The Evolution of Wealth Inequality, 1668 to 2012: The North Atlantic Anglo-Sphere

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INTRODUCTION[1]

Long run trends in inequality are an important focus in economic history as recently evidenced by Thomas Piketty's[2] work and a preoccupation with the recent rise of wealth and income shares among the top one percent of international distributions.[3] Piketty's thesis that slower economic growth, combined with a rate of return to wealth greater than the rate of economic growth, is associated with greater inequality is invariably a pessimistic one. It is at odds with the more optimistic Kuznets curve hypothesis that inequality grows during industrialization and economic growth, while declining once industrialization has spread and the economic growth rate slows.[4]

More recently, Milanovic (2016) argues inequality has moved in broad cycles as a result of long-term Kuznets waves with the current rise in inequality being fueled by a new Kuznets wave of innovation in technology and trade. Industrialization was also a Kuznets wave of technological advance and globalization that then generated countervailing forces such as increased education and political upheaval that served to reduce inequality to the lows of the 1970s.

There is indeed debate over whether over long-term economic development and industrialization reduced or increased inequality. Some recent research suggests that the dispersion and mean of inequality statistics across countries, at pre-industrial times and today, are actually similar.[5] In the case of the United States, Williamson and Lindert[6] have argued that industrialization brought about increased inequality whereas Soltow[7] felt that the industrial revolution had the opposite long term effect because the factory revolution offered greater employment opportunities than previously existed. Yet, Soltow himself has documented that even eighteenth century America appears to have exhibited significant wealth inequality that was nevertheless tolerated because of wider rates of property holding relative to Europe.[8]

While economic inequality appears to have eventually been mitigated in the wake of industrialization, both wealth and income inequality grew during the latter part

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[1] This paper benefitted from comments on earlier drafts provided by Jim Davies, Jeffrey Williamson, Miroslav Zajicek, Christian Bjornskov, and Niclas Berggren and from discussions at presentations at the 2016 Canadian Economics Association Meetings (Ottawa) and the University of Economics, Prague, Research Seminar Series.

[2] See Piketty (2014, 2000, 2006, 1992). Roine and Waldenstrom (2015), Piketty and Saez (2003), Saez and Veall (2003).

[3] See for example: Yalnizyan (2010), Wolff (2010), Oxfam (2015), Macdonald (2014), Jackson (2015), Freund and Oliver (2016).

[4] Kuznets (1955, 1966).

[5] See Milanovic, Lindert and Williamson (2010)

[6] See Lindert (1991), Lindert & Williamson (1985) and Williamson and Lindert (1980).

[7] Soltow (1989: 5)

[8] The case that wealth inequality increases during industrialization is not supported unambiguously is also noted by Ohlsson, Roine and Waldenstrom (2008), who find that wealth inequality in Denmark, Sweden and Norway did not rise during their early industrialization.

of the twentieth century with wealth inequality generally higher than income inequality though given the abundance of data on income inequality the latter is occasionally used as a proxy for the former.[9] Lindert and Williamson (2012, 2016) show income inequality in the United States in particular rising in two waves – from 1774 to 1860 and then again from the 1970s to the present.

This paper presents an examination of wealth inequality focusing on Canada and extending to the North Atlantic Anglo-sphere countries of the United Kingdom and the United States over the period stretching from 1668 to 2012 – a longer-term perspective than is often used when analyzing wealth inequality. The current policy debate over economic inequality rarely places changes in inequality over the course of the last fifty years into any longer term perspective. An advantage of using these three countries is that they share a common history, language, institutional, economic and cultural features given the original colonial relationships between Canada and the United States with respect to Great Britain.

A combination of measures, data sources and estimates is used including own-estimates from original micro-data as well as results from previously published estimates. The results show high wealth inequality in all three countries in the nineteenth century with a decline during the twentieth century. Evidence for Canada, the United States and the UK in this paper show rising wealth inequality after the 1970s, coinciding with changes in estate and death tax regimes in all three countries suggesting that these taxes may have indeed played a key role in affecting the distribution of wealth.

[9] While the share of the top 1 percent of income earners has grown, it remains substantially below the wealth share of the top 1 percent of wealth holders. For example, Statistics Canada reports that in 2013, Canada's top 1 percent of income earners earned 10.3 percent of income. See http://www.statcan.gc.ca/daily-quotidien/151103/dq151103a-eng.htm. The wealth share of the top one percent in 2005 was nearly 20 percent. For an overview of income distribution and its evolution in Canada and the United States, see Saez and Veall (2005). For an overview of wealth and income inequality trends for the United States and the world, see Wolff (2010) and Davies et al., (2011).

CONTEXT

While there is an abundance of regional and national studies of economic inequality at points in time, integrative long-term views of wealth inequality across countries are rarer. It is well known that wealth is generally more unequally distributed than income and that there has been a downward trend in wealth inequality since the end of the nineteenth century followed by some reversal in the second half of the twentieth century.[10] While wealth and income distribution are correlated, they differ in that wealth is considered a better measure of economic and ultimately political power in a society while income better reflects current standards of living.[11] Indeed, Shammas (1993:427) argues that the tenacious hold of the top 1 percent on a quarter to one third of total American wealth has been a force in political continuity.

North American studies of wealth during the nineteenth and early twentieth centuries find high rates of accumulation as well as high degrees of wealth inequality, even in frontier areas of recent settlement.[12] Australia and New Zealand as regions of recent European settlement have also shown high levels of inequality in the nineteenth century and early part of the twentieth century.[13] European studies have also found quite high inequality in the eighteenth and nineteenth centuries with some reduction

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[10] Davies and Shorrocks (1999:3). Gini coefficients for income in developed countries currently range from 0.3 to 0.4, while for wealth the range is 0.5 to 0.9. See also Davies et al. (2010: 224) who find that "find that intra-country inequality is so much larger in the case of wealth that it accounts for a larger share of global inequality than it does for income, according to the Gini coefficient. Thus the principal reason for the high global inequality of wealth may be the long-recognized high inequality of wealth within countries."

[11] Shammas (1993: 415).

[12] For Canada: Siddiq, 'Size Distribution' (1988), Osberg / Siddiq, 'Inequality' (1993), Osberg / Siddiq, 'Wealth' (1993), Darroch, 'Industrialization' (1983), Siddiq / Gwyn, 'Importance' (1991), Di Matteo / George, 'Canadian Wealth' (1992), Di Matteo / George, 'Patterns' (1998), Gwyn / Siddiq, 'Wealth Distribution' (1992), Darroch / Soltow, *Property* (1994), Bouchard, 'Economic Inequalities' (1998), Baskerville, 'Women' (1999), For the United States: Gallman (1969), Main, 'Probate' (1975), Jones, *Wealth* (1980), Burchell, 'Opportunity' (1987), Bolton, 'Inequality' (1982), Soltow, *Men* (1975), Soltow, 'Inequality' (1979), Atack / Bateman, 'Egalitarianism' (1981), Newell, 'Inheritance' (1986), Newell, 'Wealth' (1980), Herscovici, 'Distribution' (1993), Pope, 'Households' (1989), Gregson , 'Wealth' (1996), Ferrie, 'Wealth' (1994), Steckel, 'Poverty' (1990), Steckel / Moehling, 'Rising Inequality' (2001), Stewart, 'Migration' (2006), Clay / Jones, 'Riches' (2008), Walker, 'Opportunity' (2000), Canaday, 'Property' (2008), Stewart, 'Economic Opportunity' (2006).

[13] Shanahan, 'Distribution' (1995) and Galt, 'Wealth' (1985) and McAloon, *Idle Rich* (2002). See also Rubinstein, 'Distribution' (1979). For a reference on the use of probate records in English economic history, see Owens et al., 'Measure' (2006).

over the course of the twentieth century.[14] While some of these studies have examined change over time, the emphasis of many of these wealth micro data studies is on measuring inequality at specific points in time or change over time in a specific region.

Some long-term studies of wealth inequality are of particular interest given the comparisons being pursued in this paper. Williamson and Lindert (1980) find that wealth in the United States was less concentrated during the colonial period while nineteenth century industrialization brought great inequality bringing it on par with that of Western Europe. Soltow (1989) on the other hand argues that American inequality did not increase quickly during industrialization and that industrialization indeed actually operated to reduce inequality. Wealth concentration then diminished during the twentieth century with the advent of social security being a factor but also technological change, labour supply and capital accumulation over time and the impact of the war and depression era.

Woolff and Marley (1989) using individual based estate data estimate a decline in wealth concentration in the United States from the late 1920s to the late 1940s, a slight increase in the 1960s, a sharp drop in the 1970s, and then a minor increase to 1981. They also find that including social security wealth in the household portfolio increases the decline in inequality over the period 1939-81, while changing the unit of observation in the estate data, from individual to household, reduces the decline in wealth concentration over the period 1922-53, but not in the 1970s.

Shammas (1993:428) argues that additional factors involve changes in property laws and the legal emancipation of women along with the advent of liberal government programs in the wake of the Depression and the Second World War. Looking at select measures of wealth inequality using probate, census and survey records, for the years 1774, 1860, 1870 and 1962, Shammas (1993) finds that the evolution of inequality measures for the United States often can vary depending on whether one measures inequality based on the adult population or households and that the wealth share of the top one percent appears to be subject to short-term fluctuations rather than a steady decline.[15]

Indeed, the wealth share claimed by the top 1 and 5 percent of households appears higher in the late twentieth century than in 1774. What is perhaps the most remarkable according to Shammas is "how little wealth in any period has been owned by the majority of households, those in the bottom three quintiles."[16] Moreover, what wealth has trickled down has generally come not from the top 1 percent but rather those placed lower in the top quintile.

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[14] See for some recent examples, see Roine and Waldenstrom (2015), Nicolini and Palencia (2015), Alfani (2015). See also Atkinson (2000) and Lindert (1986, 1991, 2000).

[15] For Canada, Wolfson (1979) finds that adjustments to definitions of household or family size can have significant effects on measures of wealth distribution that vary by age in particular understating the economic position of the elderly.

[16] Shammas (1993: 421). A similar result has also been noted for Canada in Di Matteo (2016a).

Roine and Waldenstrom (2015) review long run developments in the distribution of wealth starting from circa 1750 – the time of the start of the British industrial take-off – for about ten developed countries[17] and find that wealth inequality was high and fairly constant in the nineteenth century. However, wealth inequality decreased during the first 80 years of the twentieth century almost everywhere with the subsequent years marked by divergent trends across countries. Roine and Waldenstrom find estimated top wealth shares at the beginning of the twentieth century clearly higher in the U.K. relative to the U.S. but starting around the First World War the top percentile group wealth shares decrease substantially until approximately 1980.

For the United Kingdom, estimates going back for the period prior to 1800 done by Lindert (1986, 2000) and Soltow (1981) using probate and tax assessment records find high and increasing wealth inequality in the second half of the eighteenth century with the nineteenth century also seeing increasing concentration at the top of the distribution. After the First World War, work using estate tax data by Atkinson and Harrison (1978) and Atkinson et al.,(1989 find a steep drop in wealth inequality until the 1980s and then the start of an increase. Atkinson (2013) finds that inherited wealth as a share of national income fell from the First World War until the 1970s but has since grown.

Studies documenting the long-term evolution of wealth for Canada are much more limited. Recent studies using primarily Statistics Canada Survey of consumer Finance and Survey of Financial Security Data find there has been an increase in Canadian wealth inequality since the early 1980s.[18] This is after a period of some decline from the late 1960s and early 1970s.[19] Di Matteo (2016a) takes a longer-term perspective using estate multiplier estimates for Ontario in 1892 and 1902 and wealth distributions for Canada constructed from micro data for 1984 Survey of Consumer Finances and the 2005 Survey of Financial Security.

