Wealth: A Survey of Evidence from Historical Micro-data

Livio Di Matteo, Department of Economics Seminar, November 7, 2008

Outline

- > The Data
- > Women and Wealth
- Wealth, Fertility and Religion
- International Comparisons: Thunder Bay & South Australia

Wealth Research Projects to Date

- > Wentworth County: 1872-1902 (405)
- > Ontario: 1892 (3515)
- > Thunder Bay District: 1885-1920 (1293)
- > Ontario: 1902 (3641)
- > A total of 8,854 decedents

Wealth Collection in Progress

- **> Thunder Bay 1921-30**
- Wentworth County: 1907, 1912, 1917, 1922, 1927

The Data-I

• Sources: (1) Ontario County Surrogate Court Probate Records (2) Manuscript Census of Canada, 1871-1901

The Data-II

- Probated estates for Ontario 1892 and 1902 linked back to 1891 and 1901 Census. Estates for Wentworth County 1872-1902 linked back to 1871, 1881, 1891 and 1901 Census.
- Probate inventories have 16 wealth categories
- Key socio-economic data not in probate records available in census such as age, religious affiliation

What is Probate?

- PROBATE AN INSTITUTIONAL PROCESS OF PROPERTY TRANSFER FROM DEAD TO LIVING
- EXECUTOR CONDUCTED INVENTORY OF PROPERTY
- INVENTORY AND VALUATION OF PROPERTY A KEY ASPECT

ASSET CATEGORIES

- HOUSEHOLD GOODS
- **FARM IMPLEMENTS**
- STOCK IN TRADE
- HORSES
- CATTLE
- SHEEP & SWINE
- BOOK DEBTS
- MORTAGES
- LIFE INSURANCE
- STOCKS AND SHARES
- SECURITIES
- CASH
- CASH IN BANK
- FARM PRODUCE
- REAL ESTATE
- OTHER PERSONAL PROPERTY

Variables Available from Probate

- WEALTH BY CATEGORY
- PLACE OF RESIDENCE
- DATE OF DEATH
- TESTATE OR INTESTATE
- OCCUPATION
- MARITAL STATUS
- NUMBER OF CHILDREN
- GENDER

Potential Disadvantages of Probate

- LIFETIME ACCUMULATION
- SOCIO-ECONOMIC STATUS
- BIAS DUE TO TAXES
 - Ontario 1892 Succession duty Act exempted estates under \$100,000 with bequests to direct family.
- INTERVIVOS TRANSFERS

Example of Data Collection Sheets

Page 1

Cens	us Reference					Probate Refere	ence	
District:			Co	unty:	Wen	tworth Will I	No.:	12480
Sub District:	Ward:							
Polling Sub Division	on No.:		Da	te of App	licat	ion for Probate	e:	
Page: Number:			192	1922.05.10				
Name	Age			f Residence Birthplace		Birthplace		
Nellie Putnam			New York,	NY				
Occupation	Katz Cat.	Da	te of Death Ethnic Ori		Orig	rigin Marit		al Status
N/A		192	21.10.14				Wido	wed
Religion	Date of Wi	II	Spouse: Name, Age, Religion, Ethnicity &		ity & B	irthplace		
	1910.01.25		N/A					
		No. of Offspring		Of	Offspring Data (Probate)		te)	
		To	Total: 6		Pı	Putnam, Frank		Manhattan
						riffin, Ella		Bronx
		Ма	le: 2			alt, Sarah		Bronx
						alt, Laura		Bronx
		Fe	Female: 4			Putnam, Jessica		Bronx
					, N	/lark		Bronx
Inventory and Valuation of Property			Value or Amount			Description		Notes & Comments
(1) Household Good								
(2) Farming Implem	ents							
(3) Stock in Trade (4) Horses								
(5) Horned Cattle								
(6) Sheep and Swin	ie							
(7) Book Debts & Pi								
(8) Money Secured								
(9) Money Secured)						
(10) Bank Shares a								
(11) Securities for M	loney							
(12) Cash on Hand								
(13) Cash in Bank	6 11 16: 1		2	051.04				
(14) Farm Produce	of all Kinds							
(15) Real Estate	Description							
(16) Other Personal	Property		_	051.04				
TITLI TOTAL VAIDA			''	1127 114				

Page 2

(1) Household Goods & Furniture	(2) Farming Implements	(3) Stock in Trade	(4) Horses
Total:	Total:	Total:	Total:
(5) Horned Cattle	(6) Sheep & Swine	(7) Book Debts and Promissory Notes	(8) Money Secured by Mortgage
Total:	Total:	Total:	Total:
(9) Money Secured by Life Insurance	(10) Bank Shares & Other Stocks	(11) Securities for Money	(12) Cash on Hand
Total:	Total:	Total:	Total:
(13) Cash in Bank	(14) Farm Produce of	(15) Real Estate	(16) Other Property
	all Kinds	394 Queen S. 700	
Total:	Total:	Total:	Total:
Additio	nal Data		
Executors/Administrators	S	Able to sign own name:	Yes
Mary Lucas	Wife Hamilton	Able to read and write:	Yes
		Servants Present in House	ehold:

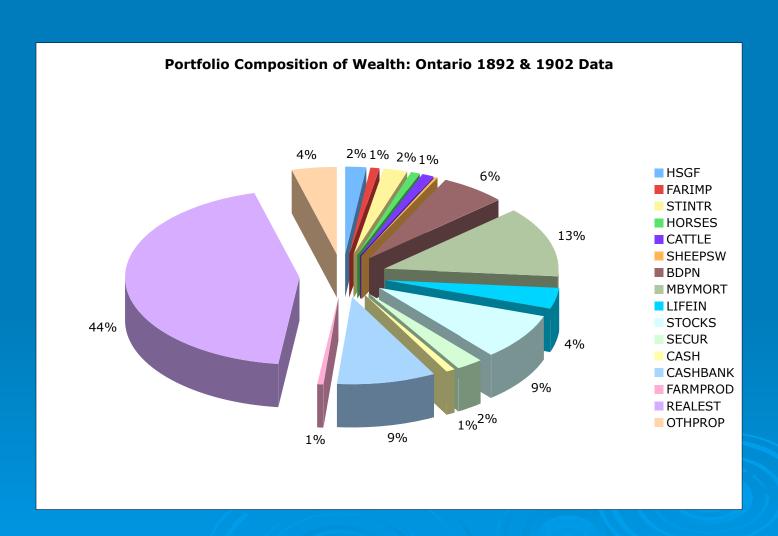
Page 3

Name		Bequest		
Mitchell, Annie	Daughter	Wh	nole of estate.	
Anecdotal Evidence				
	Court Costs:	Registrar 5.75	Judge 2.00	In Stamps 5.00

