

The urban dimensions of income inequality in Canada, 1996 - 2006

Kenyon Bolton
Supervisor: Sébastien Breau

McGill University, Department of Geography

Paper presented to the OICSS 4th New Researchers Conference
Université de Montréal, Friday March 13th 2009

Acknowledgements: Thanks to Gael Lejeune and Marie-Eve Gauthier for logistical support on this project. Funding for the study was provided by a Statistics Canada Research Fellowship, a grant from the Social Sciences and Humanities Research Council of Canada, and an RDC OICSS grant. All results have been screened to ensure no confidential information is revealed.

Outline

- Motivation
 - Research questions
- Theoretical framework
- Empirical literature
- Data and methods
- Model specifications
- Results and discussion
- Conclusion, future research

Motivation and research questions (1)

- Increasing income / wage inequality in Canada (1980s on, though mainly post-1990)

Median earnings, Canada (\$2005)

Quintile	1980	2005	% change
Bottom 20%	19,367	15,375	-20.6
Middle 20%	41,348	41,401	0.1
Top 20%	74,084	86,224	16.4

Source: Statistics Canada (2008), Cat. No. 97-563-X

- Why does inequality matter?
 - Social justice, impact on economic growth
- Why study inequality at the metropolitan level?
 - Local labour market dynamics, public policies

Motivation and research questions (2)

- Research questions:
 - 1. How has income / wage inequality evolved across metropolitan areas in Canada (1996-2006)?
 - 2. How do we account for these patterns? What factors influence distribution of income / wages at the metropolitan level?

Theoretical Framework

Social and Demographic Changes

- Age composition
- Household characteristics
- Educational Attainment
- Visible minority status
- Immigrant status

Economic Structural Changes

- Unemployment
- Industrial Mix
 - % Manufacturing
- Development level
 - Median income

Spatial Attribute Changes

- Population size
- Regional characteristics

Changes in
Metropolitan
Wage and Income
Inequality

```
graph LR; A["Social and Demographic Changes"] --> D["Changes in Metropolitan Wage and Income Inequality"]; B["Economic Structural Changes"] --> D; C["Spatial Attribute Changes"] --> D;
```

Empirical literature

- US: cohesive literature on inequality across metropolitan areas
 - General models across urban areas
 - Chakravorty (1996a, 1996b), Cloutier (1997), Morrill (2000), McCall (2001), Drennan (2005), Hipp (2007), Wheeler and Lajeunesse (2008)
- Canada: mostly descriptive and varied
 - Soroka (1999), Moore and Pacey (2003), Heisz et al. (2004), Saez and Veall (2005), Yalnizyan (2007), Osberg (2008), Walks and Maaranen (2008)

Data

- Census of Population (1996, 2001, 2006)
 - 20% sample based on the long-form questionnaire (2B)
 - Accessed through the QICSS RDC program
 - Sensitivity
- Defining metropolitan areas:
 - CMAs and CAs with minimum population threshold of 25,000 ⇒ 94 consistent urban areas

Methods (1), the dependent variable

- For the labour force, ages 25 – 64, wages > \$1000
- Total income vs. wages
- Measuring inequality:

Inequality index	Advantage, disadvantage
$Gini = \frac{1}{2n^2 \bar{y}} \sum_{i=1}^n \sum_{j=1}^n y_i - y_j $	Simple, easy to interpret (range: 0 to 1) Sensitive to changes in middle of income / wage distribution
$Theil = \sum_{i=1}^n s_i \log(ns_i)$	Entropy measure (range: 0, --) Sensitive to changes in top of income / wage distribution

- Generated in Stata 10.0 using Jenkins (2001) *ineqdeco.ado* file.

Methods (2), model specification:

$$INEQ_{it} = a_{it} + b_{1it} x_1 + b_{2it} x_2 + b_{3it} x_3 + \dots + b_{nit} x_n + e_{it}$$

Variable (x_{it})	Description	Exp. Sign
Log (LF population)	The natural log of the labour force population, ages 25-64, with minimum and wages > \$1000	+
Median wages	The median wages of the studied labour force	-
Unemployment Rate	The rate of unemployment within the studied labour force	+
Female part.rate	The rate of female participation in the studied labour force	?
% Manufacturing	The percentage of those working in manufacturing according to 1980 SIC/NAICS02	-
% Visible min.	The percentage of self-reported visible minorities represented, including Aboriginals, in the studied LF	+
% University deg.	The percentage of those with a bachelor's degree or higher in the studied labour force	+
% With no secondary school	The percentage of those without a secondary school diploma or equivalent, in the studied labour force	+
% Young	The percentage of youth < 15 years old relative to the studied labour force	+
% Senior	The percentage of those aged > 64 years old, relative to the studied labour force	?