Di Matteo finds that for the period 1892 to 1902, the wealth of the top ten percent ranges from 72.6 percent to 80.9 percent while that of the middle 40 percent ranges from 19.1 to 20.5 percent and that of the bottom 50 percent ranges from zero to seven percent. By 1984, the wealth (net worth) of the top ten percent is down to 51.9 percent while that of the middle 40 percent rises to 42.2 percent. However, the share of the bottom 50 percent is only six percent. The share of the top ten percent then rises by 2005 reaching 60.1 percent while that of the middle forty percent falls to 35.5 percent and that of the bottom 50 percent declines to 4.4 percent.

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[17] Australia, UK, France, USA, Switzerland, Finland, Norway, Denmark, Netherlands, Sweden.

[18] See Morissette and Zhang (2006). For 1984, Morissette and Zhang report that in Canada by 1984, the top 10 percent owned 51.8 percent of wealth, while the next 40 percent owned 42.8 percent of wealth and the bottom 50 percent 5.4 percent. By 2005, they report that the share of the top 10 percent had grown to 58.2 percent while the next forty had declined to 38.6 percent and that of the bottom fifty percent had dropped to 3.2 percent.

[19] See Wolfson (1979), Oja (1983).

DATA SOURCES AND METHODOLOGICAL ISSUES

There are potentially a large number of methodological issues when it comes to examining wealth inequality that are compounded if international comparisons are to be made. Among them are the actual definition of what wealth is, the unit of observation, assorted biases of the data source being made use of, asset coverage, sampling differences as well as institutional differences when data from different countries is compared.[20]

These issues are exacerbated when long-term international comparisons of historical wealth inequality are to be made given the diversity of data sources over time. Roine and Waldenstrom (2014) in their look at long-term trends in wealth inequality use international data sets that cover households, adults, families and males only and that were generated from surveys, tax records and probate. They note that even when a common unit of comparison is available across countries (for example, households) the definition is not identical across countries and can even vary over time within a country. Nevertheless, as Roine and Waldenstrom (2015: 5) write: "Finally, one should remember that it is not always a matter of choosing the right inequality measure for the question at hand. In fact, when it comes to the study of long run inequality the availability of any data at all is often the binding constraint."

In light of these issues, the approach in this paper will use a large number of estimates over time obtained from a variety of sources to provide a range of inequality estimates both at points in time, over time and within the countries being examined. It should be noted that the definition of wealth as well as the underlying units for comparison differ across these countries both at points in time and over time. Units of study range from individuals to families to households while the definition of wealth includes gross estate, estimates of net worth and household wealth. As a result, smoothing procedures will be used in an effort to deal with outliers in the process of determining longer-term trends in inequality over time.

Canada

The wealth inequality estimates for Canada are for the period 1851 to 2012 and come from four main sources: 1) historical wealth micro-data collected from probate records 2) published scholarly estimates, 3) Statistics Canada Survey data and 4) Federal Government tax data. The historical probate wealth micro data was collected for four regional data sets: they are Wentworth County, Ontario (1872-1927), Thunder Bay District, Ontario (1885-1927), Ontario (1892, 1902) and Manitoba (1875-1927). These data sets vary in size with Ontario 1892 and 1902 consisting of 3,515 and 3,641 individuals; Wentworth County at 2,516; Thunder Bay District at 2,338 and Manitoba at 826. The primary data source is the probate records of Ontario and Manitoba surrogate Courts with probate being an institutional process that transferred property from the

[20] Wolff (1991: 94)

dead to the living and as part of the process did a detailed market based evaluation of assets.[21]

There have also been several wealth inequality studies done for Canada for the nineteenth century and these studies have invariably included estimates of inequality in terms of either Gini coefficients or wealth shares by decile. In a series of papers, Siddiq (1988) and Siddiq and Gwyn (1992) looked at the distribution of wealth in Nova Scotia using probate records and provide estimates of Gini Coefficients and wealth shares for 1851 and 1871. Darroch (1983) uses municipal property assessment rolls and analyzes inequality of real estate holdings for Toronto for the period 1861 to 1899.

Moving into the twentieth century, there are a number of wealth and financial surveys by Statistics Canada, which have provided estimates of wealth distribution. Public use micro-data is available from Statistics Canada with the Survey of Consumer Finances and the Survey of Financial Security. For 1970 and 1977, estimates of wealth inequality are taken from Oja (1987) while Gini Coefficients and wealth shares were calculated from micro-data files for 1984, 1999, 2005 and 2012.[22] The Statistics Canada micro data includes estimates of family net worth along with numerous individual and family characteristics as well as detail on specific assets.[23]

While estimates of Canadian wealth inequality for this paper are available at various points in time for the period 1851 to 1927 and from 1970 to 2012, there is an important gap for the period 1927 to 1969. In an effort to obtain some estimates of wealth inequality for this critical period spanning the Great Depression as well as World War II and the post-war era, Federal Estate Taxation information was used to construct wealth inequality measures for the years 1950 to 1952 and 1959 to 1960. These estimates are detailed in Appendix I.

Estate and gift taxes have a long history in Canada at both the federal and provincial levels.[24] Provincial succession duties – that is a tax on the beneficiary in respect of the amount received from an estate - were levied in numerous provinces in

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[21] For some details on these data sets, their construction and previous use, see Di Matteo (2004, 2012, 2013, 2016).

[22] These sources are as follows: Statistics Canada. Household Surveys Division, Statistics Canada Survey of Consumer Finances, 1977 [Canada]: Economic Family and Unattached Individuals Income, Assests and Debts Study Documentation, October 7, 2015; Statistics Canada. Household Surveys Division. Survey of Consumer Finances, 1984 (Canada): Economic Family and Unattached Individuals Income, Assets, Debt. Study Documentation. October 7, 2015; Income Statistics Division, Statistics Canada Survey of Financial Security, 1999 [Canada]: Economic Family File Study Documentation October 7, 2015; Income Statistics Division, Statistics Canada Survey of Financial Security, 2005 [Canada] Study Documentation, October 7, 2015; Income Statistics Division, Statistics Canada Survey of Financial Security, 2012 [Canada] Study Documentation October 7, 2015

[23] These include deposits, savings bonds, cash on hand, registered retirement savings plans, registered home ownership plans, other liquid and non-liquid assets, value of vehicles owned, the value of owner occupied homes and vacation homes.

[24] Goodman (1995).

the 1890s and remained in effect in most provinces until the 1970s.[25] The Federal government imposed estate taxes – a duty imposed on the value of property passing at the time of death – in 1941, under the Succession Duty Act that was then replaced by the Estate Tax Act in 1959.[26] While the difference in practice between these two acts was minor in terms of the actual application and administration of estate taxes, in terms of reporting, prior to 1959 the Taxation Statistics report estate income on which taxation was levied while after 1959 estate size and tax on the taxable value is reported.

The Estate Tax was repealed in 1972 as part of a process of tax reform. While generally a minor source of federal government revenue (See Figure 1), Bird (1978) argues that the abolition of the federal estate tax was the most important tax reform of the post-World War Two era in that it symbolized a retreat from direct attempts to affect the distribution of Canadian wealth via taxation. Bird (1978: 144) concluded that: "Canada has gained few, if any, benefits from its move away from death taxes and has paid a significant price in terms of reduced equality of opportunity, probably increased inequality of wealth, and certainly increased fossilization of the structure of wealth." [27]

Department of National Revenue, Taxation Statistics for the years 1952, 1953 and 1954 were used to estimate the distribution of the income from estates for the years 1950 to 1952 as a proxy for the wealth distribution while those for 1961 and 1962 were used to estimate the distribution of estates for 1959 and 1960.[28] There were 3,990 estates in 1950, 4,610 in 1951 and 5,500 in 1952. The income per estate by income class was calculated and then based on the number of estates in each income class a

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[25] See Perry (1984: 125).

[26] By the 1960s, the Federal Estate Tax for domiciled decedents allowed a basic exemption of $40,000 with additional exemptions if there were surviving spouses and children. Rates of taxation ranged from 10% to 16% for the first $20,000 of taxable estate value. For values of $20,000 to $200,000, the tax rate ranged from 18% to 26%. From $200,000 to $750,000, the rates ranged from 28% to 42%. From $750,000 to $1,800,000 the rates continued rising eventually reaching 52%. On remaining amounts the rate was 54%. See Department of National Revenue, Taxation Division, Taxation Statistics 1964, Queen's Printer, Ottawa, Canada, pp.80-81. There was also a Gift Tax first imposed in 1935. See Perry (1984:228). By the 1960s, the Gift Tax ranged from 10 percent on an aggregate taxable gift value of $5000 and under to 28 percent on amounts over $1,000,000. The Federal Gift Tax was also repealed in 1972. See Canada Year Book, 1962, p. 1021.

[27] Bird (1978: 140) also notes a report of the Ontario Government's Taxation Committee in 1967 that notes that wealth taxation and death taxes in particular had a significant role in controlling extremes of wealth.

[28] Department of National Revenue, Taxation Division, Taxation Statistics 1952, Queen's Printer, Ottawa, Canada; Department of National Revenue, Taxation Division, Taxation Statistics 1953, Queen's Printer, Ottawa, Canada; Department of National Revenue, Taxation Division, Taxation Statistics 1954, Queen's Printer, Ottawa, Canada; Department of National Revenue, Taxation Division, Taxation Statistics 1961, Queen's Printer, Ottawa, Canada; Department of National Revenue, Taxation Division, Taxation Statistics 1962, Queen's Printer, Ottawa, Canada.

simulated distribution was constructed with the individuals in each income class assigned the average estate income for that class.

This process was repeated for 1959 and 1960 but with some modification given that there was an exemption for estates under $50,000 in size resulting in an absence of these estates in the Taxation Statistics Tables. Using the numbers of estates by estate size ranges provided in the tables, an exponential function was used to interpolate the numbers of estates below $50,000 and the average estate value used was the average of the range employed. With this adjustment, there were a total of 4,092 estates in 1959 and 7,128 in 1960 and these were used to construct a simulated wealth distribution with the individuals in each estate size class assigned the average estate size for that class. Detailed tables illustrating these calculations for 1950 to 1952 and 1959 to 1960 are provided in Appendix 1.

United States

The wealth inequality estimates for the United States come from an assortment of secondary sources and research and span the period 1680 to 2011. Moreover, they include wealth inequality estimates calculated for the entire country as well as for separate states, regions, as well as some urban areas resulting in considerable geographic diversity for these point estimates. Moreover, there is variation as to whether decile shares or Gini coefficients are consistently available.

Roine and Waldenstrom (2014) provide a convenient set of wealth shares for the period 1774 to 2010 for the top 1, 5 and 10 percent, which they also take from a substantial secondary literature. Their work uses estimates from Shammas (1993), Kopczuk and Saez (2004), Lindert (2000), Wolff (1987,1996) and Kennickell (2009,2011). Piketty (2014) also provides wealth decile shares based on the work of Kennickell (2009, 2011) and Wolff (1994).

Soltow (1989) presents Gini coefficients for the nineteenth century United States estimated from census data as well as includes other estimates done by other scholars for the Charleston District in South Carolina, New Jersey and Suffolk County, Massachusetts for the period from 1720 to 1983. Jones (1980) presents estimates of Gini coefficients and wealth share constructed from colonial probate data.

