

# **Mortgages in Canadian Wealth Portfolios: 1870-1930**

**Livio Di Matteo**  
**Lakehead University**  
**Livio.dimatteo@lakeheadu.ca**

**Paper Prepared for Wealth and Debt Accumulation in Informal Financial Markets,  
A Marcus Wallenberg Symposium, Stockholm, September 2018**

**Draft: Comments Welcome**

## **Mortgages in Canadian Wealth Portfolios: 1870-1930**

### **Introduction & Summary**

The late nineteenth and early twentieth centuries saw expansion of the Canadian financial system in terms of asset volumes as well as product differentiation. Moreover, probate wealth micro-data for the period 1872 to 1927 for Ontario and Manitoba suggest that not only did financial assets held through formal financial intermediaries grow but also individual asset holding via the issuing of personal mortgages. While land-based credit and personal mortgages were a feature of early nineteenth century Canada, it would appear that the practice persisted well into the twentieth century in both rural and urban areas going into decline only after WWI. The evidence suggests that private mortgage lending remained a major personal investment vehicle alongside a growing and diversified formal financial sector.

Historical probate wealth micro data for Ontario and Manitoba reveal that the real value of mortgages rose over time peaking just before the First World War and then declined. Regression results suggest that the holding of mortgages was positively and significantly related to age, urbanization, high occupational status, and being a widow. At the same time, mortgages were negatively and significantly related to the share of wealth held in all other financial assets net of mortgages. They were also somewhat negatively related to the growth of bank branches and there was a separate significant negative time trend that marked their holding.

During the rapid economic growth of the Canadian wheat boom, there was brisk demand for saving and personal investments and private mortgages were a substitute for other financial assets in wealth portfolios particularly for individuals of high occupational status with their greater income and wealth. Prior to WWI, the average value of nominal personal mortgages held as a financial asset expanded faster than both nominal per capita financial assets held and GDP. Between 1870 and 1925, real (\$1900) per capita total financial assets in Canada grew 510 percent and real per capita GNP grew 171 percent. In Wentworth County, Ontario, the real per capita value of mortgages held from 1872 to 1927 grew 625 percent while in Manitoba from 1882 to 1927 the increase was approximately 500 percent and in Thunder Bay district from the early 1890s to 1927, the increase was 462 percent.

This suggests the demand for financial assets was robust with the demand for private mortgages as an asset particularly so. However, the growth of the formal financial sector appears to have been a competitive factor that ultimately reduced demand for private mortgages as a financial asset. Moreover, structural changes in the economy saw a decline in agricultural employment, the rise of a larger industrial middle class, and a decrease in the relative share of higher status occupations, which were also factors in the ultimate decline of private mortgages as a major financial asset. Mortgages particularly marked the wealth portfolios of the top ten percent of the wealth distribution and a decline in their share of wealth over time also affected mortgage demand.

## Mortgages and Financial Development: A Brief Survey

Financial innovation via the growth and development of formal financial markets and institutions, has been crucial to economic growth and wealth creation since the 1700s.<sup>1</sup> Indeed, it has been argued that the emergence of industrial society was the direct result of the rise of new forms of saving, lending and financial intermediation.<sup>2</sup> However, private mortgages and loans were a common feature of pre-twentieth century economic life not only in Canada, but also in other countries. Indeed, private mortgages were a feature of more traditional, socially determined systems of resource allocation as opposed to more formal institutionalized market mechanisms and there is an extensive literature on local private financial markets in both Europe and North America.<sup>3</sup>

For example, in Sweden the traditional financial network consisted of urban dealers and brokers, prosperous farmers and merchants who made loans and accepted deposits from the public with the informal market dominated by promissory notes and mortgages.<sup>4</sup> Lindgren (2017) notes the existence of a private credit market in rural Sweden based largely on promissory notes in the early nineteenth century.<sup>5</sup>

In eighteenth-century Spain, there was a decentralized and more fragmented network of credit that relied on public granaries, public treasuries, pawnshops, merchants and merchant companies and local ecclesiastical institutions. Indeed, ecclesiastical institutions such as monasteries were dominant in Spain's mortgage credit market in the mid-eighteenth century.<sup>6</sup>

In Wildberg, Germany over the early modern period from 1602 to 1700, nearly 81 percent of debts were to personal creditors – namely family and community members – with the remainder owed to non-personal creditors consisting of institutions and officials.<sup>7</sup> Indeed, the use of mortgages was a common financial tool in pre-modern Europe with the practice linked to the transformation of the agrarian economy.<sup>8</sup>

In his study of the eighteenth-century English land market in Lincolnshire, Holderness (1974: 563-68) notes that individual investment activity for owners of large estates indicated portfolios of mixed investments including mortgages of land. More modest property owners such as lawyers and clergymen also benefitted from opportunities offered by mortgages and money-lending in general. In another example, Cannadine (1997: 634) notes that the Marquesses of

---

<sup>1</sup> For an overview, see Attack and Neal (2009).

<sup>2</sup> Lindgren (2002: 810). Mortgages were also important in areas associated with late economic development. For example, Brazil before WWI saw its industrialization also funded by a credit boom based on mortgage issues. See Cortes et al., (2014).

<sup>3</sup> See for example Holderness (1976), Muldrew (1998), Hoffman et al., (2000), Gelderbloom et al., (2016), Spence (2016) and Dermineur (2015).

<sup>4</sup> Lindgren (2002: 811-14).

<sup>5</sup> For other studies on Swedish wealth and credit markets, see Hellgren (2003), Lilja (2004) and Perlinge (2005).

<sup>6</sup> Milhaud (2018).

<sup>7</sup> Ogilvie, S., M. Kupker and J. Maegraith (2012: 147)

<sup>8</sup> See Briggs and Zuijerdijn (2018).

Downshire between 1801 and 1811 had seven mortgages totaling 96,500 pounds on their Irish estates four of which were held by Belfast merchants and two by neighboring gentry.

Canada experienced rapid and robust financial market development in the half century after Confederation in 1867 (See Figure 1). In 1870, Chartered Banks had the largest amount of assets at \$103.1 million followed by Building Societies and Mortgage Loan companies at \$9.6 million dollars. By 1925, Building Societies and Mortgage Loan Companies ranked third in assets at \$277 million after Life Insurance companies at \$887 million and Chartered Banks at \$2275 million. The real per capita value of total financial assets (\$1900) was \$37.60 in 1870 and rose to reach \$229.20 by 1925 with the period after 1915 marked by a decline and then a recovery.

Adjusting for inflation, between 1870 and 1925 the real value (\$1900) of total private financial assets rose from \$124.9 million to \$1.9 billion yielding an annual implied growth rate of 5%, which was in excess of real GDP growth.<sup>9</sup> The savings ratio rose from an average of 8.7% of GDP during the 1870s to 15.7% during the first decade of the twentieth century and 19 percent by the mid 1920s.<sup>10</sup> The period between Confederation and the First World War saw the most rapid growth of the Canadian financial sector both in terms of asset volumes and product differentiation and was accompanied by the growth of new financial institutions and products such as life insurance<sup>11</sup>, building societies, mortgage and loan companies and government savings banks and an expansion of banking branches.<sup>12</sup> The growth of the chartered bank network and its assets was particularly pronounced as the number of bank branches in Canada rose from 230 in 1875 to 2,962 by 1913.<sup>13</sup>

Despite the growth of the Canadian financial sector, private mortgages and loans were still an important feature of economic life in Canada and featured in personal financial activity. In the Niagara District of Upper Canada between 1795 and 1850, private mortgage lending was occurring on approximately the same scale as bank lending with up to one quarter of all mortgages used to finance purchases of land and one in ten landowners being mortgaged.<sup>14</sup> In Toronto Gore Township in the early 1840s, about 16 percent of landowners had mortgages on their property.

As well, chattel mortgages were used to raise capital for individuals, as well as farmers and businesses.<sup>15</sup> The transactions tended to be personal and local and were substantial well into the twentieth century. For example, between 1892 and 1917, approximately 460,000 individuals and businesses in Ontario borrowed just short of a half-billion dollars on the security of chattels – an amount equivalent to \$7.6 billion Canadian dollars in 2005 dollars.<sup>16</sup> However, Baskerville

---

<sup>9</sup> Financial asset data from Neufeld (1972: 592-599). GNP Implicit Price Index and GNP data from Green and Urquhart (1987). Implied annual rate of real GNP growth was 3.6 percent.

<sup>10</sup> Green and Urquhart (1987: 87).

<sup>11</sup> See Di Matteo and Emery (2002).

<sup>12</sup> Di Matteo and Redish (2015).

<sup>13</sup> See Urquhart and Buckley (1965), Series H294.

<sup>14</sup> Redish (2003).

<sup>15</sup> Chattels are personal goods other than real estate and ships. The personal goods served as security for the loan. See Baskerville (2006).

