

THE ACQUISITION OF WEALTH IN NOVA SCOTIA IN THE LATE NINETEENTH CENTURY

Lars Osberg and Fazley Siddiq

ABSTRACT

This paper uses probate records from 1871 and 1899 to estimate the distribution of personal wealth and to analyze the process of wealth acquisition. Wealth inequality in 1871 was considerably greater than it is currently. The data are consistent with a Schumpeterian model of uneven development, where the gains from a boom are highly sector specific, with no necessary tendency to general prosperity. A boom in ocean shipping and shipbuilding in Nova Scotia enabled merchants, by 1871, to accumulate substantial wealth over the life cycle, but this wealth was greatly diminished by the turn of the century. Farmers and other occupational groups did not accumulate wealth over the life cycle.

Research in Economic Inequality, Vol. 4, pages 181–202.
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ISBN: 1-55938-591-X

I. INTRODUCTION

In thinking about economic development, Joseph Schumpeter (1934) emphasized the unevenness and discontinuity of the entrepreneurial process which generates capitalist economic development. A combination of local resources and entrepreneurial energy may produce a surge of profits in a particular sector. However, this prosperity does not generalize to the local economy as a whole unless the expanding sector has substantial local linkages or unless the local economy happens to possess other profitable opportunities for the investment of profits. In general, the role of capital markets is to channel investment to expanding sectors, *wherever* they might be.

Between the 1840s and the 1870s the oceangoing commerce of Nova Scotia expanded dramatically. The shipbuilding industry expanded its production from an average annual tonnage for the 1840s of 24,551 to 51,362 in the 1870s with a peak of 84,810 tons launched in 1875 (Saunders, 1939, p. 110).¹ Substantial fortunes were made in the West Indies trade and in general carrying, as well as in shipbuilding, and the period has passed into local renown as an era of "wooden ships and iron men."

The popular perception of Nova Scotia in the third quarter of the nineteenth century is of a golden era of generalized prosperity, shortly to be undermined by restriction of access to the American market due to the abrogation of the Reciprocity Treaty by the United States in 1866 and union with the Province of Canada in 1867. During the twentieth century, rural Nova Scotia has been characterized by chronic unemployment and emigration, while the relative prosperity of urban areas has been a pale imitation of general Canadian trends.

In Osberg and Siddiq (1993), we argue that other sectors were not particularly prosperous and that the period just before Confederation was in fact marked by increasing inequality in Nova Scotia. Halifax merchant capital grew increasingly prosperous while rural agriculture sank into depression, as farmers expanded onto increasingly marginal acreage and the terms of trade moved against agriculture (see also Gwyn, 1988, 1991). In this paper, we want to emphasize that the prosperity of mid-nineteenth-century Nova Scotia was highly sector specific and fairly transitory. Estate data on individual wealth do not reveal a generalized prosperity in 1870, and by the turn of the century few large fortunes remained in Nova Scotia. This paper therefore builds on our previous paper (Osberg and Siddiq, 1988) by examining the processes underlying inequality in the distribution of wealth in Nova Scotia in the late nineteenth century.

Appendix A presents the details of our calculations of the distribution of wealth in Nova Scotia, while Section II summarizes some of the facts about the distribution of wealth which any plausible theory of wealth acquisition must explain. Section III argues that a theory of the acquisition of wealth, in order to be relevant to the historical evidence, must recognize the qualitative differences between the acquisition of wealth in small-scale agriculture and in urban merchant capital. Since most

Nova Scotian agriculture was a subsistence activity, with no tendency to wealth accumulation over time, the accumulation of wealth was limited to the urban merchant classes. This capital was highly mobile. There is little evidence that it remained in Nova Scotia. In this, as in other respects, the general picture of nineteenth-century Nova Scotia is rather similar to that of the twentieth.

II. THE DISTRIBUTION OF WEALTH IN NOVA SCOTIA IN 1871

Table 1 presents our estimates of the distribution of wealth in Nova Scotia in 1871 based on the estate multiplier methodology. (For details, see Appendix A.) Table 1 also compares the inequality of the wealth distribution in 1871 with more recent

Table 1. Inequality of Wealth
(Percentage shares of net worth among family units)

	<i>Nova Scotia 1871^a</i>			<i>Canada^b</i>	<i>Canada—S.C.F.^c</i>		
	<i>MAX</i>	<i>MIN</i>	<i>BEST</i>	<i>1970</i> <i>(Davies)</i>	<i>1970</i>	<i>1977</i>	<i>1984</i>
Share of top							
1%	41.0	37.9	39.2	19.6	18.0		
5%	74.6	69.4	71.9	43.4	39.2		
Decile shares							
10 Top	83.5	78.1	80.9	58.0	53.3	50.7	51.3
9	9.7	9.7	10.0	16.0	17.6	17.6	17.5
8	4.8	5.2	5.4		11.8	12.1	11.6
7	2.1	2.7	2.8		8.3	8.6	8.2
6	0.1	0.9	0.8	25.8	5.4	5.9	5.7
5	0.0	0.7	0.1		3.0	3.5	3.6
4	0.0	0.7	0.02		1.3	1.6	1.8
3	0.0	0.7	0.02		0.3	0.5	0.6
2	0.0	0.7	0.02	0.2	0.0	0.1	0.1
1 Bottom	-0.2	0.7	0.02		-0.1	-0.6	-0.4
Gini coefficient	0.91	0.84	0.89	0.75	0.72	0.69	0.69
Coefficient of variation	4.90	4.51	4.68	2.52	2.32		
Theil	2.33	1.99	2.19				
Atkinson ($\epsilon = 0.5$)	0.79	0.62	0.74				
Mean (per family unit) \$	3,045.49	3,345.34	3,231.68	27,600	18,189	46,273	85,344
Mean (per capita) \$	540.36	593.57	573.40	7,423	5,375	15,905	31,354
Median (family unit) (\$)	0.0	227.46	16.44	11,000	7,575	21,754	39,876

Note: Wealth = net value of marketable assets.

^aSource: Siddiq (1986, pp. 144–147). MAX = maximum inequality; MIN = minimum inequality; BEST = best guess.

^bSource: Davies (1979, p. 255). Based on adjustments to the 1970 Survey of Consumer Finance.

^cSource: (Oja, 1986; Davies, 1979, p. 239). Based on unadjusted Survey of Consumer Finance data.

