

# Immigration, Ethnic Wage Differentials and Output Pay: Evidence from the WES

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## Context

- A variety of studies, including our earlier examination, suggest that the extent of earnings discrimination is smaller when payment methods tie earnings to measurable output indicators.

# Issues for Inquiry

- Does controlling for immigration and language influence the role played by output pay in determining the ethnic wage differential in Canada?
- What role does ethnicity play in determining the sector in which workers are employed (output pay or time rate sector)?

## Role of Immigration and Language

- Canadian population is more diverse than ever before: 80% of recent immigrants (1991-2001) are non-Europeans (Statistics Canada: Census)
- In our sample, correlations of approximately .5 between the dummy variables for non-European, immigrant and minority language
- Increasingly research focuses on the impact of the complex mixture of language, ethnic origin and immigration status (Lazear, 1995; Pendakur et al. 1998, 2002).
- Language knowledge may increase individuals' trade and consumption opportunities but may also impose transaction costs on work interactions and act as a mark for economic discrimination (Lang, 1986, 1993)

## Theory on the Role of Output Pay

- Pay schemes that tie earning to observed productivity make it harder (more expensive) for employers to discriminate in earnings
  - such schemes make the relationship between pay and productivity more transparent to outside authorities and workers themselves. This increases the likelihood of being caught and so the expense of discrimination (Heywood and O'Halloran 2005, 2006).
  - greater cognitive barrier

Imagine two extremes:

1. Supervisors evaluate performance by judging effort, allowing the prejudice of the supervisor to be translated into differences in evaluations and then into differences in earnings (Elvira and Town 2001)
2. A piece rate in which a homogenous product is produced, counted at the end of the day and for which there is a fixed and known rate. Ethnic prejudice becomes harder to translate into differential earnings.

Typically cases lie between these extremes

- Even a piece rate leaves latitude for judging whether the quality standard is met and machines adequately maintained
- A sales commission often leaves the territory assignment to a supervisor
- Targets in a production bonus may be “individualized”

## Even with Subjective Evaluation Discrimination may be Limited

- Bureaucratic Rules (Prendergast and Topel 1996)
- Reputation Concerns (Baker, Gibbons and Murphy 1994)
- Union wage setting

# Past Empirical Evidence

- Gender Discrimination:
  1. Gunderson (1975) The average differential within Canadian occupations across establishments is smaller when the establishments use piece rates or commissions
  2. Jirjahn and Stephan (2004) In German micro data the average gender differential is significantly smaller among those paid piece rates than those receiving time rates.
  3. Bronars and Moore (1995) No systematic evidence that payment method influenced the US gender differential

## Racial or Ethnic Discrimination

1. Belman and Heywood (1988) US industries making more use of performance pay had lower black wage differentials
2. Bronars and Moore (1995) No evidence of a systematic role for performance pay in US micro data
3. Heywood and O'Halloran (2005, 2006) Racial wage differentials were smaller among those on piece rates and commissions in the US NLS (98 - 02)

## Fang and Heywood (2006)

- Canadian WES 1999 to examine ethnic wage differentials (European vs. Non-European)
- The ethnic differential among those paid by piece rates, commissions or productivity bonuses was zero (point estimate of less than 1 percent and insignificant).
- The ethnic differential among those on time rates was significant and slightly more than 6 percent.
- The return to performance pay was larger for minorities
- Despite this, ethnic status played no role in probit estimations of sectoral choice.

## Current Inquiry

- Return to the WES to expand controls by including immigration and language (motivated by the high correlations between ethnic minority status in Canada and these two variables)
  1. Check the Robustness of the wage differential results
  2. Reexamine the sectoral choice estimations by including earnings differences by sector in the estimations

## Data

- 1999 Workplace and Employee Survey (Statistics Canada): Linked data on 23,540 employees within 6,322 workplaces (longitudinal with rotating panels)
- Information available on various payment methods (piece rates, commissions, tips, bonuses tied to a performance indicator)
- Also available: workers' ethnic background, gender, education, union/CBA status, team participation, etc.