<sup>16</sup> Baskerville (2006: 584).

(2006) notes that tenants were disproportionately heavy users of chattel mortgages suggesting that they were reflective of the degree of poverty.

Mortgages were used as a personal investment tool and women in nineteenth century Canada frequently had their share of a deceased spouse's estate invested in mortgages and financial securities as a directive of the will. For example, the will made by Hamilton physician Henry Orton, who died in 1882, is typical of others in directing that his estate be liquidated by his executors and the monies arising from the sale be invested in good securities for his wife Annie with the interest from the investments to be paid for the education and support of the children.<sup>17</sup> Adam Bowman who died in 1892 directed that the rest and residue of his estate be invested and the proceeds paid to his wife Ann during the course of her natural life.<sup>18</sup> Shoemaker Peter McGregor with an estate of \$20,125 directed his executors to convert his wife's share of the estate into money and to "invest the net proceeds from such sale...in such securities as my executors shall think proper."<sup>19</sup> Lumber merchant Michael Brennan who died in 1892 at age 58 with an estate of \$96,500 of which \$3600 was held as moneys secured by mortgage, directed that a sum be set aside out of the rest and residue of the estate to yield his widow Sarah a yearly sum of \$1200 in twelve monthly installments.<sup>20</sup>

Mortgages on land were also a mechanism for credit and capital formation as Canada underwent industrialization. They were a strategy employed to sustain business enterprises resulting in large numbers of businessmen being indebted. About twenty percent of businessmen in Brantford Ontario in 1851 actually had mortgages against their holdings with much of that mortgage debt concentrated amongst the wealthiest members of the business class.<sup>21</sup> At the same time, many businessmen also loaned out money via mortgages as an investment vehicle. Indeed, one of the advantages of mortgages in particular in nineteenth-century Ontario was that they together with any income derived, were by exemption not liable to taxation as personal property under municipal property taxes.<sup>22</sup> As well, it was often easier for men to bequeath stocks, bonds and mortgages to their wives because such financial assets could be managed more cheaply than land or businesses.<sup>23</sup>

## Data

The historical probate wealth micro data used in this analysis is from established data sets for: Wentworth County, Ontario (1872-1927), Thunder Bay District, Ontario (1885-1931), Ontario (1892, 1902) and Manitoba (1875-1927). These data sets vary in size with Ontario 1892 and 1902 consisting of 3,515 and 3,641 individuals; Wentworth County at 2,516; Thunder Bay

---

<sup>17</sup> Will of Henry Orton, (Wentworth County Will 1745, 1882).

<sup>18</sup> Will of Adam Bowman (Wentworth County Will 3395, 1892)

<sup>19</sup> Will of Peter McGregor (Bruce County Will 2808, 1902).

<sup>20</sup> Will of Michael Brennan (Wentworth County Will 3400, 1892).

<sup>21</sup> Burley (1987: 94-95). As Burley (1987: 96) notes: "For some businessmen land was a savings bank and mortgages were withdrawals from their accounts."

<sup>22</sup> Burley (1994: 131).

<sup>23</sup> Shammass (1994: 24-26).

District at 2,338 and Manitoba at 826. The details on the construction and linking of this data set are available in Di Matteo (2008, 1997).

The primary data source for Ontario is the probate records of the Ontario surrogate courts. Under the Surrogate Courts Act, 1858 a surrogate court with the power to issue grants of probate and administration valid throughout the province was established in each Ontario county, replacing the centralized Court of Probate established in 1793.<sup>24</sup> The Manitoba probate data set was constructed from the probate records of the Eastern Judicial District of Manitoba available at the Archives of Manitoba. The Manitoban legal system for probate and estates was for all intents and purposes identical to that for Ontario and was governed by the Surrogate Courts Act (Revised Statutes of Manitoba, c. 37, s.1) and the Devolution of Estates Act (Revised Statutes of Manitoba, C.45, s.1).

Probate was an institutional arrangement transferring property from the dead to the living and application for probate generally occurred in the county or district where most of the deceased's property was located.<sup>25</sup> The probate process granted administration over the estate, authenticated the will and provided evidence as to the character of the executor.<sup>26</sup> In intestate cases (being those without a will) the application to the court for administration was made by an interested party - often the widow or next of kin - but sometimes a creditor with estate distribution made according to law. Of key importance in these data sets is the inventory and valuation of property.<sup>27</sup> The inventory was conducted by the executor of the estate (administrator in intestate cases) and legally was performed in response to a request by a legatee or creditor but the inventory was usually brought in voluntarily without awaiting the summons.

Probate records are unique and important sources in terms of the comprehensiveness and detail of the asset information provided but some additional features and sources of bias require comment. First, probated decedents were generally of higher socio-economic status than the general population and not all deaths saw estates probated. Second, terminal wealth levels can be affected by whether the probated decedents died unexpectedly or had been ill a long time and therefore run down the value of their assets. Third, the presence of estate taxes may provide incentives for estate administrators to underestimate inventoried wealth and succession duties came into effect in both Manitoba and Ontario in the 1890s, but they allowed for numerous exemptions especially to immediate family and therefore provided no obvious incentive to underestimate the value of the estate for most decedents.<sup>28</sup> Finally, *intervivos* transfers means some wealth may be unaccounted for by probate and while estate taxes did not seem to present a major obstacle to intergenerational wealth transmission in either Manitoba or Ontario, there is nevertheless potential for a portion of wealth to be unaccounted for in these data sets.

---

<sup>24</sup> Statutes of Canada, 22 Vict., Cap. 93, 1858.

<sup>25</sup> For more detailed discussions of probate and the data collection process see Di Matteo (1990, 1997, 2012), and Di Matteo and George (1992).

<sup>26</sup> Howell, Law (1880), 155.

<sup>27</sup> 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, (16) Other personal property.

<sup>28</sup> For discussions of the Succession Duty Acts in Ontario and Manitoba, see Di Matteo and George (1992) and Di Matteo (2012).

## Analysis

### *Summary Statistics and Trends*

An overview of the summary statistics for these five micro-data probate wealth data sets is provided in Table 1. The data sets are overwhelmingly male with the percent male ranging from a low of 63 percent in Wentworth County to a high of 77 percent in Manitoba. Average nominal wealth in these data sets ranges from highs of \$11,083 and \$10,513 in Thunder Bay District and Wentworth County to lows of \$6,334 in Ontario 1892 and \$6,390 in Manitoba. The percent owning mortgages as a financial asset range from highs of 21 to 22 percent in Ontario 1892/1902 and Wentworth County with lows of 9 and 12 percent respectively in Manitoba and Thunder Bay district. Average nominal mortgage wealth in these data sets ranged from a low of \$405 in Manitoba to a high of \$1306 in Wentworth County. As a share of total wealth, the range was from a low of 6 percent in Manitoba to a high of 14 percent in Ontario 1892.

Of course, these are snapshots of the aggregate data in nominal terms and one needs to look at trends over time as well as adjust for inflation. Figures 2-4 plot LOWESS<sup>29</sup> smoothed profiles of nominal and real mortgage wealth for Manitoba, Thunder Bay District and Wentworth County while Figure 5 does so for Ontario in 1892 and 1902. Real figures are generated using the Urquhart-Green GDP Implicit Price Index with 1900=100.<sup>30</sup> The LOWESS smoothed inflation adjusted series take the rapid price inflation of the peak wheat boom era in Canada into account – a period generally taken to be the years from approximately 1896 to 1914.

Given the role of mortgages in funding housing purchases, it is useful to note that the trends in Canadian dwelling starts broadly parallel those in Figure 2-5. Dwelling starts rose gaining speed in the 1890s and peaking in 1910 before coming down dramatically (See Appendix I). For Manitoba, real smoothed wealth held as mortgages is \$67 in 1882 and climbs rapidly peaking in 1917 at \$479 and then entering a period of decline that brings it to \$399 by 1927. For Thunder Bay District, from \$50 in 1894, peak real mortgage wealth is reached in 1910 at \$1,140 and then a decline sets in that is much more pronounced than Manitoba with a decline to \$806 by 1920 and then a steeper fall to \$281 by 1927. For Wentworth County, real mortgage wealth is \$114 in 1872 and rises to peak at \$919 in 1912 and then declines but only very gradually to \$806 in 1922 and then rises and stabilizes thereafter at \$826 by 1927. Finally, for Ontario as a whole in 1892 and 1902, the value of real mortgage wealth declines between those two years from \$979 to \$756.<sup>31</sup>

---

<sup>29</sup> Locally Weighted Scatterplot smoothing is a non-parametric data smoothing technique.

<sup>30</sup> See Green and Urquhart (1987). For 1926 to 1931 in the Thunder Bay District use was made of Urquhart (1988) to extend the series.