Table 2. Wealth Inequality in Nova Scotia

	1871 Weighted Data		1871 Unweighted Data		1899 Unweighted Data	
	Commercial Class	Agricultural Class	Commercial Class	Agricultural Class	Commercial Class	Agricultural Class
Tenth decile (richest 10)	55.75	26.69	55.39	32.65	71.76	37.81
Top quintile (richest 20%)	80.29	41.61	78.67	49.08	84.63	55.82
Fourth quintile	15.65	23.04	14.14	22.10	10.67	19.75
Third quintile	1.98	18.69	4.41	14.67	3.84	12.31
Second quintile	1.80	11.24	2.14	9.45	1.74	8.20
Bottom quintile	0.28	5.42	0.64	4.70	-0.88	3.92
Mean (in current \$)	19,769.86	2,279.64	17,621.04	2,306.75	13,937.05	2,209.89
Mean (in 1989 \$)	293,412.40	33,833.05	261,520.90	34,235.40	239,598.44	37,991.27
Median (in current \$)	4,004.80	1,962.83	3,836.07	1,643.96	2,713.59	1,393.14
Median (in 1989 \$)	59,436.81	29,131.20	56,932.65	24,398.67	46,650.61	23,950.05
Coefficient of variation	2.01	0.68	1.98	0.95	3.49	1.16
Gini coefficient	0.72	0.35	0.71	0.44	0.79	0.39
Atkinson's index ($\epsilon = 0.5$)	0.45	0.12	0.43	0.16	0.54	0.19
Theil's Index	1.04	0.22	1.01	0.33	1.55	0.43

Note: The Gini coefficient, Atkinson's index, and Theil's index were computed using nonnegative wealth holdings only.

estimates of wealth inequality among Canadian households.² In aggregate, the distribution of wealth was highly concentrated in Nova Scotia in 1871, either compared to the concentration of wealth that we observe in more recent statistics, or to that we observe in 1850/1852.³

In this paper, we make use of the fact that during the nineteenth century, the estate papers of probated decedents almost invariably recorded the occupation of deceased individuals. As a result, we can compare the distribution of wealth within and between social classes. Table 2 presents estimates of wealth inequality among the two main wealth-holding classes in Nova Scotia in the late nineteenth century. We can label these as "commercial" and "agriculture,"⁴ and Table 2 presents the "weighted" distribution of wealth among probated decedents (where each individual decedent is weighted by the reciprocal of their age-sex specific mortality probability) as well as unweighted data on the distribution of probated estates (in order that we may compare the distribution of estates in 1871 and in 1899).⁵

However, whether we look directly at the distribution of probated estates or whether we reweight probated wealth to reflect the age distribution of the living population, it is very clear from Table 2 that the farming population of Nova Scotia had a great deal less wealth, on average, than the commercial class. It is also clear that wealth inequality within the commercial class was very significantly greater than wealth inequality among farmers.

Table 3. Wealth Holding of the Commercial Class

	<i>Merchants</i>	<i>Gentlemen</i>	<i>Others</i>
(1871) (Unweighted data)			
Mean	\$37,117.33	\$3,707.43	\$7,775.55
Coefficient of variation	1.37	0.80	1.75
Sample size	23	11	30
(1899) (Unweighted data)			
Mean	\$11,494.21	\$34,177.78	\$3,142.78
Coefficient of variation	1.62	2.65	1.79
Sample size	21	18	29

Table 3 disaggregates the “commercial class” into its three distinct components. There is no modern-day equivalent to the occupation of “gentleman,” and there were relatively few of them in Nova Scotia in 1871, but they are an analytically important group, as they might be thought to correspond to the rentier element. From the details of their assets (e.g., the preponderance of private libraries) those who died in 1871 may well have been private scholars, or even clergymen. There may have been a tendency in a relatively isolated colony such as Nova Scotia for the really affluent to want to spend their idle years in England.⁶ If so, and if as a result we observe in the data only those gentlemen who could not afford to retire to a county seat in England, the relatively low wealth of Nova Scotia gentlemen in 1871 may be an early example of self-selection bias in economic measurement.

In the “others” category of the commercial class we include those individuals who listed a specific occupation which required some capital and some employed labor (usually as “helper”). Examples are brewer, butcher, blacksmith, contractor, grocer, hotel keeper, miller, shopkeeper, shipbuilder, trader. On average, this group is much poorer than “merchants,” but the richest are as well off as some merchants. However, we take the self-definition of occupation to indicate that their capital was specific to a particular line of business and that their own labor was employed in that line of business.

By contrast, the term *merchant* implies a mobility of capital between alternative ventures. In 1871, Nova Scotia was still in the period of prosperity of “wooden ships and iron men,” which was to last until the 1880s—a prosperity which was in large measure based on trading with the West Indies, the United States, and the United Kingdom. Syndicated ventures spread the risks involved in sea voyages, and Halifax-based banks grew to prominence.⁷ Halifax-based merchants were, on average, very prosperous and the richest were very wealthy indeed.⁸ Although the dividing line is, at the margin, a matter of judgment, it appears to us reasonable to

Table 4. Occupational Distribution in Nova Scotia and Canada, 1871

	<i>Nova Scotia (%)</i>		<i>Canada (%)</i>	
Agricultural class ^a	49,769	41.9	479,512	47.5
Commercial class ^b	13,531	11.4	75,201	7.4
Domestic class	6,755	5.7	60,104	6.0
Industrial class	34,547	29.1	212,080	21.1
Professional class	4,151	3.5	39,144	3.9
Not classified	9,892	8.3	143,079	14.2
Farmers	49,644	41.8	476,922	47.2
Merchants	1,828	1.5	13,446	1.3
Total	118,645	100.0	1,009,848	100.0

Notes: ^aIncludes farmers.

^bIncludes merchants.

Source: *Census of Canada, 1871*, Vol. 2, pp. 337, 344–345.

label “merchants” as “bourgeoisie” and “others” as “petty bourgeoisie.” It also appears from Table 3 as if the merchants of one generation are often the gentlemen of the next.

Although farmers and agricultural laborers had significantly less wealth than members of the commercial class, they did have more assets than the urban working class. As Table 4 indicates, one-third of household heads were recorded in the 1871 census as being members of the industrial or domestic class of workers, but these occupations rarely appear in probate records. As we have argued elsewhere (Osberg and Siddiq, 1988) there is every reason to believe that nonprobated decedents in Nova Scotia in the late nineteenth century were primarily the poor, who escaped the probate process because they had no significant assets whose transfer of title had to be legally recognized.

