 2009 .39

Av segment correlation .35 .38 .35 .52 .55 .53 .49 .48 .46

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

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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

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

102271 1792 to 2009 218 years Series 1

[\*] Early part of series cannot be checked from 1792 to 1795 -- not matched by another series

[B] Entire series, effect on correlation ( .489) is:

Lower 1828> -.025 1796> -.018 1991> -.012 1930> -.012 1954< -.010 1803< -.009 Higher 1947 .035 1911 .035

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

1828 +3.6 SD

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20835r 1796 to 2009 214 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

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1796 1845 0 - - - - - - -.12 .20 .10 -.22 .33\* .19 .15 -.08 -.10 .00 -.17 .00 -.15 .15 .01

1800 1849 -3 - - -.04 .08 -.04 .01 -.17 .34\*-.01 -.23 .33| .11 .15 -.10 .03 .00 -.18 -.02 -.15 .14 -.08

1825 1874 -3 -.16 -.24 -.04 .02 -.01 -.11 -.23 .32\* .16 -.04 .30| .15 .30 .13 -.01 .01 -.30 -.12 -.06 .07 -.15

[B] Entire series, effect on correlation ( .468) is:

Lower 1796< -.015 1846< -.014 1852< -.013 1840> -.012 1818< -.010 1999> -.009 Higher 1911 .030 1977 .025

1796 to 1845 segment:

Lower 1796< -.056 1818< -.039 1840> -.035 1837< -.033 1827< -.025 1807< -.023 Higher 1805 .064 1800 .042

1800 to 1849 segment:

Lower 1846< -.056 1818< -.038 1840> -.036 1837< -.032 1827< -.024 1807< -.022 Higher 1805 .062 1800 .042

1825 to 1874 segment:

Lower 1846< -.062 1852< -.057 1840> -.051 1837< -.036 1827< -.027 1854> -.019 Higher 1838 .054 1844 .037

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

1806 1807 -4.0 SD

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

122474 1797 to 2002 206 years Series 3

[B] Entire series, effect on correlation ( .462) is:

Lower 1808> -.022 1816< -.014 1865< -.014 1918> -.013 1888> -.013 1847< -.010 Higher 1977 .026 1947 .023

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

90752 1806 to 2009 204 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

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

1825 1874 0 -.10 -.04 -.33 -.06 -.22 -.07 -.04 -.23 .13 -.13 .33\* .15 .07 .26 .05 .07 .04 .15 .06 .00 .13

1850 1899 0 -.18 .04 -.31 -.08 -.14 -.03 .01 -.07 -.03 .26 .30\* .29 .29 .13 .29 .11 .10 .13 -.36 -.14 -.13

1875 1924 0 -.12 .02 -.07 -.14 .01 .10 .21 .16 .19 .15 .31\* .04 .16 .09 -.12 .07 -.09 -.20 -.16 .14 -.20

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

1960 2009 0 .05 -.29 .08 .24 -.06 .04 .05 .25 -.29 -.07 .32\*-.31 -.01 -.25 .07 -.05 -.14 .23 .04 - -

[B] Entire series, effect on correlation ( .383) is:

Lower 2003< -.019 1918> -.016 1856> -.013 1825< -.011 1915< -.009 1925> -.009 Higher 1947 .039 1838 .018

1825 to 1874 segment:

Lower 1856> -.051 1825< -.036 1851< -.021 1861> -.020 1858> -.016 1837> -.013 Higher 1838 .086 1828 .051

1850 to 1899 segment:

Lower 1856> -.073 1851< -.034 1875< -.030 1861> -.028 1858> -.021 1879> -.017 Higher 1888 .040 1891 .037

1875 to 1924 segment:

Lower 1918> -.068 1902< -.045 1915< -.039 1875< -.028 1910< -.013 1879> -.012 Higher 1891 .033 1888 .028

1960 to 2009 segment:

Lower 2003< -.078 1967< -.030 1996> -.024 1964< -.023 1979> -.015 1983< -.013 Higher 1966 .038 1999 .035

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

1855 1856 4.3 SD

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

62148 1839 to 2009 171 years Series 5

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

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

1839 1888 0 -.30 -.11 -.37 -.17 -.24 -.15 -.07 .14 .25 .23 .28\* .05 .09 .22 .07 .02 .10 .26 .01 -.02 -.05

1850 1899 7 -.29 -.20 -.25 -.30 -.12 -.09 -.01 .09 .00 .01 .09| .06 .17 .17 .03 .07 .11 .29\* .14 .01 -.02

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

1925 1974 -7 .02 -.07 .01 .40\*-.03 -.19 -.04 -.03 .09 -.18 .35| .12 -.20 -.05 -.17 .24 .02 .05 -.04 -.29 -.01

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1960 2009 0 .12 .06 .07 -.05 -.08 .17 .13 -.09 -.19 .01 .32\*-.12 -.11 .18 -.13 .27 -.20 .02 -.01 - -

[B] Entire series, effect on correlation ( .363) is:

Lower 1888> -.021 1982< -.013 2009< -.010 1930> -.010 1887> -.009 1891< -.008 Higher 1911 .040 1947 .023

1839 to 1888 segment:

Lower 1888> -.086 1887> -.038 1878< -.029 1840< -.027 1872< -.026 1850< -.026 Higher 1844 .064 1861 .058

1850 to 1899 segment:

Lower 1888> -.084 1887> -.038 1891< -.034 1878< -.026 1897< -.026 1872< -.024 Higher 1861 .085 1868 .045

1925 to 1974 segment:

Lower 1930> -.033 1955< -.021 1943> -.020 1956< -.019 1957< -.019 1944> -.019 Higher 1947 .073 1925 .066

1960 to 2009 segment:

Lower 1982< -.049 2009< -.038 2001< -.017 2006> -.016 1995< -.015 1969< -.013 Higher 1977 .086 1990 .038

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

1888 +3.5 SD

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32138A 1860 to 2015 156 years Series 6