Recent patterns (1)

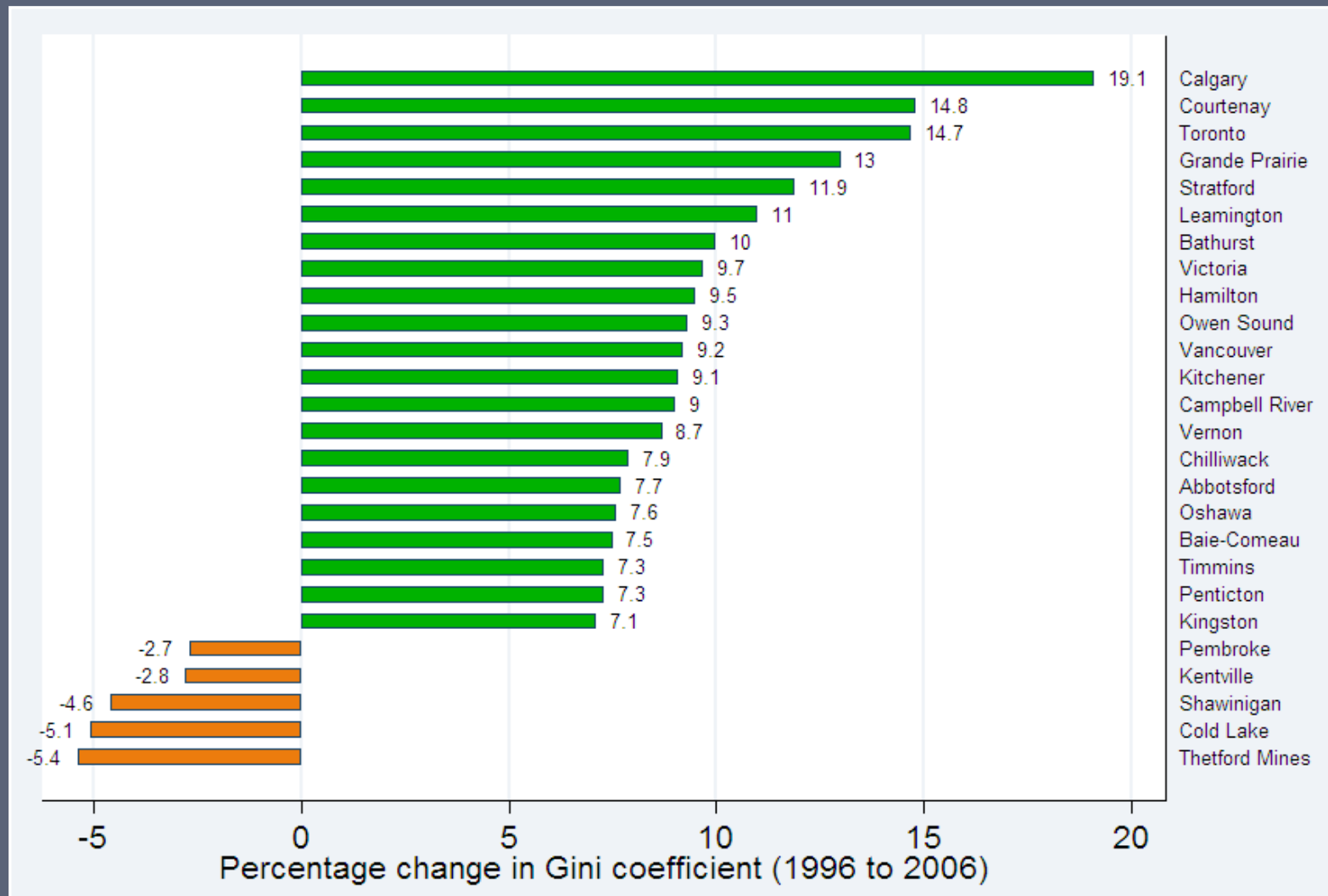
Basic descriptive statistics (dependent and independent variables)

Variable	1996	2001	2006
Gini	.364 (.018)	.364 (.021)	.379 (.026)
Theil	.233 (.030)	.241 (.043)	.271 (.063)
Median wages (\$)*	27947.2 (3248.1)	31686.4 (3602.1)	36120.6 (5294.9)
Total population	228791.9	242595.5	260597.7
Labour force pop.	85258.6	94471.8	101653.1
Female part. rate	.456 (.021)	.468 (.020)	.478 (.022)
No high school (%)	.227 (.042)	.200 (.041)	.159 (.039)
Higher education (%)	.158 (.049)	.170 (.055)	.187 (.063)
Visible minority (%)	.036 (.045)	.040 (.055)	.050 (.067)
Single parents (%)	.057 (.007)	.066 (.008)	.070 (.010)
Young (%)	.582 (.065)	.514 (.057)	.459 (.050)
Senior (%)	.345 (.107)	.362 (.108)	.382 (.108)
Manufacturing (%)	.166 (.087)	.165 (.089)	.146 (.079)
Unemployment (%)	.059 (.018)	.051 (.021)	.042 (.016)
<i>N</i>	94	94	94