Although the working class appeared to possess virtually nothing by way of marketable assets at any age, farmers in Nova Scotia in the nineteenth century left land, buildings, and agricultural implements to their heirs. Nevertheless, the 1871 data show little tendency for farmers to accumulate wealth over their own lifetimes.⁹ Table 5 presents an ordinary least square regression of the value of probated wealth as a function of the age of decedents, controlling for county of residence. If, on average, farmers accumulated wealth over their lifetimes, one would expect older decedents to possess more wealth at the time of their death than younger decedents. However, there is no statistically significant association between age at death and individual wealth among Nova Scotia farmers.

We have experimented with a variety of specifications of the age/wealth relationship for farmers. A quadratic specification which enters AGE and AGE² as regressors would be consistent with the life-cycle savings model of asset accumulation

Table 5. Age, Locality, and Wealth in 1871

	β_0	β_1	β_2	\bar{R}^2	<i>N</i>	<i>F</i>
A. Farmers	6.885 (4.6)	0.139 (.39)	-0.02 (-0.07)	-0.021	87	0.079
B. Merchants	0.356 (0.08)	2.196 (1.99)	1.866 (2.89)	0.43	18	7.49
C. Gentlemen	2.076 (0.54)	1.402 (1.50)	0.382 (0.59)	0.04	9	1.15
D. Other commercial	-12.05 (2.55)	-0.887 (-0.77)	-0.229 (-0.36)	-0.07	22	0.31

Notes: $\ln \text{Wealth} = \beta_0 + \beta_1 \ln(\text{Age}) + \beta_2 (\text{Halifax}) + \epsilon$.

T-statistic in parentheses. Halifax = 0 if estate probated outside Halifax county, = 1 if estate probated in Halifax.

while young and productive followed by dissaving while retired, if AGE entered positively and AGE² entered negatively. However, both AGE and AGE² are statistically insignificant. The double log specification presented in Table 5 is consistent with a picture of continuous, but slowing, asset accumulation—which is in turn consistent with a “target-bequest” motive for savings.¹⁰

By contrast with farmers, there is a statistically significant positive association between individual wealth and age at death among merchants. Line B of Table 5 implies that the wealth of an average merchant (aged 51.6 years) was increasing at 4.26% per annum. Of course, as Table 2 indicated, inequality among businessmen was very substantial; but, on average, merchants seem to have had a positive savings rate.

In short, in our opinion, a plausible discussion of the distribution of wealth in Nova Scotia in the 1870s should recognize that (1) merchants and other businessmen had significantly greater average wealth, accompanied by greater inequality of wealth, than other occupational groups; (2) farmers were, on average, relatively poor, with little dispersion in wealth around a low mean; (3) the working class had few, if any, marketable assets; (4) merchants tended to acquire wealth over the life cycle, but (5) farmers and other occupational groups did not accumulate wealth as they aged.

III. WEALTH INEQUALITY BY OCCUPATION

A. The Farm Population

It is really not too surprising that the wealth of farmers did not increase with age since farming in Nova Scotia in the 1870s was, on the whole, a subsistence activity. For some decades previously, Nova Scotia agriculture had been in decline. The

mainstay of the economy was agriculture, and there is little evidence of its prosperity in this period.¹¹ A great deal of land was cleared, but little of it could support the families responsible. The lowly egg was the only significant new export commodity, while the main agricultural export items—livestock and butter—actually declined when measured in per capita terms between 1851 and 1871. On the whole, Nova Scotia's farmers were less able to feed the population in 1871 than in 1851. This period was also characterized by the ready availability of cheap imports of provisions from Prince Edward Island, the Canadas, and the United States. The province had a surplus of poor farmers on marginal land; and they formed part of the emigration tide, as no adequate industrial base had developed in Nova Scotia to keep them at home.

The population was 277,000 according to the 1851 census and 388,000 in 1871, an annual growth of about 1.7%, most of this from natural increase, as there was little immigration to the province in these years. Rather, the province suffered from emigration to New Brunswick and Ontario but especially to the United States. This tide of emigration decreased only in years of low unemployment.

The 1840s had been largely years of depression and economic setback for Nova Scotia. The 1850s were seen as a more prosperous era, even though there is little that is memorable from Nova Scotia's economic standpoint. There were about four or five relatively prosperous years in the interval 1850–1871, all associated with war-induced inflation through heightened international demand. The economic downturn developed from 1865 onward, was halted only briefly in the early 1870s, before the economy again stagnated and then actually contracted.

Osberg and Siddiq (1993) indicate that although farmers did accumulate some wealth over their lifetimes in 1850/1852, such accumulation was, on average, very modest. Gwyn (1988, p. 204) presents data on food imports and exports which demonstrate that the province substantially increased its import of flour and cereals between 1832 and 1853. Copp (1967, p. 82) suggests that the province had not produced enough food for its inhabitants since the eighteenth century. Table 6 presents some data on the characteristics of Nova Scotia agriculture as revealed in the 1871 and 1881 censuses. [To put things in context, we include also comparable data from the 1986 census.]

The 1870s were a period of high natural population growth in Nova Scotia, with 11,645 births recorded in 1871 (approximately equal to 3% of the population). Because deaths in 1871 numbered 4,818, less than half the number of births, and the proportion was approximately the same in 1881, the natural rate of increase in the Nova Scotia population (before net migration) was over 1.5% per annum. Families were, on average, rather large: 5.6 persons per family.

In looking at the population/land ratio, the total acreage of Nova Scotia farms is a bit misleading, since the technology of the nineteenth century meant that a substantial fraction of acreage had to be kept in woodlot to supply fuel and other wood products. In 1871 the average Nova Scotia farm had only 17.1 acres under crops, falling slightly to 16.9 acres in 1881, or a little over 3 acres of crop land per

Table 6. Agriculture in Nova Scotia

	1871	1881	1986
Total NS population	387,800	440,572	873,180
Farms occupied	46,316	55,873	4,283
Percent owner occupied	94.6%	92.5%	96.8%
Total Farm Acreage	5,031,217	5,396,382	1,029,211
Average acreage—total	108.6	116.5	240.3
Improved	35.1	33.7	91.0
Under crops	17.1	16.9	63.2
Number of farms as a percentage of the total number of families	68.3%	70.2%	1.9%
Number of farms by size			
Under 10 acres	7,148	12,471	387
10–50 acres	11,201	13,536	480 ^a
50–100 acres	13,138	14,504	580 ^a
100–200 acres	10,401	10,742	1,000 ^a
Over 200 acres	4,428	4,620	1,840

Note: ^aApproximations based on interpolations to fit 1871/1881 size categories.