# Estimation

- We use the employee survey weights provided by the WES in all estimations
- We identify the primary survey unit as the establishment from which multiple workers may be interviewed and adjust standard errors for the common components

## Descriptive Analysis

- On average, non-Europeans earn 9% less than Europeans among those paid time rate (\$16.43 vs. \$17.88) and earn roughly the same among those on output pay (\$20.74 vs. \$20.68)
- Use of piece rates is relatively uncommon. Commissions and tips are concentrated among sales workers and bonuses are concentrated among managers

# Initial Results

	Output Pay Sector			Time Rate Sector		
	1	2	3	4	5	6
<b>Non-Europeans</b>	<b>-0.012</b> <b>(-0.41)</b>	<b>0.032</b> <b>(1.09)</b>	<b>0.048*</b> <b>(1.65)</b>	<b>-0.060***</b> <b>(-3.44)</b>	<b>-0.030</b> <b>(-1.29)</b>	<b>-0.031</b> <b>(-1.33)</b>
<b>[Non-immigrants or Immigrants arrived before 70s]</b>						
<b>Immigrants who arrived in the 70s</b>		<b>-0.001</b> <b>(-0.02)</b>	<b>0.013</b> <b>(0.36)</b>		<b>0.004</b> <b>(0.14)</b>	<b>0.003</b> <b>(0.10)</b>
<b>Immigrants who arrived in the 80s</b>		<b>-0.118**</b> <b>(-2.38)</b>	<b>-0.067</b> <b>(-1.39)</b>		<b>-0.050</b> <b>(-1.48)</b>	<b>-0.053</b> <b>(-1.52)</b>
<b>Immigrants who arrived in the 90s</b>		<b>-0.137***</b> <b>(-3.3)</b>	<b>-0.092*</b> <b>(-1.87)</b>		<b>-0.125***</b> <b>(-3.38)</b>	<b>-0.129***</b> <b>(-3.28)</b>
<b>Foreign language at home</b>			<b>-0.096**</b> <b>(-2.38)</b>			<b>0.008</b> <b>(0.31)</b>
<b>Female</b>	<b>-0.108**</b> <b>(-4.34)</b>	<b>-0.111***</b> <b>(-4.45)</b>	<b>-0.112***</b> <b>(-4.47)</b>	<b>-0.109***</b> <b>(-8.07)</b>	<b>-0.112***</b> <b>(-8.31)</b>	<b>-0.112***</b> <b>(-8.32)</b>

## Robustness Checks

Removing bonuses does not change the general pattern of results –

The pattern of results persists across both union and non-union sectors but is stronger in the latter –

## Estimates by Gender

Variable	Output Pay (Male)	Time Rate (Male)	Output Pay (Female)	Time Rate (Female)
<b>Non-Europeans</b>	<b>-0.003</b> <b>(-0.09)</b>	<b>-0.051*</b> <b>(-1.67)</b>	<b>0.127***</b> <b>(2.81)</b>	<b>-0.011</b> <b>(-0.34)</b>
<b>[Non-immigrants and Immigrants who arrived before 70s]</b>				
<b>Immigrants who arrived in the 70s</b>	<b>0.067</b> <b>(1.49)</b>	<b>0.016</b> <b>(0.39)</b>	<b>-0.037</b> <b>(-0.71)</b>	<b>0.003</b> <b>(0.08)</b>
<b>Immigrants who arrived in the 80s</b>	<b>-0.089</b> <b>(-1.33)</b>	<b>-0.078</b> <b>(-1.59)</b>	<b>-0.034</b> <b>(-0.57)</b>	<b>-0.022</b> <b>(-0.5)</b>
<b>Immigrants who arrived in the 90s</b>	<b>-0.049</b> <b>(-0.98)</b>	<b>-0.047</b> <b>(-0.92)</b>	<b>-0.157**</b> <b>(-2.06)</b>	<b>-0.208***</b> <b>(-4.47)</b>
<b>Foreign language at home</b>	<b>-0.018</b> <b>(-0.4)</b>	<b>-0.021</b> <b>(-0.66)</b>	<b>-0.183***</b> <b>(-3.24)</b>	<b>0.038</b> <b>(1.1)</b>

## Selection Adjusted Estimates

Variable	Output Pay	Time Rate
<b>Non-Europeans</b>	<b>0.069**</b> (2.29)	<b>-0.032</b> (-1.37)
<b>[Non-immigrants or Immigrants who arrived before 70s]</b>		
<b>Immigrants who arrived in the 70s</b>	<b>0.052</b> (1.23)	<b>-0.001</b> (-0.04)
<b>Immigrants who arrived in the 80s</b>	<b>-0.004</b> (-0.08)	<b>-0.059*</b> (-1.69)
<b>Immigrants who arrived in the 90s</b>	<b>-0.322**</b> (-2.50)	<b>-0.111**</b> (-2.54)
<b>Foreign language at home</b>	<b>-0.166***</b> (-3.03)	<b>0.014</b> (0.56)
<b>Female</b>	<b>-0.116***</b> (-4.74)	<b>-0.112***</b> (-8.30)
<b>Inverse Mills Ratio</b>	<b>1.244*</b> (1.94)	<b>0.165</b> (1.09)

