

Does Egalitarianism Come at a Price? Inequality and Economic Performance in Late-Nineteenth-Century Ontario

Livio Di Matteo

The relationship between economic performance and wealth inequality at a regional level is examined using county-level wealth for Ontario in 1892 and 1902. The results find that after controlling for confounding factors, declining wealth inequality was generally accompanied by slower economic performance as measured by changes in wealth levels and manufacturing output over time. This suggests that a more egalitarian wealth distribution came perhaps at the price of less robust economic performance.

Introduction

Long-run growth and economic inequality are increasingly the topic of international economic history (Piketty 2014; Roine and Waldenström 2014). Piketty's thesis, that when the rate of return to wealth is greater than the rate of economic growth the result is greater inequality, is a pessimistic one. Moreover, it is at odds with the more hopeful Kuznets curve hypothesis that inequality grows during industrialization and economic growth but declines once industrialization is widespread and economic growth moderates (Kuznets 1955, 1966).

Deaton (2013: 78) remarks that rapid economic growth and change can be accompanied by greater inequality. Indeed, inequality is "one of the 'gifts' of civilization" in that innovation, growth, and progress must start somewhere and differential timing inevitably results in some divergence in material standards of living. The economic inequality characterizing late-nineteenth-century Europe and America during their economic expansion and industrialization that also raised individual material welfare is evidence of this. Certainly, evidence for Canada also suggests periods of rapid growth like the wheat boom era were also associated with rising inequality.¹

There is debate and mixed evidence over whether long-term economic growth, development, and industrialization reduced or increased inequality. For example, recent research suggests that income inequality across countries, at preindustrial times and today, is similar.² In the case of the United States, Williamson and Lindert³ have argued that industrialization brought about increased inequality whereas Soltow

The author wishes to thank two anonymous reviewers and participants in sessions at the BETA-Workshop in Historical Economics, University of Strasbourg (May 2013), Economic History Association Meetings, Washington (September 2013), and the Social Science History Association Meetings, Baltimore (November 2015) for their comments on various drafts of this article.

1. The wheat boom era is commonly associated with the period from 1896 to 1914 though broader interpretations extend the period to the start of the Great Depression in 1929. See Di Matteo (2012).

2. As noted in Milanovic et al. (2010: 268): "Simply put, both the dispersion and the mean of inequality statistics across countries, at pre-industrial times and today, are similar."

3. See Lindert (1991), Lindert and Williamson (1985, 2016), Williamson and Lindert (1980).

(1989: 5) has felt that the Industrial Revolution had the opposite long-term effect because the factory revolution offered greater employment opportunities than previously existed. Yet, Soltow 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.⁴

To provide another dimension to addressing the relationship between economic performance and wealth inequality—a relationship usually addressed using national-level data—evidence at a regional level is examined using county-level wealth for Ontario in 1892 and 1902. The Canadian province of Ontario has been a keystone of the Canadian economy since Confederation with the largest provincial share of national population and output. Yet, late-nineteenth-century Ontario was marked by an economic slump that was not reversed until the early-twentieth-century boom. At the same time, this period for Ontario was accompanied by declining inequality of wealth.

Most studies of the relationship between inequality and economic growth and performance use national-level data.⁵ There are potentially several 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 are compared (Wolff 1991: 94).

These issues are exacerbated when long-term international comparisons of historical wealth inequality are 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 (e.g., households) the definition is not identical across countries and can even vary over time within a country.⁶

In this article, the availability of data from one large jurisdiction with substantial geographic diversity and a common set of institutions is an opportunity to examine inequality free from some of these data issues. The results here find that after controlling for confounding factors, declining wealth inequality was generally accompanied by slower economic performance as measured by changes in wealth levels. This suggests that a more unequal wealth distribution may sometimes be the price of more robust economic growth.

4. The case that wealth inequality increases during industrialization are not supported unambiguously is also noted by Ohlsson et al. (2008), who find that wealth inequality in Denmark, Sweden, and Norway did not rise during their early industrialization.

5. E.g., Benabou (2000) documents a dozen studies on the relationship between inequality and growth using international cross-section data.

6. As Roine and Waldenstrom (2014: 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.”

Economic Inequality and Economic Performance

Economic inequality was a prominent feature of nineteenth-century economies (see Piketty 2014). The complex determinants of inequality ultimately depend on individual abilities to take advantage of economic opportunities as well as absorb economic shocks. Any study of inequality using historical microdata must be placed into the context of Simon Kuznets (1955, 1966) and the inverted-U hypothesis relationship between economic growth and inequality. The relative optimism of the Kuznetsian hypothesis lies in the inverted u-shaped relationship demonstrating rising inequality during the initial phase of industrialization and rapid economic growth and then declining inequality.

However, Piketty (2014) argues inequality rises when the rate of return to capital exceeds the economy's growth rate. Furthermore, Piketty's work implies an era of slower economic growth will inevitably be associated with rising inequality given the long-term trend in rates of return to capital.⁷ Piketty (ibid.) argues that increasing equality during the twentieth century was at best an aberration brought about by war, which eroded the return to capital.

Causal links between economic inequality and economic growth include capital market imperfections that hinder the poor from borrowing to invest in human capital, policy responses to economic inequality, the disruptive effect of social unrest and revolution on the economy from high economic inequality, and the effect of inequality on savings rates.⁸ While most of the literature on the relationship between inequality and economic performance growth focuses on income inequality, it can apply to wealth inequality (see Forbes 2000).

Persson and Tabellini (1994) maintain that in a society where distributional conflict is important, political decisions produce economic policies that tax investment and growth-promoting activities in order to redistribute income. They find a significant and negative empirical relationship between inequality and growth. Alesina and Rodrik (1994) present a model in which the public sector provides a public input into production financed using a tax on capital income with the result that a more equal distribution of income results in lower taxation rates and faster economic growth. Alesina and Perotti (1996) model high levels of income inequality creating social unrest, which results in instability and less investment thereby reducing economic growth.

The effect of inequality of savings rates is also the subject of some debate with the traditional view being that because the rich have higher savings rates, inequality may lead to greater saving and investment (see Ashton 1948: 7; Kaldor 1957). However, Stiglitz (2012) argues that greater inequality leads to a higher savings rate but this results in a decline in aggregate demand, which reduces economic growth.

Most developed economies saw increasing wealth inequality during nineteenth-century industrialization that abated during the first three-quarters of the twentieth

7. On a global level, Piketty places the historical pure rate of return to capita (pretax) at rates between 4 and 5 percent. See Piketty (2014: 354).

8. For an overview, see Dahlby and Ferde (2013). See also Aghion et al. (1999), Barro (2000, 2008), Perotti (1993), and Castello-Climent (2010).

century.⁹ North American studies of wealth accumulation document high rates of accumulation as well as high wealth inequality, even in frontier areas of recent settlement.¹⁰ Wealth inequality was also high for continental Europe, Australia, and New Zealand in the nineteenth century and early part of the twentieth century.¹¹

Banerjee and Duflo (2003) estimate an inverted u-shaped relationship between growth and inequality using cross-country data but caution that while this result is consistent with a Kuznets curve, it could also reflect measurement error as well as identification problems. 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. Green argues that regional inequality continued to increase because the wheat boom era stimulated an agricultural expansion that was a low-income sector in the west while the high-income manufacturing sector expanded in central Canada. By contrast, Inwood and Irwin (1998: 18), using pre-World War I regional income estimates for the period 1870 to 1890, observe a modest reduction in spatial inequality between 1870 and 1890.¹²

Williamson (1996, 1998) and Higgins and Williamson (2002) move beyond examining inequality as simply an unconditional Kuznets curve relationship and consider that inequality is rooted in changes in income or wealth, as well as public policy, skills, institutions, education, resource endowments, and age structure.¹³ Indeed, Atack and Bateman (1981) and Gallman (1978) maintain that because wealth does rise with age, the larger the proportion of young people in a society, the more wealth inequality there would be. International studies have generally found that relative inequality falls sharply over the first 10 to 15 years of the working lifetime, levels off over the remainder of the working period, and then begins to increase during retirement.¹⁴

As well, values and beliefs regarding equity can be factors affecting economic inequality making religion a factor in determining wealth and income distributions. For

9. See Ohlsson et al. (2008) and Roine and Waldenstrom (2014) for evidence on several European countries. The Scandinavian countries were an exception to inequality rising with industrialization.

10. For Canada: Siddiq (1988), Osberg and Siddiq (1988, 1992), Darroch (1983), Siddiq and Gwyn (1991), Di Matteo and George (1992), Gwyn and Siddiq (1992), Darroch and Soltow (1994), Bouchard (1998), Baskerville (1999). For the United States: Main (1975, 1977), Jones (1980, 1984), Burchell (1987), Bolton (1982), Soltow (1975, 1979), Atack and Bateman (1981), Newell (1980, 1986), Herscovici (1993), Pope (1980), Galenson and Pope (1989), Gregson (1996), Ferrie (1994), Steckel (1990), Steckel and Moehling (2001), Stewart (2006, 2009), Clay and Jones (2008), Walker (2000), and Canaday (2008).

11. Shanahan (2001), Galt (1983), and McAloon (2002). See also Rubinstein (1977, 1979, 1987, 1988). For a reference on the use of probate records in English economic history, see Owens et al. (2006) and Lindert (1986). For Argentina, see Hora (2012). See also Roine and Waldenstrom (2014).

12. Inwood and Irwin, "Extending" (1998: 23) calculate descriptive income inequality measures for 1870 and 1890. Using districts weighted by population, they find that the value of the Gini coefficient in Canada was 0.14 in 1870 and 0.15 in 1890. As well, the income shares of the wealthiest and poorest fifth of the population remained about the same at 27 and 13 percent, respectively.

13. As another example, Spain sees a fall in income inequality during the beginning phases of its economy opening 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).

14. These empirical results have been documented for Canada (Magee et al. 1991), the United Kingdom (Shorrocks 1975a, 1975b), and the United States (Greenwood 1987).

late-nineteenth-century Ontario, Di Matteo (2016) finds differences across religious affiliations when it comes to the degree of partibility in estate division with more partibility associated with less wealth inequality. At the international level, Fernandez (2014) notes that between 1910 and 1930, countries such as Spain, New Zealand, Belgium, Australia, and Italy displayed higher inequality in land distribution while Finland, Denmark, Sweden, and Canada had less inequality. The latter countries had more prevalent Protestant populations.

Ontario's Poor Late-Nineteenth-Century Economic Performance

Understanding Ontario's late-nineteenth-century economic performance is a challenge given the dearth of detailed long-term evidence on Canadian regional economic performance combined with national economic evidence suggesting slower national growth after Confederation followed by the more rapid growth of the prairie settlement era. Taken together, the evidence suggests that Canada and Ontario experienced slower economic growth prior to 1900 with Ontario being particularly hard hit. Growth then becomes quite robust after 1900 in Canada including Ontario as a result of the wheat boom era and prairie settlement. The wealth accumulation and distribution evidence provided by the Ontario 1892 and 1902 probate records would invariably reflect much of this pre-1900 era of slower economic growth.

At the international level, Canada appears to do relatively well between 1870 and 1929. Figure 1 shows the average annual growth rate of nominal per capita gross domestic product (GDP) for several countries and shows Canada's growth compares favorably with both the United States and Argentina. However, Canadian economic growth was more pronounced after 1896 and especially after 1900 coinciding with the wheat boom era and sustained manufacturing productivity and development, though the 1890s do appear to have witnessed an export surge (see Ankli 1980; Green and Urquhart 1987, 1994; Key 2000a, 2000b). While some recent work suggests the Canadian economy actually grew at its most rapid pace for a decade prior to the settlement effects of the wheat boom,¹⁵ Buckley and Altman have placed more emphasis on the period from 1872 to 1892 as one of "secular depression" (see Altman 1987; Buckley 1955) with the year 1891 associated with a particularly severe downturn (Darroch 1983).