Sources: *Census of Canada, 1871*, Table XII, Vol. 3, pp. 100–101.

Census of Canada, 1881, Table XXII, Vol. 3, pp. 114–115.

Census of Canada, 1986, Families, p. 1.

Census of Canada, 1986, Nova Scotia Agriculture, Table 6, pp. 37–44.

family member.¹² Although there is some good farmland in Nova Scotia, and some good weather, the average of both is not high. The hilly, glaciated, topography of Nova Scotia dictates that (with the notable exception of parts of the Annapolis Valley) agriculture land is generally found in discontinuous valley fragments, often of quite limited extent. The growing season is short (May to September). There is no class I agricultural land in Nova Scotia and only 410,000 acres is graded class II.¹³

Furthermore, many farms were substantially below average in size. As Table 6 indicates, almost 40% of Nova Scotia farms in 1871 were under 50 acres in total size. Even if these very small units were cropped somewhat more intensively than larger farms (and there is no evidence of this), it would still not have been possible to eliminate the need for pasture and woodlot to support draft animals and the household need for fuel. And one should note that the increase in the number of farm units between 1871 and 1881 occurred almost entirely in the smallest size categories. The number of farms under 10 acres in size increased between 1871 and 1881 by 5,323, and the number between 10 and 50 acres in total size increased by 2,335. By contrast, the number of large farms of over 200 acres remained virtually constant, increasing only from 4,428 to 4,620. In short, Nova Scotia agriculture in

the 1870s expanded, as a growing population carved out small farms barely capable of sustaining a subsistence existence, but very few farms were of a size which could reasonably be expected to produce a cash surplus that might be available for capital accumulation. In essence, expansion was "at the Ricardian margin" implying (as Ricardo would have predicted), a subsistence life style.¹⁴

Some simple calculations can demonstrate how difficult it would have been for Nova Scotia farmers to save in 1871. Since the estates of the previous generation are the initial capital of the current generation, one can see from Table A1 that 80% of Nova Scotia farmers started with assets less than about \$3,000. Assume that Eq. (1) represents the desired consumption behavior of household i in period t subject to the liquidity constraint of Eq. (2) and the budget constraint of Eq. (3).

$$C_{it} = b_0 + b_1 Y_{it} \quad (1)$$

$$C_{it} \leq Y_{it} + M_{it} \quad (2)$$

$$Y_{it} = w_i L_i + r_i K_i + \varepsilon_i, \quad (3)$$

where Y = total income, wL = earnings, r = rate of return, K = value of assets, ε = random component, M = cash on hand, and C = consumption.

Savings will be positive if $Y_{it} > C_{it}$, but this requires that

$$r > \frac{b_0}{K_i(1 - b_1)} - \frac{w_i L_i}{K_i} - \frac{\varepsilon_i}{K_i}. \quad (4)$$

From the 1871 census (Vol. 3, p. 455) we observe that there were 15,595 "hands employed" in Nova Scotia industry who were paid a total of \$3,176,266, or an average of \$203.67 (if the Urquhart [1983] price series are accepted, this would be equivalent to \$3,022 in 1989 prices).¹⁵ Remembering that the average family had 5.4 people, it is hard to conceive how b_0 could be much less, but even if we assign a value of \$100 and considered K_i to be at the eightieth percentile (i.e., \$3,000), a consumption propensity of $b_1 = 0.9$ means that $b_0/K_i(1 - b_1) = 0.33$.

Taking average industrial earnings as equivalent to $w_i L_i$ and the eightieth percentile value of K_i (both surely overestimates) implies $w_i L_i/K_i = 0.068$. Since, on average, $\varepsilon_i/K_i = 0$, we conclude that the rate of return on agricultural capital would have had to be in excess of 0.265 (= 0.33 - 0.068) for positive capital accumulation to occur. And we would emphasize that lower assumed values of capital (K_i), lower assumed returns to agricultural labor ($w_i L_i$), and a higher assumed cost of subsistence (b_0) would all be *very* reasonable—and would all imply that an even higher rate of return is required to generate positive savings.

At all wealth levels, real estate comprised roughly two-thirds of the value of farmers' estates. In most cases, it is not possible in the estate papers to clearly distinguish between types of personal property—to disentangle cash on hand from the value of other personal property such as home furnishings, cattle, draft animals,

carriages and wagons, or farm implements. However, where explicitly mentioned, cash and other financial assets were very limited in amount. Because, on average, the real estate wealth of farmers was \$1,409 out of a total average wealth of \$2,279, financial wealth could only have been a small fraction of the remaining \$870 of personal property. We therefore conclude that the wealth of farmers was almost entirely comprised of sector-specific real assets.¹⁶

Some models of economic development have discussed the role of rural savings and the possible investment of those savings in urban industry. It is clear that such models are inappropriate for Nova Scotia. There is no evidence that Nova Scotia agriculture generated in 1871 any net savings and plenty of evidence that its capital stock was almost entirely composed of the land, buildings, animals, and equipment necessary for the subsistence support of a rapidly growing farm population.

B. Merchants

By contrast, in 1871 the average net worth of merchants in Nova Scotia was \$38,534.34, nearly 12 times the average net worth (\$3,120.72) of all wealth holders. In the third quarter of the nineteenth century, the shipping business was highly profitable and was expanding rapidly.¹⁷ (In the 1880s shipbuilding declined to 27,605 tons per year.) Sager and Fischer (1979, p. 25) estimated that the annual growth rate of tonnage handled by the port of Halifax was 7.1% between 1860 and 1869 and 4.5% between 1870 and 1875. After 1875, however, tonnage declined by 5.6, 5.8, and 5.2% per annum between 1875 and 1879, 1880 and 1889, and 1890 and 1899, respectively.

