A Blinder-Oaxaca Decomposition of the Canadian White-Aboriginal Wage Gap

Austin Roche

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Background

- Aboriginals are indigenous peoples of Canada
  - First Nations
  - Métis
  - Inuit*
- Total 4.9% of the population (1.67 million people)
- European Settlement and the "Indian Problem"
  - Indigenous not considered citizens until 1951
  - Residential schools

Explanation of Dataset

- Cross-sectional subset of 2016 Canadian Census PUMFs
- 96,973 observations
  - 3,757 aboriginals
- Large dataset useful, and necessary to have a sufficient number of aboriginals
- Only includes:
  - Whites and aboriginals (non-Inuit)
  - Non-immigrants
  - Holds a job
  - Does not live in territories
  - Age 20 to 64 years

Issue at Hand

- How does "aboriginality" contribute to patterns of wage disparities?

- How much are aboriginals disadvantaged when compared to the majority white population?

- Does schooling allow Aboriginal workers to overcome earnings disparity?

Table 2. Median income by group.

Group	Median income	Obs.	Group	Median income	Obs.
White Male	$59,000	48,957	**White Female**	$39,000	43,586
Male	$59,000	50,823	**Female**	$39,000	45,350
Aboriginal Male	$49,000	1,866	**Registered Indian**	$38,000	1,422
White	$48,000	92,543	**First Nations**	$37,000	1,748
Métis	$46,000	1,882	**Member in Band**	$37,000	1,343
Aboriginal	$42,000	3,630	**Aboriginal Female**	$36,000	1,764

Table 3. Highest degree attained by group and gender (%).					
Degree attained	**Aboriginal, total**	**White, total**	**Degree attained**	**Aboriginal women**	**White women**
No Degree	15.98	7.79	No Degree	13.32	5.84
High School	34.93	29.65	High School	33.56	29.67
Trades	6.58	6.32	Trades	4.82	5.27
Apprenticeship	6.31	6.15	Apprenticeship	1.64	1.55
College	22.75	24.72	College	28.85	28.55
Bachelor's	11.16	19.48	Bachelor's	15.14	22.89
Master's	2.04	4.65	Master's	2.49	5.24
PhD	0.19	0.63	PhD	0.11	0.46
Medical	0.06	0.60	Medical	0.06	0.54
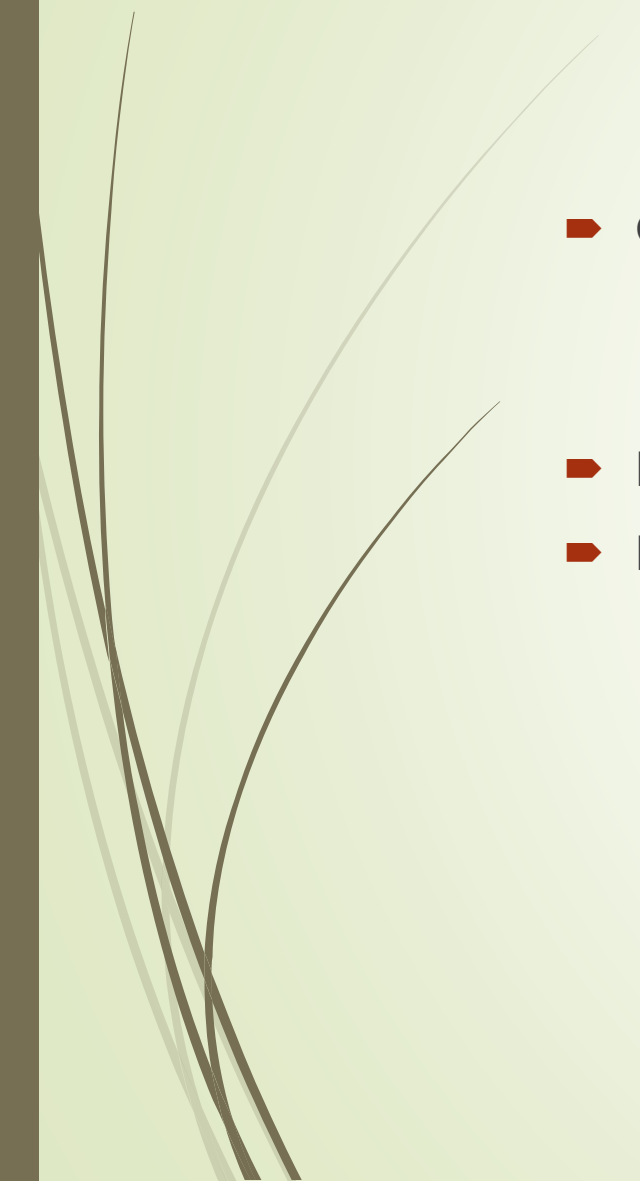
Degree attained	Aboriginal men	White men	Degree attained	First nation	Métis
No Degree	18.49	9.53	No Degree	19.85	12.38
High School	36.23	29.64	High School	35.01	34.86
Trades	8.25	7.26	Trades	6.41	6.75
Apprenticeship	10.72	10.24	Apprenticeship	5.43	7.12
College	16.99	21.32	College	21.00	24.39
Bachelor's	7.40	16.45	Bachelor's	10.47	11.80
Master's	1.61	4.13	Master's	1.66	2.39
PhD	0.27	0.78	PhD	0.17	0.21
Medical	0.05	0.65	Medical	0.00	0.11