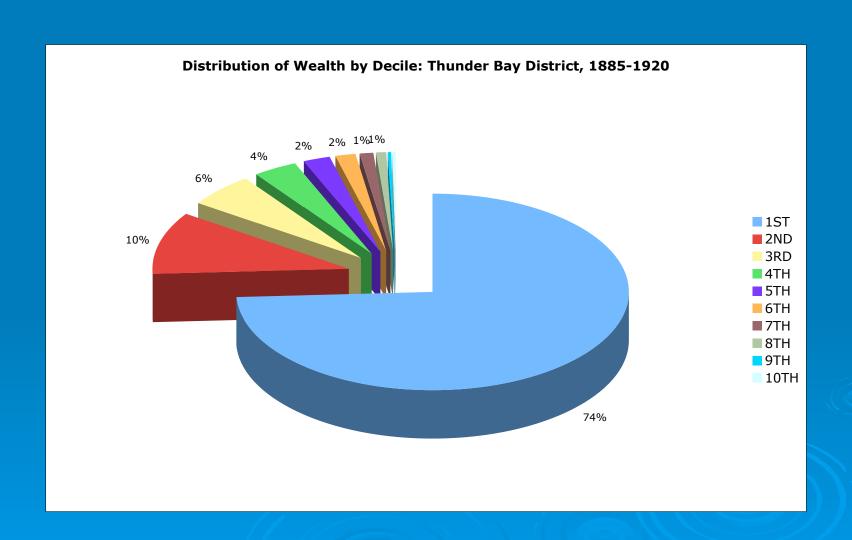
Topics Explored

- Life cycle & bequest wealth accumulation
- > Determinants of wealth
- Portfolio composition
- > Wealth Distribution
- > Economic booms
- > Wealth of the Irish in nineteenth century
- Religion and wealth

Portfolio Composition



Wealth Distribution



1. Wealth and Gender in Ontario: 1870-1920

Introduction

- Did female property holding grow in wake of property rights legislation?
- Micro Data for two regions in Ontario
- 1,183 probated decedents for Wentworth County (1872-1912)
- 1,780 probated decedents for Thunder Bay District (1885-1925)

Evolution of Female Property Holding

- > 19th century era of female property rights
- > Ontario
 - Married Woman's Real Estate Act (1873)
 - Married Woman's Property Act (1884)

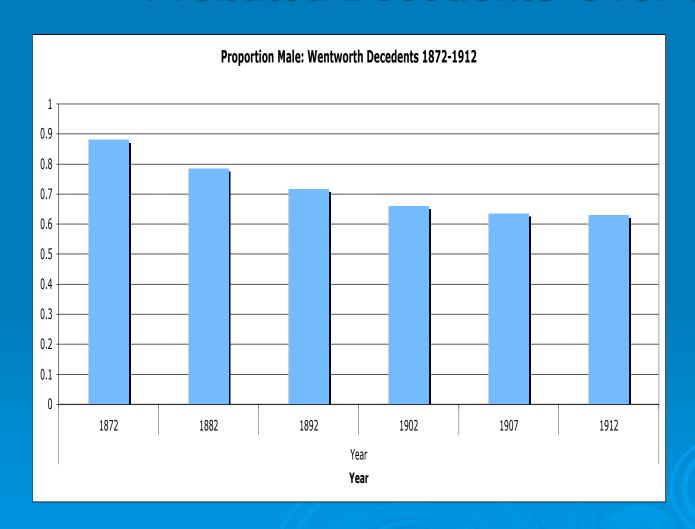
Ontario Literature

- Chambers (1997) concludes impact of laws not substantial
- Baskerville (1999) finds gains made by women in Victoria greater than Hamilton
- Inwood and Ingram (2000) find women of Guelph increased their share of property
- Inwood and Sligtenhorst (2004) argue property rights legislation legitimized idea of women holding property

British Literature

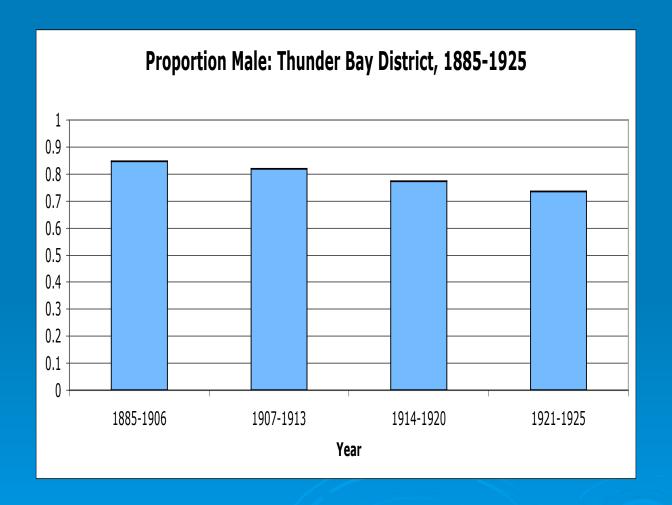
- Britain 1870 Married Women's Property Act
- Combs (2004) finds women married after 1870 owned a larger share of household wealth
- Green and Owens (2003) document long term trend of increased government security ownership by women prior to 1870

Wentworth County: Decline in Male Probated Decedents Over Time



Percent female rose from 12 percent in 1872 to 37 percent in 1912

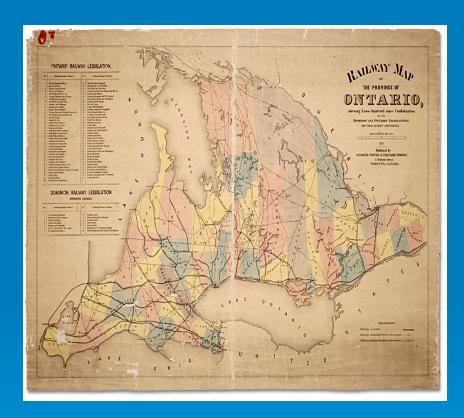
Thunder Bay District: Decline in Male Probated Decedents Over Time

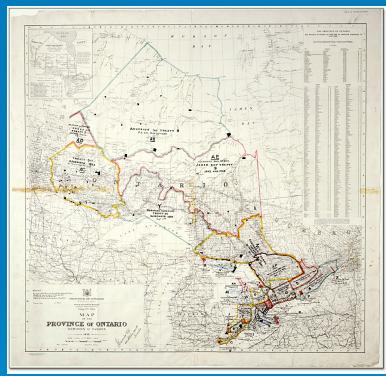


Percent female rose from 15 percent in 1885/1906 to 26 percent by 1921/1925

The Data: Context, Sources, Construction

Ontario

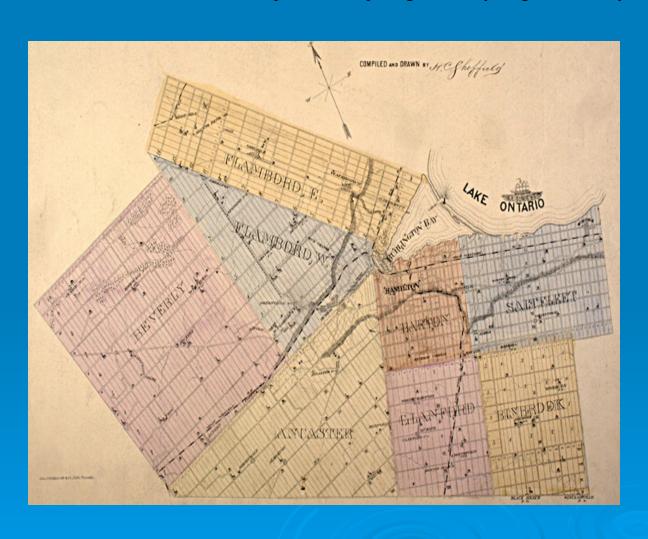




- http://www.archives.gov.on.ca/english/exhibits/tourism/big/big_17_railway_map.htm
- http://www.archives.gov.on.ca/ENGLISH/exhibits/archives/big/big_32a_ontario_map.