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

Lower 2001< -.029 2010> -.016 1947> -.012 1940< -.011 2006> -.010 1998< -.009 Higher 1911 .057 2015 .018

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132206 1866 to 2009 144 years Series 7

[B] Entire series, effect on correlation ( .649) is:

Lower 1947> -.021 1996> -.018 1980> -.014 1874< -.008 1873< -.007 1993< -.007 Higher 1911 .063 1991 .017

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162397 1868 to 2009 142 years Series 8

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

Lower 1958< -.021 1947> -.019 1915< -.015 1980> -.014 2007< -.014 1868< -.013 Higher 1911 .062 1977 .034

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162398 1868 to 2009 142 years Series 9

[B] Entire series, effect on correlation ( .652) is:

Lower 1980< -.042 1940< -.015 1968< -.011 1939> -.011 1965< -.008 1973> -.008 Higher 1947 .021 1911 .021

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172036 1868 to 2009 142 years Series 10

[B] Entire series, effect on correlation ( .446) is:

Lower 1871< -.042 1998< -.020 1887> -.013 1966> -.010 1920< -.010 1991> -.009 Higher 1911 .039 1918 .028

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60507 1870 to 2009 140 years Series 11

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

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1870 1919 0 -.15 .04 -.12 .04 .01 .14 -.15 -.22 -.09 -.24 .32\* .12 .13 .01 .16 .22 .10 .22 -.15 -.21 -.24

[B] Entire series, effect on correlation ( .338) is:

Lower 2001< -.018 1927< -.018 1991> -.016 1932< -.015 1985< -.011 1987> -.011 Higher 1977 .018 1891 .015

1870 to 1919 segment:

Lower 1882< -.028 1880> -.023 1879> -.021 1887> -.019 1914> -.014 1904< -.012 Higher 1891 .051 1915 .037

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70069 1871 to 2009 139 years Series 12

[B] Entire series, effect on correlation ( .492) is:

Lower 1910> -.034 1909> -.017 1918> -.011 1936< -.009 1996> -.007 1956< -.007 Higher 1911 .120 1891 .011

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

1887 1888 -6.0 SD

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

1888 -6.5 SD; 1909 +3.9 SD; 1910 +5.9 SD; 1911 +5.0 SD

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100990 1871 to 2009 139 years Series 13

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

Lower 1977> -.029 1921< -.015 1918> -.015 1974< -.013 1942< -.009 1896< -.008 Higher 1947 .039 1991 .030

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162295 1871 to 2009 139 years Series 14

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

Lower 1953< -.038 2004> -.013 1942< -.011 1993< -.010 1959> -.009 1933< -.008 Higher 1911 .075 1918 .017

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

1953 -5.0 SD

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122404 1872 to 2009 138 years Series 15

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

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1960 2009 3 -.02 -.16 -.12 -.14 -.01 -.15 -.08 .01 .13 -.03 .44|-.04 -.32 .48\*-.11 -.05 .04 -.06 -.05 - -

[B] Entire series, effect on correlation ( .533) is:

Lower 1993< -.056 1938< -.011 1990< -.010 2004> -.010 1891< -.009 1991> -.007 Higher 1947 .035 1977 .022

1960 to 2009 segment:

Lower 1993< -.132 1990< -.025 2004> -.025 1991> -.022 2009< -.012 1960< -.008 Higher 1977 .072 1966 .029

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

1993 -4.8 SD

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80745 1874 to 2009 136 years Series 16

[B] Entire series, effect on correlation ( .513) is:

Lower 2000< -.044 1966> -.012 1958< -.012 1874> -.011 1942< -.009 2002< -.008 Higher 1996 .035 1947 .026

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50314 1875 to 2009 135 years Series 17

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

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1875 1924 0 -.26 -.13 -.14 .02 -.20 .19 .05 .14 .21 .12 .26\* .14 -.18 -.04 -.03 -.04 -.06 .03 -.01 .08 .08

1900 1949 0 -.15 -.01 -.04 .09 -.33 .20 -.11 .01 .06 .11 .32\*-.09 .09 .04 -.03 .07 -.16 .08 .07 -.03 .09

[B] Entire series, effect on correlation ( .358) is:

Lower 1937< -.032 1911> -.019 1996> -.015 1969< -.011 1991> -.011 1943> -.011 Higher 1977 .063 1947 .038

1875 to 1924 segment:

Lower 1876< -.027 1903< -.025 1878< -.025 1891< -.023 1911> -.022 1885> -.019 Higher 1895 .041 1888 .039

1900 to 1949 segment:

Lower 1937< -.078 1911> -.043 1943> -.024 1903< -.018 1941< -.015 1931< -.015 Higher 1947 .099 1939 .027

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60121 1877 to 2009 133 years Series 18

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

Lower 1911> -.024 1886< -.018 1939> -.015 1891< -.012 1877> -.010 1994< -.008 Higher 1947 .049 1996 .030

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70471 1878 to 2009 132 years Series 19

[B] Entire series, effect on correlation ( .588) is:

Lower 2008< -.027 1966> -.015 1930> -.012 1947> -.011 2007< -.011 1897< -.010 Higher 1911 .057 1996 .034

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

2008 -5.8 SD

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102371 1878 to 2009 132 years Series 20

[B] Entire series, effect on correlation ( .546) is:

Lower 1996> -.032 2005< -.017 1980> -.011 1992< -.009 1991> -.009 1947> -.008 Higher 1911 .030 1977 .024

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180996 1880 to 2009 130 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

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1960 2009 0 -.03 .08 -.01 .08 .06 -.01 .02 .24 -.21 .10 .29\*-.24 .06 -.24 .01 .12 -.10 .24 -.19 - -

[B] Entire series, effect on correlation ( .473) is:

Lower 1996> -.050 1947> -.022 1941< -.018 1921< -.015 1979> -.012 2001< -.011 Higher 1911 .035 1966 .014

1960 to 2009 segment:

Lower 1996> -.125 2001< -.028 1979> -.025 2000< -.017 1977> -.016 1963> -.012 Higher 1966 .060 1978 .032