Degree attained	Membership in a First Nations or Indian band
No Degree	21.44
High School	33.66
Trades	5.88
Apprenticeship	4.91
College	21.44
Bachelor's	11.02
Master's	1.56
PhD	0.07
Medical	0.00

Return to Education

- Clear that:
  - aboriginals make less money than white Canadians, and:
  - do not achieve as many years of schooling
- Lower dropout rate for Métis than for other aboriginals
- Higher dropout rate for indigenous in band

Estimation Method: OLS – Reduced Form

$$y_i^D = \boldsymbol{\beta}_0^D + \boldsymbol{\beta}_1^D \text{Female}_i + \boldsymbol{\beta}_2^D \text{English}_i + \boldsymbol{\beta}_3^D \text{Married}_i + \boldsymbol{\beta}_4^D \text{PTWK}_i + \boldsymbol{\beta}_5^D \text{HDGREE}_i +$$

$$\boldsymbol{\beta}_6^D \text{agegrp}_i + \boldsymbol{\beta}_7^D \text{PR}_i + \boldsymbol{\beta}_8^D \text{nChildren} + u_i^D$$

- Reference Group:
  - White Male
  - Single
  - HS education
  - No children
  - Lives in Ontario
  - Aged 30-34 years
  - Works full-year, full-time
  - Primary language is French

Estimation Method: OLS

$$y_i^D = \boldsymbol{\beta}_0^D + \boldsymbol{\beta}_1^D \text{Female}_i + \boldsymbol{\beta}_2^D \text{English}_i + \boldsymbol{\beta}_3^D \text{Married}_i + \boldsymbol{\beta}_4^D \text{PTWK}_i + \boldsymbol{\beta}_5^D \text{NoDegree}_i +$$

$$\boldsymbol{\beta}_6^D \text{Trades}_i + \boldsymbol{\beta}_7^D \text{Apprenticeship}_i + \boldsymbol{\beta}_8^D \text{Col}_i + \boldsymbol{\beta}_9^D \text{Bachelor}_i + \boldsymbol{\beta}_{10}^D \text{Masters}_i + \boldsymbol{\beta}_{11}^D \text{PhD}_i +$$

$$\boldsymbol{\beta}_{12}^D \text{Medical}_i + \boldsymbol{\beta}_{13}^D \text{Age20\_24}_i + \boldsymbol{\beta}_{14}^D \text{Age25\_29}_i + \boldsymbol{\beta}_{15}^D \text{Age35\_39}_i + \boldsymbol{\beta}_{16}^D \text{Age40\_44}_i +$$