Wentworth County 1880

Map source: http://digital.library.mcgill.ca/CountyAtlas/

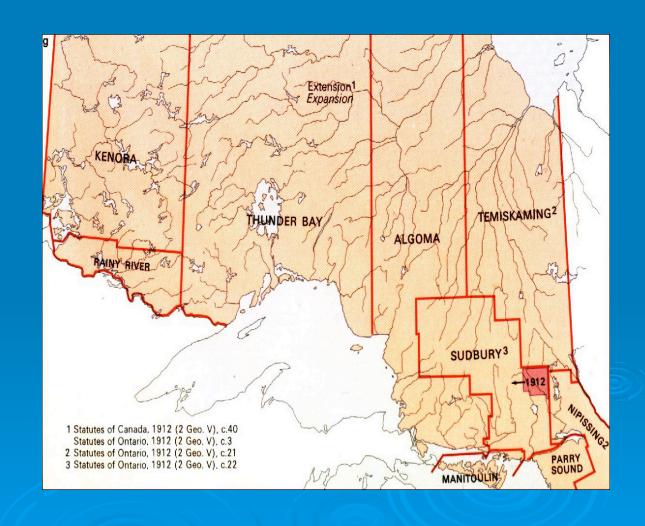


- Europeansettlementdating from late18th century
- Industrial region in 19th century
- Hamilton major urban center

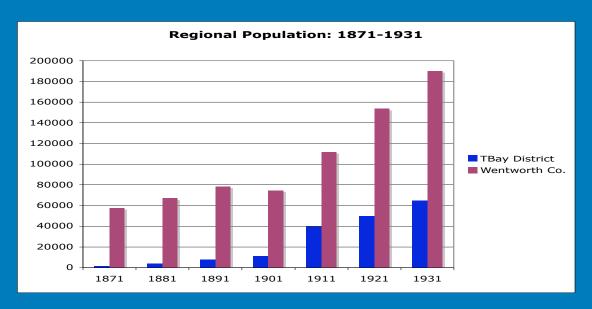
Thunder Bay District 1912

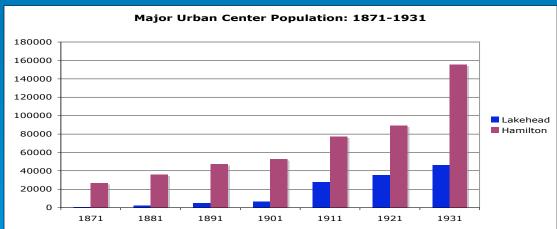
Source: http://www.archives.gov.on.ca/english/exhibits/maps/textdocs/north1912big.htm

- Resource extraction
- Port for grain trade at the Lakehead
- Major urban center - The Lakehead (PA & FW)



Boom & Population Growth



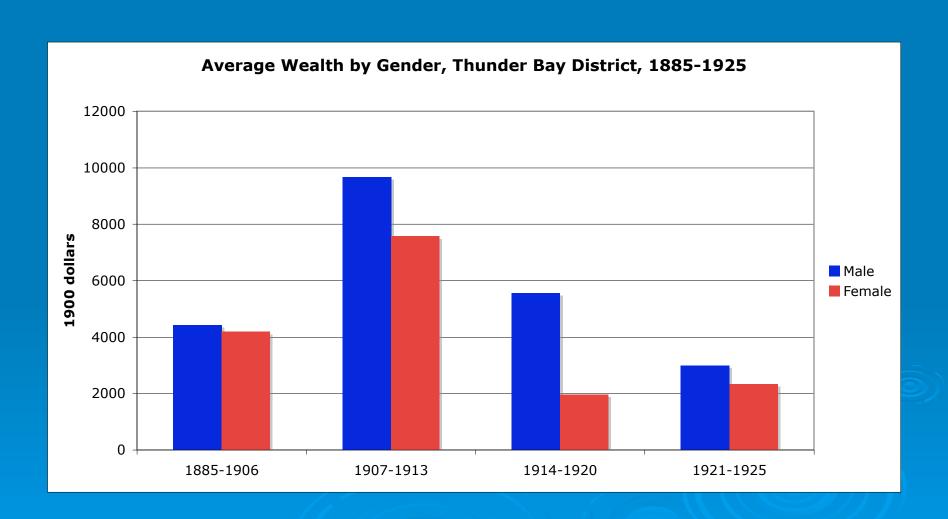


Thunder
 Bay District
 as share of
 Wentworth
 County
 population
 grew from
 2.5 percent
 in 1871 to
 34 percent
 by 1931

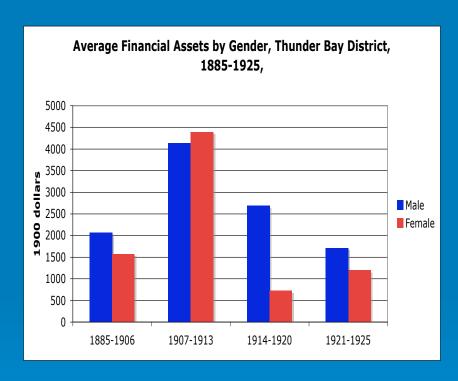
Summary Statistics for Two Data Sets (\$1900)

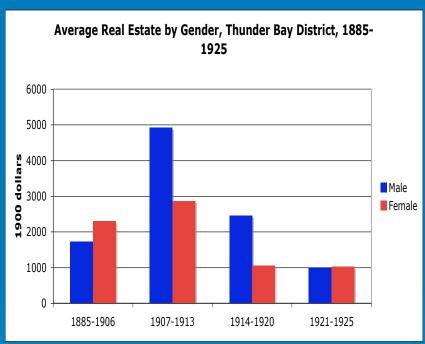
ті	hunder Bay Dist (1885-1925)	Wentworth Co. (1872-1912)
N	1780	1183
Percent Male	78.5	67.5
Average Wealth (\$)	5156	7014
Average Real Estate (\$)	2310	2848
Average Financial Assets(\$)	2449	3388
Percent Testate	50.0	68.5
Percent Farmer	9.3	17.8
Percent Married	54.9	54.1
Percent Widow	8.0	17.6
Percent Widower	8.5	12.7
Percent Single	28.4	15.7
Average No. of Children	1.6	2.4

Wealth - Thunder Bay District



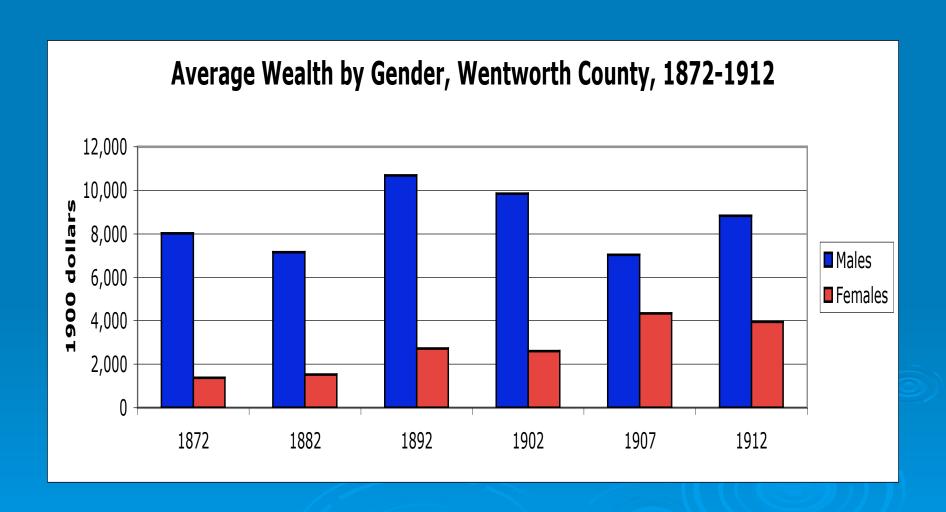
Thunder Bay District, Real Estate & Financial Assets