From 1871 to 1896, real per capita gross national product (GNP) in Canada grew at an implied annual rate of 1.0 percent whereas from 1896 to 1926 it grew at 2.4 percent.¹⁶ While Ontario over the entire pre-1926 period still has the highest real per capita output of the Canadian provinces (see Inwood and Irwin 2002), it does appear to have been afflicted with poorer performance. For example, Ontario population growth—which can be taken as one sign of response to economic opportunity—was

15. McInnis (2007) argues that three-quarters of the income gain of the boom era occurred between 1896 and 1907.

16. Author's calculations. Data Source: Green and Urquhart (1994).

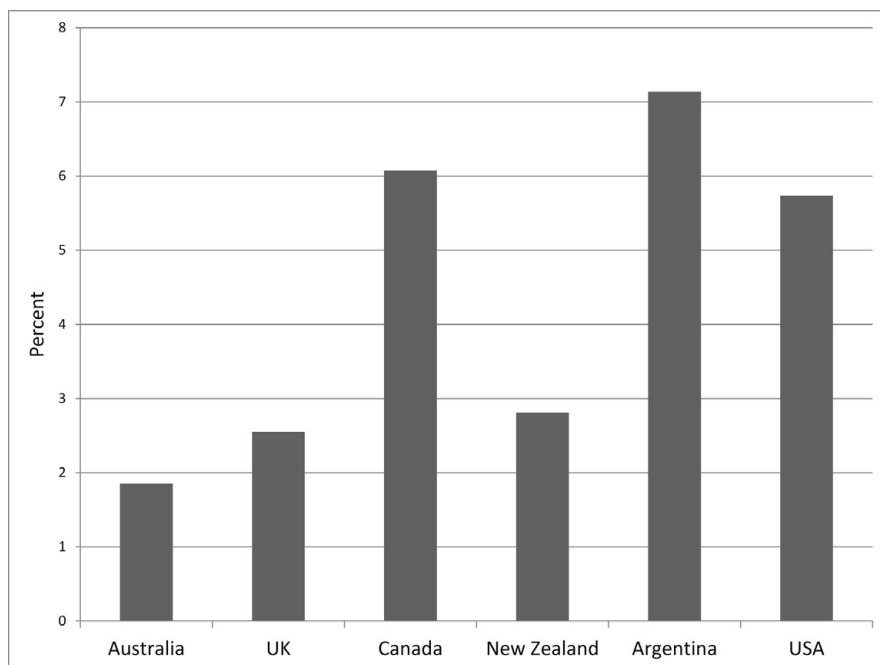


FIGURE 1. *Average annual growth rate of per capita GDP, 1870–1929.*

Source: Sources for this calculation: McLean (2004) provides multipliers for GDP relative to US data for Canada, Australia, New Zealand, Argentina, and the United Kingdom; US per capita nominal GDP taken from Johnston and Williamson (2016). See also: Urquhart (1993) and Officer (2016).

only slightly better than the rest of Canada from 1861 to 1881. It then fell below the rest of Canada from 1881 through to 1921 as illustrated in figure 2. In addition, between 1890 and 1910, Ontario's share of national output declined from 49.2 to 41.4 percent, though after 1900 this would be the result of the opportunities of the wheat boom expanding the western frontier economy and population faster than Ontario rather than slower growth in Ontario per se (Green 1967: 238).

Employment growth as illustrated in figure 3 provides additional evidence of Ontario's economic performance relative to the rest of Canada throughout the period 1871 to 1921. Between 1871 and 1901, Canada and Ontario's employment growth rate fell, though Ontario's fell substantially more. Whereas Ontario's rate of employment growth exceeded Canada's slightly during the 1870s, it fell slightly behind in the 1880s and then plummeted during the 1890s. Ontario's employment growth remained below that of the rest of Canada after 1901, though that can be attributed to the rapidly expanding western Canadian economy as a result of the wheat boom. The pre-1900 performance cannot be explained by western settlement and is more likely the result of a relatively more poorly performing Ontario economy.

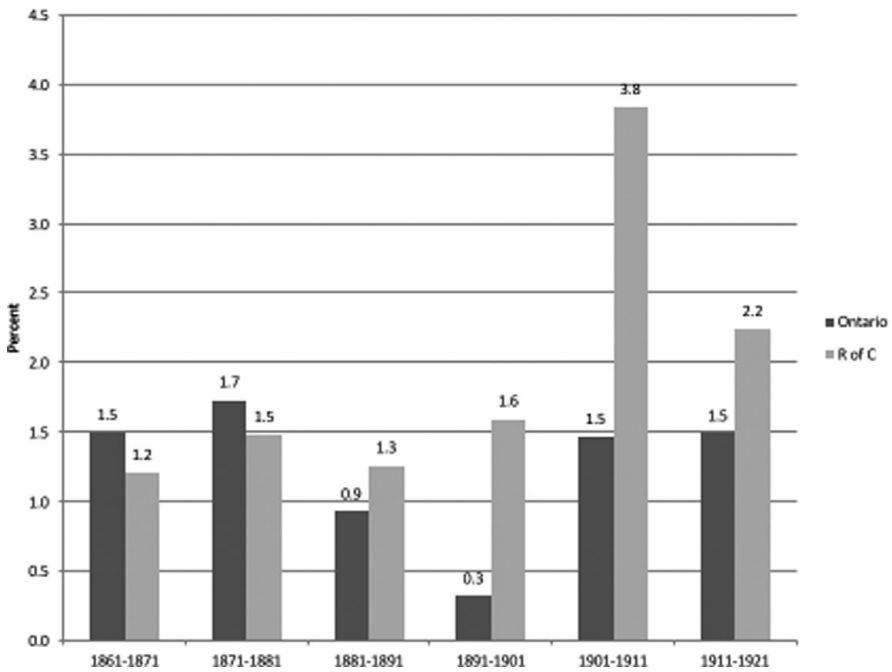


FIGURE 2. *Implied population growth rates: Ontario versus rest of Canada, 1861–1921.*

Source: Statistics Canada (1999).

Ontario even in the nineteenth century was regarded as Canada's industrial heartland but Ontario's performance in manufacturing also appears to have substantially worsened especially relative to the rest of the country. Percent growth in real output per worker in manufacturing in Ontario was 12.6 percent between 1870 and 1880 and rose to 15.5 percent from 1880 to 1890 before plummeting to -1.2 percent from 1890 to 1900 (see Drummond 1987: table 7.3).¹⁷ Comparing the growth rate of manufacturing output between Ontario and the rest of Canada, they were similar between 1870 and 1890 but the period from 1890 to 1900 saw Ontario's manufacturing output drop 7.5 percent while the rest of Canada's grew by 61.3 percent.¹⁸ In their study of Canadian regional industrial growth, Inwood and Chamard (1986) find that Ontario's manufacturing output growth exceeded that of Quebec and the Maritimes but was below the Prairies and British Columbia during the 1880s. During the 1890s, Ontario's growth in manufacturing output only exceeded that of the Maritimes falling even below that of Quebec.

17. Output per worker deflated by DBS General (1926 = 100).

18. Author's calculations. Data sources: Urquhart (1993: table 1.1) and Drummond (1987: appendix C, table 7.1).

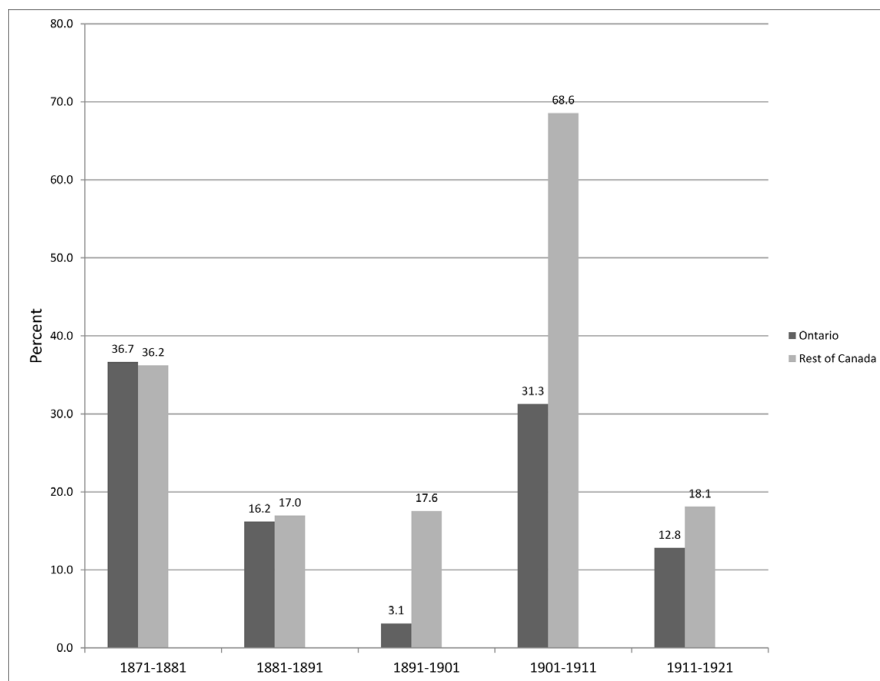


FIGURE 3. *Employment growth by decade, all occupations, Canada and Ontario, 1871–1921.*

Source: 1870–71 Census of Canada, Statistics Canada (1999), Drummond (1987: appendix C, table 2.1).

More direct evidence of poorer economic opportunities in Ontario is also suggested by the tendency of English Canadians to migrate to the United States, which also had higher per capita income.¹⁹ Indeed, according to the IPUMS 5 percent census sample for the year 1900, 1.64 percent of the US population was Canadian born and Canadians made up 12 percent of the foreign-born population (Ruggles et al. 2010). This outflow of Canadians is significant when compared to the size of Canada’s population at the time.²⁰

19. The absolute numbers of Canadian-born residents of the United States grew from 147,711 in 1850 to 1,204,637 by 1910 as between 1850 and 1920 nearly two million Canadians immigrated to the United States. Jackson (1923: 27–28). Jackson quotes Goldwin Smith as follows: “‘The Americans may say with truth,’ wrote Goldwin Smith in 1891, ‘that if they do not annex Canada, they are annexing the Canadians. They are annexing the very flower of the Canadian population, and in the way most costly to the country from which it is drawn, since the men whom that country has been at the expense of breeding leave it just as they arrive at manhood and begin to produce.’”

20. Whereas in 1950, the Canadian born living in the United States represented 6.2 percent of Canada’s population, in 1900 it was 22 percent. Vedder and Gallaway (1970: 477).

A study of the distribution of Canadian migrants to the United States over the period 1850 to 1950 found migrants were particularly sensitive to state income differentials and employment opportunities. There was a pronounced tendency to settle along the border particularly between 1880 and 1900 (Vedder and Gallaway 1970: 482–84).²¹ Indeed, nominal per capita incomes in Canada were substantially lower than the United States between 1870 and 1907 with some convergence only occurring during the peak of the wheat boom era between 1907 and 1913.²²

Evidence of greater economic opportunity in the United States also comes from probate wealth evidence for American regions near Ontario. King (1915) in a survey of American wealth and income provides several tables on the distribution of wealth from estates of males probated in Massachusetts and Wisconsin.²³ These tables were used to compute the average wealth and wealth share of the top male 1 percent in Massachusetts and Wisconsin.

The top 1 percent of 35,148 male estates probated in Massachusetts over the period 1889 to 1891 had an average wealth of \$271,494 and owned 47.1 percent of all probated wealth. The top 1 percent of 2,332 male estates probated in Wisconsin in the year 1900 had an average wealth of \$219,081 and owned 46.0 percent of all probated wealth. By contrast, the top 1 percent of male Ontario probated decedents reported an average wealth over the 1892 to 1902 period of \$201,610 and owned 24.9 percent of the wealth probated. Thus, average wealth in Ontario was also lower than these two nearby American jurisdictions.²⁴

Of course, ideal evidence would entail estimates of real per capita GDP growth for Ontario prior to 1900 compared to the rest of the country, but this is difficult given the absence of regional GDP estimates on an annual basis for Canada. As well, comparisons are inevitably complicated by the westward expansion of industrialization, increases in wheat exports, and increasing working hours over time.²⁵ Canada's

21. It was also noted that French-speaking migrants were more sensitive than English-speaking ones to income differences. For additional discussion of migration to North America, see Green et al. (2002) and Minns (2000).