$$\boldsymbol{\beta}_{17}^D \text{Age45\_49}_i + \boldsymbol{\beta}_{18}^D \text{Age50\_54}_i + \boldsymbol{\beta}_{19}^D \text{Age55\_59}_i + \boldsymbol{\beta}_{20}^D \text{Age60\_64}_i + \boldsymbol{\beta}_{21}^D \text{ATL}_i + \boldsymbol{\beta}_{22}^D \text{QC}_i$$

$$+ \boldsymbol{\beta}_{23}^D \text{MNT}_i + \boldsymbol{\beta}_{24}^D \text{SASK}_i + \boldsymbol{\beta}_{25}^D \text{AB}_i + \boldsymbol{\beta}_{26}^D \text{BC}_i + \boldsymbol{\beta}_{27}^D \text{pkid0\_1}_i + \boldsymbol{\beta}_{28}^D \text{pkid2\_5}_i +$$

$$\boldsymbol{\beta}_{29}^D \text{pkid6\_14}_i + u_i^D$$

Table 4. Robust regression for whites.

y, log employment income	Coef.	St.Err.	y, log employment income	Coef.	St.Err.
Female	-0.42***	0.004	Age40_44	0.185***	0.012
English	-0.012	0.009	Age45_49	0.233***	0.012
Married	0.266***	0.009	Age50_54	0.24***	0.012
PTWK	-0.337***	0.005	Age55_59	0.185***	0.012
NoDegree	-0.186***	0.009	Age60_64	0.025**	0.013
Trades	0.013	0.009	ATL	-0.165***	0.008
Apprenticeship	0.208***	0.009	QC	-0.113***	0.009
Col	0.203***	0.006	MNT	-0.026**	0.011
Bachelor	0.475***	0.006	SASK	0.053***	0.011
Masters	0.722***	0.011	AB	0.197***	0.197
PhD	0.861***	0.027	BC	0.022***	0.008
Medical	1.168***	0.027	pkid0_1	-0.14***	0.014
Age20_24	-0.639***	0.013	pkid2_5	0.036***	0.009
Age25_29	-0.222***	0.014	pkid6_14	0.028***	0.006
Age35_39	0.107***	0.012	Constant	10.605***	0.015
R-squared		0.438	Number of obs		92,543

Table 5. Robust regression for aboriginals.

y, log employment income	Coef.	St.Err.	y, log employment income	Coef.	St.Err.
Female	-0.396***	0.022	Age40_44	0.12**	0.056
English	0.028	0.041	Age45_49	0.149***	0.056
Married	0.319***	0.039	Age50_54	0.112**	0.056
PTWK	-0.373***	0.023	Age55_59	0.105*	0.059
NoDegree	-0.08**	0.033	Age60_64	-0.068	0.065
Trades	0.176***	0.046	ATL	-0.1***	0.039
Apprenticeship	0.279***	0.047	QC	-0.029	0.05
Col	0.216***	0.03	MNT	0.013	0.034
Bachelor	0.494***	0.038	SASK	0.134***	0.042
Masters	0.685***	0.077	AB	0.262***	0.035
PhD	0.522**	0.244	BC	-0.01	0.035
Medical	0.586	0.454	pkid0_1	-0.116	0.074
Age20_24	-0.592***	0.058	pkid2_5	-0.048	0.042
Age25_29	-0.24***	0.061	pkid6_14	0.009	0.028
Age35_39	0.12**	0.054	Constant	10.545***	0.068
R-squared		0.418	Number of obs		3,630

Estimation Method: Blinder-Oaxaca Decomposition

Explains the difference between the means of the dependent variables for different groups by decomposition

Differentiate gaps in the observable characteristics of both groups from the gaps in the effects of the observable characteristics

Vets for differences in controls' sample means from the differences in the β of two groups