<sup>31</sup> Interestingly, these trends are similar to what happens using national aggregate financial data from Neufeld with the real per capita value of financial assets in Building Societies and Mortgage Loan Companies as a comparator. The real per capita value of financial assets held in building loan and mortgage companies rose and peaked in the mid 1890s and then also began a decline. The timing of the national peak in 1895 predates that of Manitoba (1917), Thunder Bay District (1910) and Wentworth County (1912) but more closely coincides with Ontario as a whole given it sees a decline from 1892 to 1902. This result is interesting given that the Neufeld data shows rising financial assets from 1870 to 1930 (See Figure 1).

It should be noted that Manitoba, Thunder Bay District and Wentworth County are marked by wealth changes over time that parallel the performance of mortgage assets but with mortgages peaking after wealth. For example, real LOWESS smoothed wealth in Manitoba peaks in 1912 at \$6899 and then declines while mortgages peak in 1917. For Thunder Bay District, real wealth reaches a peak in 1908 at \$6508 and then declines to reach a low of \$5109 in 1922 and then starts to rise again while mortgages peak in 1910 and decline throughout afterwards. As for Wentworth County, real wealth peaks in 1907 and then declines slightly and stabilizes while real mortgages peak in 1912.

However, the proportion of decedents reporting mortgages as an asset rises until World War I and then generally stabilizes in these three regions. However, this is not always replicated when mortgages are examined as a share of wealth portfolios. The percentage of total wealth held as mortgages in Manitoba rises steadily reaching 16 percent by 1927. Meanwhile, in Thunder Bay District, the share of total wealth held as mortgages rises and peaks at 18 percent in 1913 and then starts to decline reaching two percent by 1930. As for Wentworth County, the share of wealth held as mortgages peaks in 1912 at 14 percent and then declines to 12 percent from 1927.

This suggests that while there was a diversification into other financial assets as the 20<sup>th</sup> century wore on, there was still a demand for private mortgages as an asset that peaked later than the national formal financial asset sector figures would suggest. However, even where the demand for holding mortgages as an asset continued to rise - as in Manitoba - average values still declined. Moreover, this peak in real mortgage wealth was reached earlier in the more settled and developed areas such as Wentworth County relative to the more frontier regions such as Manitoba and Thunder Bay District.

### *Regression Models and Results*

Along with trends over time, it is useful to understand what the specific social and economic determinants of mortgage wealth were. A complete census-linked set of data with numerous social and economic variables is available for Ontario in 1892 and 1902 and the variables allow for examining the relationship between the ownership and value held of mortgages with determinant variables such as age, occupation, birthplace and religion. The variables used in the regression are summarized in Table 2 with results in Tables 3 and 4. Results are presented using OLS as the estimation technique as well as using Tobit and Probit, given that the dependent variables are also limited dependent /qualitative variables with a minimum of zero. The natural log of the value of mortgages was taken making the specification for the non-qualitative linear dependent variable regression log-linear.

The explanatory variables reflect the social and economic determinants of private wealth held as mortgages. They include age, urbanization, high occupational status, being a farmer, place of birth, religious affiliation, marital status, literacy, regional effects (with the Golden Horseshoe region around Toronto as the omitted variable), number of children, a year fixed effects variable and the proportion of wealth held as financial assets (net of mortgage wealth).<sup>32</sup>

---

<sup>32</sup> Wealth was included in preliminary specifications but excluded as it was correlated with many of the variables in the regression and highly correlated with occupational status.



The proportion of wealth held as financial assets net of mortgages could have either a positive or negative relationship with mortgage wealth depending on whether other financial assets were substitute or complementary assets. However, one expects that as formal financial markets developed over time, other financial assets would be substituted for mortgages in wealth portfolios given the potential riskiness of private transactions relative to more secure assets such as bonds or bank accounts. Along with moneys secured by mortgage, the financial assets in this probate data include book debts and promissory notes,<sup>33</sup> life insurance, bank stocks and other shares, securities, cash on hand and cash in bank.

Bank branch variables are additional variables designed to capture the development of the financial sector in late nineteenth century Ontario. These variables take on a value of 1 if there was a bank branch in the sub-location a probate decedent resided in, 0 otherwise. Di Matteo and Redish (2015) using the Ontario 1892 and 1902 micro-data as well as bank branch location information from the Canadian Almanac for 1891 and 1901, find that the presence of a bank branch in late nineteenth century Ontario was correlated with the use of deposit banking. One would expect that as bank branches increased in number, it would reduce the use of privately held mortgages as a financial asset given the competition, lower transactions costs and security afforded by chartered banks relative to private transactions.

In 1891, the Chartered banks had a total of 231 branches in Ontario. By 1901, the number of branches had risen to 320, although the number of chartered banks had not increased. The expansion was rural and urban. The number of bank branches in Toronto rose from 27 to 40, and the number of branches in the four largest cities (Toronto, Ottawa, Hamilton and London) rose from 53 to 73. However, a major expansion in branches actually occurred in rural areas as in 1891 there were 61 locations that had only one branch whereas by 1901 branches had been opened in 30 additional rural locations.<sup>34</sup>

The results for both the value of mortgages held as well as the propensity to hold mortgages are quite consistent in terms of sign and significances of the explanatory variables across estimation technique but the coefficient magnitudes vary. Age is a positive and significant determinant of both the value of mortgages held as well as the tendency to hold them. The age and age-squared specification is significant suggesting a life-cycle component to the use of mortgages as an investment tool. Urban probated decedents were more likely to use mortgages as a financial asset as well as hold higher amounts relative to non-urban dwellers.

Mortgage holding, and amounts held were also positively and significantly associated with higher occupational status but negatively associated with being employed as a farmer. Given farmers held a much larger proportion of their wealth as land, an obvious liquidity constraint is imposed on their ability to free up resources for loan as opposed to other high occupational status individuals such as merchants who held larger proportions of their wealth as financial assets.

High occupational status individuals owned 123 percent more in mortgage assets than those of lower occupational status based on the OLS results and 571 percent more based on the Tobit

---

<sup>33</sup> Book debts and promissory notes are also a financial asset based on private lending. It's use in this probate data appears to occur mainly amongst merchants.

<sup>34</sup> For a detailed discussion and maps, see Di Matteo and Redish (2015: 968-971).

results. In terms of birthplace, relative to the Canadian born, the Irish born held less mortgage wealth – about 37 percent less using OLS and 180 percent less using Tobit - while the all other birthplaces had significantly more. As for religious affiliation, relative to Anglicans, Roman Catholics tended to hold fewer mortgages as well as lower amounts of mortgages.

When it comes to marital status and gender, relative to single males, married men held significantly less financial wealth as mortgages and were less likely to hold mortgages as an asset. Being a widow or a single woman was a positive and significant factor. The OLS estimates suggest that relative to single males, widows had 51 percent more mortgage assets and single women 67 percent. The comparable numbers using Tobit were 292 and 373 percent respectively. Being literate was a positive and significant factor determining the use of mortgages as a financial asset as well as the amount held. Mortgages were also negatively related to the number of children a probated decedent had but the results were not significant. There was also a strong regional effect. Relative to the Golden Horseshoe, probated decedents in northern Ontario and the Huronia region were significantly more likely to hold mortgages while those in western Ontario less likely.

The financial sector and development variables reveal that after controlling for confounding factors, the value of mortgages held and the propensity to hold mortgages was negatively and significantly related to the share of wealth held in financial assets net of mortgages. As well, there was also a significant tendency towards less mortgage holding over time between 1902 and 1892. However, the number of bank branches in a location does not seem to have been as statistically significant factor in influencing mortgages holding though it was significant for the value of mortgages at the 10 percent level in the OLS results. Collinearity between these bank branch variables and wealth and the financial asset share variable may be a factor in this result.

### *Discussion*

These results suggest that the demand for private mortgages was driven by age, urbanization, and higher occupational status all of which would have been positively correlated with income and wealth. There was also a regional component to demand with areas outside the highly developed and more urban Golden Horseshoe such as northern Ontario and Huronia being marked by more private mortgage activity. Mortgages were also important for females who were either widowed or single. Other significant factors affecting private mortgage holding were the number of children (negative effect), being Irish-born (negative effect), being born somewhere other than England, Ireland, Scotland, the USA or Canada (a positive effect), being Roman Catholic (negative effect) and being literate (positive effect).

Mortgages can be considered a substitute for other financial assets and the increase in wealth held as bank accounts, securities, stocks and bonds resulted in less wealth being held as mortgages. The number of bank branches in a location was not as important a factor affecting private mortgages though the effect when significant was negative. Some of the effect of bank branches may be picked up by the regional variables given the greatest number of bank branches was in the Golden Horseshoe region. Finally, these results also suggest that there was a time-related decline independent of these other confounding factors in both the level of private mortgages held and the propensity to hold them in Ontario between 1892 and 1902. This may

reflect the effect of changing preferences or some other cost or technological factor the holding of mortgages as an asset.