22. The exchange rate between the US and Canadian dollars was at parity for the period 1870 to 1913 making a comparison of nominal GDP satisfactory. In 1870, nominal per capita GDP in Canada was \$107 compared to \$196 in the United States. By 1890, the comparable figures were \$150 for Canada and \$273 for the United States while by 1913 they were \$366 and \$406, respectively. Data source: Green and Urquhart (1994) and Eh.Net (<https://measuringworth.com/usgdp/>).

23. Table IX, p. 69 provides the estimated distribution of estates of men dying in Massachusetts over the period 1889 to 1891. Table XI, p. 76 provides the estimated distribution of the value of estates of men dying in six Wisconsin counties in the year 1900.

24. There is additional evidence that particularly innovative, inventive, and entrepreneurial Canadians did move to the United States to pursue opportunities in the larger and often more dynamic American market. Zorina Khan's work (Khan 2005) on US patent activity and innovation has constructed a database of inventors and Canadian-born individuals feature prominently in the list. Among them are Reginald A. Fessenden (1866–1932) with patent activity in radio-communications and submarines, James L. Kraft (1874–1953) with patent activity in cheese processing and packaging, and Charles L. G. Fortescue (1876–1936) with patent activity in electric power.

25. Huberman (2004) finds that while hours at work declined for many countries between 1870 and 1913, they increased in Canada. As a result, once adjusted for less leisure time, Canadian economic growth and per capita incomes are less impressive during this period.

economy between 1870 and 1920 underwent western settlement, industrialization, and rapid immigration especially after 1896, which together entailed a significant structural change in the economy and also needs to be acknowledged prior to any estimates of per capita output growth.²⁶ The temporary arrest of industrial relocation in central Canada noted by Inwood and Chamard (1986) could also be expected to be reflected in a slower Ontario growth rate.²⁷

However, by way of another estimate, one can apply Ontario's share of national income in 1871, 1891, 1911, and 1929 as estimated by Inwood and Irwin (2002) and Green (1967)²⁸ to annual Canadian GNP as constructed by Green and Urquhart (1994) and Urquhart (1993) and then dividing by population to obtain an estimate of Ontario real per capita GNP (\$1,900) for those years and then estimating the implied annual growth rates for Ontario and Canada net of Ontario. An estimate is also constructed for 1901 using the average of Ontario's output share for the years 1891 and 1911. These estimates of real per capita GNP and the accompanying growth rates are provided in figures 4 and 5. Estimates are provided both using the Urquhart GNP deflator as well as a revised deflator constructed by Altman (1992).²⁹

The results show that while Ontario's level of real per capita GDP was higher than the Canadian average as well as Canada net of Ontario, there were some marked differences in the growth rates of real per capita GDP particularly in the period prior to the 1890s—the decade for which the probate wealth data was collected. Over the period 1871 to 1891, Ontario's real per capita GDP growth ranged from 1.3 to 1.8 percent annually while Canada net of Ontario ranged from 1.9 to 2.4 percent. For the period 1891 to 1901, Ontario's annual real per capita GDP growth ranges from 2.5 to 2.8 percent while Canada net of Ontario ranges from 2.8 to 3.1 percent. Ontario then rebounds significantly over the period 1901 to 1911 reflecting the effects of the wheat boom era that kicked in after 1896 and became especially robust after 1900 based on aggregate Canadian results. Real per capita income (\$1,900) for Canada as a whole from 1890 to 1896 is essentially flat going from \$138 to \$134

26. Western settlement certainly picks up based on land entries recorded by the federal government. Between 1872 and 1896, the value of land grant entries for Alberta, Saskatchewan, and Manitoba (the Prairie provinces) ranged from a low of 283 in 1872 to a high of 7,383 in 1882 for an annual average of 2,665 entries. From 1897 to 1914, they ranged from a low of 1,140 in 1897 to a high of 44,273 in 1911 for an annual average of 24,895. Source: Author's calculations. Data from Statistics Canada (1999), Historical Statistics of Canada, Series L34-L41.

27. Inwood and Chamard (1986) note that the 1890s fall between the period of more erratic growth and tariff introduction of the pre-1890 period and the investment boom after 1900. As well, the 1890s was a period of centralization of some branches of Canadian industry within central Canada. They specifically note that (Inwood and Chamard 1986: 114): "[T]he peripheral regions of Canada fared no worse during the 1890s than in most other decades and they fared better than the published unadjusted census data would suggest. Only two decades stand out during the entire period. The 1880s saw a temporary arrest of the tendency of industry to concentrate in Central Canada and during the 1900s the westward movement of manufacturing activity accelerated." The temporary arrest of industrial relocation in central Canada could also be expected to be reflected in a slower Ontario growth rate.

28. These shares are 1871 (52.3 percent), 1891 (49.3 percent), 1911 (41.4 percent), and 1929 (39.4 percent).

29. Altman's Series A is used as the deflator. See Altman (1992: 456–57). It should be noted that estimates were also done with Altman's Series B and they generated identical results to Series A.

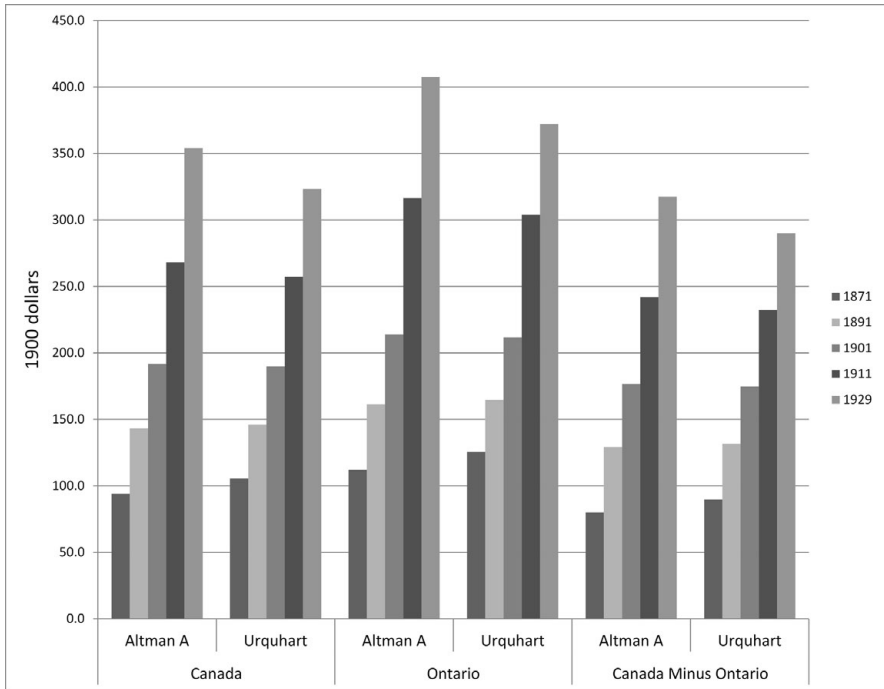


FIGURE 4. *Real per capita GDP, Canada and Ontario, 1871–1929.*

Source: Author's calculations from Urquhart (1993) and Altman (1992).

but then recovers reaching \$171 by 1900 and \$246 by 1911 (Green and Urquhart 1987: 183). In addition, Ontario's population during this period is growing slower than the rest of the country thereby making its per capita income growth performance appear better than if its population growth was matching the rest of Canada. One can therefore reasonably conclude that from the early 1870s to at least the mid-1890s, Ontario's economic performance was relatively poor and lagged that of the rest of Canada.

Data

The microdata consists of census-linked probated decedents from the 37 southern counties and six northern districts of Ontario, Canada for the years 1892 and 1902. It was constructed from the probate records of the county surrogate courts³⁰ and the

30. The primary data source is the probate records of Ontario surrogate courts with probate being an institutional process that transferred property from the dead to the living and as part of the process did a detailed market-based evaluation of assets. The process of probate began in Ontario upon initial settlement

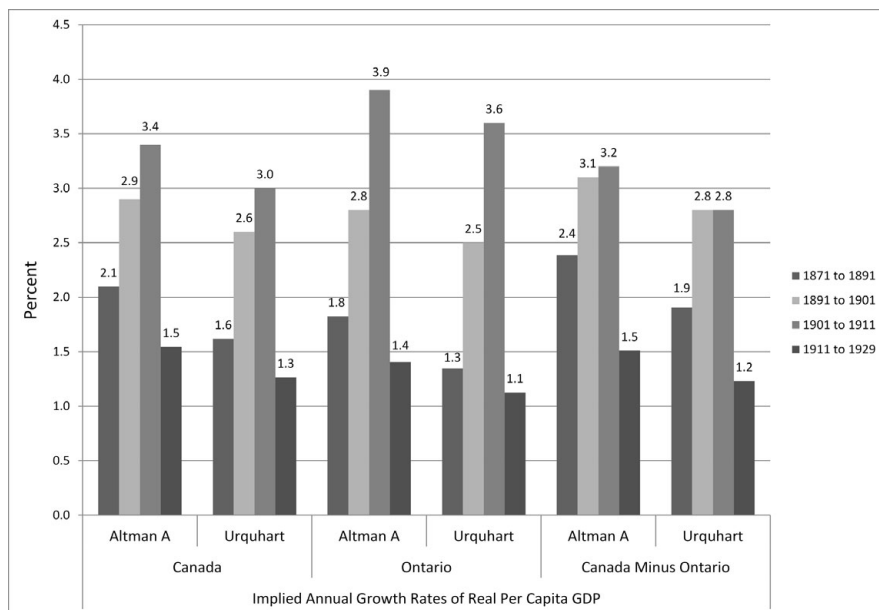


FIGURE 5. *Implied annual growth rates of real per capita GDP, Canada and Ontario, 1871–1929.*

Source: Author's calculations from Urquhart (1993) and Altman (1992).

1891 and 1901 Census of Canada.³¹ Detailed wealth information across 16 probate inventory categories is available allowing for estimates of individual net wealth.³² While income and output are often used as indicators of economic growth, wealth and its change over time will be used in this article as an indicator of economic growth

in 1790. For further details on probate and the construction of these data sets, see Di Matteo (1997, 2001, 2008, 2016).

31. There are 7,156 decedents with 3,515 from 1892 and 3,641 from 1902. For 1892, a total of 4,925 estates were taken down of which 4,236 were traceable and 3,515 successfully traced for a success rate of 83 percent. For 1902, a total of 4,969 estates were taken down of which 4,233 were traceable and 3,646 successfully traced for a success rate of 86 percent. Five of these traced individuals from 1902 did not have age recorded and therefore for analysis, the final number for 1902 is 3,641. Sources for the data set were: (1) Public Archives of Ontario, Surrogate Court Wills, 1892, 1902 and (2) Public Archives of Canada, Census of Canada, 1891, 1901 Manuscripts. Details on the construction of the data and probate as a data source are available in Di Matteo (2008).

32. The inventory categories were (1) household goods and furniture, (2) farm implements, (3) stock in trade, (4) horses, (5) cattle, (6) sheep and swine, (7) book debts and promissory notes, (8) moneys secured by mortgage, (9) life insurance, (10) bank stocks and other shares, (11) securities, (12) cash on hand, (13) cash in bank, (14) farm produce, (15) real estate, and (16) other personal property. Probate data suffers from biases as it reflects individuals of a higher socioeconomic and often older age distribution. When studying the wealth holding of the general population, an attempt can be made to adjust the data for potential biases using the estate multiplier technique. See Siddiq and Gwyn (1991: 103–17), and Di Matteo and George (1992: 453–83).