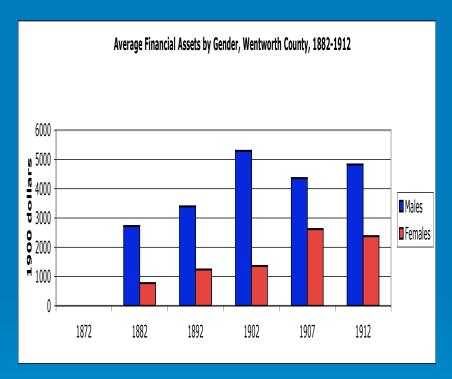


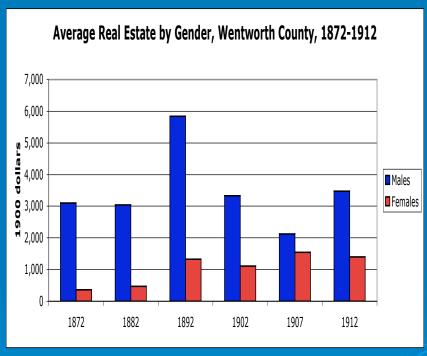
Post boom collapse in wealth greater for women comparing 07/13 to 14/20. Real estate falls 50% for men and 63% for women. Financial asset decline is 35% for men and 84% for women.

Wealth-Wentworth County



Wentworth County, Real Estate and Financial Assets





> From 1882-1912, male financial asset wealth increased 78% while for females the increase was 207%.

Comparisons

- ➤ In TBD, by 1907-13, average male wealth was 28% greater than female wealth.
- ➤ In WC, by 1907, average male wealth was 61% greater than female wealth.
- Women appear to have made relatively larger gains in frontier area

Rising Wealth and Financial Assets

- Financial asset growth pronounced in both Wentworth County & Thunder Bay District
- Mortgages a large component of the increase
- ➤ In TBD, by 1907-13, mortgages account for 36% of average female wealth, real estate 38%.
- In WC, by 1907, mortgages account for 20% of average female wealth, real estate 36%
- Men generally less reliant on mortgages in both regions

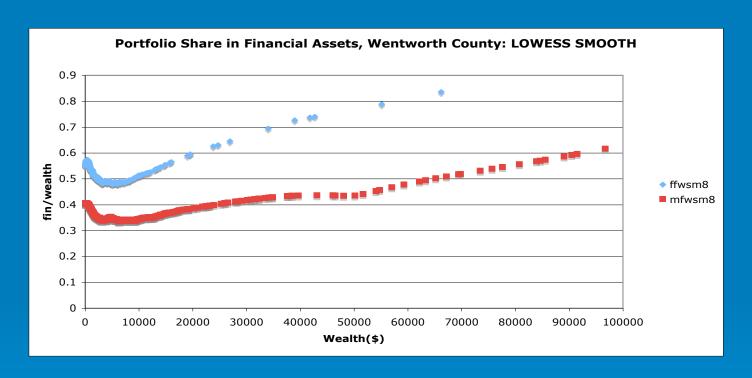
Women and Mortgages

- Were women overly dependent on the local real estate market for their wealth portfolios via land and mortgages?
- During boom period 1907-13, in TBD "real estate" accounts for 74% of women's wealth, 69% of male wealth. For 1914-20, comparable figures are 66% and 65%.
- In WC in 1907, "real estate" accounts for 55% of women's wealth, 39% of male wealth. In 1912, comparable figures are 46% and 61%.

Questions

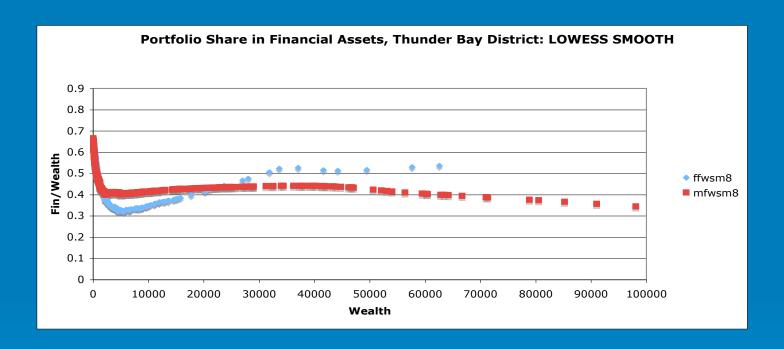
- As relatively new investors in the wake of the Property Law Reforms, did women extend themselves into riskier investments under the artificial security of rising prices during boom times? Risk aversion?
- Did women experience wealth setbacks in the wake of economic downturns? eg., TBD 1914-1920; Wentworth Co. in 1892 and 1907.
- Was wealth accumulation continuous over the period 1870-1925?
- Can attempt an answer using LOWESS profiles.

Risk Aversion: Wentworth County



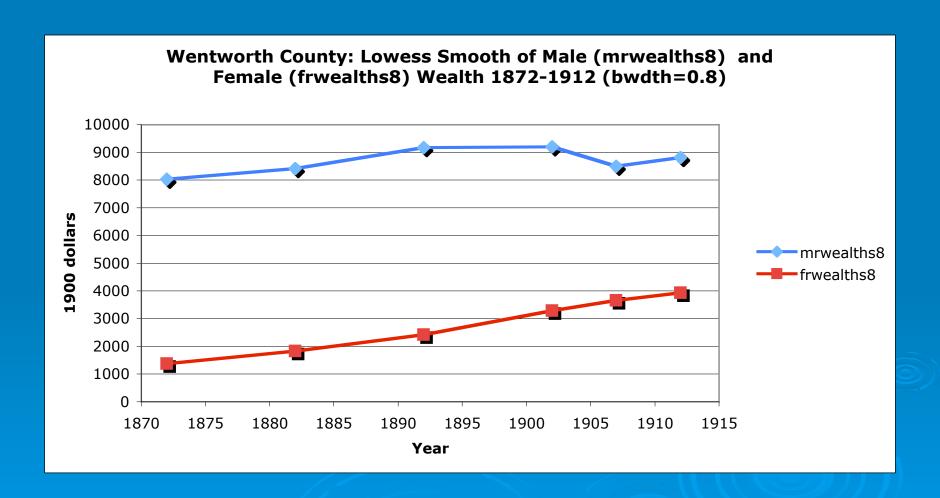
- Lowess Smooth (bandwidth=0.8)
- Financial assets/wealth vs wealth
- Wealth<=\$100,000</p>