The remarkable increase in tonnage in the third quarter of the nineteenth century coincided with an increase in freight rates on the one hand and, on the other, an improvement in the quality of wooden ships, which considerably lowered the rate of depreciation. The result was that between 1867 and 1874 the rate of return to investment in the shipping business was at least 7% a year, according to McClelland (1965). However, Sager and Fischer (1982, p. 144) have argued that McClelland (1965, 1966) overestimated the capital value and underestimated the durability and the expected life span of ships. Reestimating McClelland's mean annual rate of return, Sager and Fischer conclude that it was close to 20% per annum before 1874. At this rate, a dollar invested in the shipping business in 1850 would have swelled to \$46 in 1871. In the circa 1870 shipping business, substantial fortunes were made within a relatively short period of time.

In our view, however, one should not neglect the risks to which merchant capital was subject. One can think of the rate of return on merchant capital as a random variable, as per Eq. (5).

$$\alpha_{it} \sim F(\bar{\alpha}, \sigma_{\alpha}). \quad (5)$$

If the savings (dissavings) rate of merchants is denoted by s , and initial wealth is K_{i0} the rate of capital accumulation is given by Eq. (6) and the total wealth of an individual by Eq. (7).

$$\Delta K_{it} = s^{\infty_{it}} K_{it-1} \quad (6)$$

$$\begin{aligned} K_{it} &= (1 + s^{\infty_{it}}) K_{it-1} \\ &= \prod_{k=0}^t (1 + s^{\infty_{it-k}}) K_{i0} . \end{aligned} \quad (7)$$

Since ∞_{it-k} is a random variable, so is $\ln(1 + s^{\infty_{it-k}})$ and, taking the logarithm of (7) and using the central limit theorem we have

$$\ln K_{it} = \sum_{k=0}^t \ln(1 + s^{\infty_{it-k}}) + \ln K_{i0} \sim N(\mu, \sigma_t^2) . \quad (8)$$

This is a random walk model of merchant wealth and implies a lognormal distribution of wealth at any age. As well, a random walk model implies that average wealth increases each year at the rate s^{∞} and that the variance of wealth among individuals of the same age increases with age.

As noted earlier, the average age of merchants at death was 51.6 years and the regression of Table 5 implies that wealth was increasing at 4.25% per annum for such individuals. If Sager and Fischer are correct that the rate of return in shipping was 20% p.a. in Nova Scotia in the 1870s, then $\infty \cong 0.2$. If $s^{\infty} = 0.04$, this implies $s = 0.2$, that is, we estimate the rate of merchant savings, on average, to be 0.2 as a fraction of profits.

The regression of Table 5 is specified as $\ln w_i = \beta_0 + \beta_1 \ln \text{Age} + \beta_2 [\text{Hfx}] + \varepsilon_i$. The random walk hypothesis implies that residual variation in wealth is lognormally distributed, that is, ε_i should follow a normal distribution. This hypothesis is strongly confirmed by the data. The chi-square statistic of the Jarque–Bera asymptotic Lagrange multiplier normality test is 0.6918, indicating no reason to reject the null hypothesis of a normal distribution of ε_i .

However, contrary to the random walk hypothesis, we detect no tendency to heteroscedasticity. The Park test for heteroscedasticity regresses estimated residuals on explanatory variables, but in our data there is no significant association.

C. Gentlemen and Others

Since our data on the conditions of gentlemen and other commercial occupations are much more limited, we have little to say about rentiers and the self-employed. We note from Table 5 that these occupations do not appear to accumulate wealth

over the life cycle. Because in 1871 the rentier element would have inherited its wealth from the generation which preceded it (i.e., those who died circa 1840–1850), its inheritances were pretty meager and it would have been difficult to save from the interest on a few thousand dollars. But this picture of genteel poverty in 1871 had undoubtedly changed by 1899. The rentier element in 1899 data would have inherited the shipping fortunes made during the 1850 to 1875 period, and the data indicate a level of wealth sufficient to support a bourgeois life style and, perhaps, to save. However, the absence of data on age in 1899 prevent us from examining the accumulation of rentier wealth over the life cycle.

The “other” class of self-employed grocers, innkeepers, and others clearly did better in 1871 than in 1899. We suspect that this class contains both nascent merchants and self-employed tradespeople and that this amalgamation explains the insignificance of age as a predictor of wealth, but our data do not permit us to further disaggregate, in a reliable fashion, their behavior.

IV. CONCLUSIONS

Discussions of Canadian economic history have often mentioned the prosperity of the 1850–1875 period in Nova Scotia, but this paper argues that such prosperity was *very* selectively enjoyed. Gwyn (1988, p. 194) has drawn a distinction between extensive growth due to a swelling population and intensive growth in output per capita. For the period 1832 to 1853 he argues that “changes in the Nova Scotian economy . . . were not intensive, but merely extensive.” For the majority of the population, the late nineteenth century was also a period of extensive growth. The vast majority of the Nova Scotian population were, in the 1870s, subsistence farmers, who acquired little or no wealth over the life cycle. Gwyn and Siddiq (1992) argue that the wealth of farmers, who formed the bulk of the formally occupied population, failed to grow. The acquisition of wealth was limited to a small merchant class, predominantly Halifax based, who benefited from very high rates of return in the shipping industry and who became, by any standard, very wealthy. Beyond this elite class there is little evidence of retained wealth in Nova Scotia during the latter part of the nineteenth century.

A comparison of the 1871 and 1899 estate returns indicates both an increase in the fraction of decedents who claimed the status of gentleman and a decrease in the size of estates probated in Nova Scotia. There seems to have been some tendency for merchant capital to become rentier capital and an even greater tendency for merchant capital to slip out of the jurisdiction of the Nova Scotia courts.

It is possible that the merchant fortunes of the 1870s were dissipated in orgies of consumption in the 1880s, but if so these must have been extraordinarily discreet since there is no evidence of conspicuous consumption in Halifax, either documentary or anecdotal. Alternatively, merchant fortunes may have been lost in subsequent unfortunate attempts at local industrialization.

However, it seems to us unlikely that merchant capital was lost locally. The coal mines and iron foundries of Pictou were developed by British capital in the 1830s (Gwyn, 1988, p. 220). The steel industry of Cape Breton was founded by American capital in 1899 (Saunders, 1939, p. 22).¹⁸

Although Halifax mercantile families were prominent in the development of Nova Scotia Steel and Coal in New Glasgow, this firm was later absorbed by Montreal interests and was, in any case, an aberration. Acheson (1972, p. 8) comments, "The participation of the St. John and Halifax business communities in the industrial impulse which characterized the early 1880s can only be described as marginal." Local firms were chronically short of investment capital while "Halifax merchants preferred to invest their large fortunes in banks and American railroad stocks rather than to venture them on building a new order."¹⁹ Even in the 1840s, Nova Scotia was well integrated into London capital markets, and as Canadian development shifted inland, the focus of financial decision making shifted to Montreal. As players in an international capital market, Nova Scotian merchants have followed the lure of higher profits, wherever they might be.