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

1996 +3.2 SD

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50322 1881 to 2009 129 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

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1881 1930 0 -.13 -.09 .14 .03 -.05 .02 -.02 .05 .13 .19 .27\* .17 -.09 .13 -.01 .14 -.06 -.18 -.06 -.19 .12

1900 1949 0 -.16 .06 .17 .22 -.21 -.14 .05 .08 .04 .18 .30\* .06 .00 -.01 .00 .24 -.02 -.15 -.09 -.12 .08

[B] Entire series, effect on correlation ( .529) is:

Lower 1911> -.037 1923> -.024 1941< -.014 1915< -.012 1925> -.012 1994< -.009 Higher 1947 .040 1977 .039

1881 to 1930 segment:

Lower 1923> -.059 1911> -.038 1915< -.030 1925> -.026 1901< -.020 1905> -.017 Higher 1895 .043 1891 .040

1900 to 1949 segment:

Lower 1923> -.061 1911> -.046 1941< -.033 1925> -.028 1915< -.027 1937< -.020 Higher 1947 .192 1924 .029

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80089 1882 to 2009 128 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

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1882 1931 0 -.14 .01 -.09 .27 -.08 .07 -.17 -.16 .01 .03 .32\*-.14 -.05 -.17 .00 .04 -.05 -.03 .11 .01 -.15

[B] Entire series, effect on correlation ( .483) is:

Lower 1903< -.042 1953< -.031 1892< -.018 1952> -.011 1919< -.006 1944> -.006 Higher 1947 .054 1991 .013

1882 to 1931 segment:

Lower 1903< -.111 1892< -.045 1919< -.016 1926< -.012 1920< -.011 1882> -.009 Higher 1925 .041 1911 .035

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112142 1882 to 2008 127 years Series 24

[B] Entire series, effect on correlation ( .504) is:

Lower 1991> -.035 1998< -.019 2001< -.015 1895< -.012 1995< -.011 1980> -.011 Higher 1996 .048 1947 .029

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92046 1885 to 2009 125 years Series 25

[B] Entire series, effect on correlation ( .664) is:

Lower 1958< -.024 1918> -.019 1980> -.016 1979> -.008 1993> -.008 1963< -.007 Higher 1947 .044 1991 .017

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60078 1886 to 2009 124 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

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1886 1935 0 -.15 .04 .06 .13 .17 .22 -.21 -.08 .01 -.05 .27\*-.02 -.11 -.08 -.05 .03 -.24 .10 -.12 .10 -.11

[B] Entire series, effect on correlation ( .506) is:

Lower 1888> -.023 1891< -.022 1968< -.018 1932> -.017 1887> -.012 1976< -.009 Higher 1996 .048 1918 .018

1886 to 1935 segment:

Lower 1888> -.049 1891< -.049 1932> -.037 1887> -.027 1916< -.016 1931< -.015 Higher 1911 .093 1918 .072

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

1888 +3.1 SD; 1996 -5.3 SD

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90558 1887 to 2009 123 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

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1950 1999 0 -.05 -.14 .06 .19 -.20 .25 -.06 .08 -.15 .06 .29\*-.13 -.12 -.36 .08 -.02 -.14 .13 .02 -.01 .02

1960 2009 0 .01 -.11 .02 .25 -.25 .03 .02 .11 -.19 .06 .29\*-.13 -.09 -.41 .25 -.20 -.11 .13 -.02 - -

[B] Entire series, effect on correlation ( .547) is:

Lower 1977> -.018 1947> -.016 1894< -.012 1945< -.012 1984< -.010 1981< -.007 Higher 1911 .088 1891 .009

1950 to 1999 segment:

Lower 1984< -.028 1977> -.026 1981< -.020 1995< -.016 1967< -.016 1959> -.015 Higher 1996 .049 1958 .037

1960 to 2009 segment:

Lower 1977> -.029 1984< -.029 1981< -.020 1967< -.017 1995< -.017 1998< -.016 Higher 1996 .047 2009 .033

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101212 1891 to 2009 119 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

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1950 1999 0 .28 -.23 .06 .03 .00 -.16 .04 -.18 -.11 .29 .31\*-.28 .12 .00 -.05 .12 -.07 .13 -.04 -.16 .00

1960 2009 0 .26 -.15 .04 .09 .11 -.27 .18 -.14 -.22 .27 .28\*-.21 .15 -.08 -.01 -.04 -.09 .06 -.05 - -

[B] Entire series, effect on correlation ( .434) is:

Lower 1996> -.049 1981< -.038 1939> -.026 1891< -.024 1997< -.018 1941< -.014 Higher 1911 .037 1918 .018

1950 to 1999 segment:

Lower 1996> -.110 1981< -.078 1997< -.028 1972< -.018 1984< -.014 1954< -.011 Higher 1977 .046 1958 .030

1960 to 2009 segment:

Lower 1996> -.119 1981< -.079 1997< -.027 1972< -.018 1984< -.014 2003< -.012 Higher 1977 .048 2001 .030

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

1939 +3.1 SD; 1996 +3.2 SD

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72232 1893 to 2009 117 years Series 29

[B] Entire series, effect on correlation ( .603) is:

Lower 1968< -.025 1977> -.014 1957< -.011 2009< -.010 1973> -.009 1953> -.008 Higher 1947 .055 1911 .041

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60377 1895 to 2009 115 years Series 30

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

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1895 1944 4 .00 -.29 .07 -.04 -.09 .11 -.15 .16 .03 .18 .26| .02 -.05 .03 .27\* .10 -.22 -.07 .02 -.01 -.10

[B] Entire series, effect on correlation ( .350) is:

Lower 1958< -.029 1903< -.027 1996> -.025 1923> -.024 1895< -.021 1988< -.013 Higher 1947 .037 1991 .033

1895 to 1944 segment:

Lower 1903< -.062 1923> -.058 1895< -.045 1933< -.026 1931< -.018 1919< -.013 Higher 1911 .047 1925 .025