Shammas (1993) provides wealth inequality estimates for the period 1774 to 1986 incorporating work by Lindert and Williamson, and Jones as well as household net worth data from survey data. Gallman (1969) provides decile shares of US personal wealth from the US manuscript census for the period 1810 to 1900. Osberg (1984) includes estimates done for 1962 and 1973 from U.S. survey data.

Finally, some late twentieth century numbers are produced by Pfeffer et al.,(2013) spanning the years from 1984 to 2011 as well as by Davies et al., (2010) for 2000. Pfeffer et al., provide Gini coefficients for US net worth data from the U.S. Panel Survey of Income Dynamics while Davies et. al., provide an estimate of the Gini coefficient of inequality for household wealth from Survey of Consumer Finance data.

These estimates of US wealth inequality are quite diverse combining census, tax and survey data, but also different units of observation including households and

families as well as for the case of the nineteenth century free households or free adults as well as adult males only. As well, there are some gap periods in the US data also. In the case of Gini coefficients, there is an absence of Gini coefficient estimates from 1870 to the late 1950s. There is fortunately more comprehensive coverage to the data when it comes to the wealth share of the top ten percent for this period. The presence of data gaps for either one measure or another make it valuable to have more than one measure of wealth inequality when trying to ascertain the evolution of long term trends.

Another important dimension with respect to any discussion of American wealth inequality is again the effects and importance of estate taxation. While estate taxes in various forms have a long history in the United States as far back as the post-revolutionary period, the modern estate tax system begins in 1916.[29] Like Canada, these taxes made up a relatively small share of total federal revenues accounting for at most 1 to 2 percent.[30] In terms of maximum rates, they rose dramatically from 1920 to 1940, were at a peak from 1940 to the mid 1970s and then began to drop.[31]

In 1976, there was a major overhaul of the system that combined the previously separate exemptions for estate and gift taxes into a single unified tax and that saw a reduction in the top rates from 77 percent down to 55 percent by 1981. In the period since 1977, less than two percent of deceased adults have left estates large enough to be taxable and at present a relatively small percentage of estates are taxable. The Economic Growth and Tax Relief Reconciliation Act of 2001 began eliminating the death tax with a scheduled phase-out of rates but as a result of sunset provisions in 2011 the estate tax reverted back to the 1997 law with a top rate of 55 percent.[32]

United Kingdom

The wealth inequality estimates for the United Kingdom come from primary and secondary sources that span the period 1668 to 2010. They are essentially national estimates though the definition of nation varies somewhat with United Kingdom and England and Wales both being used in this paper interchangeably. As with Canada and the United States, the aim was to collect as many estimates as possible for Gini coefficients and wealth shares of the top 10 percent.

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[29] U.S. Federal taxes on wealth at death have been enacted since 1797 often in response to revenue needs in time of war or crisis.

[30] Congressional Budget Office (2009:1).

[31] DeLong (2003: Figure 4).

[32] The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) phased out the estate tax beginning in 2001, essentially by increasing the tax exempt amount of an estate and by reducing the top marginal tax rate an estate). In 2010, the estate tax is was temporarily repealed. Starting in 2011, the estate tax is reinstated with an effective exemption amount of $1 million and a maximum marginal tax rate of 55 percent. See Congressional Budget Office (2009). For a longer-term history of US Federal estate taxation, see also Johnson and Eller (1998).

A key data source is the net estate values from probate estate data for England and Wales compiled by Peter Lindert[33] for the period stretching from 1661 to 1875. This data set contains 12,592 individual observations and was used to calculate Gini coefficients and the wealth share of the top 10 percent for selected years starting in 1668 and ending in 1875.[34] Roine and Waldenstrom (2014) provide a series for the wealth share of the top 10 percent stretching from 1740 to 2005. Davies and Shorrocks (1999: 641) provide estimates of both a Gini coefficient and the top decile share for UK adjusted net worth for the years 1966, 1976, 1985 and 1993. Similar numbers are provided in a website publication by the Institute for Economic Affairs publication for the years 2006, 2008 and 2010.[35]

The Chartbook of Economic Inequality[36] provides the wealth share of the top 10 percent taken from estate tax data for years from 1923 to 1930, 1936 to 1937, 1950 to 1962 and 1964 to 2003. Rowlingson (2012) provides estates of both top decile shares and Gini coefficients for wealth for select years from 1976 to 2005. Di Matteo et al., (2012) is the source for Gini coefficient estates for probate wealth for 1870 and 1902 while Davies et al (2000) provides a Gini coefficient estimate for household wealth in 2000.

While England also has a long history of probate and succession duties stretching back to a stamp duty on wills probated in 1694, the modern United Kingdom system of estate taxation as a tax on property passing on death with higher rates begins in 1894. When the estate tax was introduced, approximately 15 percent of estates were liable for tax but the proportion began to rise given the fixed 100-pound exemption threshold until 40 percent of estates were liable to tax by 1945. The threshold was then increased to 2000 pounds and the proportion liable to tax fell to 10 percent and there was a downward trend from this until the 1990s.[37]

The estate duty tax was replaced in 1975 by a Capital Transfer Tax that was then renamed the Inheritance Tax in 1986.[38] It was accompanied by declining rates starting in 1981 that reduced the rate on transfers at death to 60 percent from 75 percent. Moreover, in 1986 reforms were made that allowed donors to escape the tax by making gifts that they survived by seven years. By 2009, the rate had fallen to 40 percent on the value of estates over a basic threshold.[39]

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[33] See Lindert (1986)
[34] The years are: 1668, 1669, 1670, 1698, 1699, 1700, 1729, 1730, 1731, 1738, 1739, 1740, 1741, 1810 and 1875.
[35] Wealth Inequality the Facts. Institute for Economic Affairs. http://www.iea.org.uk/sites/default/files/publications/files/Wealth%20inequality%20briefing%20formatted.pdf
[36] Chartbook of Economic Inequality. http://www.chartbookofeconomicinequality.com
[37] Atkinson (2013: 8).
[38] Atkinson (2013: 7).
[39] Boadway et al., (2009).

ANALYSIS

Determinants of Inequality

The complex long-term determinants of inequality ultimately depend on the ability of economic units to take advantage of economic opportunities and the capacity to absorb economic shocks. Any study of inequality using historical micro-data must be placed into the context of Simon Kuznet's (1955, 1966) work on the inverted U-hypothesis relationship between economic growth and inequality, which was based on income distribution data for the United States and the United Kingdom.

Milanovic (2016) builds on this approach in terms of looking at inequality as moving in cycles as a result of a series of long-term waves of Kuznets cycles. Studies finding a Kuznets type relationship in an American context include Williamson (1965), Lindert and Williamson (1985), Williamson and Lindert (1980), and Lindert (1991). For Canada, Alan Green (1967, 1968/69, 1971) found evidence of a Kuznets curve with regional disparities converging after World War I. The Kuznets Curve is by no means uncontroversial and there is also a literature that has found weak empirical support for the relationship.[40]

Williamson (1996, 1998) and Higgins and Williamson (2002) move beyond examining inequality as simply an unconditional Kuznets curve relationship and consider that along with changes in income or wealth, inequality is rooted in public policy, skills, institutions[41], education, resource endowments and age structure.[42]

A key public policy factor that affects the long-term evolution of economic inequality and especially wealth inequality[43] is the system of inheritance and of course estate taxation. In the North-Atlantic Anglo-sphere, the system of inheritance is rooted in British institutions with a key feature being primogeniture – the eldest son receiving the bulk of the inheritance – that functioned to enhance long-term dynastic wealth

[40] For an overview of some of this literature, see Gallup (2012) as well as Deininger and Squire (1998), Savvidesa and Stengos (2000), Atkinson and Brandolini (2001) and Barro (2000, 2008).
[41] Religious affiliation can also be a factor. See Di Matteo (2016b).
[42] As another example, Spain sees a fall in income inequality during the opening phases of its economy opening up to international competition from the 1850s to the 1890s and then a rise in inequality from the 1890s to the start of World War I which coincided with a return to protectionism. See Escosura (2008).
[43] Intergenerational wealth transmission can have significant effects on wealth distribution over time. The simple decision as to whether inheritances go to the firstborn son (primogeniture) or whether there is more partible or equal division (multi-geniture) is important in affecting wealth distribution. See Di Matteo (2016).

accumulation and played a factor in fostering inequality.[44] In the land-rich settler countries such as Canada and the United States, the purpose of inheritance shifted towards providing offspring with a start in life in return for old-age support and moved inheritance systems more towards multi-geniture.[45] In all of these three countries, increased wealth inequality ultimately brought about the call for estate taxation.

While Canada, the United States and the United Kingdom all bring in wealth taxes on the property of the deceased by the middle of the twentieth century, these taxes are all either eliminated or reduced substantially after the 1970s. For Canada, the federal estate taxes are in effect from 1941 to 1973. For the United States, the modern system is in effect from 1916 to 1977 with reductions in wealth taxation rates take effect after 1977. In the UK, the modern estate tax system with a jump in rates starts in 1894 and a period of declines in the rate begin in 1981. Thus, for all three countries, we have a period of relatively higher or effective estate taxation that can be used as a determinant variable for wealth inequality.

Results

The available data compiled for both Gini coefficients over time and the wealth share of the top 10 percent of the wealth distribution for Canada, the United States and the United Kingdom are provided in Appendices 2-4. Figures 2 to 4 plot the Gini coefficients against time separately for each of the three countries using a non-parametric local polynomial smoother while Figure 5 combines the Gini coefficients for all three countries into one plot. Figure 6 to 8 plot the wealth shares of the top 10 percent against time separately for each of the three countries while Figure 9 combines them into one diagram. In all of these figures, a third degree polynomial smoothing line is estimated to gauge the broad direction of inequality changes and see if they are in

[44] Delong (2002:4-5).

[45] Ransom and Sutch (1986) argued the nineteenth century saw America's transition from a target bequest motive to life cycle saving as evidence from surveys of industrial workers in Michigan and Maine, found declining savings rates for older workers and a hump-shaped profile indicative of life cycle saving. Di Matteo (1997) also finds evidence of such a transition for nineteenth century Ontario. For the colonial United States Alston and Schapiro (1984) argue the North was characterized by multi-geniture while the South was marked by primogeniture. Salamon (1980) finds that Germans in east-central Illinois used partible inheritance whereas the Irish impartible. Newell (1986) in a study of Butler County, Ohio found a shift in towards more equal division of estates over time. The British legal legacy in nineteenth century English Canada made primogeniture dominant but over time there was a move towards greater equality in estate division. Gagan (1976) chronicles three inheritance systems in nineteenth century Peel County, Ontario: partible, impartible and partible-impartible. While the first two are self-explanatory, the latter is a system whereby the estate was devolved on one or several heirs (usually the sons) with compensation payments to the siblings.

accord with the general literature – that is, an increase during industrialization, a decrease during the twentieth century and then an increase again since the 1970s.[46]

In terms of smoothed trends, Figures 2 and 6 for Canada show rising inequality from the middle of the nineteenth century until the early twentieth century and then a slight decline going until the 1970s and then an increase in inequality. Based on the smoothed line, Canadian wealth inequality rises more gently during the 19th century and overall appears to be more stable especially when compared to the United States. Relative lower inequality in Canada may also be a function of the nature of the wealth accumulation provess. For example, Freund and Oliver (2016) provide a data analysis that shows that billionaires in the United States are more dynamic than Europe in that one half of European billionaires inherited their fortunes while only one-third in the United States.