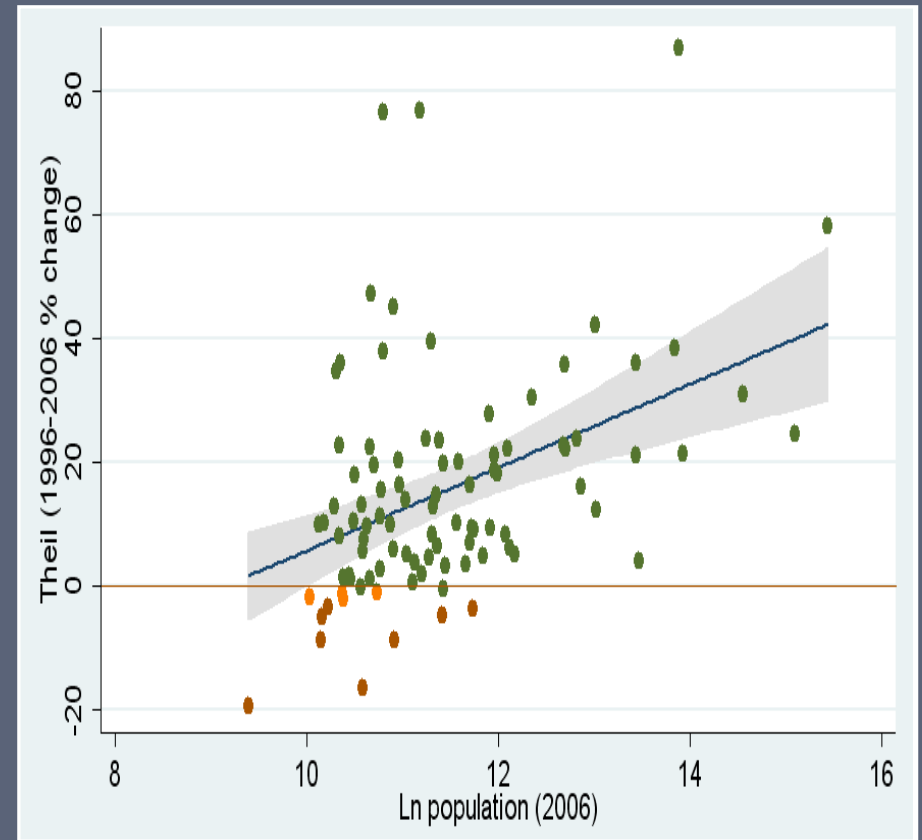
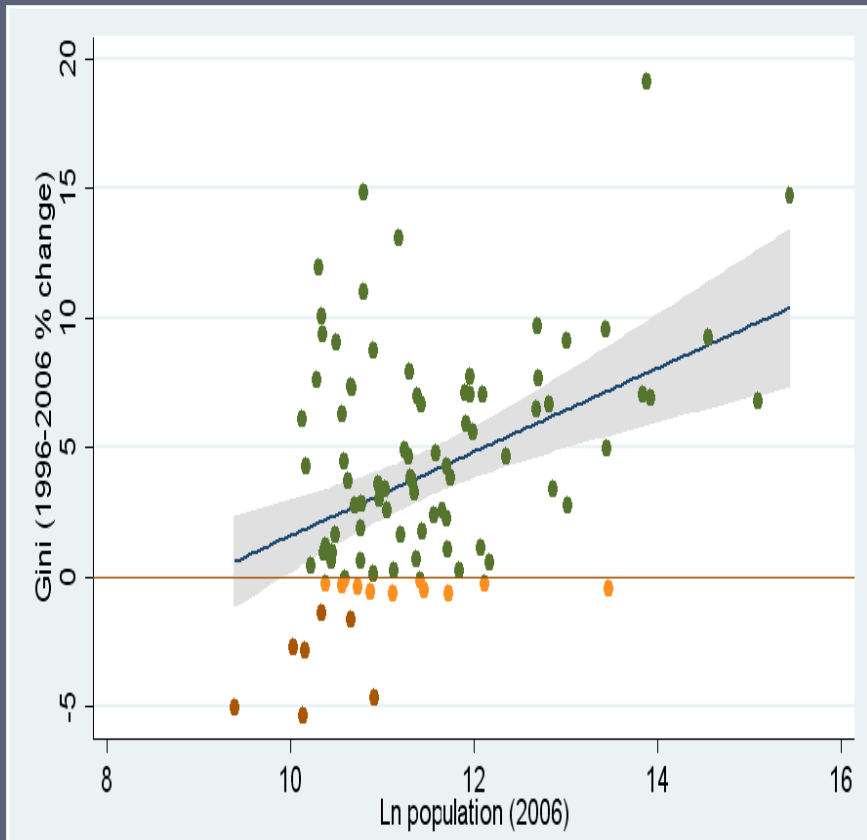
Note: Standard deviations are shown in parentheses.