TABLE 1. *Summary statistics for key characteristics, 1892 and 1902 combined*

| | <i>All Decedents</i> | <i>Top 1 %</i> | <i>Bottom 1 %</i> |
|--|----------------------|----------------|-------------------|
| Proportion Male | 0.73 | 0.90 | 0.60 |
| Average Age in Years | 61.5 | 68.1 | 49.4 |
| Proportion Urban | 0.44 | 0.92 | 0.64 |
| Proportion Farmer | 0.44 | 0.07 | 0.14 |
| Average No. of Children | 3.08 | 3.95 | 1.58 |
| Proportion Canadian Born | 0.45 | 0.34 | 0.51 |
| Proportion Married | 0.60 | 0.64 | 0.42 |
| Proportion Single | 0.12 | 0.05 | 0.28 |
| Proportion Anglican | 0.19 | 0.30 | 0.25 |
| Proportion Catholic | 0.11 | 0.11 | 0.13 |
| Proportion Literate | 0.92 | 0.99 | 0.90 |
| Proportion of Wealth in Land | 0.46 | 0.31 | 0.01 |
| Proportion of Wealth in Financial Assets | 0.38 | 0.58 | 0.44 |
| Proportion from Golden Horseshoe | 0.22 | 0.55 | 0.26 |

and performance. Wealth is a stock while income is a flow, and both can be indicators of material welfare that economic growth generally improves over time.

Table 1 presents summary statistics for all decedents as well as the top and bottom 1 percent and reveals the decedents were mainly male, largely Canadian born, married, and quite literate. The top 1 percent was overwhelmingly male. Indeed, 90 percent were men. As well, the top 1 percent were clustered in the Golden Horseshoe³³ region around the Western end of Lake Ontario with 55 percent of them from this region. Overall, only 21 percent of decedents were from the Golden Horseshoe and only 73 percent were male. In contrast, 59 percent of the bottom 1 percent was female and 26 percent are from the Golden Horseshoe. As well, the average age at death of the top 1 percent on wealth holders was 68 while for the bottom 1 percent it was 49 reinforcing the adage that the poor, like the good, die young.

Table 2 provides a description of the distribution of wealth separately for 1892 and 1902 as well as average wealth using a division employed by Piketty (2014: 237–70) into top, middle, and bottom portions. Average wealth declines for each component of the distribution across the two years. Meanwhile, the wealth share held by the bottom and middle of the distribution grows while that held by the top declines suggesting a relationship between poor growth and greater equality.

Between 1892 and 1902, the average wealth of the top 1 percent of the distribution dropped from \$194,397 to \$148,958 and its share of total wealth fell from 26.1 to 23.3 percent. The share of the next 9 percent also dropped slightly between these two years while the share of the remaining 90 percent of the wealth distribution rose. Between 1892 and 1902, the wealth share of the middle 40 percent rose from 32.8 to 35.8 percent while that of the bottom half rose from 8.8 to 9.1 percent.

33. The Golden Horseshoe is defined as the counties of Wentworth, Lincoln, Welland, Peel, Halton, and York.

TABLE 2. *Wealth distribution and average wealth*

| | <i>Wealth Share (%)</i> | | <i>Average Wealth (\$)</i> | |
|----------------|-------------------------|-------------|----------------------------|-------------|
| | <i>1892</i> | <i>1902</i> | <i>1892</i> | <i>1902</i> |
| Top 10 Percent | 58.36 | 55.15 | 43,283 | 34,943 |
| Top 1% | 26.06 | 23.25 | 194,397 | 148,958 |
| Next 9% | 32.3 | 31.9 | 26,598 | 22,430 |
| Middle 40% | 32.8 | 35.77 | 6,091 | 5,667 |
| Bottom 50% | 8.84 | 9.08 | 1,313 | 1,150 |
| Bottom 1% | 0.01 | 0.01 | 48 | 39 |

It should be noted that Ontario had a more equitable wealth distribution relative to other nineteenth-century jurisdictions.³⁴ While the link between slower economic performance and growth and greater equality is the focus of this article, it is worth noting other potential factors resulting in a more equitable wealth distribution. An additional reason may simply be the rural and agricultural nature of Ontario's economy. In 1851, 86 percent of Ontarians were rural residents and largely employed in the agricultural sector. While the rural share of the population declined during the nineteenth century, it was still significant with the crossover period occurring between 1901 and 1911. In 1901, 57 percent of Ontarians were rural whereas by the 1911 census, 48 percent of Ontarians were rural.³⁵

There is evidence supporting greater wealth equality in jurisdictions with economies rooted in farming and agriculture. For example, throughout the period 1870 to 1930, wealth inequality was less pronounced in the agricultural frontier of Manitoba relative to that of industrializing Ontario with higher rates of land ownership and greater farm employment as key factors in the difference (Di Matteo 2012). This suggests that in a manner akin to other rural farming jurisdictions, Ontario may have been a region in the nineteenth century that afforded a reasonable standard of living to people of relatively modest means even if it meant they were in the lower end of the wealth distribution.³⁶

34. It is useful to benchmark Ontario's wealth inequality with international comparisons. A comparison of the wealth share of the top 1 percent in Ontario in the 1892 and 1902 data set with five other countries compiled by Ohlsson et al. (2008) and Roine and Waldenström (2014) for the period stretching from the late 1860s to the early 1920s finds that compared to these other countries, Ontario was more egalitarian with respect to wealth distribution. Whereas Ontario's wealth share held by the top 1 percent ranged from 26.1 to 23.3 percent, the United Kingdom ranged from 61.1 to 69.0 percent, France from 47.1 to 57.7 percent, Sweden from 53.5 to 51.5 percent, Norway from 36.0 to 37.2 percent, and the United States was at 38.1 percent. See also Shanahan (2001: 58), Shanahan and Corell (1997, 2000) and Hora (2012) for other international comparisons.

35. Source: Statistics Canada, Population, Urban and Rural by Province, 1851–2011, www.statcan.gc.ca/tables-tableaux/sum-som/101/cst01/demo62a-eng.htm.

36. In a sense, this could be seen as a "Jeffersonian" vision of a rural society of stout yeoman. E.g., southeastern Pennsylvania in the eighteenth century was a rural society with growing inequality and yet a large proportion of the population could be characterized as neither rich nor poor. See Lemon (1972).

Another possibility is that this probate wealth data set is simply marked by extremely bad luck in that extremely wealthy Ontarians did not have their estates probated in either 1892 or 1902. A limited search of the Canadian Dictionary of Biography (www.biographi.ca/en/index.php) was done to see if any additional evidence could be uncovered on Ontario's wealth elite with the purpose of seeing if very wealthy individuals had somehow escaped probate. A search was done using Volume XII, which covers the period 1891 to 1900 for males in central Ontario using the key words of *business*, *energy*, and *resources*. The results yielded 47 individuals, many with multiple business interests.

Of these, 28 percent report activity in transportation and utilities, 26 percent in resources, 6 percent in banking or finance, 28 percent in trade and commerce including retail, merchant activities, or real estate while 19 percent were manufacturers and 9 percent publishers. Nine of these individuals reported an estimate of business value while 10 had an estimate of the value of their estates at death.

The average reported value of business was \$355,644 ranging from a low of \$30,000 to a high of \$835,800 dollars. The average estate value reported was \$373,069 ranging from a low of \$28,697 to a high of 2.2 million dollars. Based on these values, these individuals were indeed on average wealthier than the top 1 percent reported in the Ontario 1892 and 1902 probate records but still none of them could be classified as being in the same league as the wealthiest Americans during this time period. Even the wealthiest of them—Hart Massey, the farm implement manufacturer—who dies in 1896 with an estate valued at 2.2 million dollars, almost double the wealth of the wealthiest Ontarian in the probate data set—pales in comparison with the wealth of American robber barons.³⁷

Economic Performance and Inequality in Ontario: An Analysis

The 1892 and 1902 microdata are used to construct county-level inequality measures and variables as defined in [table 3](#). In 1892, average county wealth ranged from a minimum of \$2,415 to a maximum of \$18,556 while in 1902 the range was from \$2,508 to \$17,241. The value of the Gini coefficient³⁸ ranged from 0.459 to 0.818 in 1892 and from 0.425 to 0.839 in 1902. Average wealth in this entire data set fell from \$7,427 to \$6,334 between 1892 and 1902 or 14.7 percent. This was accompanied by a fall in the Gini coefficient of inequality from 0.687 to 0.670.

There were also substantial regional fluctuations in average wealth and inequality in Ontario counties between 1892 and 1902. Average wealth was highest in York

Lemon documents how the average farmer was able to produce sufficient output to provide for a family while generating a marketable surplus thereby generating a reasonably high level of material welfare as demonstrated through home consumption.

37. Railroad magnate George Pullman, e.g., who died in 1897, was estimated to have died with a fortune of more than \$75 million. See "The Wealthiest Americans Ever," *New York Times*, July 15, 2007.

38. The Gini coefficient takes on a value between 0 and 1 with 0 as perfect equality and 1 as perfect inequality. See Cowell (1977) and Cowell and Flacheire (2007).

TABLE 3. *Variables used in regression analysis*

| <i>Variable</i> | <i>Definition</i> |
|-------------------------------------|--|
| Gini coefficient | Gini coefficient of inequality for county/district. |
| Theil coefficient | Theil coefficient of inequality for county/district. |
| Average wealth | Total wealth of county/district probated decedents divided by number of decedents. |
| Average age | Average age of probated decedents in county/district. |
| Proportion aged 30–49 | Proportion of probated decedents in county/district aged 30–49 years. |
| Proportion male | Proportion of probated decedents in county/district who were male. |
| Proportion farmer | Proportion of probated decedents who were employed as farmers. |
| Proportion skilled trades | Proportion of probated decedents in county/district who were in skilled trades defined as Katz Occupational Category III. ^a |
| Proportion urban | Proportion of probated decedents in county/district who were urban dwellers. ^b |
| Proportion Canadian born | Proportion of probated decedents in county/district who were Canadian born. |
| Proportion Roman Catholic | Proportion of probated decedents in county/district who were Roman Catholic. |
| Proportion Presbyterian | Proportion of probated decedents in county/district who were Presbyterian. |
| Average ratio of real estate wealth | Average ratio of real estate to wealth for probated decedents in county/district. |
| Average stock ownership proportion | Proportion of probated decedents who reported ownership of stocks and shares. |
| Average number of children | Average number of children per probated decedents in county/district. |
| Proportion widows/widowers | Proportion of decedents in county/district who were widows or widowers. |
| Proportion single | Proportion of probated decedents in county/district who were unmarried. |
| Proportion literate | Proportion of county/district probated decedents who were literate (could read/write according to census). |
| Manufacturing output per capita | Value of census manufacturing output divided by census population in county/district. |
| Eastern ^c | 1 if an Eastern Ontario county/district, 0 otherwise. |
| Western | 1 if an Western Ontario county/district, 0 otherwise. |
| Northern | 1 if a Northern Ontario county/district, 0 otherwise. |
| Huronia | 1 if county/district in Huronia/0 otherwise. |
| Golden Horseshoe | 1 if county/district in Golden Horseshoe, 0 otherwise. |
| Year 1902 | 1 if observation from 1902, 0 otherwise. |

^aThese are socioeconomic occupational status categories with OCC1 as the highest, OCC5 as the lowest, and OCC6 as an unclassifiable (see Katz 1975: 343–48). Category OCC1, for example, contains lawyers, merchants, doctors, etc. Categories OCC2F includes farmers, while OCC2NF contains minor government officials and small businessmen. Category OCC3 includes skilled tradesmen, such as blacksmiths, while OCC4 contains barbers and restaurant workers. Category OCC5 is mainly unskilled labor, while OCC6 is unclassifiable. OCC6 contains mainly women.⁷

^b*Urban* is defined as a resident of a city, town, or village.