In terms of a narrative explaining the rise and fall of private mortgage holding in late nineteenth and early twentieth century Canada, these results suggest that literacy, age and occupational status was correlated with a demand for mortgages as a private asset. However, this demand was also tempered by the effects of other social economic variables such as birthplace and religion. Mortgages were also important in the wealth portfolios of women especially those who were single or widowed and one would expect that as employment opportunities for single women grew and the wealth and occupational status of women rose during the twentieth century, there would be increased demand for mortgages as assets also. By way of example, there were 636,000 gainfully employed men in Ontario in 1891, which rose to 1,097,000 million by 1931- a 72 percent increase. Meanwhile, the number of gainfully employed women in Ontario rose from 96,000 in 1891 to 249,000 by 1931 - an increase of 159 percent.<sup>35</sup>

However, increases in the share of wealth held in all other financial assets was negatively correlated with private mortgages as a financial asset. This suggests that with the development of the Canadian financial sector particularly after 1900, one would see a substitution of private mortgages by assets such as securities, cash in bank, life insurance and stocks and shares. This would serve to counteract the positive effects on demand of age, urbanization and higher occupational status.

By their nature, wealth data based on probate data is biased towards individuals of higher socio-economic status and perhaps one of the reasons for the eventual decline of private mortgages as a financial asset is because of decline in the population share of higher status individuals. Individuals of high socio-economic status were characterized by greater wealth and financial asset holding relative to those of lower status and with rising wealth over the life cycle, mortgages were a useful financial asset. Figure 6 plots the LOWESS smoothed (band width = 0.8) mortgage asset-age profiles for high occupational status (Katz Categories I and 2) decedents and all the rest defined as low occupational status decedent. For both groups, peak mortgage asset holding occurs at about age 70 but at nearly \$1500 for high status decedents and only \$600 for lower status ones. Thus, high occupational status individuals would have been a major driver of the use of private mortgages as a financial asset.

However, over time, the composition of probated decedents changes and the proportion of individuals of high occupational status as defined by the Katz occupational categories declines. For example, Figure 7 shows the proportion of decedents of high occupational status over time for Wentworth County. The decline of the agricultural sector and farm employment, the rise of industrial occupations and the growth in female employment all served to reduce the share of decedents of high occupational status which fell from 68 percent in 1872 to 33 percent by 1927. Economic and structural change between 1870 and 1930 was substantial as the agricultural share of GDP in Canada fell from 38 percent in 1870 to 21 percent by 1920.<sup>36</sup> As well, the middle

---

<sup>35</sup> Drummond (1987: 363).

<sup>36</sup> See Urquhart (1993).

wealth holding classes grew over time<sup>37</sup> and the growth of a larger middle class would have found the formal financial sector a more attractive option for investment compared to private mortgages with their relatively higher risk and higher transaction costs.

Thus, private mortgages were ultimately an investment tool of wealth elites. As further evidence that mortgages were an elite investment tool, the average wealth, value and incidence of private mortgages was calculated for the Ontario 1892 and 1902 data for the top 10 percent, next 40 percent and bottom 50 percent of the wealth distribution. The top ten percent of the distribution reported an average wealth of \$39,100 and average mortgages held of \$6,167 with 54 percent of the top ten percent reporting they held a private mortgage as an asset. For the next 40 percent of the distribution, average wealth was \$5,877, average mortgage value was \$574 and 26 percent reported owning mortgages as an asset. For the bottom 50 percent, average wealth was \$1,229 with the average value of mortgages at \$94 and 11 percent reporting owning a mortgage.<sup>38</sup>

## Conclusion

The period from 1870 to 1925 saw a major expansion of the Canadian financial system in terms of both amounts of assets held as well as types of products. At the same time, probate micro-data for this period for Ontario and Manitoba suggest that not only did financial assets held through formal financial intermediaries grow but also individual asset holding via the issuing of personal mortgages – at least until the era of the First World War. The period following the war saw a decline in average values and incidence.

Rising literacy, age and high occupational status was correlated with a demand for mortgages as a private asset. However, this demand was also tempered by the effects of other social economic variables such as birthplace and religion. Mortgages were also important in the wealth portfolios of women who were single or widowed and as employment opportunities for women and their occupational status rose during the twentieth century, there would be some increased demand for mortgages as assets also. However, this effect would have been tempered by growing financial sector development as well as the relative decline in the share of high occupational status individuals.

Financial development in terms of increases in the share of wealth held in all other financial assets as well as the growth of bank branches was negatively correlated with private mortgages as a financial asset. This suggests that with the development of the Canadian financial sector particularly after 1900, one would see a substitution for private mortgages by assets such as securities, cash in bank, life insurance and stocks and shares. This served to counteract the positive effects on private mortgage demand of age, urbanization and higher occupational status.

---

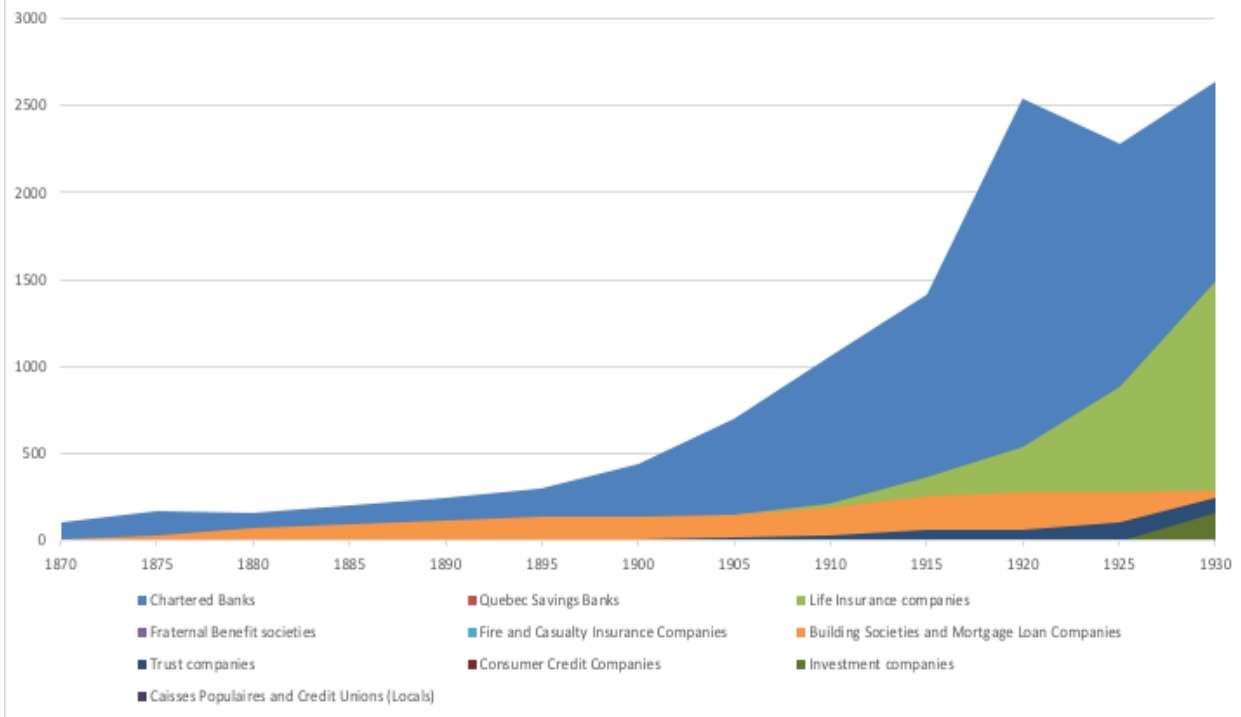
<sup>37</sup> See Di Matteo (2016).

<sup>38</sup> The results are similar for the other data sets. For example, for Wentworth County, the average nominal wealth of the top 10 percent was \$67,376, while average mortgage wealth was \$8,835 and 54 percent of the top ten percent reported owning mortgages. For the next 40 percent, average wealth was \$7,886, average mortgages were \$1,011 and 30 percent owned mortgages. For the bottom 50 percent, the comparable numbers were \$1,352 for wealth, \$93 for mortgages held and 9 percent reporting ownership of a mortgage.

Even within the generally higher socio-economic status nature of probate data, there was a decline in the proportion of higher occupational status individuals over time and the result would have weakened demand for private mortgage lending. From a broader societal perspective, the growth of a more equitable distribution of wealth during the course of the twentieth century would have served to reduce the use of private mortgages as an investment tool given that their use especially marked the portfolios of the top ten percent of the wealth distribution.