## Probits (Performance Pay = 1)

Variable	(1)	(2)	(3)
	Whole Sample	Male	Female
<b>Predicted Wage Gap</b>	<b>5.333***</b> (4.76)	<b>4.025**</b> (2.49)	<b>6.468***</b> (4.69)
<b>Non-Europeans</b>	<b>-0.4052***</b> (-3.04)	<b>-0.2642</b> (-1.43)	<b>-0.5430***</b> (-3.36)
<b>Female</b>	<b>-0.0004</b> (-0.01)		
<b>[Non-immigrants or Immigrants before 70s]</b>			
<b>Immigrants who arrived in the 70s</b>	<b>-0.0008</b> (-0.01)	<b>-0.1687</b> (-1.11)	<b>0.1645</b> (1.21)
<b>Immigrants who arrived in the 80s</b>	<b>0.1591</b> (1.30)	<b>0.0765</b> (0.51)	<b>0.2615</b> (1.51)
<b>Immigrants who arrived in the 90s</b>	<b>-0.5012***</b> (3.67)	<b>-0.5538***</b> (-3.14)	<b>-0.3944**</b> (-2.12)
<b>Foreign language at home</b>	<b>0.4478***</b> (3.11)	<b>0.4019**</b> (2.13)	<b>0.4899**</b> (2.47)

## Summary of Results

- Controlling for immigration and language moves the ethnic wage differential in favor of non-Europeans (positive in the output pay sector and zero in the time rate sector)
- Both genders of non-Europeans do better in the output pay sector.
- While simple probit estimations show ethnicity playing no role, after including estimated sectoral differences, ethnicity is a significant negative determinant of working in the output pay sector.

## Conclusion and Caveats

- The pattern of results is consistent with output pay reducing the scope for earnings discrimination and causing those with prejudice to engage in employment discrimination
- The reduced earnings discrimination might suggest a policy of increase performance pay but such schemes are not suitable for many settings.
- Further testing might attempt to identify if there is a queue of non-Europeans for jobs in the performance pay sector (either through surveys or partial observability estimations)

# Ethnicity Questions

55. Canadians come from many ethnic,  
cultural

did your parents or grandparents descend?

Group A

- 1   Canadian
- 2   British (from England, Scotland,
- 3   French
- 4   Any other European groups

# Ethnicity Questions

## Group B

- 5   Arab (from Egypt, Jordan, Lebanon, Iraq, etc.)
- 6   Black (from Africa, Caribbean, Haiti, U.S.A., Canada, etc.)
- 7   Chinese
- 8   East Indian (from India, Pakistan, East Africa, etc.)
- 9   Filipino
- 10   Inuit (Eskimo)
- 11   Japanese
- 12   Korean
- 13   Latin American (from Mexico, Central America or South America)
- 14   Métis
- 15   North American Indian (First Nations, Aboriginal persons, Native Peoples)
- 16   North African (from Egypt, Morocco, Algeria, etc.)
- 17   South East Asian (from Burma, Cambodia, Laos, Viet Nam, etc.)
- 18   West Asian (from Syria, Turkey, Afghanistan, Iran, etc.)
- 19   Other, specify \_\_\_\_\_

# Method of Pay Questions

36. In the past 12 months, did you earn any commissions, tips, bonuses, paid overtime or any other types of variable pay such as profit sharing, productivity bonuses (gain sharing) or piecework?

- 1   Yes
- 3   No -----> Go to Question 37 (a)



# Method of Pay Questions

36 (c) Which of the following types of pay did you receive in the past 12 months? (Check all that apply and make sure the amount was included in Question 36 (b).)

Is this:

- 1   Overtime pay
- 2   Productivity-related bonuses
- 3   Profit-sharing or profit-related bonuses
- 4   Other bonuses
- 5   Shift differentials
- 6   Tips
- 7   Commissions
- 8   Piecework payments
- 9   Other, specify \_\_\_\_\_