^cThe counties in each of the regional dummies are as follows: NORTHERN: Renfrew, Districts of Muskoka and Parry Sound, Sudbury-Nipissing, Algoma, Manitoulin, Kenora and Rainy River, and Thunder Bay; GOLDEN HORSESHOE: Wentworth, Lincoln, Welland, Peel, Halton, and York; WESTERN: Haldimand, Norfolk, Elgin, Kent, Essex, Lambton, Middlesex, Oxford, and Brant; HURONIA: Waterloo, Perth, Huron, Wellington, Bruce, Grey, Simcoe, and Dufferin; EASTERN: Ontario, Victoria and Haliburton, Durham and Northumberland, Peterborough, Hastings, Prince Edward, Lennox and Addington, Frontenac, Leeds-Grenville, Dundas-Glenagary-Stormont, Oprescott and Russell, and Carleton and Lanark.⁷

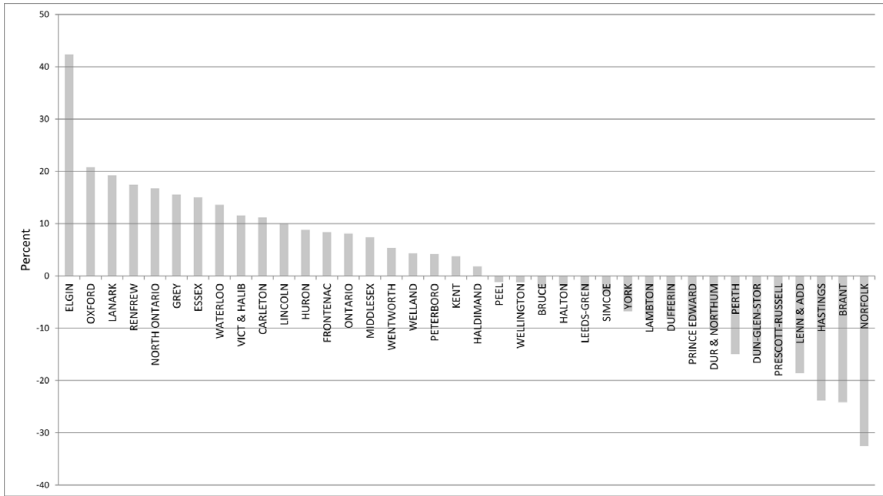


FIGURE 6. Percent change in Gini coefficients, Ontario counties, 1892–1902.

County (Toronto area) in 1892 at \$18,556 but then declined by 50 percent to reach \$9,225 in 1902. In 1902, average wealth was the highest in Carleton County (Ottawa area) and here wealth was up 65 percent from \$10,483 in 1892. Inequality was also highest in York in 1892 but the value of its Gini fell 6.8 percent by 1902. In 1902, inequality was highest in Carleton County with the value of its Gini up 11.2 percent over 1892.

Between 1892 and 1902, wealth inequality fell in 18 counties and grew in the remainder as shown in figure 6. This raises the concern as to whether such large swings are reasonable.³⁹ It should be noted that along with being a period of economic change and industrialization, the 1890s also saw a major recession early on which inevitably could have differential effects across the province and be a factor in swings in both average wealth and inequality across counties. For example, Darroch (1983: 44–45) notes a decline in assessed property values in Toronto between 1892 and 1902, which he attributes to an inflation in real estate values during the 1880s that was ended by the recession in 1891.

There appears to be a strong correlation between changes in average wealth and inequality in these counties between 1892 and 1902 as shown in figure 7, which plots the relationship between the percent change in the value of the Gini coefficient and the percent change in average wealth for these counties between 1892 and 1902. While this evidence suggests a relationship between growing wealth and rising inequality,

39. In terms of percentage changes, the range is from 42.3 percent to -32.6 percent over a 10-year period. It should be noted that other researchers have also found large swings in inequality over time even using national level data. Banerjee and Dufo (2003: table 2) note over five-year periods for countries in the Deininger and Squire data set with percentage changes in the Gini coefficient ranging from increases of 11.0 percent and declines of 9.3 percent.

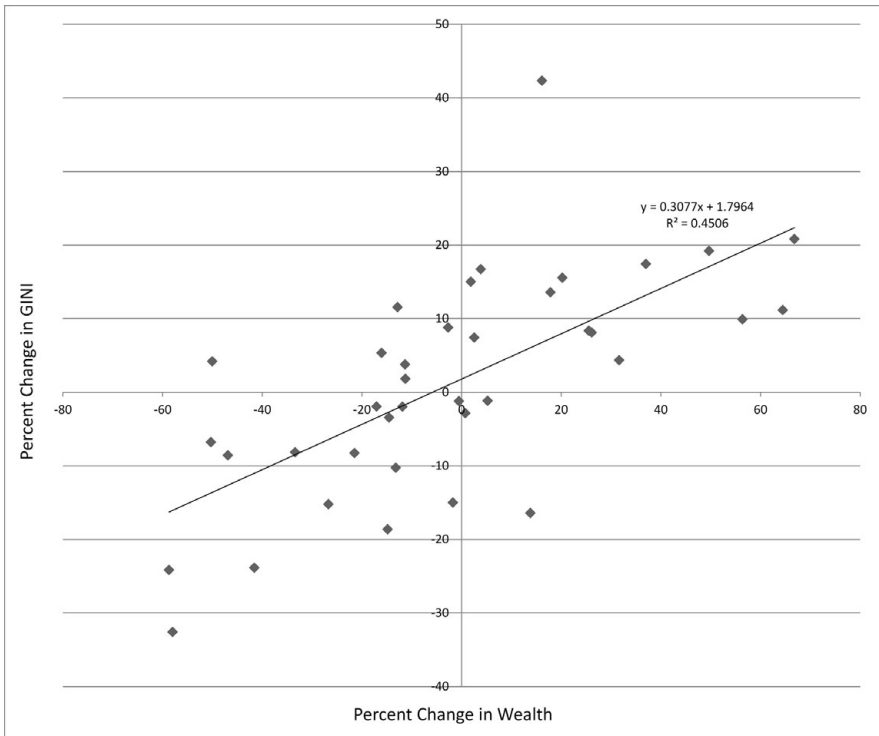


FIGURE 7. Relationship between inequality and average county wealth changes.

it is also useful to see if the relationship is sufficiently robust when age or gender are accounted for.

Figures 8 and 9 plot the relationship between changes in county wealth and inequality for individuals aged less than 60 and then for males. Given the high average age of probate data as well as the predominance of males in the data, adjusting for age or sex is useful to see if the relationship between wealth and inequality emerges for a younger subset of the data given that wealth generally rises with age or if only males are considered. Figures 8 and 9 also show a strong positive correlation between county changes in average wealth and inequality even when these subcategories of data are used.

When examining the relationship between economic performance and inequality, it is also important to control for confounding factors in a more rigorous fashion. Regression analysis is used next to examine the determinants of changing wealth inequality in these county divisions of Ontario between 1892 and 1902. The difference in value between 1902 and 1892 (1902 value minus 1892 value) in Gini and Theil

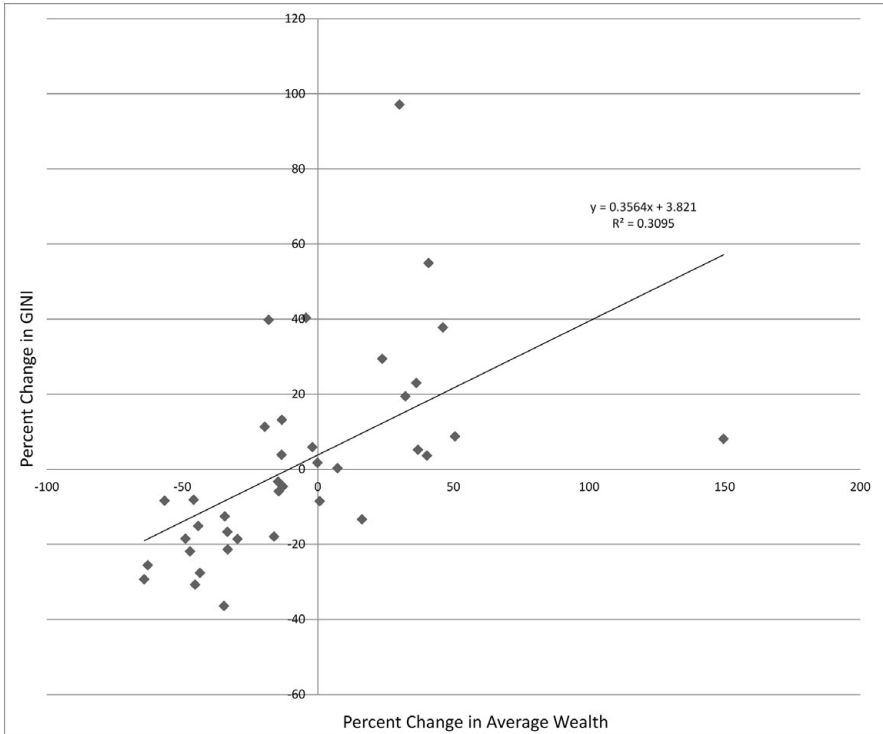


FIGURE 8. Relationship between inequality changes and wealth changes: Population aged less than 60 years.

coefficients⁴⁰ is regressed on the difference in average wealth as well as differences in other economic, demographic, and social characteristics to take the broader determinants of inequality into consideration. These additional variables include average age, proportion male, proportion urban dweller, the number of children, marital status (county proportion of spouse deceased or single), and religion (county proportion who are Roman Catholic or Presbyterian).

Roman Catholics and Presbyterians were included as opposed to Anglicans or Baptists or Methodists because of their inheritance practices. Di Matteo (2016) shows that wealth inequality was positively related to the presence of impartible estate division and inversely related to more partible division. Di Matteo (2016) also shows that in late-nineteenth-century Ontario, Roman Catholics were significantly more likely to engage in impartible estate division and Presbyterians in partible estate division.

40. The Theil coefficient uses information theory to interpret individuals as events and their wealth share as probability and then proceeds to construct an index. It ranges from 0 to infinity with larger values being associated with greater degrees of inequality. See Cowell (1977).

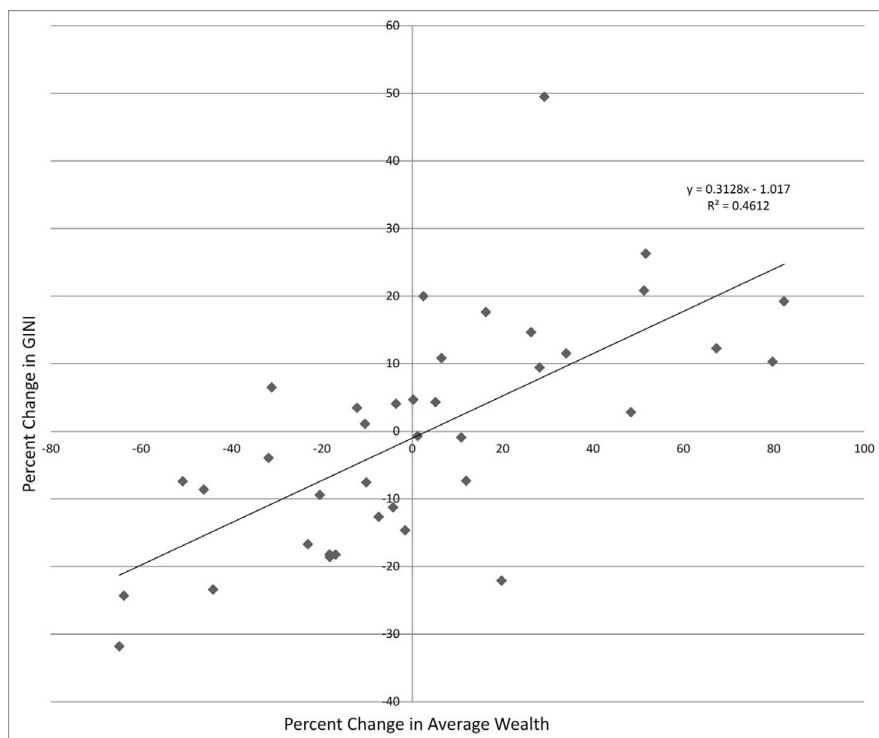


FIGURE 9. *Relationship between inequality changes and wealth changes: Males only.*

Additional variables include regional dummies (with the Golden Horseshoe as the omitted category), portfolio variables (the ratio of average real estate to average wealth and the proportion reporting ownership of stocks and shares), a literacy variable, an age-distribution variable defined as the proportion between ages 30 and 49,⁴¹ farm occupation, and a skilled trades variable to capture the potential effects of skills deepening on inequality changes. As well, the value of inequality in 1892 is included as to provide an estimate of the change in inequality against the initial level of inequality.