In the end, private mortgage lending in Canada was a financial tool that especially marked an era of more limited opportunities in terms of economic growth, employment, economic status and choice when it came to financial assets. It was certainly a tool of the economic elite. With economic growth and development, the growth of the middle class and the spread of financial markets, private mortgage lending came to be increasingly relegated to a shrinking proportion of higher occupational status individuals.

**Figure 1: Assets of Canadian Private Financial Intermediaries (\$millions), 1870 to 1930 (Source: Neufeld, 1972)**



**Table 1: Selected Summary Statistics**

	Manitoba	Thunder Bay District	Wentworth County	Ontario 1892	Ontario 1902
<b>n</b>	826	2338	2516	3515	3641
<b>Average Wealth (\$)</b>	6390	11083	10513	7427	6334
<b>Average Real Estate (\$)</b>	4052	3683	3536	3468	2551
<b>Percent Owning Mortgages</b>	9	12	21	22	21
<b>Average Mortgage Wealth (\$)</b>	405	1068	1306	1019	771
<b>Mortgage/Wealth(%)</b>	6	10	12	14	12
<b>Percent Male</b>	78	77	63	73	70
<b>Percent Farmers</b>	23	9	14	44	41

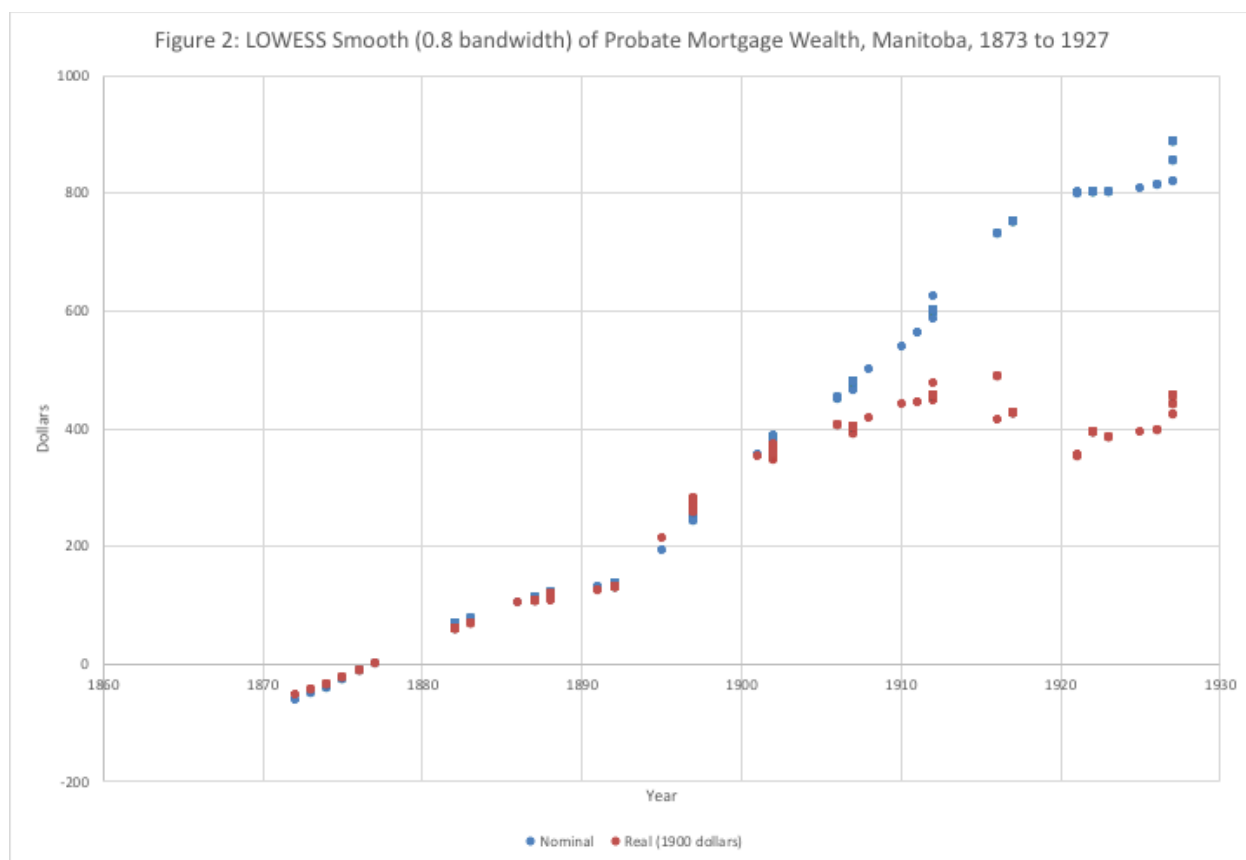


Figure 3: LOWESS Smooth (0.8 bandwidth) of Probate Mortgage Wealth, Thunder Bay District, 1885 to 1931