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

1959 1960 4.2 SD

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

1959 -6.0 SD

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70519 1895 to 2009 115 years Series 31

[B] Entire series, effect on correlation ( .518) is:

Lower 1947> -.015 1923> -.014 1936< -.012 1902> -.008 1962> -.007 1925> -.006 Higher 1911 .012 1990 .010

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

1976 1977 -5.7 SD 1977 1978 6.3 SD

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

1977 -7.6 SD

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70559 1895 to 2009 115 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

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1895 1944 0 -.19 -.16 -.32 .00 -.14 .08 -.01 -.11 .10 .17 .27\* .08 .02 .22 .08 .18 -.01 .12 .07 -.13 -.28

1900 1949 0 -.12 -.15 -.31 -.01 -.17 .09 -.05 -.16 .11 .18 .27\* .08 .03 .17 .10 .16 -.07 .12 -.01 -.20 -.28

[B] Entire series, effect on correlation ( .427) is:

Lower 1977> -.039 1911> -.021 1980< -.018 1923> -.017 1939> -.010 1981< -.010 Higher 1996 .067 1991 .031

1895 to 1944 segment:

Lower 1923> -.041 1935< -.027 1939> -.025 1941< -.023 1926< -.019 1940< -.014 Higher 1895 .030 1901 .023

1900 to 1949 segment:

Lower 1923> -.040 1935< -.033 1939> -.025 1941< -.021 1926< -.020 1940< -.016 Higher 1947 .032 1901 .027

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

1979 1980 -4.1 SD 1995 1996 -4.6 SD 1996 1997 4.5 SD

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

1977 +3.0 SD; 1980 -4.5 SD; 1981 -4.5 SD

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80451 1895 to 2009 115 years Series 33

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

Lower 1990< -.038 1923> -.025 1980> -.017 2000< -.016 1911> -.014 1976< -.011 Higher 1947 .063 1991 .019

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142565 1895 to 2009 115 years Series 34

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

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1950 1999 0 .07 -.20 .03 .02 -.15 -.17 -.32 .19 -.02 .12 .23\*-.07 .00 .22 .17 .04 -.09 -.14 -.16 -.11 -.10

1960 2009 -3 -.05 -.15 .13 .03 .01 -.29 -.29 .23\*-.09 .17 .23| .00 .04 .14 .12 -.02 -.16 -.16 -.06 - -

[B] Entire series, effect on correlation ( .469) is:

Lower 1996> -.033 1895< -.026 1978< -.020 1994< -.018 1966> -.015 1929< -.014 Higher 1911 .100 1947 .034

1950 to 1999 segment:

Lower 1996> -.062 1978< -.049 1994< -.044 1966> -.031 1953> -.017 1991> -.014 Higher 1999 .043 1958 .031

1960 to 2009 segment:

Lower 1996> -.068 1978< -.051 1994< -.046 1966> -.034 1991> -.017 1977> -.013 Higher 1999 .045 2001 .035

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52111 1896 to 2009 114 years Series 35

[B] Entire series, effect on correlation ( .481) is:

Lower 1897< -.051 1957< -.028 2003< -.015 1996> -.014 1977> -.013 2004> -.011 Higher 1911 .051 1991 .023

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112336 1896 to 2009 114 years Series 36

[B] Entire series, effect on correlation ( .421) is:

Lower 1905< -.031 1911> -.018 1921< -.015 1908> -.012 1901< -.012 1998< -.010 Higher 1977 .024 1923 .021

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70371 1897 to 2009 113 years Series 37

[B] Entire series, effect on correlation ( .709) is:

Lower 1911> -.029 1899> -.011 2002< -.009 1927< -.009 1925> -.008 1960< -.008 Higher 1947 .039 1996 .024

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70536 1897 to 2009 113 years Series 38

[B] Entire series, effect on correlation ( .588) is:

Lower 1930< -.021 1998< -.021 1999> -.013 1967< -.010 1973> -.010 1963> -.008 Higher 1977 .038 1996 .020

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142539 1898 to 2009 112 years Series 39

[B] Entire series, effect on correlation ( .554) is:

Lower 1993< -.042 1996> -.033 1983< -.013 1947> -.012 1957< -.010 1955< -.008 Higher 1911 .060 1977 .039

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90546 1901 to 2009 109 years Series 40

[B] Entire series, effect on correlation ( .646) is:

Lower 1911> -.027 1957< -.009 1997< -.008 1925> -.008 1980< -.007 1917< -.006 Higher 1947 .049 1996 .027

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172168 1906 to 2009 104 years Series 41

[B] Entire series, effect on correlation ( .527) is:

Lower 1947> -.037 1994< -.017 1933< -.016 1991> -.014 2007< -.011 1997> -.011 Higher 1911 .062 1996 .051

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110870 1907 to 2007 101 years Series 42

[B] Entire series, effect on correlation ( .517) is:

Lower 1966> -.018 1950< -.014 2001< -.012 1987> -.010 1926< -.010 1978< -.010 Higher 1911 .038 1996 .030

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60331 1910 to 2009 100 years Series 43

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

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1910 1959 0 -.10 -.24 -.11 .22 .13 .03 -.08 .00 .05 .07 .22\*-.01 -.26 -.05 .22 -.05 -.10 -.11 .09 .20 .05

1925 1974 0 .01 -.23 -.18 .15 -.05 .22 -.08 -.04 .03 -.04 .27\*-.05 -.15 -.07 .14 -.21 -.10 -.10 .12 .25 .08

[B] Entire series, effect on correlation ( .406) is:

Lower 1923> -.032 1935< -.031 1947> -.024 1980> -.015 1954< -.014 1938< -.012 Higher 1977 .050 1996 .025

1910 to 1959 segment:

Lower 1923> -.057 1935< -.049 1947> -.024 1954< -.022 1938< -.019 1936< -.013 Higher 1958 .026 1911 .023

1925 to 1974 segment:

Lower 1947> -.058 1935< -.052 1954< -.024 1938< -.022 1925> -.019 1936< -.016 Higher 1958 .030 1968 .021