Furthermore, an industrial output variable is included to capture any effects on inequality of industrialization. It is defined as the per capita county value of

41. Attack and Bateman (1981) and Gallman (1978) suggest that because wealth does rise with age, the larger the proportion of young people in a society, the more wealth inequality there would be. A mature age demographic has been associated with a reduction in inequality. Higgins and Williamson (2002) finds that the relative size of the “mature” population cohort between ages 40 and 59 had a negative and significant impact on inequality. The definition of *mature* in this article differs from that used by Williamson, but it is based on preliminary plots of the data showing the proportion aged 30 to 49 associated with lower Gini coefficients. Davies (1996) also argues the relationship between age structure and inequality can be u-shaped.

manufacturing production as provided in the 1891 and 1901 Census of Canada. While the value of manufacturing output (and wealth) is in nominal rather than real dollars, inflation adjusting is of little consequence between these two years.⁴² Manufacturing and industrialization were important features of the economy in late-nineteenth-century Canada with manufacturing's share of GDP at more than 20 percent making manufacturing output a reasonable indicator for industrial output as well as a good correlate for total GDP (see Urquhart 1993). It should also be noted that this manufacturing output variable provides a measure of current output and can therefore be considered as another economic growth variable.

These variables are defined in table 3 and the results presented in table 4. The regressions are estimated using ordinary least squares (OLS) and all significances are reported at the 5 percent level (from t-statistics) unless otherwise specified. The estimates are for both Gini and Theil coefficients and are done for all the variables as well as a parsed subset of the most significant variables from the first regression.⁴³ The presence of a high r-squared and numerous insignificant variables in the full specification suggested that multicollinearity was a problem and therefore a parsed specification was run that dropped the least significant variables.

Furthermore, given that probated decedents were more likely to be older and male, an effort was made to adjust the data using age-sex specific mortality multipliers.⁴⁴ Regressions were done using weighted OLS⁴⁵ with the county average inverse of the age-sex specific mortality rate⁴⁶ used to weight the regression data. The mortality rates used are from historic life-tables constructed for Canada by Bourbeau and Légaré (1982). One can treat each probated decedent as a household head and then multiply each decedent by the inverse of his or her age-sex specific mortality rate.⁴⁷ The average value of this "multiplier" was calculated for each county and used as the weight and

42. According to Green and Urquhart (1987: 183), the value of the implicit price index (1900 = 100) was 104 in both 1892 and 1902.

43. Inequality indices can be sensitive to the presence of outliers as well as the size of tails in a distribution and therefore using several measures is a good practice. See Cowell and Flachaire (2007).

44. When constructing historical wealth distributions, such an approach is often used to adjust probate data to consider the living population. The estate multiplier technique is a method by which the probated estates of those dying in a particular year can be used as a sample of the population still alive at that time. If it can be assumed that the age and sex of those dying in a given year are representative of the living population, you can then "blow up" the estate data by a mortality multiplier equal to the reciprocal of the mortality rate. See Atkinson and Harrison (1978).

45. Suppose our initial model is $W_i = Z_i' B + v_i$ where W_i is wealth, Z_i is the independent variable, B is the coefficient to be estimated, and v_i is the error term. If we define the inverse of the mortality rate as a multiplier M_i , then each observation W_i, Z_i is replicated M_i times. The weighted least squares estimator is obtained by applying OLS to the transformed model: $M_i^{1/2} W_i = M_i^{1/2} Z_i' B + v_i$.

46. Bourbeau-Légaré's (1982) mortality rates are available for every five years—e.g., males aged 5, 10, 15, 20, 25. For the purposes of assigning the mortality rates, the death rate for males aged 20 was assigned to males in the data set aged 17.6 to 22.5 years, for males aged 25 to those between the ages 22.6 to 27.5, etc.

47. E.g., suppose that there is a 25-year-old male decedent with \$1,000 in reported wealth and the age-sex specific mortality multiplier is 5 deaths per 1,000 for individuals his age. The estate multiplier technique would say that there are 200 such individuals each with wealth of \$1,000.

TABLE 4. Regression results for changes in wealth inequality from 1892 to 1902

| | Full Specification | | Parsed Specification | |
|---|---------------------------|----------------------------|---------------------------|----------------------------|
| | Δ Gini Coefficient | Δ Theil Coefficient | Δ Gini Coefficient | Δ Theil Coefficient |
| Δ Average wealth | 0.00001 | 0.00008 | 0.00001 | 0.00008 |
| Δ Average age | -0.00594 | -0.05063 | | |
| Δ Proportion aged 30–49 | -0.57707 | -2.77376 | -0.65704 | -2.46302 |
| Δ Proportion male | 0.17416 | 0.30463 | | |
| Δ Proportion farmer | -0.40638 | -2.04801 | -0.33374 | -1.80093 |
| Δ Proportion skilled trades | 0.43520 | 0.27648 | 0.38128 | 0.22444 |
| Δ Proportion urban | 0.06546 | 0.19899 | | |
| Δ Proportion Canadian born | -0.05345 | -0.48304 | | |
| Δ Proportion Roman Catholic | -0.20991 | -1.34320 | | |
| Δ Proportion Presbyterian | 0.18974 | 0.42380 | | |
| Δ Average ratio of real estate wealth | -0.00805 | 0.30327 | | |
| Δ Average stock ownership proportion | -0.20284 | -1.56345 | | |
| Δ Average number of children | 0.03579 | 0.06744 | | |
| Δ Proportion widows/widowers | 0.10895 | 0.50807 | | |
| Δ Proportion single | 0.34352 | 0.87208 | | |
| Δ Proportion literate | -0.18527 | -0.01914 | | |
| Δ Value of manufacturing output per capita | 0.00034 | 0.00231 | 0.00043 | 0.00158 |
| Gini coefficient in 1892 | -0.47318 | | -0.36171 | |
| Theil coefficient in 1892 | | -0.24331 | | -0.18139 |
| Eastern | -0.05828 | -0.12925 | -0.03091 | -0.04520 |
| Western | -0.05586 | -0.17762 | -0.03215 | -0.12234 |
| Northern | -0.05055 | -0.06673 | -0.03602 | 0.04967 |
| Huronian | -0.07163 | -0.17759 | -0.06183 | -0.18006 |
| Constant | 0.37069 | 0.47943 | 0.24596 | 0.18282 |
| n | 38 | 38 | 38 | 38 |
| F-statistic | 3.05 | 4.14 | 8.15 | 9.34 |
| Adjusted R ² | 0.5493 | 0.6514 | 0.6589 | 0.6927 |

^aBold denotes significant at 5 percent level. Bold italic denotes significant at 10 percent level.

placed a higher weight on the younger individuals in the data set in an attempt to make it more reflective of the age distribution of the general population. These results are presented in table 5.

The parsed results for both the unweighted and weighted regressions provide strong support for changes in wealth, the proportion employed as farmers and age structure as being the key factors driving the changes in wealth inequality across these counties between 1892 and 1902. The proportion employed in skilled trades and the value of manufacturing output per capita also seems to have had a positive effect on inequality but they are not very significant. All other things given, there was also a decline in inequality from 1892 and the Huronia region appears to have exhibited significantly less inequality relative to the Golden Horseshoe. However, the significance of the variables varies depending on whether Gini or Theil measures of inequality are used.

TABLE 5. *Weighted regression results for changes in wealth inequality from 1892 to 1902*

Dependent Variable: Change in value of inequality measure
Weighting Variable: County average inverse of the age-sex specific mortality rate
Estimation Technique: Ordinary least squares^a

| | <i>Full Specification</i> | | <i>Parsed Specification</i> | |
|--|---------------------------|----------------------------|-----------------------------|----------------------------|
| | <i>Δ Gini Coefficient</i> | <i>Δ Theil Coefficient</i> | <i>Δ Gini Coefficient</i> | <i>Δ Theil Coefficient</i> |
| Δ Average wealth | 0.00001 | 0.00008 | 0.00001 | 0.00008 |
| Δ Average age | -0.00578 | -0.05161 | | |
| Δ Proportion aged 30–49 | -0.59993 | -2.84428 | -0.68164 | -2.54862 |
| Δ Proportion male | 0.20068 | 0.35783 | | |
| Δ Proportion farmer | -0.45634 | -2.21052 | -0.36794 | -2.00058 |
| Δ Proportion skilled trades | 0.43027 | 0.23434 | 0.37051 | 0.04899 |
| Δ Proportion urban | 0.05841 | 0.19060 | | |
| Δ Proportion Canadian born | -0.02668 | -0.41541 | | |
| Δ Proportion Roman Catholic | -0.26475 | -1.50212 | | |
| Δ Proportion Presbyterian | 0.18453 | 0.38908 | | |
| Δ Average ratio of real estate wealth | 0.00202 | 0.34666 | | |
| Δ Average stock ownership proportion | -0.23217 | -1.66160 | | |
| Δ Average number of children | 0.03592 | 0.06769 | | |
| Δ Proportion widows/widowers | 0.13625 | 0.60623 | | |
| Δ Proportion single | 0.34055 | 0.87241 | | |
| Δ Proportion literate | -0.18372 | -0.00520 | | |
| Δ Value of manufacturing output per capita | 0.00034 | 0.00228 | 0.00037 | 0.00145 |
| Gini coefficient in 1892 | -0.47067 | | -0.33249 | |
| Theil coefficient in 1892 | | -0.22655 | | -0.12096 |
| Eastern | -0.06022 | -0.13109 | -0.03194 | -0.04460 |
| Western | -0.05664 | -0.17828 | -0.03222 | -0.12028 |
| Northern | -0.05063 | -0.07615 | -0.04583 | -0.01492 |
| Huronian | -0.07025 | -0.16375 | -0.05888 | -0.15770 |
| Constant | 0.36836 | 0.46299 | 0.22696 | 0.12612 |
| n | 38 | 38 | 38 | 38 |
| F-statistic | 3.13 | 4.44 | 8.20 | 9.34 |
| Adjusted R ² | 0.5593 | 0.6716 | 0.6604 | 0.6926 |

^aBold denotes significant at 5 percent level. Bold italic denotes significant at 10 percent level.

The most consistently significant variables at the 5 percent level across all the specifications are the change in average wealth (*Δ Average Wealth*) and the change in the proportion of population aged 30 to 49 (*Δ Proportion aged 30–49*).⁴⁸ However, increases in the proportion employed in skilled trades and the per capita value of manufacturing output both had a positive effect on inequality while increases in the proportion employed as farmers had a negative effect on inequality.

Wealth inequality in late-nineteenth-century Ontario was indeed related to changes in economic performance especially as measured by changes in wealth. Between 1892

48. Specifications were also run using changes in county median wealth and yield similar results. Also, regressions were also run using county Gini coefficients constructed for males only as well as only for individuals aged less than 60 years of age. The results for males closely paralleled those reported here. As for those aged less than 60 years of age, the results were less significant.

and 1902, increases in wealth were associated with increases in the value of inequality coefficients while decreases in wealth were associated with a fall in inequality. This result represents an exception to the pessimistic Piketty prognosis that slower economic growth, albeit combined with a rate of return to capital greater than the rate of economic growth, is associated with greater inequality.