Risk Aversion: Thunder Bay District

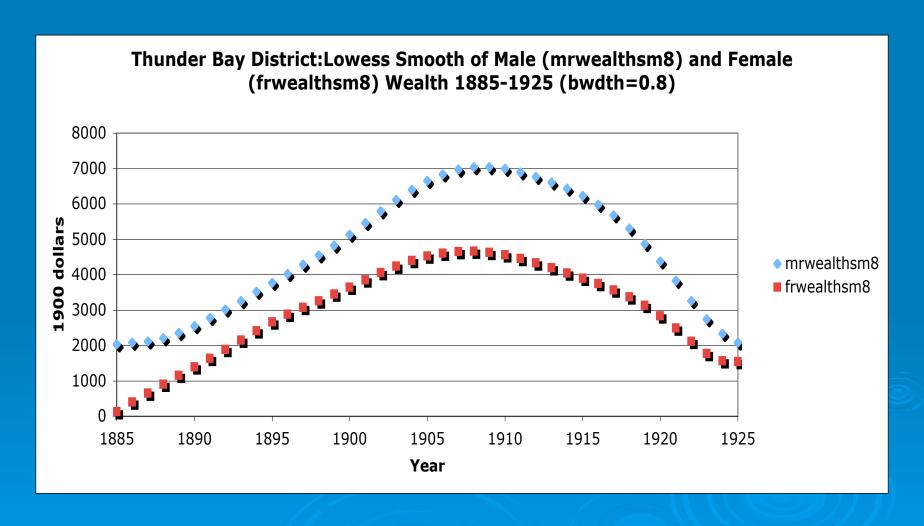


- Lowess Smooth (bandwidth=0.8)
- Financial assets/wealth vs wealth
- Wealth<=\$100,000</p>

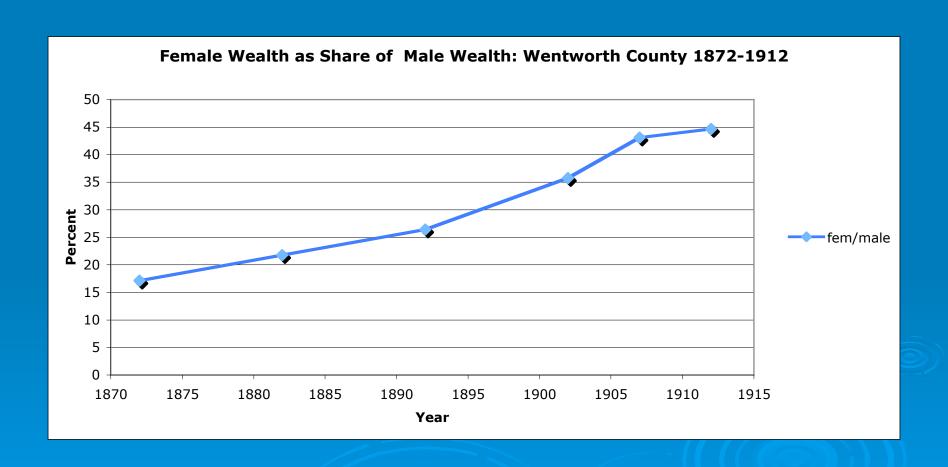
Wentworth Co.



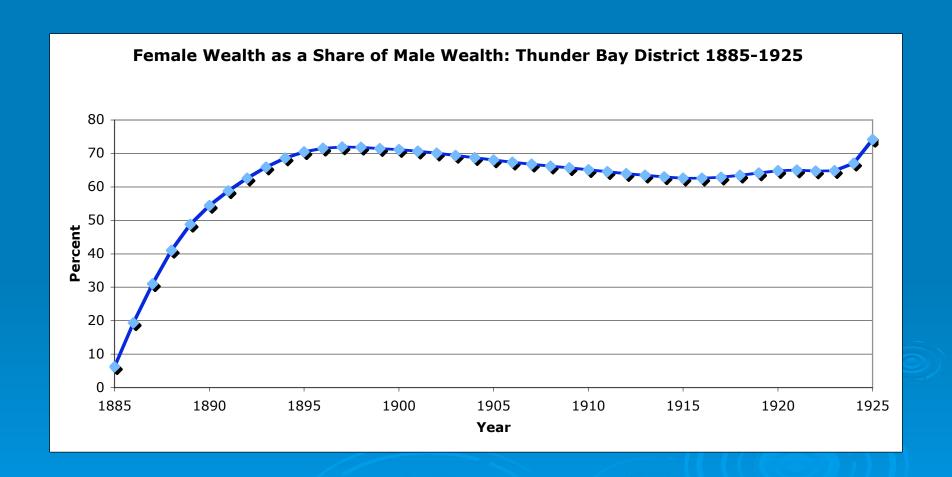
Thunder Bay District



Wentworth Co.



Thunder Bay District

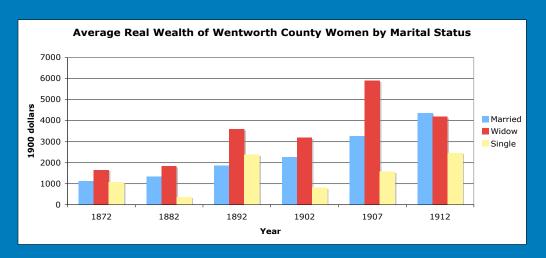


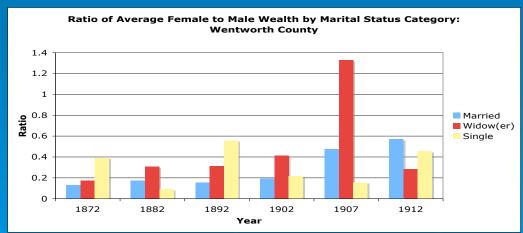
Results?

- Women's wealth increased in the wake of Ontario property rights legislation
- Regional differences seem to be present.
- ➤ In WC, average female wealth was 15 percent that of men in 1872 and rose to 45 percent by 1912.
- ➤ In TBD, average female wealth was 10 percent that of men in 1885 and rose to 60-70 percent range after 1900.

However...

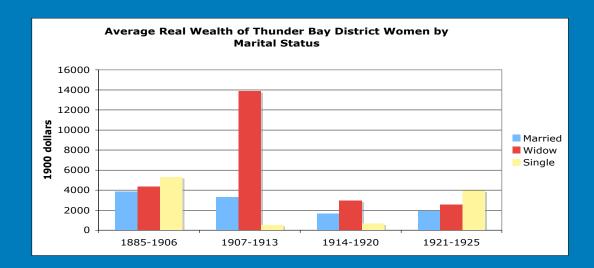
Wentworth County: Wealth by Marital Status

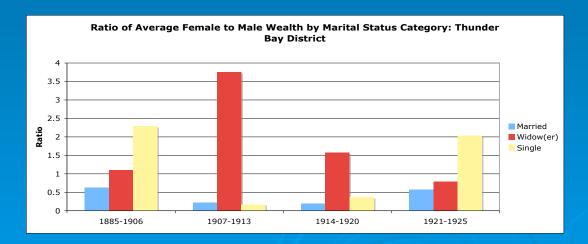




> 1872-1912: Real wealth of married women rises 293%; that of widows rises 153%; that of sinle women rises 131%.

Thunder Bay District: Wealth by Marital Status





- Effect of boom/bust complicate analysis
- Improvements for married and single women occur after the bust
- Widows appear to have been hard hit by the post-boom period
- Higher female to male wealth ratios than Wentworth not consistent

Conclusion

- Increases in overall female property holding over time with greater increases in frontier as opposed to established areas.
- Female property owners experienced setbacks in wake of downturns but no worse than for males.
- After 50 years of property rights legislation, women owned 45-70 percent the levels of male wealth.
- Rather than two steps forward, one step back, it appears overall female wealth acquisition in aggregate was characterized by small continuous steps forward over the period 1870-1925.
- However, when examined by marital status, gains are steady in Wentworth County, more erratic in Thunder Bay District

2. Go Forth and Multiply: The Effect of Religion on Family Size

Outline

- > Introduction
- Fertility and Family Size: Theoretical Approaches and Empirical Results
- A Model of Family Size Determination
- > Data
- Empirical Model and Results
- > Conclusion

Introduction

- The impact of religion on economic behaviour
- > Weber Thesis
- > Adam Smith
- Keister, Tomes, Meng

Direct Relationships between Religion & Fertility

- Leasure (1982)
- Conservative faiths, empowerment and fertility
- Hacker (1999)
- Does stricter adherence to religious teaching result in larger families?