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

1923 +3.2 SD

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70602 1914 to 2009 96 years Series 44

[B] Entire series, effect on correlation ( .581) is:

Lower 1943< -.026 1980> -.015 1917< -.014 2004> -.014 1998< -.010 1951< -.010 Higher 1977 .034 1996 .019

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70601A 1916 to 2014 99 years Series 45

[B] Entire series, effect on correlation ( .398) is:

Lower 1918> -.052 1978< -.021 1990< -.017 2014> -.016 1977> -.014 1920< -.014 Higher 1996 .084 1947 .039

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192029 1916 to 2009 94 years Series 46

[B] Entire series, effect on correlation ( .617) is:

Lower 1996> -.020 1978< -.018 1966> -.018 1963> -.014 1920< -.011 1930> -.011 Higher 1947 .075 1918 .022

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50517r 1917 to 2009 93 years Series 47

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

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1950 1999 3 -.29 -.07 -.10 -.11 -.18 .09 -.14 -.10 -.13 -.07 .23|-.14 .14 .26\* .03 .16 -.13 .02 .00 .03 -.12

1960 2009 0 -.17 -.07 -.14 .09 .14 -.02 -.27 -.01 -.11 -.04 .22\*-.18 .10 .13 -.03 .13 -.08 -.17 .00 - -

[B] Entire series, effect on correlation ( .446) is:

Lower 1996> -.022 1999> -.020 1994< -.019 1977> -.015 1988< -.014 1958< -.012 Higher 1947 .031 1923 .022

1950 to 1999 segment:

Lower 1999> -.037 1994< -.036 1988< -.028 1953> -.022 1996> -.022 1958< -.019 Higher 1990 .048 1991 .043

1960 to 2009 segment:

Lower 1999> -.040 1994< -.038 1988< -.029 1996> -.025 2002< -.020 1979> -.015 Higher 1990 .053 1991 .044

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70535 1917 to 2009 93 years Series 48

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

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1917 1966 -9 .12 .28\*-.14 .14 -.17 -.03 .19 .08 .13 .04 .23| .08 -.06 -.08 .02 -.13 -.34 -.03 -.23 .01 .02

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1960 2009 0 .10 .18 .06 -.14 .04 -.03 -.07 -.06 -.05 .03 .24\*-.16 -.03 -.01 .24 -.16 .12 -.08 .03 - -

[B] Entire series, effect on correlation ( .225) is:

Lower 1921< -.027 1922< -.025 1985< -.019 1923> -.019 1980> -.018 2004> -.017 Higher 1996 .021 1990 .020

1917 to 1966 segment:

Lower 1921< -.068 1922< -.059 1923> -.035 1927< -.021 1950< -.011 1925> -.008 Higher 1918 .030 1941 .023

1960 to 2009 segment:

Lower 1985< -.035 1980> -.034 2004> -.030 2000< -.027 1988< -.027 2002< -.011 Higher 1990 .038 1996 .033

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

1922 1923 4.5 SD

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60210 1918 to 2009 92 years Series 49

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

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1960 2009 0 .00 .10 -.07 -.19 .03 -.06 -.13 .15 .10 -.23 .27\* .21 .01 -.05 -.14 .02 .13 -.11 -.25 - -

[B] Entire series, effect on correlation ( .437) is:

Lower 1995< -.037 1947> -.032 2004> -.016 1966> -.015 1960< -.013 1968< -.013 Higher 1918 .046 1923 .028

1960 to 2009 segment:

Lower 1995< -.068 2004> -.028 1966> -.026 1960< -.024 1968< -.024 2009< -.018 Higher 1996 .029 1967 .027

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50234 1921 to 2009 89 years Series 50

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

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1921 1970 0 -.07 .05 .08 .01 -.17 .17 .02 .22 .03 .04 .27\*-.13 .12 -.09 .18 -.06 -.24 -.03 .13 .15 .01

1925 1974 4 -.33 -.05 .03 .09 .02 .13 .11 .14 .08 .15 .16| .03 -.06 -.14 .24\*-.10 -.11 -.09 .21 .12 .04

1950 1999 0 -.26 .15 -.09 -.06 -.15 .29 -.08 .09 .25 -.27 .32\*-.01 .00 .11 -.01 -.19 -.06 -.03 .01 .01 .21

1960 2009 0 -.27 .22 -.14 -.08 -.16 .26 -.07 .06 .12 -.35 .33\*-.03 .02 .16 -.02 -.11 -.02 .03 .01 - -

[B] Entire series, effect on correlation ( .329) is:

Lower 1987> -.031 1991> -.027 1980> -.026 1959> -.018 1989< -.017 1968< -.015 Higher 1996 .141 1977 .034

1921 to 1970 segment:

Lower 1959> -.050 1968< -.038 1921< -.034 1930> -.031 1967< -.022 1925> -.021 Higher 1923 .082 1939 .043

1925 to 1974 segment:

Lower 1959> -.049 1968< -.047 1974> -.033 1930> -.029 1967< -.027 1926< -.026 Higher 1947 .070 1939 .060

1950 to 1999 segment:

Lower 1987> -.049 1991> -.046 1980> -.039 1959> -.028 1989< -.023 1968< -.022 Higher 1996 .268 1977 .049

1960 to 2009 segment:

Lower 1987> -.050 1991> -.048 1980> -.040 1989< -.025 1968< -.025 1997> -.020 Higher 1996 .283 1977 .051

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

1996 1997 4.8 SD

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

1996 -5.5 SD

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80540 1921 to 2002 82 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

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1950 1999 8 -.07 -.11 -.18 .02 .03 .30 -.07 -.13 -.06 .08 .25|-.07 -.18 .08 -.08 -.07 .21 -.11 .32\* .04 -.09

1953 2002 -5 -.06 -.16 -.19 .04 .04 .36\*-.07 -.03 -.04 .07 .22|-.06 -.16 .09 -.10 -.13 .17 -.15 .27 .10 -.12

[B] Entire series, effect on correlation ( .286) is:

Lower 1977> -.042 1924< -.031 1990< -.027 1959> -.025 1930> -.021 1999> -.019 Higher 1996 .099 1947 .081

1950 to 1999 segment:

Lower 1977> -.065 1990< -.042 1959> -.038 1999> -.027 1983< -.025 1974> -.016 Higher 1996 .178 1966 .061

1953 to 2002 segment:

Lower 1977> -.066 1959> -.040 1990< -.039 1999> -.029 1983< -.023 1974> -.018 Higher 1996 .188 1966 .065

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90273 1922 to 2007 86 years Series 52

[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 -.07 -.04 .05 .09 -.03 .03 .19 .00 .19 -.03 .32\* .04 -.07 -.05 .00 .01 -.36 -.18 -.09 -.01 .01

[B] Entire series, effect on correlation ( .390) is:

Lower 2001< -.026 1966> -.025 1993< -.018 1979> -.014 1950< -.012 1959> -.012 Higher 1991 .070 1925 .024

1925 to 1974 segment:

Lower 1966> -.058 1950< -.029 1959> -.025 1932> -.024 1965> -.024 1936< -.018 Higher 1925 .073 1947 .060

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

1991 -5.8 SD

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

60016 1923 to 2009 87 years Series 53

[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 .17 .05 .03 .13 .27 -.13 -.05 -.14 -.16 -.05 .28\*-.26 -.29 .06 .07 .03 -.03 -.05 .09 -.09 .01

1960 2009 -8 .05 .09 .26\*-.06 .22 -.12 -.02 -.12 -.18 -.06 .24|-.14 -.25 .08 .04 -.02 -.13 -.07 .20 - -

[B] Entire series, effect on correlation ( .315) is:

Lower 1983< -.060 1930> -.030 1954< -.023 1981< -.021 1996> -.019 1938< -.013 Higher 1923 .027 1978 .018

1950 to 1999 segment:

Lower 1983< -.102 1954< -.036 1981< -.034 1996> -.032 1999> -.014 1961< -.012 Higher 1978 .033 1959 .027

1960 to 2009 segment:

Lower 1983< -.111 1981< -.037 1996> -.029 1961< -.014 1999> -.014 2006> -.011 Higher 1978 .038 1967 .023

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

1930 +3.1 SD

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

50455 1924 to 2009 86 years Series 54

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

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

1924 1973 0 -.09 .03 -.06 .27 -.21 -.11 -.05 .03 -.12 -.29 .30\*-.06 .10 .08 .07 .07 .07 -.16 .09 -.25 -.08

1925 1974 0 -.07 -.01 -.09 .24 -.16 -.13 -.06 .01 -.15 -.25 .27\*-.02 .08 .06 .06 .06 .11 -.17 .11 -.26 -.08

1950 1999 0 .09 -.02 .07 .08 -.13 -.05 -.02 .13 -.27 -.13 .25\*-.03 .14 -.02 .07 -.03 .05 -.21 .11 -.19 -.03

1960 2009 0 .18 -.08 .09 .17 -.02 -.05 -.06 .15 -.28 -.13 .21\*-.07 .19 -.09 .12 -.03 -.05 -.18 .08 - -

[B] Entire series, effect on correlation ( .321) is:

Lower 1969< -.069 1960< -.053 1978< -.025 2001< -.018 1966> -.015 1939> -.011 Higher 1925 .034 1977 .023

1924 to 1973 segment:

Lower 1969< -.091 1960< -.072 1966> -.026 1939> -.019 1956< -.012 1948> -.011 Higher 1925 .062 1924 .028

1925 to 1974 segment:

Lower 1969< -.093 1960< -.074 1966> -.026 1939> -.020 1956< -.012 1927< -.010 Higher 1925 .064 1947 .032

1950 to 1999 segment:

Lower 1969< -.100 1960< -.077 1978< -.037 1966> -.022 1995< -.013 1991> -.013 Higher 1977 .043 1967 .023

1960 to 2009 segment:

Lower 1969< -.095 1960< -.075 1978< -.038 2001< -.027 1966> -.023 1991> -.013 Higher 1977 .046 2009 .028

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

1977 1978 -4.0 SD

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80371 1925 to 2009 85 years Series 55

[B] Entire series, effect on correlation ( .422) is:

Lower 2009< -.064 1977> -.038 1925> -.028 2005> -.015 1943> -.013 1959> -.013 Higher 1996 .067 1991 .060

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90283 1925 to 2009 85 years Series 56

[B] Entire series, effect on correlation ( .518) is:

Lower 1980< -.043 1955< -.039 2002< -.017 1956< -.015 2008< -.010 1996> -.009 Higher 1947 .041 1987 .015

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90130 1927 to 2009 83 years Series 57

[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 -.11 .11 .01 -.16 .07 -.04 -.16 .07 -.15 .02 .19\*-.11 .00 .17 -.06 -.06 .15 .16 -.01 -.21 -.24

1960 2009 -8 -.08 .18 .23\*-.19 .14 .06 -.30 .06 -.06 .04 .13|-.14 .02 -.04 -.10 -.12 .01 .21 -.04 - -

[B] Entire series, effect on correlation ( .300) is:

Lower 1977> -.045 1996> -.039 1987> -.024 1991> -.019 1941< -.016 1990< -.015 Higher 1947 .026 1978 .017

1950 to 1999 segment:

Lower 1977> -.064 1996> -.052 1987> -.037 1988< -.027 1990< -.027 1991> -.021 Higher 1978 .036 1967 .032

1960 to 2009 segment:

Lower 1977> -.063 1996> -.051 1987> -.036 1988< -.024 1990< -.023 1991> -.021 Higher 1980 .043 1978 .040

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60060 1931 to 2007 77 years Series 58

[B] Entire series, effect on correlation ( .444) is:

Lower 2001< -.036 1932> -.019 1970< -.017 1959> -.014 1973< -.011 1950< -.010 Higher 1996 .047 1947 .027

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60315 1932 to 2009 78 years Series 59