For the United States, Figures 3 and 7 show a steep increase in wealth inequality from the colonial era until the late nineteenth century, which is then followed by some mitigation of that inequality into the twentieth century[47] with an increase in wealth inequality starting after 1970. Indeed, by the early 21st century, American wealth inequality appears comparable to that of the nineteenth century.

For the United Kingdom, Figures 4 and 8 reveal wealth inequality actually declining from the late 17th to the mid 18th century but there is then a steep ascent until approximately 1900 followed by a steep decline that continues into the present period based on the smoothed trend lines.

Finally Figures 5 and 9 combines the wealth inequality measures for all three countries and fit polynomial smoothing while Figure 10 combines the Gini coefficients for all three countries but allows for differentiation to facilitate comparison. When all three countries are combined, there is a general trend of declining inequality from the middle of the 17th century to the middle of the 18th century followed by an increase in inequality – coinciding with industrialization – and then a reduction in inequality as we move into the twentieth century.

[46] The local polynomial smoother is estimated using STATA 13 and assumes the default epanechnikov kernel function (which is is said to be the most efficient in minimizing the mean integrated squared error). The bandwidth is also default selected and in STATA is chosen by the rule-of-thumb method that provides the asymptotically optimal constant bandwidth by minimizing the conditional weighted mean integrated squared error.

[47] Delong(2003) also notes the sustained increase in inequality brought about in America during the second half of the industrial revolution and based on estimates of the share of the top 1 percent of wealth held by households (Delong 2003; Figure 3) finds increasing inequality up to 1900 and diminishment afterwards.

Figures 10 and 11 show that American wealth inequality was substantially less than that of the United Kingdom prior to 1800 but whereas inequality in the United Kingdom was high and stable until the twentieth century. America was indeed a more egalitarian land relative to Britain during the colonial era which no doubt spawned its ethos as a land of opportunity. However, wealth distributions grew more unequal over time as American wealth inequality grew dramatically between the mid 17th and the late 19th centuries.

Between 1680 and 1750, the average value of the Gini coefficient for the United States was 0.585 while for the United Kingdom it was 0.765 - which could be attributed to land abundance and availability during the colonial settlement period. However, for the 19th century, the average value of the Gini coefficient was 0.799 for the United States and 0.833 for the United Kingdom. For the nineteenth century, wealth inequality was higher in both the United States and the United Kingdom relative to Canada, which for the period 1851 to 1900 sees an average Gini wealth coefficient of 0.704.

The twentieth century sees the steepest declines in wealth inequality in the United Kingdom and Canada. For the United Kingdom, the Gini coefficient drops from 0.863 in 1902 to 0.640 by the mid 1980s. It then rises peaking at about 0.70 in 2005 before starting to decline again and then reaches 0.610 by 2010. For Canada, from an average Gini coefficient of 0.724 in 1902, wealth inequality fell to reach values that ranged from 0.551 to 0.716 between 1959 and 1970. For the United States, 1870 sees a Gini coefficient of 0.830 and by the early 1980s it falls to about 0.720 but by 2011 it had grown to 0.879. Early 21st century American wealth inequality is now comparable to what existed in the late nineteenth century.

All three North Atlantic Anglo-sphere countries appear to be marked by rising inequality during nineteenth century industrialization era followed by declines in inequality during the twentieth century that bottomed out during the 1970s. Since the 1970s, there was an increase in wealth inequality in Canada and the United States with the United States being the most pronounced. Interestingly enough, for the United Kingdom, inequality appears to continue top fall into the 21st century and is the lowest of the three countries. A key question is whether the decline in wealth inequality during the twentieth century can be statistically and significantly related to the higher estate tax regimes of that period in all three countries.

Table 1 presents a pooled regression for the determinants of inequality that regresses the natural log of Gini coefficients for these three countries on year, year-squared and year cubed as well as a dummy variable for the existence of a higher tax rate estate tax regime (For Canada, 1941 to 1973; for the United States, 1916 to 1977; For the UK, 1894 to 1981) and dummy variables for the United States and the United Kingdom with Canada as the omitted category. OLS is used as the estimation technique. However, given the differences in the relative sizes of the three countries, a weighted OLS

regression is also estimate with the weighting variable being the country's population share.[48]

The results confirm a "cubic" pattern to inequality over time with decline, increase and then decline though the magnitude of the coefficients show that overall, inequality has declined over time. Inequality in the United States and the United Kingdom is significantly higher than in Canada – given the log-linear specification, the Gini coefficients from the weighted OLS regression are 14.3 percent higher for the United States and 15.9 percent higher for the United Kingdom. As well, the higher estate tax regime variable was negative and significant for the weighted regression and negative but only significant at the 10 percent level for the un-weighted regression.

Conclusions

An examination of wealth inequality is conducted focusing on Canada and extending to the North Atlantic Anglo-sphere countries of the United Kingdom and the United States over the period stretching from approximately 1668 to 2012 using assorted estimates for Gini coefficients and the wealth share of the top ten percent of the wealth distribution. A key advantage of using these three countries is that they share a common history, language, institutional, economic and cultural features given the historical colonial relationship between Canada and the United States with respect to Great Britain.

This is a longer-term perspective than is often used when analyzing wealth inequality and allowed the opportunity to see whether the era of industrialization was associated with rising or falling inequality. The results show high wealth inequality in all three countries in the nineteenth century with mitigation during the twentieth century. Prior to 1750, wealth inequality was higher in the United Kingdom than the United States but inequality grew rapidly in the United States to the point where it matched

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[48] The average population for each of these three Anglosphere countries was calculated for the years 1650-1750, 1750-1800, 1800-1850, 1850-1900, 1900-1950, 1950-2000 and the period 2000-2010. Population shares were estimated by dividing the average population for the period to the sum of the averages of the three countries and the population share was then assigned to the respective years available in the dataset corresponding to the period. Between 1650 and 2010, the US share of the Anglosphere population rises from 10% to 76%, the Canadian share rises from 0 to 8 percent and the British share falls from 90 percent to 16 percent. Data sources for the population estimates include the Census of Canada, Statistics Canada, Eh.Net and assorted web resources including http://www.visionofbritain.org.uk/census/SRC_P/6/GB1841ABS_1 and http://www.tacitus.nu/historical-atlas/population/british.htm and https://web.viu.ca/davies/h320/population.colonies.htm.

United Kingdom inequality by the mid-nineteenth century. Industrialization does appear to have been characterized in all three countries by rising inequality in wealth.

Evidence for Canada, the United States and the UK in this paper based on Gini coefficients all show falling wealth inequality during the first three quarters of the twentieth century with the UK's continuing into the 21st century. This decline in wealth inequality is correlated with the onset of more significant estate tax regimes in all three countries. However, wealth inequality begins to rise in Canada and the United States after the 1970s but not in the United Kingdom. This rising inequality can indeed be attributed to an assortment of factors such as changes in factor market incomes, globalization, skills differentials, institutions, education, resource endowments and age structure. However, it also coincides with changes in estate and death tax regimes in these countries suggesting that these taxes may have played a key role in affecting the distribution of wealth.

FIGURE 1

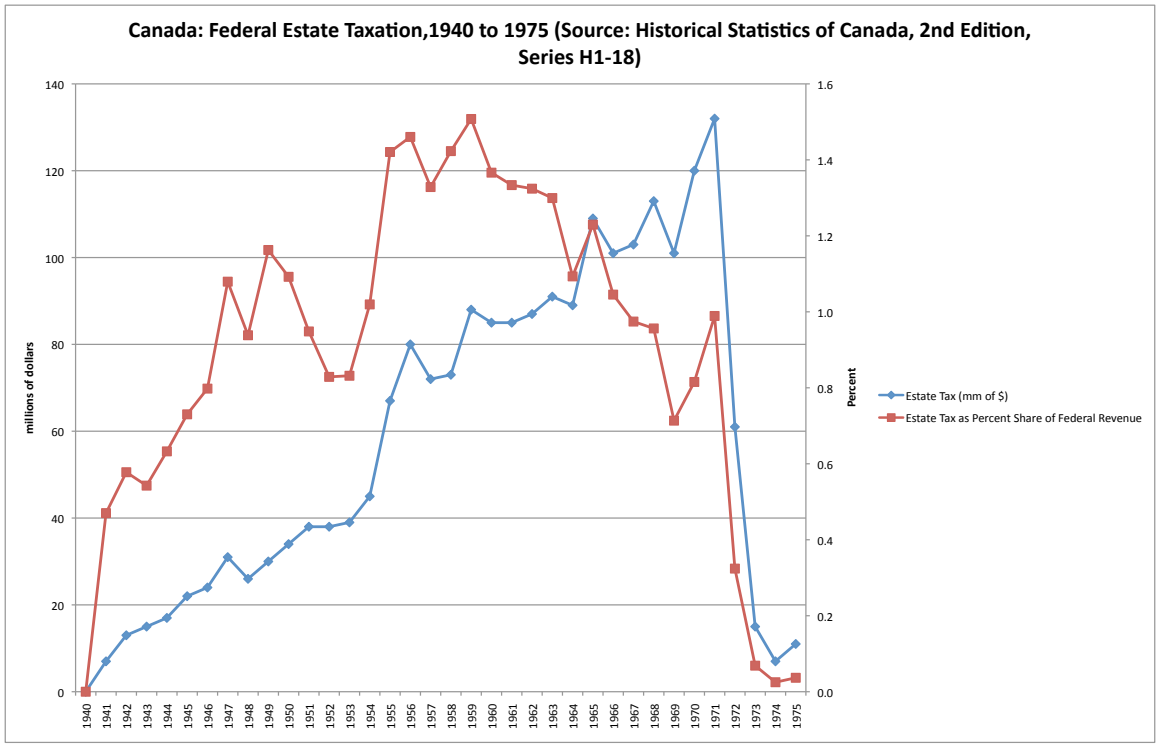
Canada: Federal Estate Taxation,1940 to 1975 (Source: Historical Statistics of Canada, 2nd Edition, Series H1-18)
millions of dollars
Percent
Estate Tax (mm of $)
Estate Tax as Percent Share of Federal Revenue