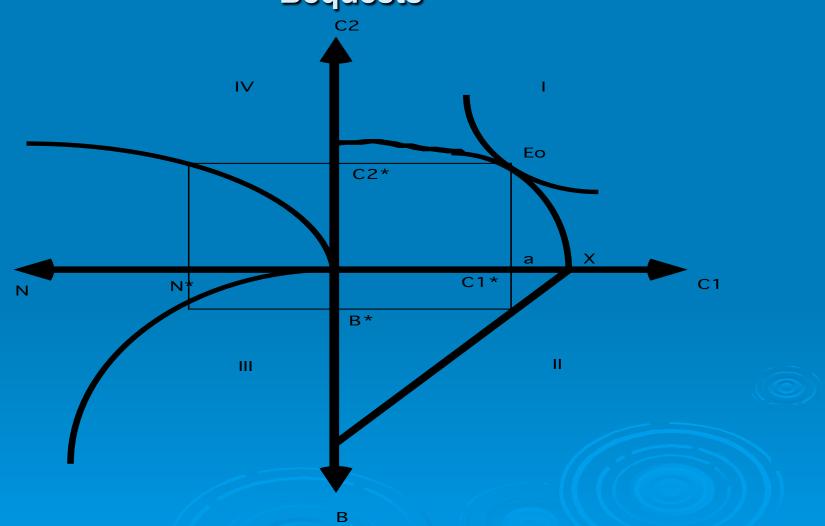
Theoretical Approaches

- Becker and micro-economic approach to fertility
- Old-age security motive for fertility
- Dependence on family labour leads to "promise of an inheritance as a control device".

Empirical Evidence: Fertility, Family Size, Religion in Canada

- Henripen(1972)
- McInnis(1991)
- Denton and George(1970,1973)
- Haan (2005)
 - Religious variables found to not contribute much to overall fit of models
 - "centrality of religion in the fertility transition should be called into question."

Simple Model of Family Size Determination: Intertemporal Consumption with Children and Bequests



The Data

- 3,515 census-linked probated decedents from 1892
- > 3,641 from 1902
- Wealth data for sixteen asset categories as well as other variables - including number of children

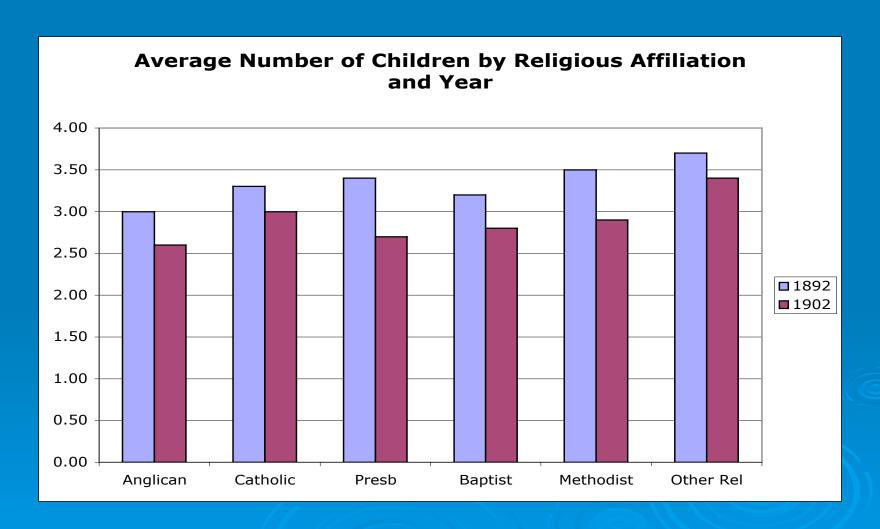
Religious Affiliation

Religious Affiliation of Probated Decedents 1892

 Anglicans 20.2 	2%
------------------------------------	----

- Roman Catholic 10.8%
- Presbyterian 27.1%
- Baptist 4.9%
- Methodist 28.9%
- All Other Religion 8.2%

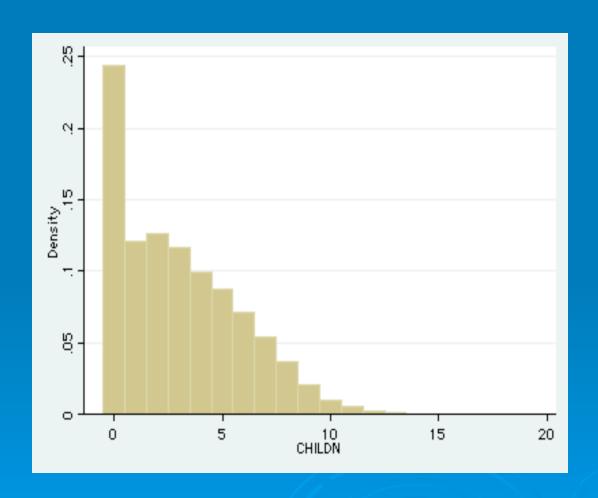
Family Size and Religion



Empirical Model

- > C= $f(z_1, z_2,....z_n)$
- "hierarchical/conservative denominations" defined as Baptists, Anglicans, Methodists, Roman Catholics.
- > OLS
- Preliminary Versions
 - Basic OLS
 - Version with "fitted wealth"
 - Count data therefore Poisson regression & negative binomial regression

Histogram of Number of Children



- Suggests a skewed distribution
- Poisson or binomial regression appropriate

Variables

WEALTH Wealth (\$)

FINP 1 if financial assets owned, 0 otherwise.

AGE Age at death in years.
SEX 1 if male, 0 otherwise
TEST 1 if testate, 0 otherwise

URB^a 1 if urban resident, 0 otherwise.

ENGLISH 1 if born in England or Wales, 0 otherwise.

IRISH 1 if born in Ireland, 0 otherwise.

SCOT 1 if born in Scotland, 0 otherwise.

USA 1 if born in United States, 0 otherwise.

CANBORN 1 if born in Canada (Ont, Que or Maritimes), 0 otherwise.

OTHBRTH 1 if born in any other place, 0 otherwise.

OCC1^b 1 if Katz Category I, 0 otherwise

OCC2F 1 if Katz Category II and a farmer, 0 otherwise OCC2NF 1 if Katz Category II and a non-farmer, 0 otherwise

OCC3

1 if Katz Category III, 0 otherwise
OCC4

1 if Katz Category IV, 0 otherwise
OCC5

1 if Katz Category V, 0 otherwise
OCC6

1 if Katz Category VI, 0 otherwise
MARRIED

1 if married, 0 otherwise
WIDOWER

1 if widower, 0 otherwise
WIDOW

1 if widow, 0 otherwise

MARSPD 1 if widower or widow, 0 otherwise.

SINGLE 1 if single, 0 otherwise
PRESB 1 if Presbyterian, 0 otherwise
CATHOLIC 1 if Roman Catholic, 0 otherwise
BAPTIST 1 if Baptist, 0 otherwise
METH 1 if Methodist, 0 otherwise
ANGLICAN 1 if Church of England, 0 otherwise
OTHREL 1 if any other religion, 0 otherwise

LITERATE 1 if decedent could read and write, 0 otherwise

CHILDN Number of children reported.