[B] Entire series, effect on correlation ( .582) is:

Lower 1985< -.021 2008< -.020 1989< -.019 1937< -.015 1981< -.013 1954< -.012 Higher 1947 .079 1991 .041

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82058 1933 to 2009 77 years Series 60

[B] Entire series, effect on correlation ( .540) is:

Lower 2000< -.047 1973< -.028 1934> -.013 1984< -.011 1959> -.009 1941< -.009 Higher 1947 .040 1991 .034

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122211 1933 to 2009 77 years Series 61

[B] Entire series, effect on correlation ( .643) is:

Lower 1980> -.021 1966> -.020 1994< -.017 2007< -.016 1987> -.015 1961< -.010 Higher 1991 .033 1977 .014

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132177 1936 to 2011 76 years Series 62

[B] Entire series, effect on correlation ( .526) is:

Lower 1977> -.033 1987> -.022 1936< -.021 1978< -.016 1988< -.013 1959> -.011 Higher 1996 .082 1947 .069

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

1947 -2.810 62 1

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

161573 1951 to 2017 67 years Series 63

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

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

1951 2000 0 -.17 .10 -.17 -.03 -.06 -.10 .01 -.18 -.02 .04 .25\* .09 -.18 .08 -.14 -.02 .06 -.03 .05 -.28 .04

1968 2017 -7 .21 .06 -.14 .27\*-.03 -.12 -.02 -.05 .06 -.23 .19| - - - - - - - - - -

[B] Entire series, effect on correlation ( .235) is:

Lower 2015> -.062 1977> -.040 1996> -.020 1986< -.016 2004> -.011 2006< -.010 Higher 2016 .053 1991 .024

1951 to 2000 segment:

Lower 1977> -.090 1996> -.043 1986< -.039 2000< -.019 1988< -.016 1984< -.012 Higher 1991 .054 1959 .030

1968 to 2017 segment:

Lower 2015> -.061 1977> -.043 1996> -.020 1986< -.018 2003< -.011 2004> -.011 Higher 2016 .065 1991 .030

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

2015 +3.4 SD

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

111195 1953 to 2017 65 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

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

1953 2002 0 -.30 .08 -.05 -.06 -.14 -.07 .03 .30 -.15 .04 .33\*-.16 -.06 .11 .00 .16 -.07 -.02 .05 -.09 .05

[B] Entire series, effect on correlation ( .381) is:

Lower 1959> -.022 1979> -.022 2012> -.021 2010< -.021 1953> -.015 2017> -.015 Higher 2015 .054 1977 .033

1953 to 2002 segment:

Lower 1979> -.039 1959> -.038 1967< -.030 1953> -.026 1968< -.023 1987> -.023 Higher 1977 .083 1978 .042

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201332 1960 to 2005 46 years Series 65

[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 2005 0 -.06 .09 -.14 .06 .16 -.31 -.05 -.11 .10 -.05 .25\* .02 -.07 -.04 .16 -.01 -.09 .02 .13 -.10 -.08

[B] Entire series, effect on correlation ( .253) is:

Lower 1983< -.108 1998< -.074 1999> -.032 1960< -.021 1963> -.016 1971> -.012 Higher 1977 .054 1966 .047

1960 to 2005 segment:

Lower 1983< -.108 1998< -.074 1999> -.032 1960< -.021 1963> -.016 1971> -.012 Higher 1977 .054 1966 .047

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142363 1969 to 2009 41 years Series 66

[B] Entire series, effect on correlation ( .393) is:

Lower 1996> -.125 1993< -.111 1974> -.012 1970< -.010 1969< -.007 1981< -.007 Higher 1977 .075 1990 .025

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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 102271 1792 2009 218 9 0 .489 1.41 3.17 .628 .846 .205 2.68 .404 .006 1