Hence, although a shipping boom produced great inequality in wealth in Nova Scotia in the late nineteenth century, the broader moral to be drawn is the lack of any wider benefits to the brief period of Nova Scotian merchant prosperity. There seems to have been very little tendency to a general spreading of prosperity in 1871, as least as evidenced in estate returns. And there is little evidence that much of the wealth accumulated in the 1850–1875 period remained in Nova Scotia to provide a base for future employment growth.

APPENDIX A

The data used in this section are drawn from the estate papers of residents of the province of Nova Scotia, Canada, who died in the year 1871 and 1899, death records for 1871 for Nova Scotia, and the 1871 census of Canada. The estate multiplier technique for estimating the distribution of wealth of the living population from the distribution of the estates left by decedents has been used by many researchers over the years.²⁰ This technique is based on the idea that in any given year a certain fraction (p_i) of those people in age/sex cohort i will die. If they leave an estate, the value of that estate will be determined as part of the legal process of probate. If the probability of death is determined by a person's age and sex, each decedent can then be seen as "representing" a certain number of living persons ($1/p_i$), hence the size distribution of personal wealth (w_i) can be estimated from the size distribution of estates (E_i) as in Eq. (A1).

$$F(w) = \int_{-\infty}^w f(E_i) dE_i = \int_{-\infty}^w 1/p_i dE_i, \quad (\text{A1})$$

Table A1. Decile Split Points, Networth

Percentile	Commercial Class			Agricultural Class		
	1871 (Weighted)	1871 (Unweighted)	1899 (Unweighted)	1871 (Weighted)	1871 (Unweighted)	1899 (Unweighted)
	\$	\$	\$	\$	\$	\$
10	225.46	679.94	376.42	679.46	627.46	474.75
20	1,078.49	1,363.04	760.60	1,127.46	789.14	661.00
30	1,604.15	1,785.06	1,202.93	1,449.49	1,037.46	889.41
40	2,783.73	2,783.73	1,624.65	1,643.96	1,381.53	1,083.94
50	3,948.40	3,836.07	2,713.59	1,948.56	1,643.96	1,393.14
60	4,827.46	5,197.71	4,045.00	2,227.46	2,149.56	1,627.05
70	13,082.35	11,268.26	7,464.23	2,573.04	2,510.73	2,205.72
80	23,377.18	24,301.84	13,866.47	3,179.51	3,167.46	3,245.60
90	52,951.34	52,786.90	22,201.26	4,223.23	4,933.46	4,662.92

where $F(\cdot)$ is the cumulative distribution function and $f(\cdot)$ is the probability density function.

Three main sources of data were used in this study: the census of Canada for 1871, death records for the province of Nova Scotia in 1871, and probate records and estate papers filed in 1871 and later years for those who died in 1871. In addition estate papers filed in 1899 are presented in Table 2. Owing to a combination of circumstances, 1871 is one of the few years in which the census, death records, and estate papers are available for Nova Scotia.

The 1871 census of Canada provides a detailed description of the population of the province of Nova Scotia by age, sex, and household characteristics. The death records of the province of Nova Scotia were used, in combination with population estimates of the census by age and sex, to construct mortality rate estimates by age and sex. In addition, the census estimate of the number of households in the province of Nova Scotia in 1871 is assumed here to be the number of potential wealth-holding units (i.e., households). The wealth data used in the study come from the probate records of decedents who died in Nova Scotia in 1871 in 13 of Nova Scotia's 18 counties. Five counties (Digby, Guysborough, Richmond, Cumberland, and Inverness) were excluded from the study because their estate papers were either missing or unusable. In the remaining 13 counties, 387 estate papers (i.e., wills, letters testamentary, letters of administration, and probate acts) were found for 1871 decedents. Since some estate papers were incomplete and some could not be matched with death records for 1871, the weighted 1871 estimates are based on 243 primary records.

The gross value of an estate in this study is the estimated market value of all the real and personal estate, including cash and bank deposits as well as moneys owing

to the deceased, at the time of his death as appraised by court appraisers. The term *his* is appropriate since it was not until the Married Womens' Property Act of 1898 that it became usual for women to be the legal owners of property in Nova Scotia. Prior to that date, unless special provision was made in the marriage contract, the assets of single women at the time of their marriage were transferred to their husbands.²¹ During this period, therefore, all the assets used by all members of a family were legally owned by the male head of family, in contrast to today, when assets may be the legal property of individual family members. It is thus most appropriate to think of the distribution of wealth discussed here as corresponding to the modern-day distribution of net worth (assets minus liabilities) among economic families and unattached individuals. The net worth of the estate is the value of the estate after all legitimate claims against the estate and debts due by the estate at the time of the wealth holder's death are deducted from the gross value.

In order to use the estate multiplier technique, one must know the age at death of each probated decedent. This information is not typically available in the estate papers, hence it was necessary to match the names of probated decedents whose estates were filed in 1871 and 1872 with the names of the death records for each county of Nova Scotia. The death records for the period 1864 to 1876/77 are available at the Public Archives of Nova Scotia but not for other years. They record the age and sex of each decedent and appear to be highly reliable. However, for 103 of the 346 estates whose net worth could be clearly established, it was not possible to establish an unambiguous link to the death records. These cases were therefore dropped from analysis. If one compares the mean, and the variance, of the distribution of estate size for the 103 excluded decedents and the 243 included cases, there is no statistically significant difference. Thus, one has some confidence in concluding that the 243 included cases are a random sample of the 346 estates whose sizes were known.

The two largest estates in the sample of 346 for 1871 were dropped from analysis, the first because the individual involved (Enos Collins) was reported to be the richest man in British North America when he died (and therefore one could not conclude that his estate "represented" the wealth of any other living persons), while the second largest estate could not be matched for age. Our measurement of wealth inequality in 1871 would have been greater if these two estates had been included, but their inclusion would also have exposed our study to the potential criticism that sampling variability in the extreme upper tail of the distribution of estates was dominating our estimate of the concentration of wealth.