YEAR1902 1 if year of probate is 1902, 0 otherwise.

NORTHERN 1 if Northern Ontario, 0 otherwise

WESTERN 1 if Western Ontario, 0 otherwise

EASTERN 1 if Eastern Ontario, 0 otherwise

HURONIA 1 if Huronia, 0 otherwise.

GOLDEN 1 if Golden Horseshoe, 0 otherwise.

Some Preliminary Results

TABLE 3: REGRESSION RESULTS-OLS-CHILDN DEPENDENT VARIABLE

Dependent Variable: CHILDN

literate

Regression Using Un-instrumented Wealth

0.2087395

Variable	Coefficient	t-statistic	Variable	Coefficient	t-statistic
AGE	0.1577171	10.74	northern	0.5480212	2.65
agesq	-0.0011825	-9.68	western	0.079164	0.81
SEX	-0.6305605	-1.22	huronia	0.493929	4.93
URB	-0.4604389	-5.47	eastern	-0.1127431	-1.15
english	0.0921378	0.92	yr1902	-0.4503326	-6.81
irish	0.1348966	1.35	wealth	5.47E-06	4.43
scot	0.2313328	1.87	_cons	-1.973643	-2.73
usa	-0.0748176	-0.39		•	_
othbrth	0.3198014	1.76			
occ1	0.619648	2.42			
occ2F	1.440987	5.9		n=6275	
occ3	0.8671955	3.33		$F_{28,6246} = 26.67$	•
occ4	0.4830189	1.49		Adj $R^2 = 0.106$	8
occ6	-0.0529784	-0.09			
occ2nf	-0.7903924	-5.5			
married	-0.0447635	-0.55			
catholic	0.4948837	3.85			
presb	0.1430143	1.3			
baptist	0.1370405	0.83			
meth	0.1945912	2			
othrel	0.404204	2.81	Ī		

1.73

RESULTS-II

TABLE 6: REGRESSION RESULTS-NEGATIVE BINOMIAL REGRESSION-CHILDN DEPENDENT VARIABLE

ariable

orthern

estern

uronia

astern r1902

cons

ealthhat

Dependent Variable: CHILDN Regression Using Fitted Wealth

Variable	Coefficient	Z	V
AGE	0.0609398	11.38	n
agesq	-0.0004513	-10.66	W
SEX	-0.2141582	-1.26	h
URB	-0.1092033	-3.31	е
english	0.0108479	0.35	У
irish	0.0162711	0.52	W
scot	0.0390549	1.02	
usa	-0.0310185	-0.52	
othbrth	0.0358712	0.65	
occ1	-0.108179	-1.41	
occ3	-0.1498191	-3.35	
occ4	-0.3031954	-3.72	
occ5	-0.5056346	-5.78	
осс6	-0.4905911	-2.86	
occ2nf	-0.2021729	-4.46	
married	-0.0165325	-0.67	
catholic	0.1451773	3.72	
presb	0.0421398	1.24	
baptist	0.0276255	0.52	
meth	0.0379594	1.15	
othrel	0.1176504	2.72	
literate	0.0801166	2.06	

n=6275LR $chi^{2}(28)=653.22$ Prob > $chi^{2}=0$ Pseudo $R^{2}=0.0225$

Coefficient z

2.13

-0.35

2.32

-1.59

-6.69

-1.28

-1.46

0.1407998

-0.0135439

0.0948086

-0.0575428

-0.1423907

-0.3365083

-7.76E-06

Conclusions

- Religion variables are statistically significant for Roman Catholics & All Other Religions
- Relative to Anglicans, Roman Catholics had 0.15 more children and All Other Religions 0.12 more
- Presbyterians, Methodists, Baptists not statistically different from Anglicans.
- Results do not fall into the liberal-conservative divide of other studies.

3. NATURAL RESOURCE EXPORTS AND WEALTH ACCUMULATION IN SETTLER ECONOMIES: NORTHWESTERN ONTARIO AND SOUTH AUSTRALIA 1905-1915

L. Di Matteo (LU)
H. Emery (UofC)

M. Shanahan (UNISA)

The "Resource Curse"

- Resource abundance correlated with slower growth and lower long run incomes
 - Seems true for post-1970 world
 - Resources crowd out "x" which causes growth
 - Resources "cause" weak institutions

Surprising given traditional "Staples" views of successful developers

- Historical cases dismissed as not informative
 - Success came from natural protection due to high transport costs
 - Economies like Can, Aus, NZ and US were never as resource intensive as many developing economies today
- explanation for the "resource curse"
 - why has successful natural resource based development has occurred historically but not recently?
 - SA and TBD an ideal laboratory

Several things in common:

- Both economies driven by grain trade
- Common time period 1905 to 1915
- Institutional quality "comparable"
 - Both are British settler economies

Important Differences:

- SA benefited from earlier wheat exports in late 19th century
 - TBD a "new economy" in 1905
 - How important was timing?
- > SA is on the coast, TBD on inland waterway
 - SA grain district all within 60km of coast
 - Factor identified as important for high incomes
- > TBD depends on grain shipment and handling
 - SA has production, shipping and handling
 - All else equal, SA could capture more linkages
- Ownership of Capital:
 - SA Railways are state railways
 - For TBD, railways and elevators are externally owned

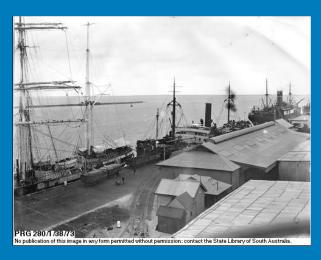
We focus on wealth, rather than per capita incomes

- > Chambers and Gordon (1966) show the "resource curse"
 - No change in p.c. GDP but increase in wealth
 - Rent to the fixed factor
 - Rodriguez and Sachs (1999)
 - Short run surplus needs to be invested for long run increase in consumption
- Use wealth date for probated decedents in SA and TBD 1905 to 1915

Fort William Waterfront and Port Adelaide 1913 and 1916



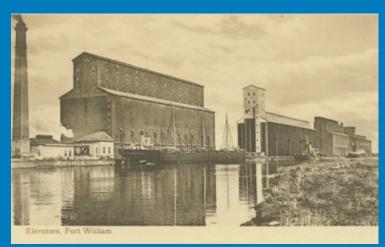
Fort William, Steamers on the Kam River, circa 1913





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Grain Handling at the Lakehead in 1907 and in South Australia, 1915, 1916