2 20835r 1796 2009 214 9 3 .468 .66 3.44 .572 .865 .294 2.84 .367 -.036 2

3 122474 1797 2002 206 9 0 .462 1.28 3.18 .537 .757 .257 2.57 .330 -.008 2

4 90752 1806 2009 204 8 4 .383 .87 3.14 .745 .866 .302 2.85 .490 -.062 1

5 62148 1839 2009 171 7 4 .363 .80 2.60 .559 .877 .263 2.81 .451 -.004 2

6 32138A 1860 2015 156 6 0 .536 1.87 7.72 1.470 .917 .193 2.72 .432 -.060 1

7 132206 1866 2009 144 6 0 .649 1.33 3.97 .504 .638 .238 2.57 .358 -.045 1

8 162397 1868 2009 142 6 0 .544 1.07 3.86 .708 .769 .284 2.76 .469 -.015 1

9 162398 1868 2009 142 6 0 .652 1.49 4.19 .725 .748 .262 2.60 .372 -.057 2

10 172036 1868 2009 142 6 0 .446 1.53 4.87 .808 .776 .230 2.70 .471 -.029 1

11 60507 1870 2009 140 6 1 .338 1.55 6.73 1.172 .875 .277 2.69 .390 -.070 1

12 70069 1871 2009 139 6 0 .492 1.77 5.50 1.251 .900 .269 2.98 .261 -.155 1

13 100990 1871 2009 139 6 0 .484 2.05 5.17 .924 .841 .195 2.59 .424 .015 1

14 162295 1871 2009 139 6 0 .597 1.71 6.44 .909 .771 .201 2.61 .359 -.009 2

15 122404 1872 2009 138 6 1 .533 1.51 3.50 .770 .834 .209 2.59 .383 -.011 1

16 80745 1874 2009 136 6 0 .513 2.12 5.90 1.257 .912 .219 2.82 .475 -.083 1

17 50314 1875 2009 135 5 2 .358 1.06 3.44 .597 .768 .273 2.79 .391 -.084 1

18 60121 1877 2009 133 5 0 .583 1.93 8.76 1.040 .679 .187 2.93 .450 -.042 1

19 70471 1878 2009 132 5 0 .588 1.21 2.87 .641 .841 .264 2.64 .413 -.116 1

20 102371 1878 2009 132 5 0 .546 2.45 5.78 .919 .788 .186 2.65 .427 -.026 1

21 180996 1880 2009 130 5 1 .473 2.02 5.50 .964 .705 .252 2.59 .457 -.038 2

22 50322 1881 2009 129 5 2 .529 1.55 3.66 .866 .913 .223 2.58 .324 -.050 1

23 80089 1882 2009 128 5 1 .483 1.81 4.96 1.057 .835 .244 2.59 .425 -.072 1

24 112142 1882 2008 127 5 0 .504 1.02 2.55 .410 .720 .243 2.56 .401 -.032 1

25 92046 1885 2009 125 5 0 .664 1.81 4.08 .702 .712 .230 2.58 .371 -.058 1

26 60078 1886 2009 124 5 1 .506 2.13 5.00 1.129 .847 .271 2.51 .341 -.013 1

27 90558 1887 2009 123 5 2 .547 1.25 3.73 .570 .802 .171 2.51 .384 .020 1

28 101212 1891 2009 119 5 2 .434 2.21 4.51 1.078 .891 .173 2.57 .479 -.062 1

29 72232 1893 2009 117 5 0 .603 2.16 4.93 .855 .741 .211 2.64 .428 .018 1

30 60377 1895 2009 115 5 1 .350 1.17 2.76 .571 .780 .263 2.70 .442 .047 1

31 70519 1895 2009 115 5 0 .518 2.13 5.91 1.067 .877 .185 2.39 .252 -.050 1

32 70559 1895 2009 115 5 2 .427 2.43 6.73 1.309 .866 .217 2.51 .342 .029 1

33 80451 1895 2009 115 5 0 .535 1.86 4.20 .957 .866 .198 2.75 .448 .023 1

34 142565 1895 2009 115 5 2 .469 1.00 3.33 .621 .924 .180 2.51 .423 -.057 1

35 52111 1896 2009 114 5 0 .481 1.72 5.27 .821 .867 .185 2.96 .547 -.130 1

36 112336 1896 2009 114 5 0 .421 1.80 6.16 .992 .747 .201 2.67 .389 -.066 2

37 70371 1897 2009 113 5 0 .709 2.34 4.59 .888 .832 .185 2.46 .430 -.007 1

38 70536 1897 2009 113 5 0 .588 2.22 6.46 .987 .691 .253 2.66 .422 -.034 1

39 142539 1898 2009 112 5 0 .554 1.83 2.79 .405 .370 .197 2.61 .479 -.032 1

40 90546 1901 2009 109 4 0 .646 2.60 5.08 1.010 .781 .213 2.60 .455 -.017 1

41 172168 1906 2009 104 4 0 .527 .92 3.19 .613 .843 .277 2.58 .396 -.047 1

42 110870 1907 2007 101 4 0 .517 .74 4.69 .648 .755 .287 2.70 .452 -.134 1

43 60331 1910 2009 100 4 2 .406 1.62 4.67 .830 .870 .193 2.75 .524 -.028 1

44 70602 1914 2009 96 4 0 .581 1.37 2.81 .613 .683 .269 2.72 .480 -.058 1

45 70601A 1916 2014 99 4 0 .398 .75 2.12 .413 .704 .289 2.54 .374 -.013 2

46 192029 1916 2009 94 4 0 .617 1.38 3.68 .827 .893 .236 2.46 .413 -.003 1

47 50517r 1917 2009 93 4 2 .446 .82 2.46 .546 .739 .314 2.61 .404 -.092 1

48 70535 1917 2009 93 4 2 .225 1.86 5.83 .942 .771 .214 2.76 .553 .019 1

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

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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 60210 1918 2009 92 4 1 .437 1.23 4.41 1.265 .939 .248 2.72 .452 -.009 2

50 50234 1921 2009 89 4 4 .329 1.03 5.50 .928 .847 .287 2.59 .315 -.123 1

51 80540 1921 2002 82 4 2 .286 .82 1.81 .426 .747 .307 3.12 .515 -.030 1

52 90273 1922 2007 86 4 1 .390 .83 2.62 .600 .858 .290 2.43 .343 -.115 1

53 60016 1923 2009 87 4 2 .315 2.13 8.43 1.763 .889 .219 2.89 .512 .061 1

54 50455 1924 2009 86 4 4 .321 1.71 5.37 1.112 .903 .218 2.56 .427 -.120 1

55 80371 1925 2009 85 3 0 .422 1.56 6.43 1.169 .827 .257 2.65 .492 -.126 1

56 90283 1925 2009 85 3 0 .518 2.41 5.81 1.137 .911 .161 2.53 .394 .002 1

57 90130 1927 2009 83 3 2 .300 .72 1.78 .426 .820 .313 2.84 .525 .038 1

58 60060 1931 2007 77 3 0 .444 .70 2.71 .557 .870 .323 3.09 .585 .088 2

59 60315 1932 2009 78 3 0 .582 2.65 4.94 .659 .565 .183 2.67 .537 -.072 1

60 82058 1933 2009 77 3 0 .540 1.51 3.60 .515 .665 .204 2.71 .513 -.034 1

61 122211 1933 2009 77 3 0 .643 1.07 2.42 .486 .767 .215 2.59 .474 -.014 1

62 132177 1936 2011 76 3 0 .526 .82 3.27 .596 .845 .294 2.50 .337 -.026 1

63 161573 1951 2017 67 2 2 .235 .66 3.45 .553 .718 .294 2.89 .502 -.102 1

64 111195 1953 2017 65 2 1 .381 .57 1.52 .354 .838 .292 2.64 .442 -.012 1

65 201332 1960 2005 46 1 1 .253 .48 .93 .213 .910 .160 2.56 .546 -.107 2

66 142363 1969 2009 41 1 0 .393 1.50 1.92 .225 .114 .166 2.38 .476 .014 1

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Total or mean: 7633 313 55 .485 1.51 8.76 .808 .801 .237 3.12 .422 -.038

- = [ COFECHA QUAL COF ] = -