The primary records are from the 1871 census, death records are for the province of Nova Scotia, and the probate court records are available at the Public Archives of Nova Scotia, Halifax, Canada. Microdata summarizing this information are available on request from the authors.

In Figure A1 the solid line AB represents a fitted Paretian function of the form (using Nova Scotia data):

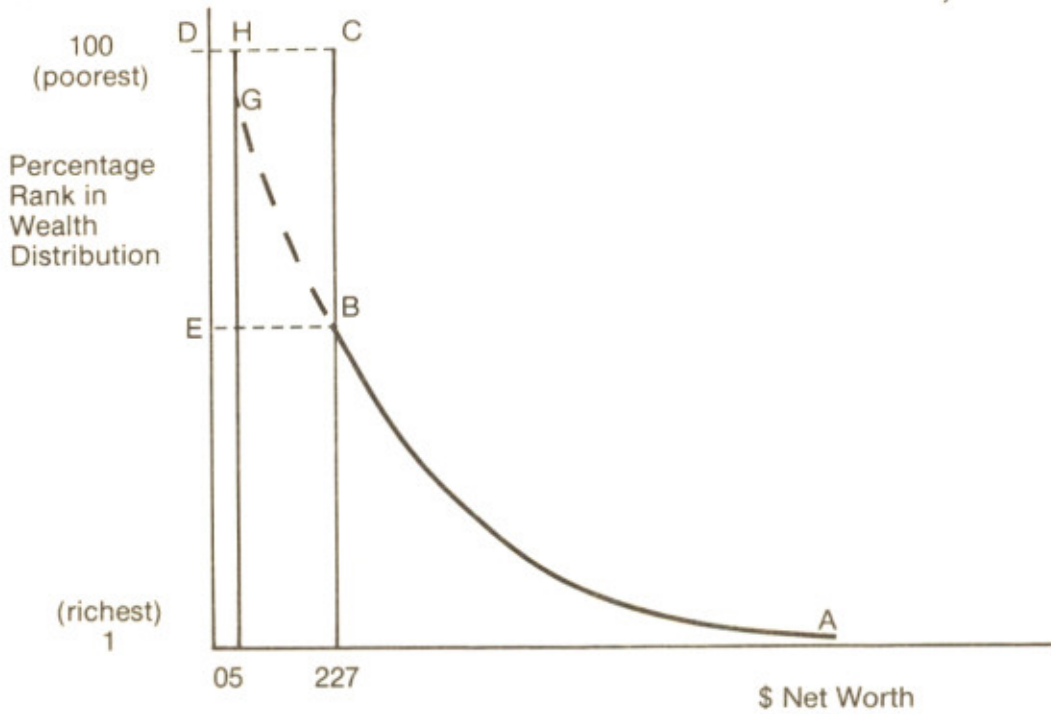


Figure A1. Distribution of Net Worth

$$\ln P(w) = 4.2376 - 0.755 \ln W$$

(0.008) (0.001)

$$R^2 = 0.965,$$

where $P(W)$ = ranking of probate type wealth holder in wealth distribution, and W = net worth of probate-type wealth holder [= estate + \$227], and the standard error is in parentheses.

We must note that some of the wealth of probated estates was not recorded in the probate process. By statute,²² articles of apparel and ornament of the widow and any minor children, wearing apparel of the deceased not exceeding 10 pounds in value, and “such provisions and other articles as shall be necessary for the reasonable sustenance of the widow, if any, and also the family of the deceased for 90 days after his death” were to be excluded from the calculation of the value of the estate.

Although not counted as part of the estate, this “nondeclared wealth” would be part of the wealth of the living population. From Firestone (1958, esp. p. 171) one can estimate that per capita consumer expenditure in Canada in 1871 was \$111.50. Since the average family size in the 13 counties of Nova Scotia in 1871 was 4.636 (excluding the family head), average consumption expenditures of 4.64 persons for 90 days would be approximately \$127.00. The assumption that all families possessed this amount of wealth and as well had \$100 worth of wearing apparel and other items implies that “nondeclared wealth” was approximately \$227 per family; then line segment BC represents the MIN assumption, namely, that all nonprobate-type families possessed this amount of wealth. Under this assumption, a diagram representing the size distribution of personal wealth would be given by the line ABCD. However, the alternative assumption (MAX in Table 1) was based on the idea that all nonprobate-type decedents had zero net worth. In Figure A1, the line

ABED would represent the size distribution of personal wealth under such an assumption.

However, if one assumes that probate-type wealth holders had wealth, while living, which included the value of "nondeclared wealth" as well as the appraised value of their personal estate, then the wealth of probate-type wealth holders would be given by the line AB. Assuming that \$5 represents a minimum lower bound on the value of wearing apparel, personal utensils, and so forth of nonprobate-type families, we extrapolate the Paretian function represented by line AB (i.e., assuming a lower bound of \$5). Our BEST estimate of the wealth distribution in Table 1 is therefore based on a size distribution of personal wealth which can be represented by the line ABGHD.

ACKNOWLEDGMENTS

We would like to thank Alan Green, Julian Gwyn, Frank Lewis, Barry Lesser, and Ed Wolff for their helpful comments. An earlier version of this paper was presented to the 1989 Canadian Economics Association meetings. Errors remaining are our sole responsibility.

NOTES

1. To put this level of activity in context, the total tonnage of the American merchant marine at the end of Civil War in 1866 was 1,387,566 tonnes (Saunders, 1967, p. 178). Nova Scotia shipbuilding production of 456,905 tons over the period 1868–1875 was therefore equal to about one-third of the American merchant marine.

2. Note that in this paper we are using the accounting definition of wealth: market value of marketable assets minus net liabilities. For a fuller discussion of alternative concepts of *wealth* and of international trends in wealth inequality over time, see Wolff (1991). See also Statistics Canada (1985).

3. See Osberg and Siddiq (1993) and Gwyn and Siddiq (1992).

4. Tables 2 and 3 include among the commercial class individuals employing labor and capital in the pursuit of trade (such as confectioners, hotel keepers, millers, shopkeepers or traders). In the 19th century data one also encounters the occupation of "gentlemen", whom we also include in the "commercial" class.