FIGURE 2
Gini Coefficients of Wealth Inequality, Canada, 1851-2012

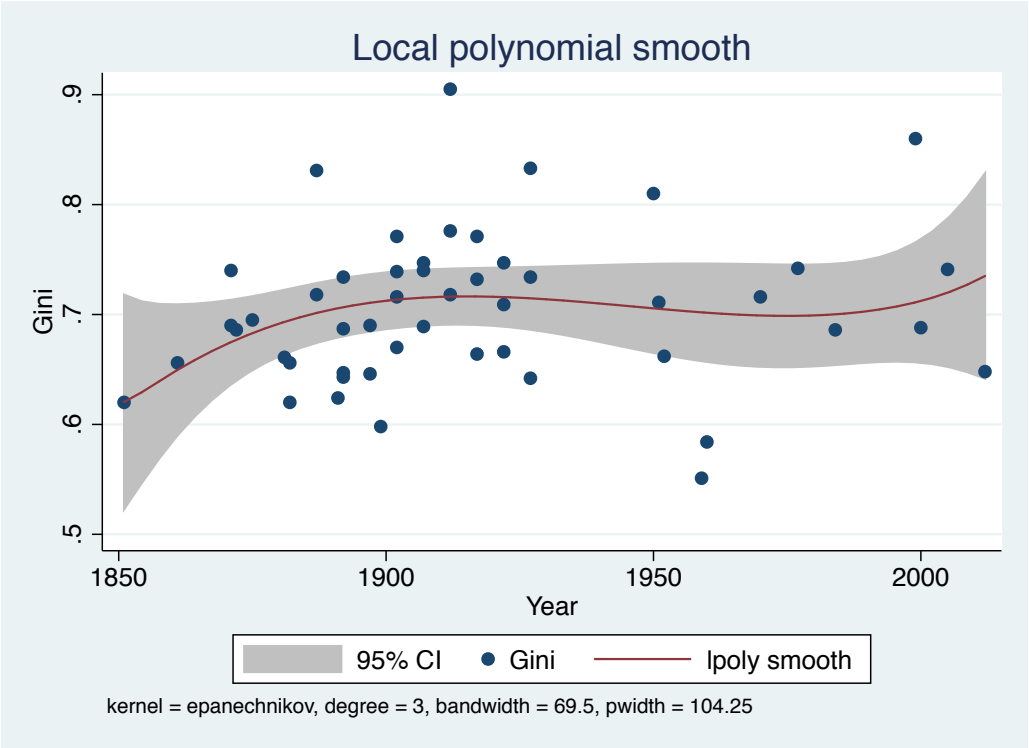

FIGURE 3
Gini Coefficients of Wealth Inequality, United States, 1680-2011

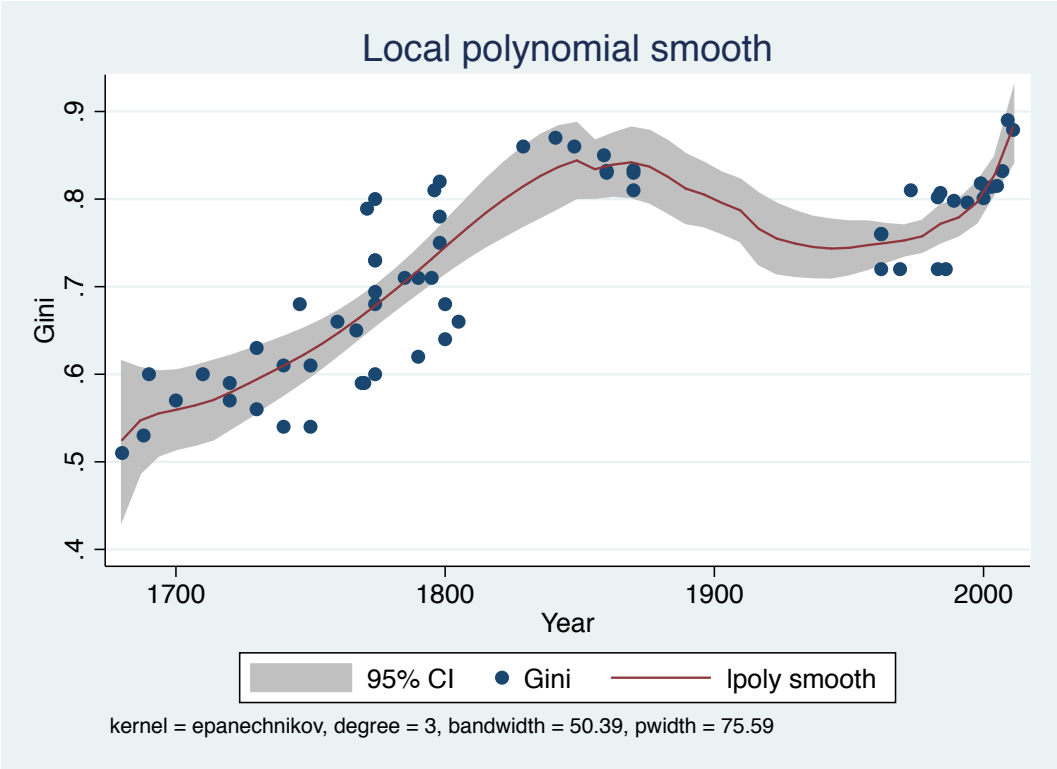

FIGURE 4
Gini Coefficients of Wealth Inequality, United Kingdom, 1688-2010

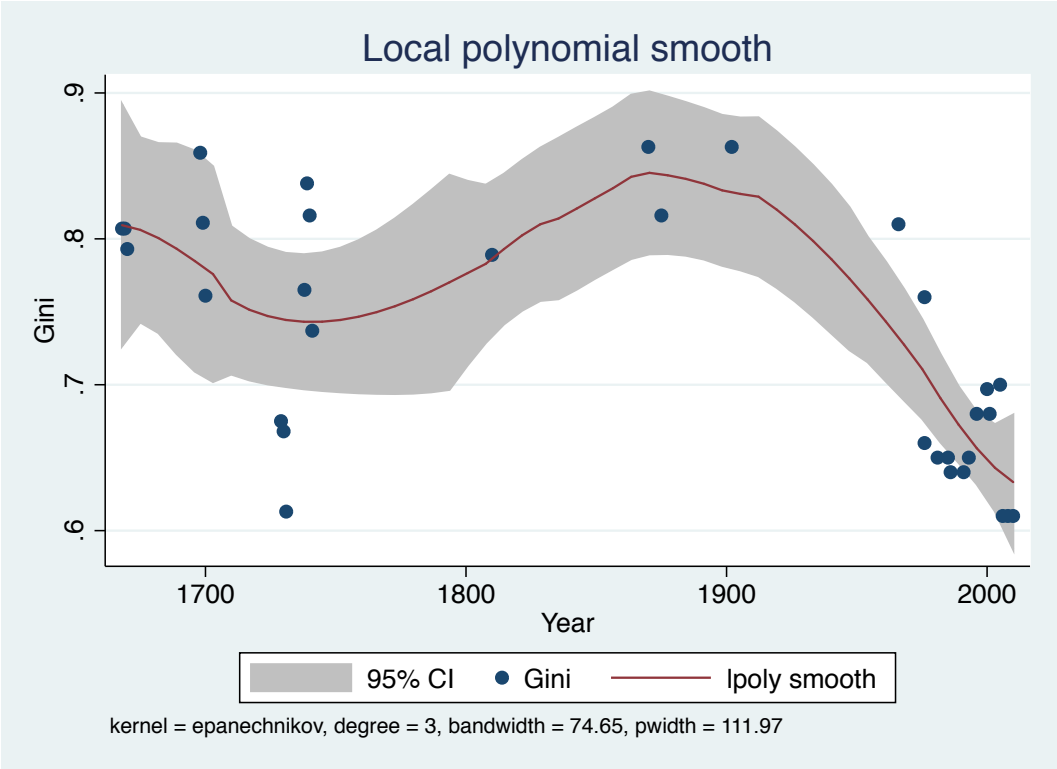

FIGURE 5
Pooled Gini Coefficients of Wealth Inequality, 1680-2012: Canada, United States and United Kingdom