Of course, an additional question is what the rate of return to capital was in nineteenth-century Ontario. Given that Canada was a small open economy, the return to wealth in Canada and Ontario could not have deviated from international norms given the flow of foreign investment into Canada for railway transportation and resource development projects.

On a global level, Piketty places the historical pure rate of return to capital (pretax) at rates between 4 and 5 percent (Piketty 2014: 354). Even estimates of the private rate of return to capital-intensive projects like the Great Western or Grand Trunk railroad in Ontario in the 1850s and 1860s range from 1.71 to 5.20 percent (Carlos and Lewis 1992: 413). The return on capital “*r*” would certainly have exceeded the growth rate of the economy “*g*” even in slow-growing Ontario and yet inequality diminished during the period of this study in contrast to the Piketty prognosis.

Conclusion

There is debate whether long-term economic growth, development, and industrialization reduced or increased inequality during the course of the nineteenth century with much of the evidence based on international data comparisons. However, comparisons of inequality using international data either in the present or the past are often fraught with measurement and coverage issues. The use of a region with common institutions and data-gathering processes, as is the case with these nineteenth-century Ontario probate records, represents a unique opportunity to control for many of the data issues that face current and past international inequality comparisons.

Ontario’s late-nineteenth-century wealth, like other jurisdictions around the world, was marked by inequality in wealth holding. Over the period 1892 to 1902, the top 1 percent of the wealth distribution in Ontario owned 25 percent of the total wealth. Moreover, over the course of this period, the wealth share of both the top 1 percent and 10 percent of the wealth distribution declined. As well, this was accompanied by a fall in the Gini coefficient of inequality from 0.687 to 0.670.

Wealth inequality as measured by Gini and Theil coefficients diminished in Ontario between 1892 and 1902 but there was substantial regional fluctuation. Between 1892 and 1902, wealth inequality fell in 18 of the 38 counties/district divisions employed in this study and grew in the remainder. However, there was a strong correlation between changes in average wealth and inequality in these counties after confounding factors were controlled for. Over the period 1892 to 1902 at the county level, declining wealth inequality was generally accompanied by slower economic performance and growth as measured by changes in wealth levels over time after controlling for other factors.

Ontario's poor economic performance during the latter years of the nineteenth century may be an explanation as to why its wealth inequality was somewhat muted relative to other faster-growing jurisdictions. Nevertheless, this appears to place Ontario as an exception to the prognosis of lower economic growth being accompanied by rising economic inequality. In the case of Ontario, the price of greater equality was less robust economic growth, and Ontario's more egalitarian distribution was therefore a mixed blessing. Future regional-based studies using other countries would be useful contributions in further delineating the relationship between economic growth and inequality.

References

- Aghion, Philippe, Eve Caroli, and Cecilia García-Peñalosa (1999) "Inequality and economic growth: The perspective of the new growth theories." *Journal of Economic Literature* 37 (4): 1615–60.
- Alesina, Alberto, and Roberto Perotti (1996) "Income distribution, political instability, and investment." *European Economic Review* 40 (6): 1203–28.
- Alesina, Alberto, and Dani Rodrik (1994) "Distributive politics and economic growth." *The Quarterly Journal of Economics* 109 (2): 465–90.
- Altman, Morris (1987) "A revision of Canadian economic growth: 1870–1910 (a challenge to the gradualist interpretation)." *Canadian Journal of Economics* 20 (1): 86–113.
- (1992) "Revised real Canadian GNP estimates and Canadian economic growth, 1870–1926." *Review of Income and Wealth, Series 38*, 4 (December): 455–73.
- Ankli, Robert (1980) "The growth of the Canadian economy, 1896–1920: Export led and/or neoclassical growth." *Explorations in Economic History* 17 (3): 251–74.
- Ashton, Thomas S. (1948) *The Industrial Revolution, 1760–1830*. London: Oxford University Press.
- Atack, Jeremy, and Fred Bateman (1981) "Egalitarianism, inequality, and age: The rural north in 1860." *Journal of Economic History* 41 (1): 85–93.
- Atkinson, Anthony B., and Alan J. Harrison (1978) "Wealth," in W. F. Maunders (ed.) *Reviews of United Kingdom Statistical Sources: Volume 6*. Oxford: Economic and Social Research Council.
- Banerjee, Abhijit V., and Esther Duflo (2003) "Inequality and growth: What can the data say?" *Journal of Economic Growth* 8 (3): 267–99.
- Barro, Robert J. (2000) "Inequality and growth in a panel of countries." *Journal of Economic Growth* 5 (1): 5–32.
- (2008). "Inequality and growth revisited." ADB Working Paper Series on Regional Economic Integration, No. 11, hdl.handle.net/11540/1762.
- Baskerville, Peter (1999) "Women and investment in late nineteenth century urban Canada: Victoria and Hamilton, 1880–1901." *Canadian Historical Review* 80 (2): 191–218.
- Benabou, Roland (2000) "Unequal societies: Income distribution and the social contract." *American Economic Review* 90 (1): 96–129.
- Bolton, Charles S. (1982) "Inequality on the southern frontier: Arkansas County in the Arkansas Territory." *The Arkansas Historical Quarterly* 41 (1): 51–66.
- Bouchard, Gerard (1998) "Economic inequalities in Saguenay Society, 1879–1949: A descriptive analysis." *Canadian Historical Review* 79 (4): 660–90.
- Bourbeau, Robert, and Jaques Légaré (1982) *Evolution de la mortalité au Canada et au Québec 1831–1931*. Montreal: Presses de l'Université de Montreal.
- Buckley, Kenneth (1955) *Capital Formation in Canada, 1896–1930*. Toronto: University of Toronto Press.
- Burchell, Robert A. (1987) "Opportunity and the frontier: Wealth-holding in twenty-six northern California counties 1848–1880." *The Western Historical Quarterly* 18 (2): 177–96.

- Canaday, Neil (2008) "The accumulation of property by southern blacks and whites: Individual-level evidence from a South Carolina cotton county, 1910–1919." *Explorations in Economic History* 45 (1): 51–75.
- Carlos, Ann, and Frank Lewis (1992) "The profitability of early Canadian railroads: Evidence from the Grand Trunk and Great Western railway companies," in C. Goldin and H. Rockoff (eds.) *Strategic Factors in Nineteenth Century American Economic History: A Volume to Honor Robert W. Fogel*. Chicago: University of Chicago Press: 401–26.
- Castello-Climent, Amparo (2010). "Inequality and growth in advanced economies: an empirical investigation." *Journal of Economic Inequality* 8 (3): 293–321.
- Clay, Karen, and Randall Jones (2008) "Migrating to riches? Evidence from the California Gold Rush." *Journal of Economic History* 68 (4): 997–1027.
- Cowell, Frank A. (1977) *Measuring Inequality: Techniques for the Social Sciences*. New York: Halsted Press, John Wiley and Sons.
- Cowell, Frank A., and Emmanuel Flachaire (2007) "Income distribution and inequality measurement: The problem of extreme values." *Journal of Econometrics* 141 (2): 1044–72.
- Dahlby, Bev, and Ergete Ferede (2013) *Income Inequality, Redistribution and Economic Growth*. SPP Research Paper 6:25, School of Public Policy, University of Calgary.
- Darroch, Gordon (1983) "Early industrialization and inequality in Toronto, 1861–1899." *Labour/Le Travailleur* 11 (Spring): 31–61.
- Darroch, Gordon, and Lee Soltow (1994) *Property and Inequality in Victorian Ontario Structural Patterns and Cultural Communities in the 1871 Census*. Toronto: University of Toronto Press.
- Davies, James (1996) "Wealth inequality and age." Research Report 9613, Department of Economics, University of Western Ontario.
- Deaton, Angus (2013) *The Great Escape: Health, Wealth and the Origins of Inequality*. Princeton, NJ: Princeton University Press.
- Di Matteo, Livio (1997) "The determinants of wealth and asset holding in nineteenth-century Canada: Evidence from microdata." *The Journal of Economic History* 57 (4): 907–34.
- (2001) "Patterns of inequality in late 19th century Ontario: Evidence from census-linked probate data." *Social Science History* 25 (3): 347–80.
- (2008) "Wealth accumulation motives: Evidence from the probate records of Ontario, 1892 and 1902." *Cliometrica* 2 (July): 143–71.
- (2012) "Land and inequality in Canada, 1870–1930," *Scandinavian Economic History Review* 60 (3): 309–34.
- (2016) "All equal in the sight of God: Economic inequality and religion in the early twentieth century." *European Review of Economic History* 20 (1): 23–45.
- Di Matteo, Livio, and Peter George (1992) "Canadian wealth inequality in the late nineteenth century: A study of Wentworth County, Ontario, 1872–1902." *Canadian Historical Review* 73 (4) 453–83.
- Drummond, Ian M. (1987) *Progress without Planning: The Economic History of Ontario from Confederation to the Second World War*. Toronto: University of Toronto Press.
- Escosura, Leandro P. De La (2008) "Inequality, poverty and the Kuznets curve in Spain, 1850–2000." *European Review of Economic History* 12 (3): 287–324.
- Fernandez, Eva (2014) "Trust, religion and cooperation in western agriculture, 1880–1930." *Economic History Review* 67 (3): 678–98.
- Ferrie, Joseph (1994) "The wealth accumulation of antebellum European Immigrants to the U.S., 1840–1860." *Journal of Economic History* 54 (1): 1–33.
- Forbes, Kristin J. (2000) "A reassessment of the relationship between inequality and growth." *American Economic Review* 90 (4): 869–87.
- Galenson, David W., and Clayne L. Pope (1989) "Economic and geographic mobility on the farming frontier: Evidence from Appanoose County, Iowa, 1850–1870." *Journal of Economic History* 49 (3): 635–55.
- Gallman, Robert E. (1978) "Professor Pessen on the 'egalitarian myth.'" *Social Science History* 2 (2): 194–207.