5. In 1871 we were able to obtain the age of most decedents from death certificates by matching the names in the estate papers and death certificates. However, death records are not available in 1899 and estate papers generally do not record age. Hence only the distribution of estate sizes is available in 1899. See Probate Records of Nova Scotia (1871, 1872, 1899, 1900) and Death Records of Nova Scotia (1871) for details.

6. For example, Samuel Cunard, the pioneer of steamship travel and founder of Cunard Lines, made his fortune in Halifax but died, a gentleman, after moving to his English estate.

7. The Bank of Nova Scotia still keeps a nominal head office in Halifax.

8. Since probate records record only wealth *within Nova Scotia*, our data understate the extent of merchant wealth. We dropped Enos Collins, reportedly the richest man in British North America, from the 1871 data since his wealth clearly cannot be "typical." His Nova Scotia assets, excluding real estate (for which there is no clear account in the estate papers), had a value of over a million dollars, to which his extensive holdings in New York and the United Kingdom should be added.

9. In 1850/1852, the net wealth of farmers *did* increase with age and was significantly higher for literate farmers than for the illiterate. This change, between 1850/1852 and 1871 can be explained by the fact that the terms of trade in Nova Scotia shifted against agriculture—and when the prices of a sector's inputs rise faster than the prices of its outputs, it becomes increasingly difficult to accumulate wealth (see Osberg and Siddiq, 1993).

10. See Di Matteo (1990) and Di Matteo and George (1992) for a discussion of savings motivation using probate records from Wentworth County, Ontario, in 1872, 1882, and 1892.

11. This interpretation is somewhat at variance with MacKinnon and Wynn (1988) and Bitterman, MacKinnon, and Wynn (1990). As well, the size of the farm population has been declining continuously for over a century. See Statistics Canada (1975, 1993) for details.

12. The difference between "cropland" and "improved land" can be explained by the need to provide fodder for livestock. Gwyn (1988, p. 207) estimates that in 1851, 49% of improved land was in pasture—of which just under half was for export.

13. By modern criteria (Environment Canada, 1976) only land graded in classes I to III is considered capable of sustained annual production of common cultivated crops. Nova Scotia has 2.83 million acres of such land. Land graded class IV or class V has severe or very severe limitations which restrict it to a narrow range of crops, with low to medium productivity or perennial forage. Nova Scotia has 1.24 million acres in these classes. But as Table 6 indicates there were 5.4 million acres in farms in 1881—clearly many people were in fact farming land then which would be classed as incapable of supporting agriculture today. See Hilchey (1970) for details.

14. An elderly relative of one of the authors succinctly summarized the main argument of this section when he noted, "They went too far up the hillsides in those days."

15. In the 1870s, many industrial establishments (e.g., sawmills, shipyards) operated on a less than full year basis. In the text, we refer to annual earnings per hand, ignoring the number of months put in by each worker, on the premise that industrial workers normally faced substantial periods of joblessness in the 1870s. However, this method will understate the annual earnings of industrial workers and overstate the total number of industrial workers if workers move between establishments (e.g., working five months at each of two establishments) and are therefore counted twice as "hands."

The microdata which underlie the 1871 census aggregates, and which are now available in manuscript form, contain the numbers employed at each industrial establishment, the average number of months of employment, and total wages disbursed for each establishment. From this, one can calculate the average monthly wage by establishment. One hundred and twenty-two establishments, employing 541 workers, were selected at random and the average monthly wage was calculated. Weighting by the size of the establishment and multiplying by 12 gives an estimate of "annualized" industrial earnings. The weighted average of annualized earnings is \$356.94, with a standard deviation of \$160.79 (20% below \$234 and 20% above \$400), but we consider annualized earnings to be an upper bound to the earnings of industrial workers in 1871 since it ignores the possibility of unemployment.

16. Although agricultural capital was immobile sectorally, the expanding number of farmers helped to maintain the demand for agricultural land and implements, hence ensuring both had positive market prices.

17. Other sectors were less consistently profitable. As Rosemarie Langhout (1985) points out, Nova Scotia was not too poor to build a railway network, but her capitalists lacked both the wealth and the desire to build it privately, so it was done at public expense, beginning in 1854. It remained of peripheral importance to the provincial economy though it became of central importance in the political sphere. The real economic benefit came to the holders of this expanded public debt for railways. They were almost exclusively resident in the United Kingdom.

The fisheries experienced few good seasons, and fishermen remained the poorest element in society. That fish products were the main item of export is more a statement about poverty than wealth, for the principal market remained the Caribbean, which wanted only the lowest grade fish. Wealth, where it was achieved in the fisheries, was confined to wholesale fish merchants, who only very rarely invested

directly in fishing. The impact of the development of the canning process, especially for lobster, begun before 1871 was still muted.

There was a steady rise in coal production, and a great increase in per capital coal consumption, until the Reciprocity Treaty was abrogated in 1866, when the United States reestablished a tariff wall against imported coal. Coal miners made no headway against the capitalists by 1871, despite the increased demand for coal and the end in the late-1850s of the General Mining Association's monopoly (Gerriets, 1990).

Gold was mined from 1862. Annual production, unimpressive compared to elsewhere—Mexico, California, Australia—peaked in 1867, resulting in sharp disappointment to the investing public.

The principal industrial site in 1871, as twenty years earlier, and much more common than shipyards, was a sawmill. It remained a small affair, on average employing two hands. Whereas an average capital investment of \$10,235 was characteristic of the 30 foundries in the province in 1871, there was only \$835 invested, on average, in each of the 1,144 sawmills of Nova Scotia. Other typical industrial sites in order of frequency were blacksmith shops, tanneries, small boot and shoe manufacturers, cooperages, flour and grist mills.

18. Saunders (1939, p. 21) notes several textile mills were established in the 1880s, most of which have by now disappeared. Although the Yarmouth mills may have had some merchant capital investment, Stanfield's in Truro grew from a small beginning in the early nineteenth century via retained earnings (personal communication).

19. Ibid., p. 28.

20. See, for example, Mendershausen (1956), Lampman (1962), Lyons (1974), McGrath (1982), Smith and Franklin (1974) as well as, of course, Jones (1972, 1980).

21. Revised Statutes of Nova, 1900, chap. 112, pp. 233–245. This is consistent with the evidence that only 1.5% of the estates in our sample were those of married women.

22. Revised statutes of Nova Scotia, 1864, chapter 127, section 21, pp. 449–450.

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