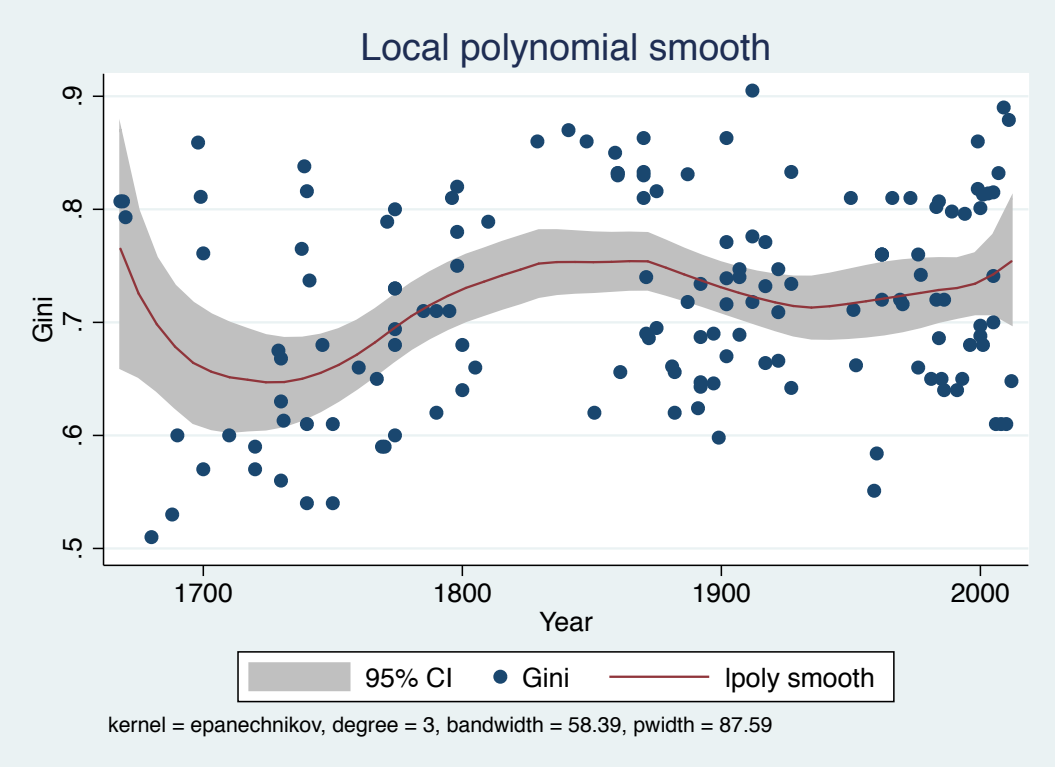

FIGURE 6
Wealth Share of Top 10 Percent, Canada, 1851-2012

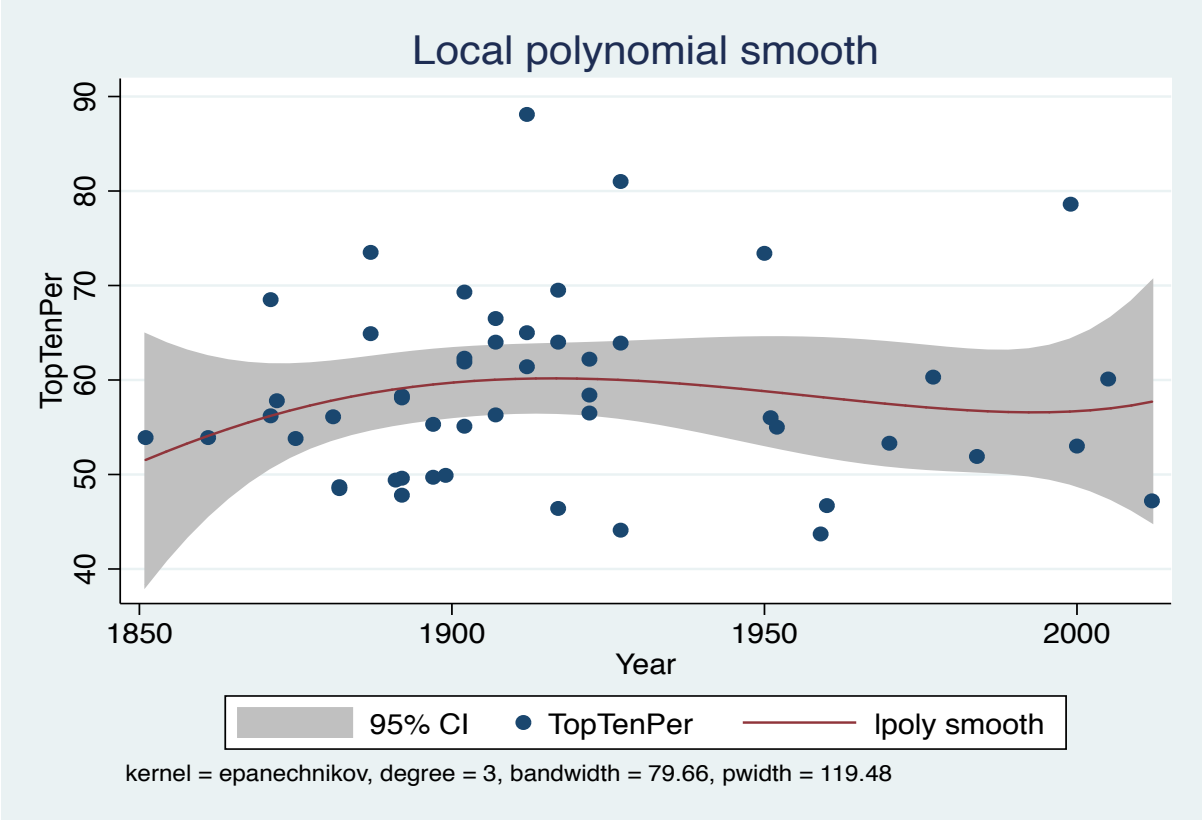

FIGURE 7
Wealth Share of Top 10 Percent, United States, 1774-2011

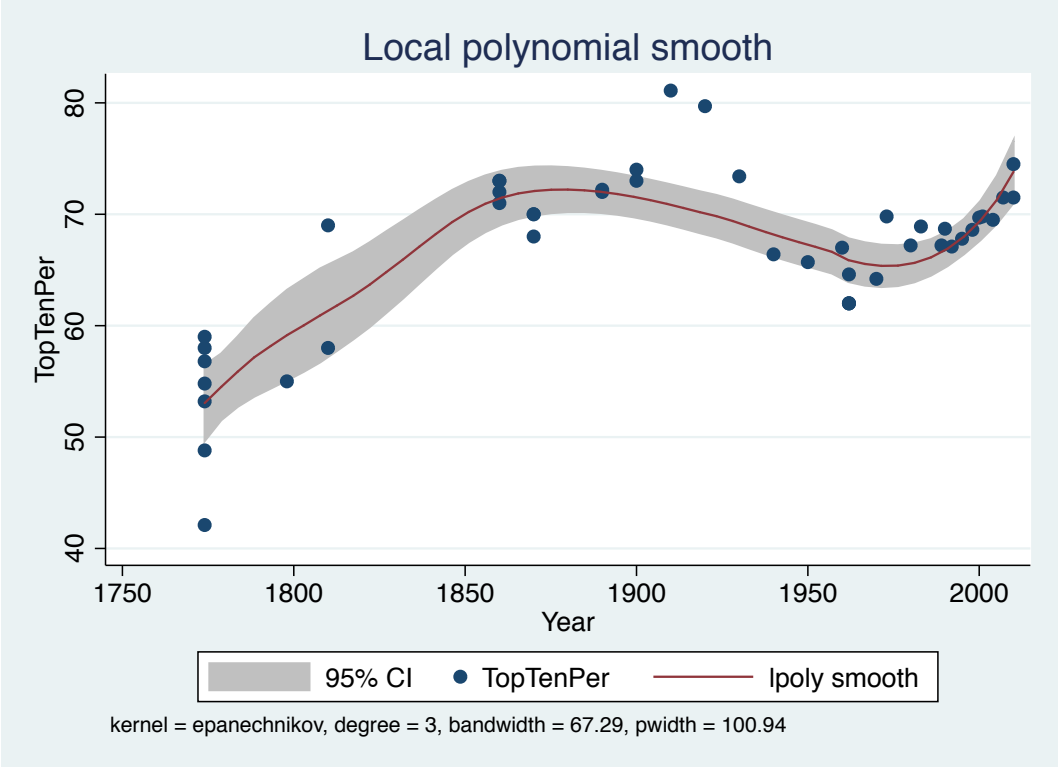

FIGURE 8
Wealth Share of Top 10 Percent, United Kingdom, 1668-2011

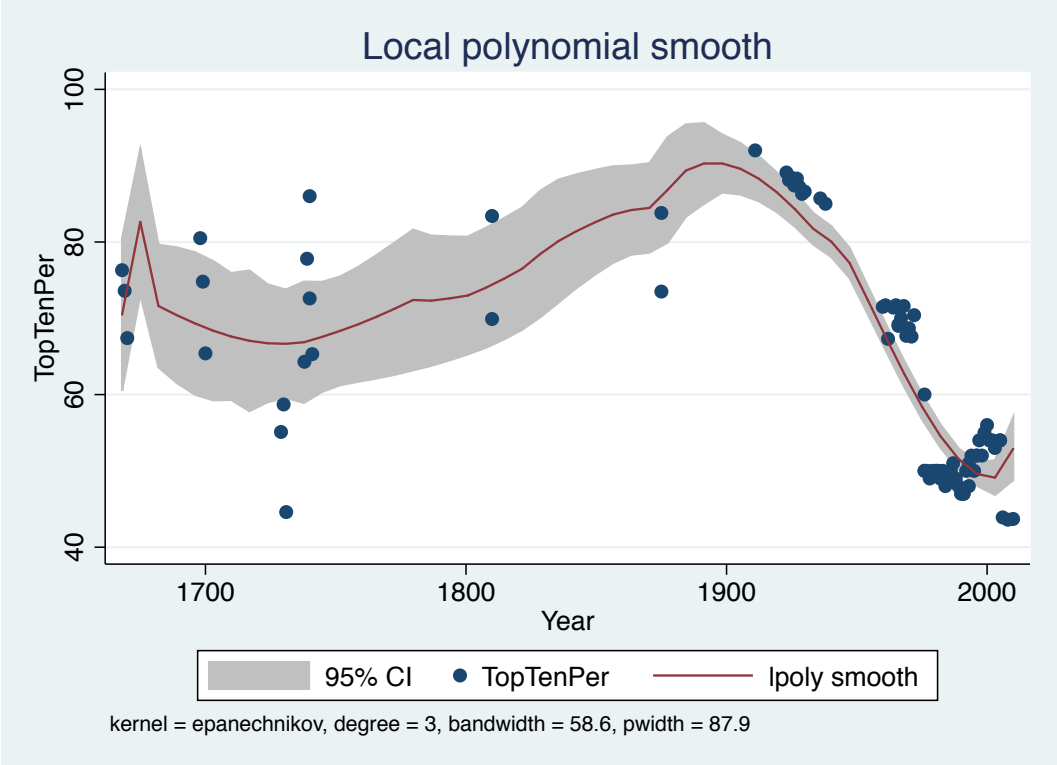

FIGURE 9
Pooled Wealth Shares of the Top Ten Percent, 1680-2012: Canada, United States and United Kingdom

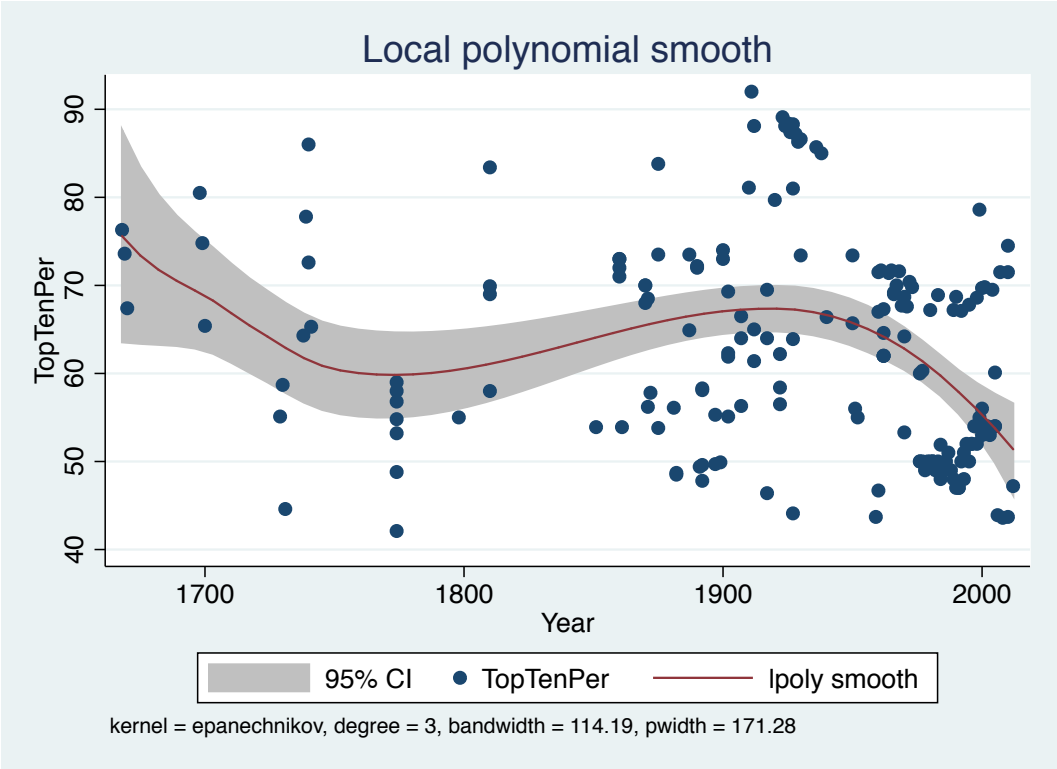

Figure 10
Gini Coefficients by Country: Canada, the United States and the United Kingdom, 1680-2012

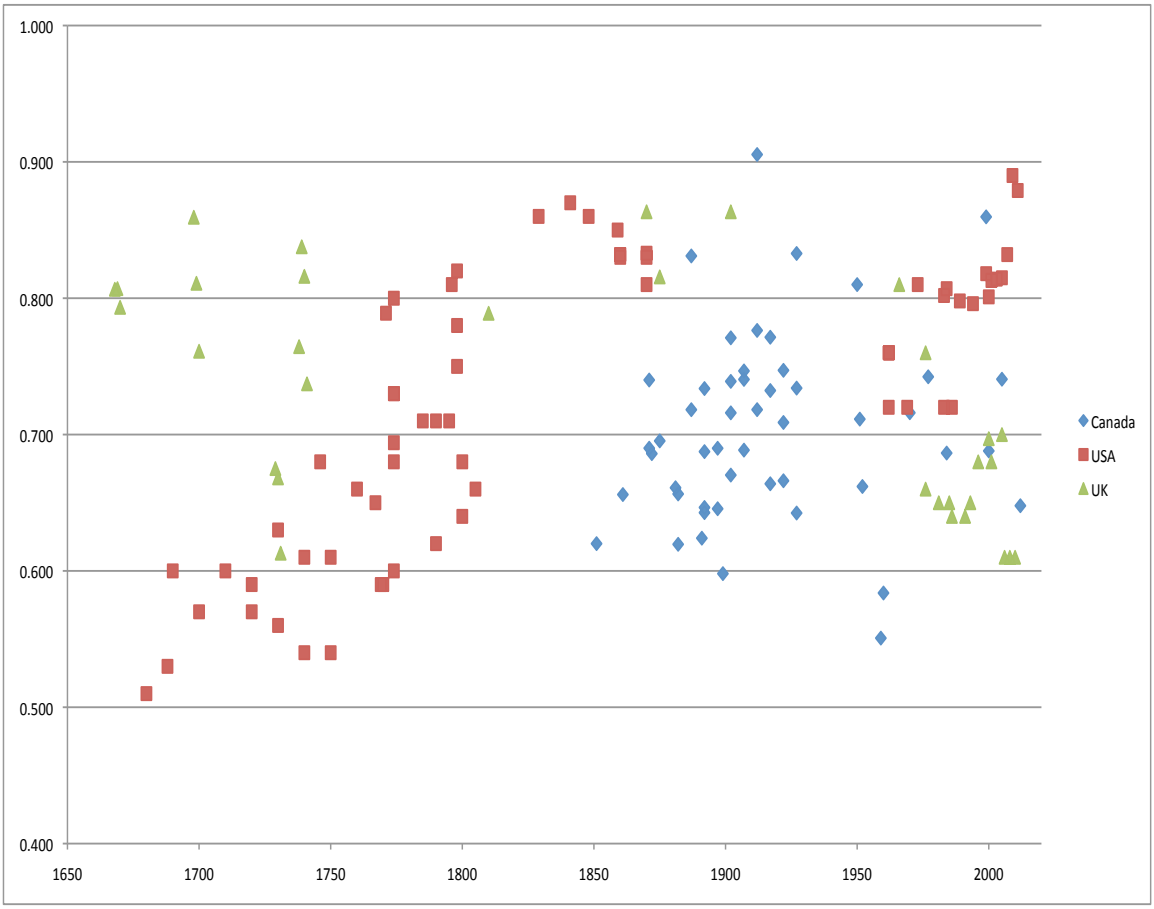

Figure 11
Gini Coefficients by Country with Separate LOWESS Smooth (bandwidth=0.5): Canada, the United States and the United Kingdom, 1680-2012