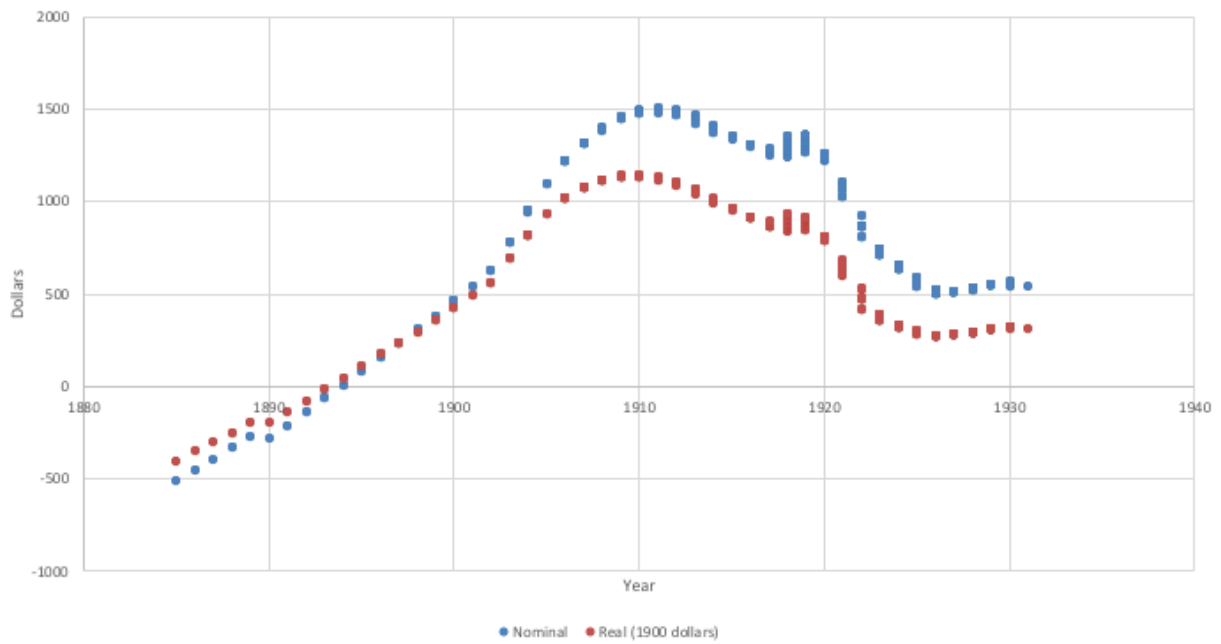
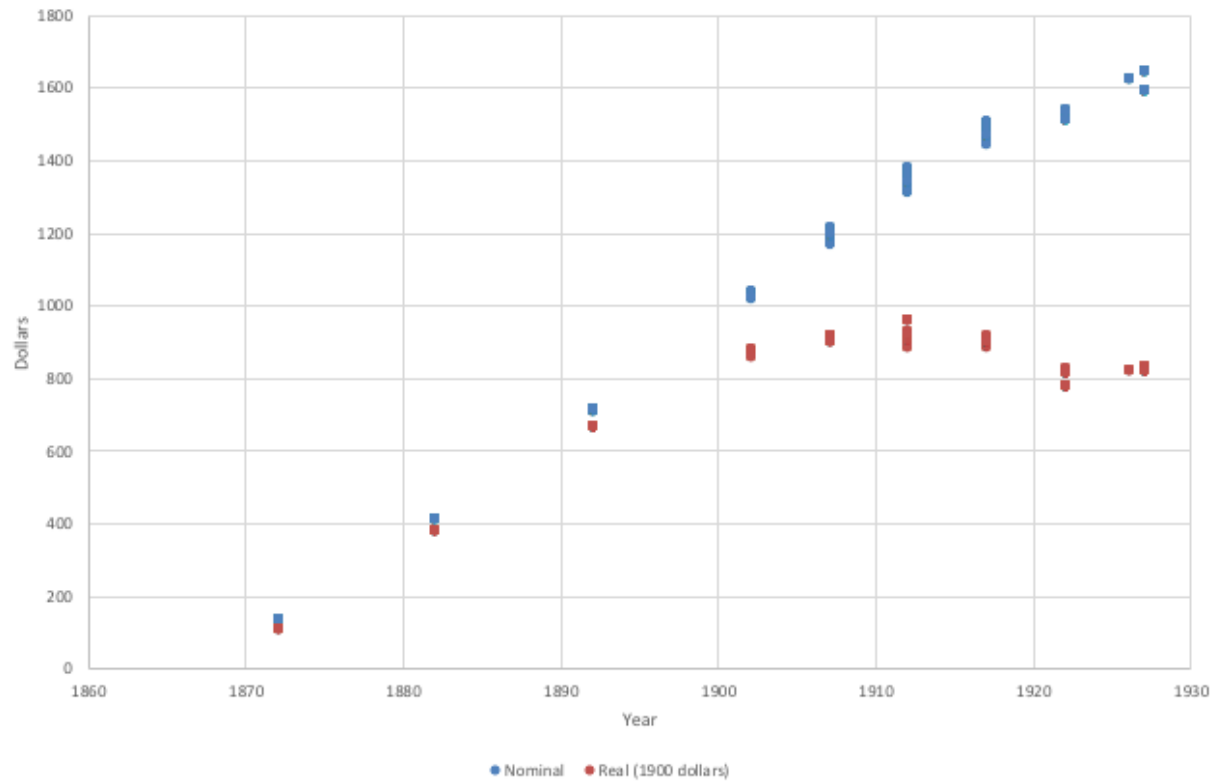
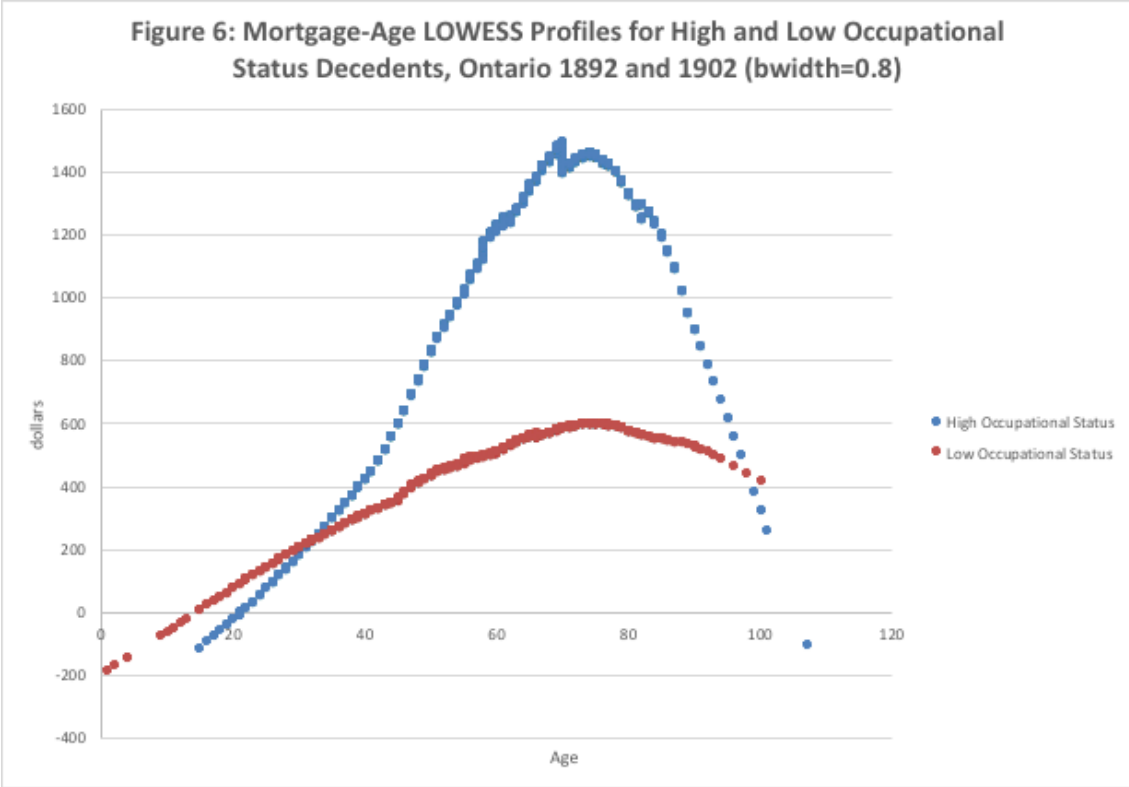
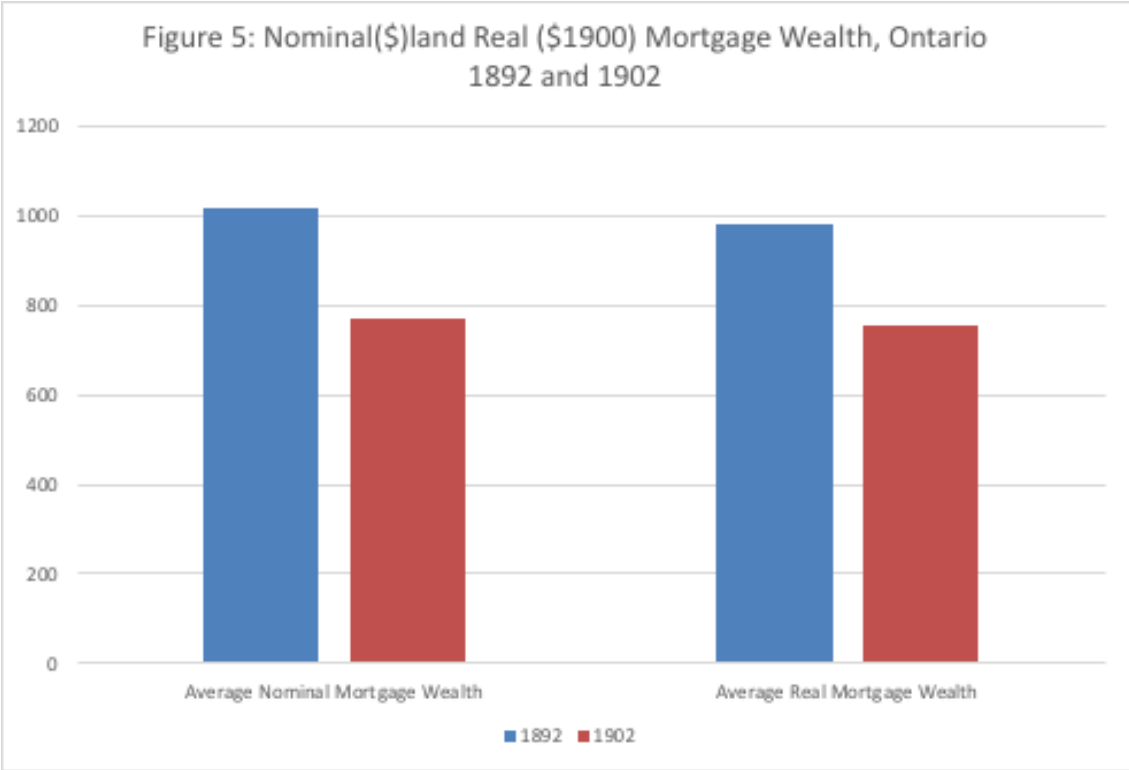


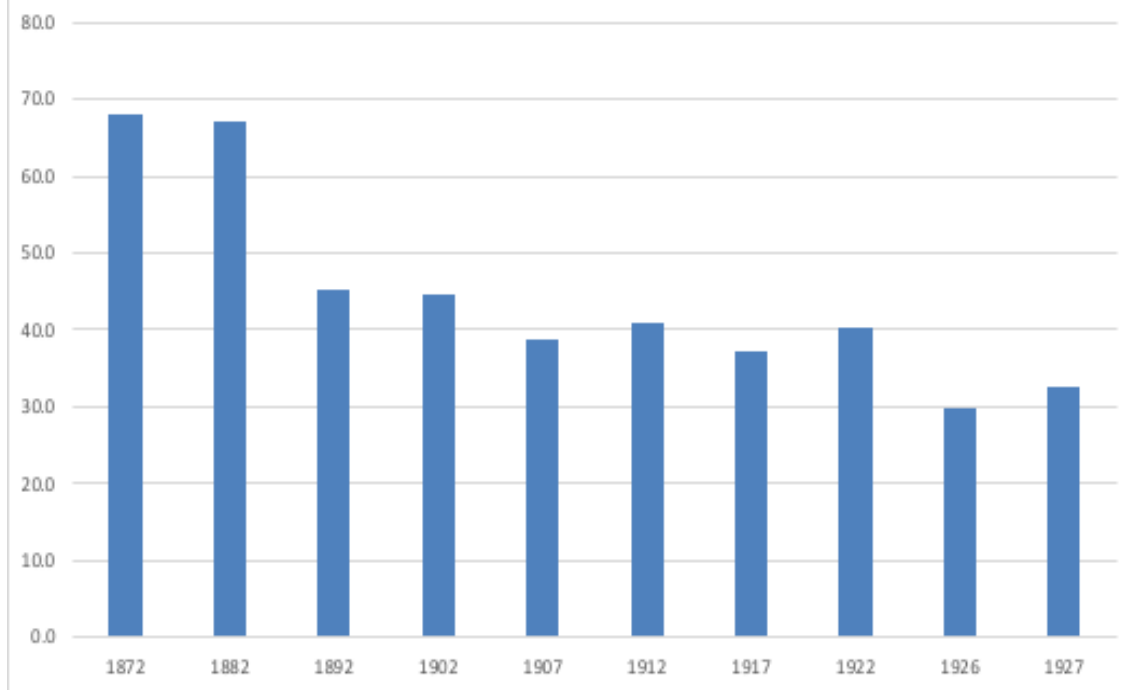
Figure 4: LOWESS Smooth (0.8 bandwidth) of Probate Mortgage Wealth, Wentworth County, 1872 to 1927