Oaxaca Decomposition (continued)

$$y^W - y^A = \boldsymbol{\beta}_0^W + X^W \boldsymbol{\beta}^W - \boldsymbol{\beta}_0^A + X^A \boldsymbol{\beta}^A + X^A \boldsymbol{\beta}^W - X^A \boldsymbol{\beta}^W$$

$$y^W - y^A = (X^W - X^A) \boldsymbol{\beta}^W - [(\boldsymbol{\beta}_0^A - \boldsymbol{\beta}_0^W) + X^A (\boldsymbol{\beta}^W - \boldsymbol{\beta}^A)]$$

Wage Gap = Explained + Unexplained

Table 6. Weighted two-fold Blinder-Oaxaca decomposition between whites and aboriginals.

Group 1: White
Group 2: Aboriginal

y, log employment income	Coef.	Std.Err.
Overall		
White	10.643***	0.003
Aboriginal	10.475***	0.016
Difference	0.168***	0.016
Explained	0.138***	0.010
Unexplained	0.029***	0.013

	Explained			Unexplained	
Female	0.007*	0.004	Female	-0.014	0.013
English	0.002	0.001	English	0.012	0.044
Married	0.016***	0.002	Married	-0.052	0.036
PTWK	0.012***	0.003	PTWK	0.021*	0.010
NoDegree	0.016***	0.001	NoDegree	-0.007	0.007
Trades	0.000	0.000	Trades	-0.010**	0.004
Apprenticeship	-0.000	0.001	Apprenticeship	-0.004	0.004
Col	0.004***	0.001	Col	-0.004	0.008
Bachelor	0.039***	0.003	Bachelor	-0.000	0.005
Masters	0.019***	0.002	Masters	0.002	0.002
PhD	0.004***	0.001	PhD	0.001	0.001
Medical	0.006***	0.001	Medical	0.000	0.000
Age20_24	0.014***	0.003	Age20_24	-0.009	0.010
Age25_29	0.005***	0.001	Age25_29	-0.003	0.006
Age35_39	-0.003***	0.001	Age35_39	0.002	0.007
Age40_44	-0.003**	0.001	Age40_44	0.007	0.009
Age45_49	0.001	0.001	Age45_49	0.012	0.009
Age50_54	0.006***	0.002	Age50_54	0.019*	0.011
Age55_59	0.007***	0.001	Age55_59	0.015	0.009
Age60_64	-0.000	0.000	Age60_64	0.006	0.006
ATL	0.002**	0.001	ATL	-0.002	0.005
QC	-0.011***	0.001	QC	-0.005	0.006
MNT	0.003*	0.002	MNT	-0.009	0.006
SASK	-0.001	0.001	SASK	-0.013***	0.005
AB	-0.004***	0.001	AB	-0.013**	0.006
BC	-0.000	0.000	BC	0.001	0.006
pkid0_1	-0.000	0.000	pkid0_1	-0.003	0.002
pkid2_5	-0.000	0.000	pkid2_5	0.013**	0.005
pkid6_14	-0.001*	0.000	pkid6_14	0.004	0.010
			Constant	0.063	0.085

Decomposition Findings

- My model finds that the **explainable factors for income** (education, marriage status, age bracket, etc.) account for **83.89 percent** of the total wage gap

- Theoretically, the unexplained portion accounts for characteristics which ***should not affect*** income that ***do affect*** income

- However, discrimination is insidious

- Effects of discrimination could cause aboriginals to:

  - drop out of schooling

  - be discouraged to find a job, and become unemployed

Limitations of Dataset

Does not account for:

- Unemployment rate

- Occupation

- Individuals with aboriginal ancestry, but do not identify as aboriginal themselves

Major Takeaways

- Aboriginals suffer from lower levels of educational attainment
- Attrition in the school system possibly comes from discrimination
- Policymakers need to address non-economic factors (in addition to economic factors) to improve aboriginal labour market outcomes
- Young population -> much to be gained from improved education rates/culture