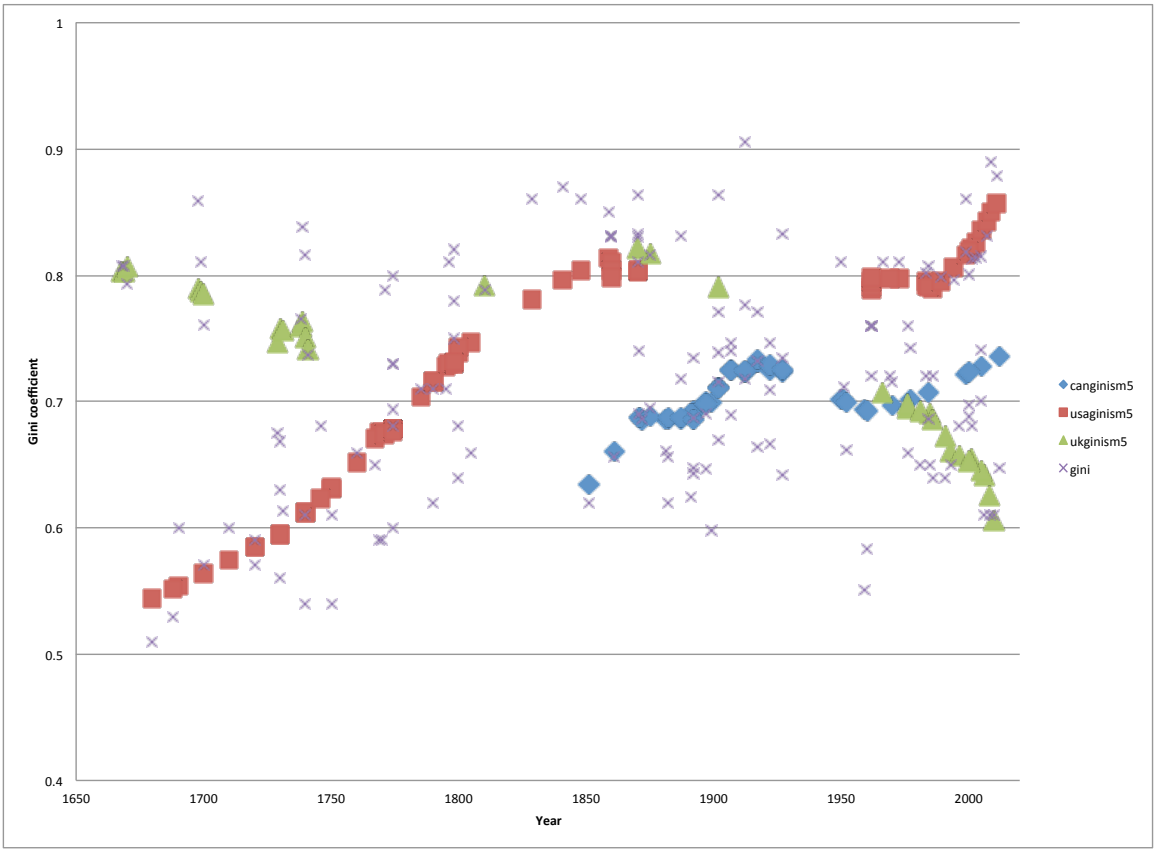

Table 1
OLS Regression Results

Dependent Variable: Natural log of Gini coefficident.

	Unweighted Regression		Weighted Regression**	
	Coefficient	t-statistic	Coefficient	t-statistic
Year	-0.48133440	-3.14	-0.53339540	-4.40
Year Squared	0.00026530	3.19	0.00029080	4.40
Year Cubed	-0.00000005	-3.24	-0.00000005	-4.40
United States	0.12942120	4.32	0.14319160	3.69
United Kingdom	0.13978450	4.16	0.15932030	3.62
Higher Estate Tax Regime	-0.06576220	-1.86	-0.09846840	-3.13
Constant	289.66280000	3.08	324.86660000	4.39
Adjusted R-squared	0.1631		0.1686	
F-statistic(6,141)	5.77		5.97	

* (wght=populaton share)

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Appendix 1

Construction of Canadian Wealth Inequality Estimates Using Federal Succession Duty and Estate Tax Data: 1950-1952 and 1959-1960.

Estate Income 1950		
Income Class	**Number**	**Income per Estate ($)**
LT $1000	2660	188
$1000 to 1500	190	1100
1,500 to 2000	170	1729
2000 to 2500	140	2186
2500 to 3000	130	2777
3000 to 3500	100	3240
3500 to 4000	70	3771
4000 to 4500	40	4225
4500 to 5000	50	4620
5000 to 6000	70	5586
6000 to 7000	30	6700
7000 to 8000	30	7200
8000 to 9000	30	8200
9000 to 10000	30	9667
10000 to 15000	100	11930
over 15000	150	37713
Total	**3990**	
Source: Estates (Table J, p.119)		
Department of National Revenue, Taxation Division, Taxation Statistics 1952, Queen's Printer, Ottawa, Canada.		

Estate Income 1951		
Income Class	**Number**	**Income per Estate ($)**
LT $1000	2640	203
$1000 to 1500	230	1230
1,500 to 2000	250	1756
2000 to 2500	340	2229
2500 to 3000	230	2717
3000 to 3500	200	3235
3500 to 4000	80	3775
4000 to 4500	90	4267
4500 to 5000	70	4743
5000 to 6000	90	5511
6000 to 7000	70	6629
7000 to 8000	70	7443
8000 to 9000	60	8500
9000 to 10000	20	9500
10000 to 15000	100	11420
over 15000	70	34743
Total	**4610**	
Source: Estates (Table 10, p. 71)		
Department of National Revenue, Taxation Division, Taxation Statistics 1953, Queen's Printer, Ottawa, Canada.		

Estate Income 1952						
Income Class	**Number**	**Income per Estate ($)**				
LT $1000	1520	371				
$1000 to 1500	650	1326				
1,500 to 2000	440	1930				
2000 to 2500	390	2274				
2500 to 3000	340	2738				
3000 to 3500	310	3113				
3500 to 4000	280	3754				
4000 to 4500	160	4213				
4500 to 5000	120	4783				
5000 to 6000	210	5452				
6000 to 7000	200	6330				
7000 to 8000	120	7367				
8000 to 9000	100	8550				
9000 to 10000	0	0				
10000 to 15000	350	12091				
over 15000	310	41152				
Total	**5500**					
Source: Estates (Table 10, p. 70)						
Department of National Revenue, Taxation Division, Taxation Statistics 1954, Queen's Printer, Ottawa, Canada.						

Taxable Canadian Domiciled Estates By Size of Estate, Fiscal Year 1959-60						
Size of Estate ($)	***Number***	**Net Value Per Estate($)**				
0-24999*	**1197**	**12500**				
25000-49999	**818**	**37500**				
50000-74999	763	62872				
75000-99999	481	86667				
100000-124999	262	110870				
125000-149999	146	135815				
150000-199999	166	172169				
200000-299999	113	247097				
300000-399999	59	341949				
400000-499999	26	437423				
500000-599999	12	553417				
600000-699999	12	639667				
700000-799999	6	729667				
800000-899999	8	852750				
900000-999999	5	943400				
1000000 and over	18	1586222				
Total	**4092**					
*Number estimated via exponential interpolation						
$y = 1751.7e^{-0.381x}$	R-sq=0.88738					
Source: Table 2, Estate Tax						
Department of National Revenue, Taxation Division, Taxation Statistics 1961, Queen's Printer, Ottawa, Canada.						

Taxable Canadian Domiciled Estates By Size of Estate, Fiscal Year 1960-61					
Size of Estate ($)	***Number***	**Net Value Per Estate($)**			
0-24999*	**2189**	**12500**			
25000-49999	**1487**	**37500**			
50000-74999	1142	62988			
75000-99999	781	86347			
100000-124999	403	111256			
125000-149999	301	136784			
150000-199999	287	171986			
200000-299999	256	242859			
300000-399999	116	344284			
400000-499999	53	449736			
500000-599999	27	547667			
600000-699999	23	645087			
700000-799999	11	747455			
800000-899999	4	829750			
900000-999999	11	952091			
1000000 and over	37	1873973			
Total	**7128**				
*Number estimated via exponential interpolation.					
$y = 3223.5e^{-0.387x}$	R-sq=0.85191				
Source: Table 2, Estate Tax					
Department of National Revenue, Taxation Division, Taxation Statistics 1962, Queen's Printer, Ottawa, Canada.					