- Galt, Margaret (1983) "Wealth and income in New Zealand c. 1870 to c. 1939." PhD diss., Victoria University of Wellington.
- Green, Alan G. (1967) "Regional aspects of Canada's economic growth, 1890–1929." *The Canadian Journal of Economics* 33 (2): 232–45.
- (1968/69) "Regional inequality, structural change, and economic growth in Canada." *Economic Development and Cultural Change* 17 (4): 567–83.
- (1971) *Regional Aspects of Canadian Economic Growth*. Toronto: University of Toronto Press.
- Green, Alan G., and Malcom C. Urquhart (1987) "New estimates of output growth in Canada: Measurement and interpretation," in D. McCalla (ed.) *Perspectives on Canadian Economic History*. Toronto: Copp Clark: 182–99.
- (1994) "New estimates of output growth in Canada: Measurement and Interpretation," in D. McCalla and M. Huberman (eds.) *Perspectives on Canadian Economic History*, 2nd ed. Toronto: Copp Clark Longman Ltd.: 158–75.
- Green, Alan G., Mary MacKinnon, and Chris Minns (2002) "Dominion or republic? Migrants to North America from the United Kingdom, 1870–1910." *Economic History Review* 55 (4): 666–96.
- Greenwood, Daphne T. (1987) "Age, income, and household size: Their relation to wealth distribution in the United States," in Edward N. Wolff (ed.) *International Comparisons of the Distribution of Household Wealth*. New York: Oxford University Press: 121–40.
- Gregson, Mary E. (1996) "Wealth accumulation and distribution in the Midwest in the late nineteenth century." *Explorations in Economic History* 33 (4): 524–38.
- Gwyn, Julian, and Fazley K. Siddiq (1992) "Wealth distribution in Nova Scotia during the Confederation Era, 1851 and 1871." *Canadian Historical Review* 73 (4): 435–52.
- Herscovici, Steve (1993) "The distribution of wealth in nineteenth century Boston: Inequality among natives and immigrants, 1860." *Explorations in Economic History* 30 (3): 321–35.
- Higgins, Matthew, and Jeffrey G. Williamson (2002) "Explaining inequality the world round: Cohort size, Kuznets curves, and openness." *Southeast Asian Studies* 40 (3): 268–302.
- Hora, Roy (2012) "Argentina's top fortunes, 1750s–1940s." Paper prepared for presentation at the World Economic History Association Meetings, Stellenbosch, South Africa, July 9–13.
- Huberman, M. (2004) "Working hours of the World Unite? New international evidence of worktime, 1870–1913." *Journal of Economic History* 64 (4): 964–1001.
- Inwood, Kris, and J. Chamard (1986) "Regional industrial growth during the 1890s: The case of missing artisans." *Acadiensis* 16 (1): 101–16.
- (1998) "Extending the Green hypothesis: Regional aspects of Canada's economic growth 1870–90." Paper presented at the conference *Regions in Canadian Growth: A Gathering in Honour of Alan G. Green*, Queen's University, Kingston, March 6–7.
- Inwood, Kris, and Jim Irwin (2002) "Land, income and regional inequality: New estimates of provincial income and growth in Canada, 1871–1891." *Acadiensis* 31 (2): 157–84.
- Jackson, G. E. (1923) "Emigration of Canadians to the United States," in *Annals of the American Academy of Political and Social Science*, 107, *Social and Economic Conditions in the Dominion of Canada*: 25–34.
- Johnston, Louis, and Samuel H. Williamson (2016) "The annual real and nominal GDP for the United States, 1790–2014." *Measuring Worth*, www.measuringworth.com/usgdp/.
- Jones, Alice H. (1980) *Wealth of a nation to be: The American colonies on the eve of the revolution*. New York: Columbia Press.
- (1984) "Wealth and growth of the thirteen colonies: Some implications." *Journal of Economic History* 44 (2): 239–54.
- Kaldor, Nicholas (1957) "A model of economic growth." *Economic Journal* 67 (268): 591–624.
- Keay, Ian (2000a) "Scapegoats or responsive entrepreneurs: Canadian manufacturers, 1907–1990." *Explorations in Economic History* 37 (3): 217–40.
- (2000b) "Canadian manufacturers' relative productivity performance, 1907–1990." *Canadian Journal of Economics* 33 (4): 1049–68.
- Khan, Zorina (2005) *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790–1920*. Cambridge: Cambridge University Press.

- King, W. I. (1915) *The Wealth and Income of the People of the United States*. New York: MacMillan.
- Kuznets, Simon (1955) "Economic growth and income inequality." *American Economic Review* 45 (1): 1–28.
- (1966) *Modern Economic Growth Rate, Structure and Spread*. New Haven, CT: Yale University Press.
- Lemon, James T. (1972) *The Best Poor Man's Country: A Geographical Study of Early Southeastern Pennsylvania*. Baltimore: John Hopkins Press.
- Lindert, Peter H. (1986) "Unequal English wealth since 1670." *Journal of Political Economy* 94 (6): 1127–62.
- (1991) "Toward a comparative history of income and wealth," in Y. S. Brenner, H. Kaelble, and M. Thomas (eds.) *Income Distribution in Historical Perspective*. Cambridge: Cambridge University Press: 212–31.
- Lindert, Peter H., and Jeffrey G. Williamson (1985) "Growth, equality and history." *Explorations in Economic History* 22 (4): 341–77.
- (2016) *Unequal Gains: American Growth and Inequality since 1700*. Princeton, NJ: Princeton University Press.
- Magee, Lonnie, John B. Burbidge, and A. Les Robb (1991) "Computing kernel-smoothed conditional quantiles from many observations." *Journal of the American Statistical Association* 86 (415): 673–77.
- Main, Gloria L. (1975) "Probate records as a source for early American history." *William and Mary Quarterly*, 3rd ser. 32 (1): 89–99.
- (1977) "Inequality in early America: The evidence from probate records of Massachusetts and Maryland." *Journal of interdisciplinary History* 8 (4): 559–81.
- McAloon, James (2002) *No Idle Rich: The Wealthy in Canterbury and Otago 1840–1914*. Dunedin, NZ: University of Otago Press.
- McInnis, Marvin (2007) "Canadian economic development in the wheat boom era: A reassessment." Queen's University Economics Department. Mimeo.
- McLean, Ian W. (2004) "Australian economic growth in historical perspective." *The Economic Record* 80 (250): 330–45.
- Milanovic, Branko, Peter H. Lindert and Jeffrey G. Williamson (2010) "Pre-industrial inequality." *The Economic Journal* 121 (March): 255–72.
- Minns, Chris (2000) "Income, cohort effects and occupational mobility: A new look at immigration to the United States at the turn of the 20th century." *Explorations in Economic History* 37 (4): 326–50.
- Newell, William H. (1980) "The wealth of testators and its distribution: Butler County Ohio, 1803–65," in James D. Smith (ed.) *Modelling the Distribution and Intergenerational Transmission of Wealth*. NBER Studies in Income and Wealth. Vol. 46. Chicago: University of Chicago Press: 95–138.
- (1986) "Inheritance on the maturing frontier: Butler County Ohio, 1803–1865," in S. L. Engerman and R. E. Gallman (eds.) *Long-Term Factors in American Economic Growth*. NBER Studies in Income and Wealth. Vol. 51. Chicago: University of Chicago Press: 261–303.
- Officer, Lawrence H. (2016) "What was the U.K. GDP then?" *Measuring Worth*, <http://www.measuringworth.com/ukgdp/>.
- Ohlsson, Henry, Jesper Roine, and Daniel Waldenstrom (2008) "Long-run changes in the concentration of wealth: An overview of recent findings," in J. B. Davis (ed.) *Personal Wealth from a Global Perspective*. Oxford: Oxford University Press: 42–63.
- Osberg, Lars, and Fazley K. Siddiq (1988) "The inequality of wealth in Britain's North American Colonies: The importance of the relatively poor." *Review of Income and Wealth*, Series 34 (2): 143–63.
- (1992) "The acquisition of wealth in Nova Scotia in the late nineteenth century," in E. N. Wolff (ed.) *Research in Economic Inequality* 4 (December): 181–202.
- Owens, Alastair, David R. Green, Craig Bailey, and Alison C. Kay (2006) "A measure of worth: Probate valuations, personal wealth and indebtedness in England, 1810–40." *Historical Research* 79 (205): 383–403.
- Perotti, Roberto (1993). "Political equilibrium, income distribution and economic growth." *Review of Economic Studies* 60 (4): 755–76.

- Persson, Torsten, and Guido Tabellini (1994) "Is inequality harmful for growth?" *American Economic Review* 84 (3): 600–21.
- Piketty, Thomas (2014) *Capital in the 21st Century*. Cambridge, MA: Harvard University Press.
- Pope, Clayne L. (1980) "Household wealth in a settlement economy: Utah, 1850–1870." *Journal of Economic History* 40 (3): 477–96.
- Roine, Jesper, and Daniel Waldenstrom (2014) "Long run trends in the distribution of income and wealth." Uppsala Center for Fiscal Studies, Working Paper 5.
- Rubinstein, William D. (1977) "The Victorian middle classes: Wealth, occupation and geography." *Economic History Review* 30 (4): 602–23.
- (1979) "The distribution of personal wealth in Victoria 1860–1974." *Australian Economic History Review* 19: 26–41.
- (1987) "The Victorian middle classes: Wealth, occupation and geography," in W. D. Rubinstein (ed.) *Elites and the Wealthy in Modern British History: Essays in Social and Economic History*. Sussex, UK, and New York: The Harvester Press: x–383.
- (1988) "The size and distribution of the English middle classes in 1860." *Historical Research* 61 (144): 65–89.
- Ruggles, Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek (2010) *Integrated Public Use Microdata Series: Version 5.0* [machine-readable data set]. Minneapolis: University of Minnesota.
- Shanahan, Martin P. (2001) "Personal wealth in South Australia." *Journal of Interdisciplinary History* 32 (1): 55–80.
- Shanahan, Martin P., and Margaret Correll (1997) "In search of Kuznet's curve: A reexamination of the distribution of wealth in the United States between 1650 and 1950." Paper presented at the Third World Congress of Cliometrics, Munich, July 10–13.
- (2000) "How much more unequal? Consistent estimates of the distribution of wealth in the United States between 1774 and 1860." *Journal of Income Distribution* 9 (1): 27–37.
- Shorrocks, Anthony F. (1975a) "The age-wealth relationship: A cross-section and cohort analysis." *Review of Economics and Statistics* 57 (2): 155–63.
- (1975b) "On stochastic models of size distribution." *Review of Economic Studies* 42 (4): 631–41.
- Siddiq, Fazley K. (1988) "The size distribution of probate wealthholdings in Nova Scotia in the late 19th century." *Acadiensis* 18 (1): 136–47.
- Siddiq, Fazley K., and Julian Gwyn (1991) "The importance of probate inventories in estimating the distribution of wealth." *Nova Scotia Historical Review* 11 (1): 103–17.
- Soltow, Lee (1975) *Men and Wealth in the United States 1850–1870*. New Haven, CT: Yale University Press.
- (1979) "Inequality amidst abundance: Land ownership in early 19th century Ohio." *Ohio History* 88 (2): 133–51.
- (1989) *Distribution of Wealth and Income in the United States in 1798*. Pittsburgh: University of Pittsburgh Press.
- Statistics Canada (1999) *Historical Statistics of Canada*. 11-516-X, www.statcan.gc.ca/pub/11-516-x/sectiona/4147436-eng.htm.
- Steckel, Richard H. (1990) "Poverty and prosperity: A longitudinal study of wealth accumulation, 1850–1860." *Review of Economics and Statistics* 72 (2): 275–85.
- Steckel, Richard H., and Carolyn M. Moehling (2001) "Rising inequality: Trends in the distribution of wealth in industrializing New England." *Journal of Economic History* 61 (1): 160–83.
- Stewart, J. I. (2006) "Migration to the agricultural frontier and wealth accumulation, 1860–1870." *Explorations in Economic History* 43 (4): 547–77.
- Stewart, James I. (2009) "Economic opportunity or hardship? The causes of geographic mobility on the agricultural frontier." *The Journal of Economic History* 69 (1): 238–68.
- Stiglitz, Joseph (2012) *The Price of Inequality*. New York: W. W. Norton.
- Urquhart, Malcolm C. (1993) *Gross National Product, Canada 1870–1926*. Kingston and Montreal: McGill-Queen's University Press.

- Vedder, Richard K., and Lowell E. Gallaway (1970) "Settlement patterns of Canadian emigrants to the United States, 1850–1960." *Canadian Journal of Economics* 3 (3): 476–86.
- Walker, Thomas R. (2000) "Economic opportunity on the urban frontier: Wealth and nativity in early San Francisco." *Explorations in Economic History* 37 (3): 258–77.
- Williamson, Jeffrey G. (1965) "Regional inequality and the process of national development." *Economic Development and Cultural Change* 13 (4, part 2): 1–84.
- (1996) "Globalization and inequality then and now: The late 19th and late 20th centuries compared." National Bureau of Economic Research, Working Paper 5491.
- (1998) "Growth, distribution and demography: Some lessons from history." *Explorations in Economic History* 35 (3): 241–71.
- Williamson, Jeffrey G., and Peter H. Lindert (1980) *American Inequality: A Macroeconomic History*. New York: Academic Press.
- Wolff, Edward N. (1991) "The distribution of household wealth: Methodological issues, time trends, and cross-sectional comparisons," in L. Osberg (ed.) *Economic Inequality and Poverty: International Perspectives*. New York: M. E. Sharpe: 92–133.