*Nominal income

Recent patterns (2)



Recent patterns (3)



Model Results

	1996		2001		2006	
	Gini	Theil	Gini	Theil	Gini	Theil
Log(LF population)	.001 (.491)	.002 (.412)	.007** (.001)	.014** (.002)	.009** (.000)	.020** (.000)
Median wages	-1.69e-06** (.052)	-2.47e-06** (.016)	-2.62e-06** (.005)	-4.54e-06** (.010)	-1.15e-06* (.061)	-2.39e-06 (.140)
Unemployment rate	.190 (.146)	.149 (.444)	.290** (.035)	.202 (.607)	.307** (.014)	.191 (.451)
Female part. rate	-.157 (.134)	-.058 (.719)	-.405** (.006)	-.452 (.132)	-.460** (.000)	-.731** (.004)
% manufacturing	-.039 (.109)	-.051 (.173)	-.055** (.041)	-.081 (.174)	-.070** (.016)	-.044 (.547)
% visible minority	.145** (.000)	.287** (.000)	.086** (.020)	.241** (.011)	.069* (.083)	.160 (.188)
% university degree	.014 (.807)	.038 (.700)	.055 (.365)	.081 (.481)	.078 (.279)	.311 (.107)
% no high school	-.069 (.290)	-.086 (.414)	.049 (.508)	.235 (.111)	.031 (.699)	.175 (.349)
% young	.023 (.510)	.085* (.100)	-.012 (.768)	-.098 (.230)	.013 (.781)	.061 (.551)
% senior	.046** (.009)	.048 (.130)	.014 (.553)	-.005 (.904)	.076** (.002)	.164** (.020)
Constant	.441** (.000)	.238** (.032)	.542** (.000)	.442* (.058)	.490** (.000)	.304 (.117)
Province fixed effects	YES	YES	YES	YES	YES	YES
R-squared	.703	.720	.669	.592	.723	.673
Number of obs.	94	94	94	94	94	94

p-values shown in parentheses; * indicates significance at the .10 level; ** indicates significance at the .05 level.

Model Results

	1996		2001		2006	
	Gini	Theil	Gini	Theil	Gini	Theil
Log(LF population)	.001 (.491)	.002 (.412)	.007** (.001)	.014** (.002)	.009** (.000)	.020** (.000)
Median wages	-1.69e-06** (.052)	-2.47e-06** (.016)	-2.62e-06** (.005)	-4.54e-06** (.010)	-1.15e-06* (.061)	-2.39e-06 (.140)
Unemployment rate	.190 (.146)	.149 (.444)	.290** (.035)	.202 (.607)	.307** (.014)	.191 (.451)
Female part. rate	-.157 (.134)	-.058 (.719)	-.405** (.006)	-.452 (.132)	-.460** (.000)	-.731** (.004)
% manufacturing	-.039 (.109)	-.051 (.173)	-.055** (.041)	-.081 (.174)	-.070** (.016)	-.044 (.547)
% visible minority	.145** (.000)	.287** (.000)	.086** (.020)	.241** (.011)	.069* (.083)	.160 (.188)
% university degree	.014 (.807)	.038 (.700)	.055 (.365)	.081 (.481)	.078 (.279)	.311 (.107)
% no high school	-.069 (.290)	-.086 (.414)	.049 (.508)	.235 (.111)	.031 (.699)	.175 (.349)
% young	.023 (.510)	.085* (.100)	-.012 (.768)	-.098 (.230)	.013 (.781)	.061 (.551)
% senior	.046** (.009)	.048 (.130)	.014 (.553)	-.005 (.904)	.076** (.002)	.164** (.020)
Constant	.441** (.000)	.238** (.032)	.542** (.000)	.442* (.058)	.490** (.000)	.304 (.117)
Province fixed effects	YES	YES	YES	YES	YES	YES
R-squared	.703	.720	.669	.592	.723	.673
Number of obs.	94	94	94	94	94	94

p-values shown in parentheses; * indicates significance at the .10 level; ** indicates significance at the .05 level.

Conclusion and future research

- Regression models that control for spatial autocorrelation
- Decomposition of inequality according to geographic and socioeconomic variables
- Panel Data Analysis to capture dynamics over time

- Thank you/Merci!