Appendix 2
Estimates of Wealth Inequality in Canada, 1851 to 2012

	Year	Gini	Top 10%
Thunder Bay District a	1887	0.718	64.9
	1892	0.647	47.8
	1897	0.646	49.7
	1902	0.771	69.3
	1907	0.740	66.5
	1912	0.776	65.0
	1917	0.732	64.0
	1922	0.666	56.5
	1927	0.833	81.0
Ontario a	1892	0.687	58.3
	1902	0.670	55.1
Toronto b	1861	0.656	53.9
	1871	0.690	56.2
	1881	0.661	56.1
	1891	0.624	49.4
	1899	0.598	49.9
Manitoba c	1875	0.695	53.8
	1882	0.656	48.7
	1887	0.831	73.5
	1892	0.643	49.6
	1897	0.690	55.3
	1902	0.716	61.9
	1907	0.689	56.3
	1912	0.905	88.1
	1917	0.664	46.4
	1922	0.747	62.2
	1927	0.642	44.1
Canada d	1970	0.716	53.3
	1977	0.742	60.3
	1984	0.686	51.9
	1999	0.860	78.6
	2005	0.741	60.1
	2012	0.648	47.2
Nova Scotia e	1851	0.620	53.9
	1871	0.740	68.5
Wentworth County f	1872	0.686	57.8
	1882	0.620	48.5
	1892	0.734	58.1
	1902	0.739	62.3

	1907	0.747	64.0
	1912	0.718	61.4
	1917	0.771	69.5
	1922	0.709	58.4
	1927	0.734	63.9
Canada g	1950	0.810	73.4
	1951	0.711	56.0
	1952	0.662	55.0
Canada h	1959	0.551	43.7
	1960	0.584	46.7
Canada i	2000	0.688	53.0

Notes

a 1887-1902 done for five years- two years before and after due to smaller sample size. Eg. 1885-1889, etc…, 1907 done for three years eg. 1906-1908. For details on the Ontario, Wentworth County, Manitoba and Thunder Bay data sets, see Di Matteo (2004, 2012, 2013, 2016).

b Real estate only taken from assessment rolls. See Darroch (1983) Early Industrialization and Inequality in Toronto, 1861-1899 Labour/Le Travailleur, 11(Spring), 31-61

c Done for years before & after - due to smaller sample size.eg. 1873-1877 for 1875, 1883 &1883 for 1882; three years afterwards 1886-1888 for 1887, 1891-1893 for 1892, etc…

d 1970 and 1977 from Oja, G. (1987). Changes in the Distribution of Wealth in Canada, 1970-1984. Statistics Canada 13-588-no 1.. !984, 2005 and 2012 calculated from SCF & SFS public use microdata files. Networth valued on termination basis.

e From Siddiq & Gwyn (1992)

f Wentworth County 1872 to 1902 Di Matteo & George (1992)Table 3

g Canada. Calculated from Estate Income Data. Taxation Statistics. Department of Revenue. Based on income from estates.

h Canada. Calculated from Estate Tax Data. Taxation Statistyics. Department of Revenue. Based on net estate value and adjusted with interpolation for estate numbers below $50000.

i Davies, Sandstrom, Shorrock and Wolff (2010) Table 7, p. 246.

Appendix 3
Estimates of Wealth Inequality in the United States

		Year	Gini	Top 10%
USA a	USA	1774		59.0
	USA	1860		
	USA	1890		72.2
	USA	1962		64.6
	USA	1969		
	USA	1983		68.9
	USA	1989		67.2
	USA	1992		67.1
	USA	1995		67.8
	USA	1998		68.6
	USA	2001		69.8
	USA	2004		69.5
	USA	2007		71.5
	USA	2010		74.5
USA b	Charleston District, S.C.	1720	0.590	
	Charleston District, S.C.	1730	0.630	
	Charleston District, S.C.	1740	0.610	
	Charleston District, S.C.	1750	0.610	
	Charleston District, S.C.	1760	0.660	
	Charleston District, S.C.	1785	0.710	
	Charleston District, S.C.	1790	0.710	
	Charleston District, S.C.	1795	0.710	
	Charleston District, S.C.	1800	0.680	
	Charleston District, S.C.	1805	0.660	
	New Jersey	1680	0.510	
	New Jersey	1690	0.600	
	New Jersey	1700	0.570	
	New Jersey	1710	0.600	
	New Jersey	1720	0.570	
	New Jersey	1730	0.560	
	New Jersey	1740	0.540	
	New Jersey	1750	0.540	
	New Jersey	1769	0.590	
	New Jersey	1770	0.590	
	New Jersey	1790	0.620	
	New Jersey	1800	0.640	
	Suffolk Co., Massachusetts	1688	0.530	
	Suffolk Co., Massachusetts	1746	0.680	
	Suffolk Co., Massachusetts	1767	0.650	

	Suffolk Co., Massachusetts	1796	0.810	
	Suffolk Co., Massachusetts	1829	0.860	
	Suffolk Co., Massachusetts	1859	0.850	
	USA	1774	0.730	58.0
	USA	1798	0.750	55.0
	Massachusetts-Maine	1771	0.789	
	Maryland	1798	0.820	
	USA	1798	0.780	
	USA	1860	0.832	
	USA	1983	0.802	
USA c	SCF (Kennickel 2009-2011; Wolff 1994)	1910		81.1
	SCF (Kennickel 2009-2011; Wolff 1994)	1920		79.7
	SCF (Kennickel 2009-2011; Wolff 1994)	1930		73.4
	SCF (Kennickel 2009-2011; Wolff 1994)	1940		66.4
	SCF (Kennickel 2009-2011; Wolff 1994)	1950		65.7
	SCF (Kennickel 2009-2011; Wolff 1994)	1960		67.0
	SCF (Kennickel 2009-2011; Wolff 1994)	1970		64.2
	SCF (Kennickel 2009-2011; Wolff 1994)	1980		67.2
	SCF (Kennickel 2009-2011; Wolff 1994)	1990		68.7
	SCF (Kennickel 2009-2011; Wolff 1994)	2000		69.7
	SCF (Kennickel 2009-2011; Wolff 1994)	2010		71.5
	Table s10.1	1810		58.0
USA d	Osberg (1984, Table 3.2, p. 44)	1962	0.760	62.0
	Osberg (1984, Table 3.2, p. 44)	1973	0.810	69.8
USA e	Thrteen colonies	1774	0.730	54.8
	New England	1774	0.800	56.8
	New Jersey, Pennsyl, Delaware	1774	0.600	42.1
	South	1774	0.680	48.8
	USA Free Adult Males Total Wealth	1860	0.830	73.0
	USA White Adult Males Total Wealth	1870	0.810	68.0
	USA All Adult Males total Wealth	1870	0.830	70.0
	USA (net worth)	1962	0.760	62.0
	USA Farm & Home Wealth, Families	1890		72.0
	Boston	1848	0.860	
	Brooklyn	1841	0.870	
	USA Consumer Units Wealth	1962	0.760	62.0
USA f	Free Households Net Worth (Lindert & Williamson)	1774	0.694	53.2
	Free Adult Males Total Assets (Lindert & Wiliamson)	1860	0.832	73.0
	Adult Males Total Assets (Lindert & williamson)	1870	0.833	70.0
	Household Net Worth	1962	0.720	
	Household Net Worth	1969	0.720	

	Household Net worth	1983	0.720	
	Household Net worth	1986	0.720	
USA g	Net Worth PSID	1984	0.807	
	Net Worth PSID	1989	0.798	
	Net Worth PSID	1994	0.796	
	Net Worth PSID	1999	0.818	
	Net Worth PSID	2001	0.813	
	Net Worth PSID	2003	0.814	
	Net Worth PSID	2005	0.815	
	Net Worth PSID	2007	0.832	
	Net Worth PSID	2009	0.890	
	Net Worth PSID	2011	0.879	
USA h	Household Wealth.	2000	0.801	
USA i	Family wealth. Manuscript census samples.	1810		69.0
		1860		71.0
		1860		72.0
		1900		73.0
		1900		74.0

Notes

a Source: Roine and Waldenstrom (2014) Tables A1-A4, Roine & D. Waldenstrom (2014) Long-Run Trends in the Distribution of Income and Wealth. IZA DP No. 8157. April.

b L. Soltow (1989) Distribution of Wealth and Income in the United States in 1798. University of Pittsburgh Press.

c Piketty (2014) Capital in the 21st Century. Chapter 10. Table s10.1.

d Osberg, Lars (1984) Economic Inequality in the United States. M.E. Sharpe, Inc. New York and London. Notes: 1962 is Wealth from consumer units. 1973 is family net worth.

e Alice Hanson Jones, Wealth of a Nation to Be (1980), Tables 6.1, 8.2 & 8.3, 8.8, 8.10.

f Carole Shammas (1993) "A New look at Long-Term Trends in Inequality" American Historical Review

g Pfeffer, F.B., S. Danziger & R.F. Schoeni (2013) "Wealth disparities Before and After the Great Recession" Ann Am Acad Pol Soc Sci. Nov. 650(1): 98-123. PSID-Panel Study of Income Dynamics.

h Davies, Sandstrom, Shorrock and Wolff (2010) Table 7, p. 246.
i Gallman (1969, Table 1. P.6).

Appendix 4
Estimates of Wealth Inequality in the United Kingdom

	Year	Gini	Top 10%
United Kingdom a	1740		86.0
	1810		83.4
	1875		83.8
	1911		92.0
	1923		89.1
	1924		88.1
	1925		88.4
	1926		87.4
	1927		88.3
	1928		87.2
	1929		86.3
	1930		86.6
	1936		85.7
	1938		85.0
	1960		71.5
	1961		71.7
	1962		67.3
	1964		71.4
	1965		71.7
	1966		69.2
	1967		70.0
	1968		71.6
	1969		67.7
	1970		68.7
	1971		67.6
	1972		70.4
	1976		50.0
	1977		50.0
	1978		49.0
	1979		50.0
	1980		50.0
	1981		50.0
	1982		49.0
	1983		50.0
	1984		48.0
	1985		49.0
	1986		50.0
	1987		51.0
	1988		49.0
	1989		48.0
	1990		47.0
	1991		47.0
	1992		50.0
	1993		51.0
	1994		52.0

	1995		50.0
	1996		52.0
	1997		54.0
	1998		52.0
	1999		55.0
	2000		56.0
	2001		54.0
	2002		54.0
	2003		53.0
	2005		54.0
United Kingdom (Lindert) b	1668	0.807	76.3
	1669	0.807	73.6
	1670	0.793	67.4
	1698	0.859	80.5
	1699	0.811	74.8
	1700	0.761	65.4
	1729	0.675	55.1
	1730	0.668	58.7
	1731	0.613	44.6
	1738	0.765	64.3
	1739	0.838	77.8
	1740	0.816	72.6
	1741	0.737	65.3
	1810	0.789	69.9
	1875	0.816	73.5
UK (Davies-Shorrocks) c	1966	0.810	69.0
	1976	0.760	60.0
	1985	0.650	49.0
	1993	0.650	48.0
UK (Institute for Economic Affairs) d	2006	0.610	43.9
	2008	0.610	43.6
	2010	0.610	43.7
UK (Rowlingson 2012) e	1976	0.660	50.0
	1981	0.650	50.0
	1986	0.640	50.0
	1991	0.640	47.0
	1996	0.680	52.0
	2001	0.680	54.0
	2005	0.700	54.0
UK 1870-1902. Probate Wealth f	1870	0.863	
	1902	0.863	
United Kingdom. Household Wealth g	2000	0.697	

Notes:

a Source: Roine and Waldenstrom (2014) Tables A1-A4, Roine & D. Waldenstrom (2014) Long-Run Trends in the Distribution of Income and Wealth. IZA DP No. 8157. April.

b Lindert Probate Data. English Probates 1670-1875. http://economics.ucdavis.edu/people/fzlinder/peter-linderts-webpage/data-and-estimates/english-probates-1670-1875

c Davies and Shorrocks (1999) Chapter 11: The distribution of Wealth in Handbook of Incozme Distribution: Volume 1. Edited by A. B. Atkinson and F Bourguignon

d Wealth Inequality the Facts. Institute for Economic Affairs. http://www.iea.org.uk/sites/default/files/publications/files/Wealth%20inequality%20briefing%20formatted.pdf

e Wealth Inequality: key facts. Karen Rowlingson. December 2012. University if Birmingham. Policy Commission on the distribution of Wealth. http://www.birmingham.ac.uk/Documents/research/SocialSciences/Key-Facts-Background-Paper-BPCIV.pdf

f Di Matteo, L., D. Green, A. Owens, M. Shanahan, J. McAloon (2012) Resources, land abundance and inequality. Understanding wealth-holding and investment in Britain and its settler colonies, 1870-1930, SSHA Meetings Vancouver, November 1-4.

g Davies, Sandsgtrom, Shorrock and Wolff (2010) Table 7, p. 246.