**Figure 7: Percent of Wentworth County Decedents of High Occupational Status, 1872 to 1927**



**Table 2: Regression Variables for Ontario 1892 and 1902 Dataset**

***Wealth & Asset Variables***

Lmbymort	The natural log of nominal mortgages (Ln mortgages+1).
fw	Ratio of financial assets net of mortgages to wealth
mortp	1 if owned mortgages, 0 otherwise

***Financial Sector Variables***

Bank1891 <sup>a</sup>	1 if location had a bank branch in 1891, 0 otherwise
Bank1901	1 if location had a bank branch in 1901, 0 otherwise

***Socio-Economic Characteristics***

Age	Age at death
Age-Squared	Age at death squared
Urban <sup>b</sup>	1 if urban dweller, 0 otherwise
English	1 if born in England or Wales, 0 otherwise
Irish	1 if born in Ireland, 0 otherwise
Scottish	1 if born in Scotland, 0 otherwise
USA	1 if born in the USA, 0 otherwise
Canadian	1 if born in Canada (Ont, Que, Maritimes), 0 otherwise
Other Birthplace	1 if born elsewhere, 0 otherwise
Anglican	1 if Anglican, 0 otherwise
Roman Catholic	1 if Roman Catholic, 0 otherwise
Presbyterian	1 if Presbyterian, 0 otherwise
Baptist	1 if Baptist, 0 otherwise
Methodist	1 if Methodist, 0 otherwise
Other Religion	1 if any other religion, 0 otherwise
Married Male	1 if married male, 0 otherwise
Married Female	1 if married female, 0 otherwise
Widower	1 if male and spouse deceased, 0 otherwise
Widow	1 if female and spouse deceased, 0 otherwise
Single Male	1 if unmarried male, 0 otherwise
Single Female	1 if unmarried female, 0 otherwise
Literate	1 if decedent could read and write, 0 otherwise
Children	Number of children
Year1902	1 if probated in 1902, 0 otherwise

***Regional Variables<sup>c</sup>***

Northern	1 if resident of northern Ontario, 0 otherwise
Western	1 if resident of western Ontario, 0 otherwise
Huronia	1 if resident of Huronia, 0 otherwise
Eastern	1 if resident of eastern Ontario, 0 otherwise
Golden Horseshoe	1 if resident of Golden horseshoe, 0 otherwise

***Occupational Categories<sup>d</sup>***

High Occupational Status	1 if high occupational status (Katz Categories 1 and 2), 0 otherwise
Farmer	1 if farmer, 0 otherwise.

a The township/town or village for each probated decedent was noted and located each branch of each bank in a township/town or village. Source: Di Matteo and Redish (2015).

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

c The counties in each regional dummy 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, York; Western—Haldimand, Norfolk, Elgin, Kent, Essex, Lambton, Middlesex, Oxford, Brant; Huronia—Waterloo, Perth, Huron, Wellington, Bruce, Grey, Simcoe, Dufferin; Eastern—Ontario, Victoria and Haliburton, Durham and Northumberland, Peterborough, Hastings, Prince Edward Lennox and Addington, Frontenac, Leeds-Grenville, Dundas-Glengarry-Stormont, Prescott and Russell, Carleton, Lanark

d These are socio-economic occupational status categories with OCC1 as the highest, OCC5 as the lowest and OCC6 as an unclassifiable (See Katz, 1975, 343–348). Category OCC1, for example, contains lawyers, merchants, doctors, etc. Categories OCC2F include 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 labour while OCC6 is unclassifiable containing a large proportion of females.

**Table 3: Regression Results - Estimation Technique: OLS**

	LN of mortgages		Mortp	
	<i>Coefficient</i>	<i>t-stat</i>	<i>Coefficient</i>	<i>t-stat</i>
Age	0.0479	<b>3.6</b>	0.0064	<b>3.6</b>
Age Squared	-0.0002	-1.3	0.0000	-1.4
Urban	0.8355	<b>6.5</b>	0.1021	<b>6.0</b>
High Occupational Status	1.2257	<b>9.9</b>	0.1516	<b>9.1</b>
Farmer	-0.6162	<b>-5.4</b>	-0.0810	<b>-5.3</b>
English	-0.1627	-1.5	-0.0243	-1.6
Irish	-0.4013	<b>-3.6</b>	-0.0511	<b>-3.5</b>
Scottish	-0.1176	-0.9	-0.0127	-0.7
USA	-0.2127	-1.0	-0.0207	-0.7
Oth Birthplace	0.3670	<b>1.8</b>	0.0382	1.4
Roman Catholic	-0.3683	<b>-2.7</b>	-0.0447	<b>-2.4</b>
Presbyterian	0.1030	0.9	0.0184	1.2
Baptist	-0.0750	-0.4	-0.0016	-0.1
Methodist	0.0460	0.4	0.0130	0.9
Other Religion	0.1367	0.9	0.0215	1.0
Married Male	-0.3848	<b>-2.6</b>	-0.0470	<b>-2.4</b>
Married Female	0.0748	0.4	0.0156	0.6
Widow	0.5067	<b>2.6</b>	0.0728	<b>2.8</b>
Widower	-0.2629	-1.5	-0.0258	-1.1
Single Female	0.6681	<b>2.9</b>	0.0925	<b>3.0</b>
Literate	0.3366	<b>2.5</b>	0.0411	<b>2.3</b>
Northern	0.3753	<b>1.7</b>	0.0675	<b>2.3</b>
Western	-0.2022	<b>-1.9</b>	-0.0191	-1.3
Huronia	0.1937	<b>1.8</b>	0.0308	<b>2.1</b>
Eastern	0.0667	0.6	0.0181	1.3
fw	-0.4876	<b>-4.4</b>	-0.0517	<b>-3.5</b>
Children	-0.0153	-1.1	-0.0025	-1.3
Year 1902	-0.1664	<b>-2.3</b>	-0.0240	<b>-2.5</b>
Bank Branch 1891	0.2340	1.0	0.0194	0.6
Bank Branch 1901	-0.4446	<b>-1.8</b>	-0.0514	-1.6
Constant	-1.3516	<b>-3.3</b>	-0.1753	<b>-3.2</b>
n	7154		7154	
F(30, 7123)	15.68		14.03	
Adj-Rquared	0.0580		0.0518	