1907



1900

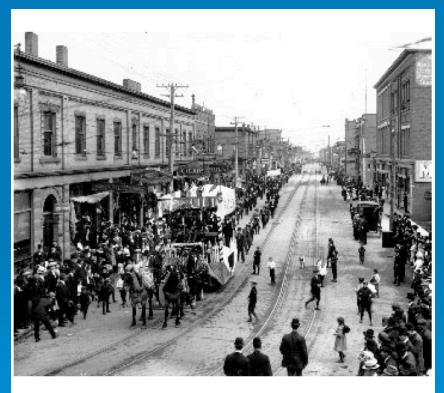




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Main Streets



Labour Day Parade, Simpson Street, Fort William, Circa 1913



King William Street, Adelaide, 1913

Prominent Buildings

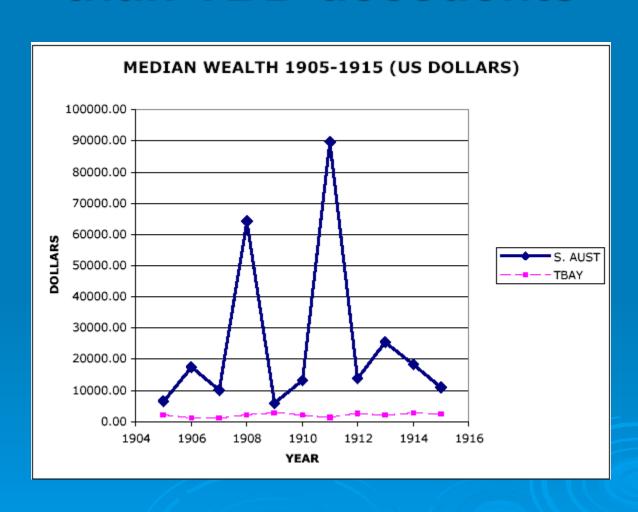




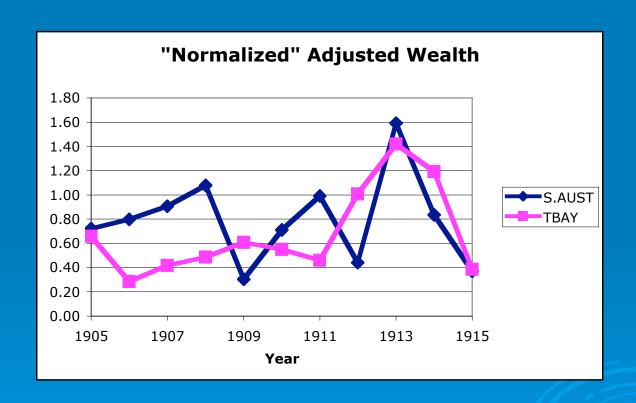
Grain Exchange Building, Victoria Avenue, Fort William, 1914

Rundle Street Shop, 1913

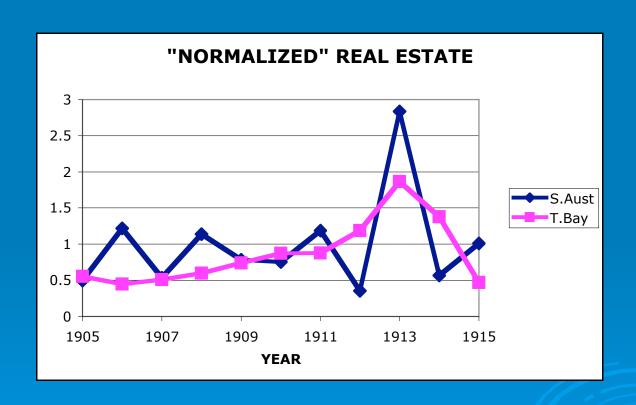
SA Decedents much wealthier than TBD decedents



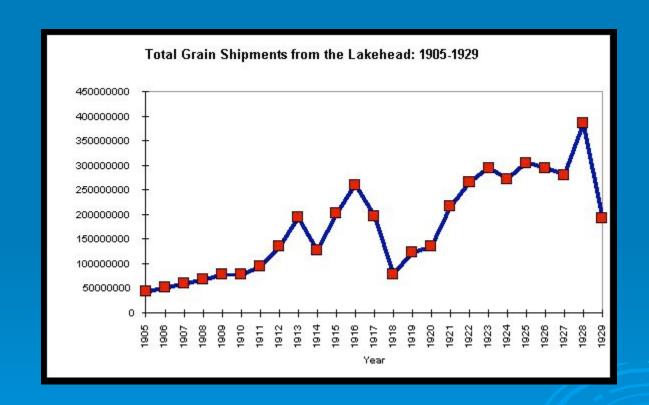
But comparable changes in wealth 1905 to 1915



Particularly with Real Estate

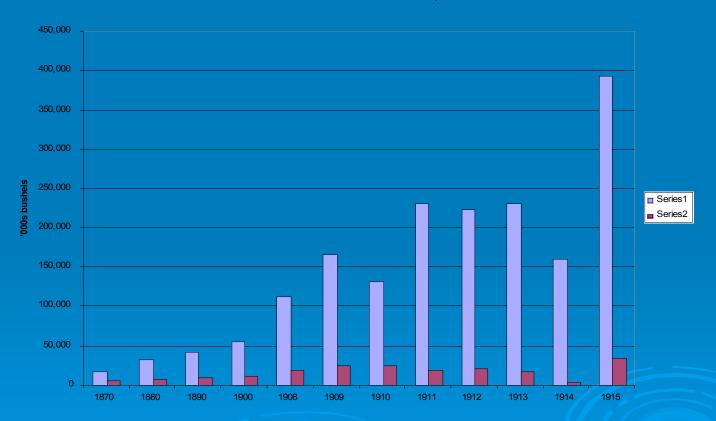


TBD Wealth levels reflect growth of grain trade



SA Wheat Production tiny compared to Canada

Bushels of Wheat Produced in Canada and SA, 1870-1915



So:

- Wealth levels are higher in SA than TBD
- Proportionate change in wealth is common
- SA wheat production tiny compared to Canada
- How did SA get so rich?
 - H1: They are not, the probated samples are not comparable
 - H2: for a given bushel of wheat, SA retained more of the value in its economy

Sources of income in the grain trade

Activity SA TBD

Production Yes No

Rail Transport Yes No

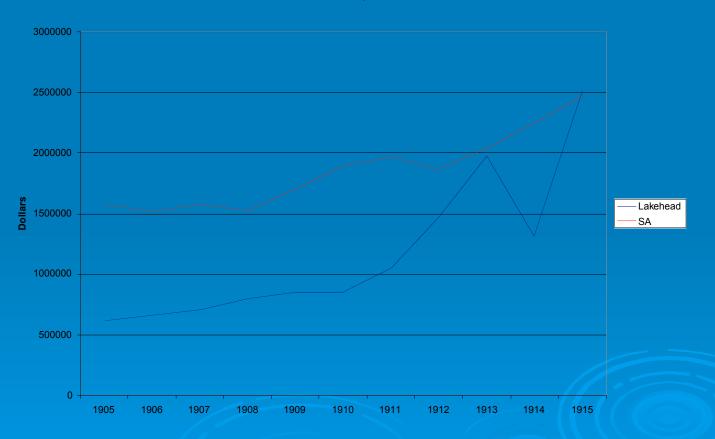
Grain Handling Yes

Shipping to mkt No
No

- Proxy value of Wheat for SA as the world price less ocean freight rate = 90 Cents/bu
- For TBD, use 1925 estimate of 1.5 cent/bu handling cost at the Lakehead from HAC

Gross Incomes from Grain Trade

Estimated Gross Incomes From Wheat Production, Transportation and Trade, The Lakehead and South Australia, 1905-1915



SA got more income from a bushel of wheat than TBD

- A mini version of Canada where grain trade had national benefit
- Our comparison highlights the regional distribution of income
- For TBD, capital and transportation capital externally owned
 - SA it is domestically owned and controlled
- In terms of development, ability to capture linkages of resource export the key thing
 - Reliance on external capital for resource development, production and shipment to market is the limiting influence on development.

CONCLUSION

- Probate wealth data lends itself to a variety of topics
- Data collection costs significant
- > Future projects: Manitoba probate sample