**Bold is significant at 5 percent level; Bold *italics* is significant at 10 percent level.**

**Table 4: Regression Results - Estimation Technique: Tobit & Probit**

	LN of mortgages		Mortp	
	Coefficient	t-stat	Coefficient	z-stat
Age	0.3599	<b>5.1</b>	0.0350	<b>4.8</b>
Age Squared	-0.0018	<b>-3.0</b>	-0.0002	<b>-2.8</b>
Urban	3.4619	<b>6.1</b>	0.3515	<b>5.8</b>
High Occupational Status	5.7146	<b>9.1</b>	0.5750	<b>8.9</b>
Farmer	-2.6239	<b>-5.1</b>	-0.2757	<b>-5.1</b>
English	-0.8472	<b>-1.7</b>	-0.0910	<b>-1.7</b>
Irish	-1.8025	<b>-3.5</b>	-0.1840	<b>-3.4</b>
Scottish	-0.6418	-1.1	-0.0607	-1.0
USA	-0.7302	-0.8	-0.0708	-0.7
Oth Birthplace	1.3468	1.5	0.1298	1.4
Roman Catholic	-1.9416	<b>-2.9</b>	-0.1888	<b>-2.7</b>
Presbyterian	0.5902	1.1	0.0716	1.3
Baptist	-0.3244	-0.4	-0.0159	-0.2
Methodist	0.2958	0.6	0.0436	0.9
Other Religion	0.5592	0.8	0.0691	0.9
Married Male	-1.7007	<b>-2.4</b>	-0.1696	<b>-2.3</b>
Married Female	1.0200	1.0	0.1121	1.1
Widow	2.9238	<b>3.1</b>	0.3037	<b>3.1</b>
Widower	-1.0133	-1.2	-0.0921	-1.1
Single Female	3.7280	<b>3.3</b>	0.3880	<b>3.3</b>
Literate	1.4667	<b>2.3</b>	0.1472	<b>2.2</b>
Northern	2.0768	<b>2.0</b>	0.2421	<b>2.2</b>
Western	-0.9594	<b>-1.9</b>	-0.0833	-1.6
Huronia	0.8236	1.6	0.0979	<b>1.9</b>
Eastern	0.4153	0.8	0.0606	1.2
fw	-2.1677	<b>-4.0</b>	-0.2034	<b>-3.6</b>
Children	-0.0807	-1.2	-0.0090	-1.3
Year 1902	-0.7676	<b>-2.3</b>	-0.0857	<b>-2.4</b>
Bank Branch 1891	0.7468	0.7	0.0658	0.6
Bank Branch 1901	-1.7027	-1.5	-0.1723	-1.4
Constant	-25.8549	<b>-11.3</b>	-2.6218	<b>-11.4</b>
n	7154		7154	
Uncensored	1510		1510	
LR chi2(30)	447.59		421.43	
Pseudo-Rsquared	0.0280		0.0571	

**Bold is significant at 5 percent level; Bold *italics* is significant at 10 percent level.**

## References

- Atack, J. and L. Neal (2009) *The Origins and Development of Financial Markets and Institutions. From the Seventeenth Century to the Present.* Cambridge University Press.
- Baskerville, P. (2006) "Chattel Mortgages and Community in Perth County, Ontario," *Canadian Historical Review*, 87, 4, December, 583-619.
- Briggs, C. and J. Zijderduijn (eds.)(2018) *Land and Credit: Mortgages in the Medieval and Early modern European countryside.* Palgrave Macmillan.
- Burley, D.G. (1994) *A Particular Condition in Life: Self-Employment and Social Mobility in mid-Victorian, Brantford, Ontario.* Montreal: McGill-Queen's University Press.
- Burley, D.G. (1987) "good for all he would ask": Credit and Debt in the Transition to Industrial Capitalism – The Case of Mid-nineteenth Century Brantford, Ontario" *Histoire sociale-social History*, XX, 39, May, 79-99.
- Cannadine, D. (1977) "Aristocratic Indebtedness in the nineteenth Century: The Case Re-opened" *Economic History Review*, 30, No. 4, 624-650.
- Cortes, G.S., R.L. Marcondes and M.D.M. diaz (2014) "Mortgages for machinery: credit and industrial investment in pre-World War I Brazil," *Financial History Review*, 21, 2, 191-212.
- Dermineur, E. (2015) "Trust, norms of cooperation, and the rural credit market in eighteenth century France. *Journal of Interdisciplinary History*, 45, 485-506.
- Di Matteo, L. (2016) "Wealth Distribution and the Canadian Middle Class: Historical Evidence and Policy Implications," *Canadian Public Policy*, 42, 2, 132-151.
- Di Matteo, L. (2012) "Land and Inequality in Canada, 1870-1930," *Scandinavian Economic History Review*, 60, 3, 309-334.
- Di Matteo, L. (2008) "Wealth accumulation motives: evidence from the probate records of Ontario, 1892 and 1902," *Cliometrica*, 2: 143-171.
- Di Matteo, L. (1997) "The Determinants of Wealth and Asset Holding in Nineteenth Century Canada: Evidence from Microdata," *Journal of Economic History*, 57, 4, December, 907-934.
- Di Matteo, L. (1990) "Wealth holding in Wentworth County, Ontario, 1872-1892," *McMaster University*. <http://digitalcommons.mcmaster.ca/opendissertations/1910>.
- Di Matteo, L. and J.C.H. Emery (2002) "Wealth and the demand for life insurance: evidence from Ontario, 1892," *Explorations in Economic History*, 39, 446-469.

Di Matteo, L. and P. George (1992) "Canadian Wealth Inequality in the Late Nineteenth Century: A Study of Wentworth County, Ontario, 1872-1902", in: *Canadian Historical Review* LXXIII, 453-483.

Di Matteo, L. and A. Redish (2015) "The evolution of financial intermediation: Evidence from 19<sup>th</sup>-century Ontario microdata," *Canadian Journal of Economics*, 48, 3, 963-987.

Drummond, I. M., (1987) *Progress Without Planning: The Economic History of Ontario from Confederation to the Second World War*. University of Toronto Press, Toronto.

Gagan, D. (1974) "The Security of Land: Mortgaging in Toronto Gore Township 1835- 95" in *Aspects of Nineteenth-Century Ontario* eds. F.Armstrong, H. Stevenson, J. Wilson , Toronto: University of Toronto Press.

Gelderblom, O., J. Jonker and J.C.M. Kool (2016) "Direct finance in the Dutch golden Age," *Economic History Review*, 69, 4, 1178-98.

Green, A. G., and M. C. Urquhart (1987) "New estimates of output growth in Canada: Measurement and interpretation." In *Perspectives on Canadian Economic History, 182–99*, ed. D. McCalla. Toronto: Copp Clark Pitman

Hellgren, H. (2003) *Fasta förbindelser. En studie av lantagare hos sparbanken och informella kreditgivare I Sala 1860-1910*. Uppsala Studies in Economic History, 66, Uppsala: Acta Universitatis Uppsaliensis.

Hoffman, P.T., G. Postel-Vinay, and J-L. Rosenthal (2000) *Priceless Markets. The Political economy of Credit in Paris, 1660-1870*. Chicago: University of Chicago Press.

Holderness, B.A. (1976) "Credit in English Rural society before the Nineteenth Century, with special reference to the period 1650-1720," *Agricultural History Review*, 24, 99-109.

Holderness, B.A. (1974) "The English Land Market in the Eighteenth Century: The Case of Lincolnshire" *Economic History Review*, 27, No. 4, November, 557-576.

Howell, A. (1880), *The Law and Practice as to Probate, Administration and Guardianship in Surrogate Courts*, Toronto: Carswell.

Katz M.B. (1975) *The people of Hamilton, Canada West: family and class in a mid-19th century city*. Harvard University Press, Cambridge.

Liljam K. (2004) *Marknad och hushall. Sparande och krediter I Falun 1820-1910 utifran ett livscykelperspektiv*. Uppsala Studies in Economic History, 71. Uppsala: Acta Universitatis Uppsaliensis.

Lindgren, Hakan (2017) "Parish banking in informal credit markets: the business of private lending in early nineteenth century Sweden," *Financial History Review*, 24, 1, 83-102.



- Lindgren, Hakan (2002) “The Modernization of Swedish Credit Markets, 1840-1905: Evidence from Probate Records,” *Journal of Economic history*, 62, 3, 810-832.
- Milhaud, C. (2018) “Interregional flows of long-term mortgage credit in eighteenth-century Spain. To what extent was the market fragmented?” <hal-01180682v3>
- Muldrew, C. (1998) *The Economy of Obligation: The Culture of Credit and Social Relations in Early Modern England*. London: Palgrave MacMillan.
- Neufeld, E.P. (1972) *The Financial System of Canada* (Toronto: Macmillan).
- Ogilvie, S., M. Kupker and J. Maegraith (2012) “Household Debt in Early modern Germany: Evidence from Personal Inventories,” *Journal of Economic History*, 72, No. 1, March, 134-167.
- Perlinge, A. (2005) *Sockenbankirerna. Kreditrelationer och tidig bankverskamhet. Vang a socken I Skane 1840-1900*. Nordiska museets handlingar, 130. Stockholm: Nordiska museets forlag.
- Redish, A. (2003) “The Mortgage Market in Upper Canada: Window on a Pioneer Economy” in *Finance, Intermediaries and Economic Development*, eds. S.L. Engerman, P.T. Hoffman, J-L. Rosenthal, K.L. Sokoloff, Cambridge University Press, 111-131.
- Shammas, C. (1994) ‘Re-assessing the Married Women Property Acts’. *Journal of Women’s History* 5: 7–30.
- Spence, C. (2016) *Women, Credit and Debt in Early Modern Scotland*. Manchester University Press.
- Urquhart, M. C., and K. A. H. Buckley (1965) *Historical Statistics of Canada*. Toronto: Macmillan of Canada.
- Urquhart, M.C. (1988) *Canadian Economic Growth, 1870-1980*. Queen’s University Discussion Paper No. 734.
- Urquhart, M.C. (1993) *Gross National Product, Canada 1870–1926: The Derivation of the Estimates*. McGill-Queens, Kingston, Ontario.

**Appendix I**

