The Impact of Immigration on the Labour Market Outcomes of Native-born Canadians

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October 20, 2007
SEDAP New Researchers Conference
Outline

• Introduction
• Theoretical Framework
• Data
• Results
• Conclusion
Introduction

• 2.4 million immigrants, 1990-2000 (= 70% of the Canadian population growth)

• Immigrants account for 18% of the total population (2001 Census)

• Canadian economic research focus on immigrant integration

• Lack of studies on the effect of immigration
Question of Interest

• What is the impact of immigrant inflows on the native-born Canadians’ labour market outcomes (wages)?

• Theoretically ambiguous:
  - Immigration $\Rightarrow$ labour supply↑ $\Rightarrow$ wage↓
  - Immigrant consumption $\Rightarrow$ demand for goods and services↑ $\Rightarrow$ labour demand↑ $\Rightarrow$ wage↑
An Empirical Question to Study

- The effect of immigration on natives’ wages is then an empirical question.

- A number of U.S., Australian, and European studies:
  - Area Approach: little effect
  - Skill Approach: large negative effects

- Little Canadian literature: negative impact
  Aydemir & Borjas (2006)
Theoretical Framework

• Divide the Canadian labour market into sub-markets by areas (cities, provinces) and skill types (education, occupation)

• Assume immigrants enter and affect each sub-market independently*.

• Regress changes in native wages on the changes in immigrant shares of a sub-market

*check for native migration by Card and DiNardo’s (2000) method.
Two-Stage Regressions

• *Step 1.* Regress native log weekly wages on skill-area dummies for each census, controlling for effects of socio-economic characteristics

\[(1) \quad \log W = \beta X + \theta (SKILL \cdot AREA) + \varepsilon\]

- $\log W_{it}$ = native log weekly wage
- $X$ = age, sex, marital status, visible minority
- $\theta$’s are average wages of each skill-area group adjusted for effects of the $X$ variables
Two-Stage Regressions

• *Step 2.* Calculate the intercensal differences in the adjusted mean wages ($\theta$), and regress them on the change in immigrant to native ratio ($M/N$)

$$\Delta \theta = \gamma \Delta (M/N) + \eta \Delta Y + SKILL + AREA + u$$

- $(M/N)$ = the ratio of immigrants $(M)$ to natives $(N)$ in a skill-area group
- $Y =$ demand side factors (unemployment rate)
Data

• The 1991, 1996 and 2001 Canadian Census Public Use Microdata File (PUMF) (3% sample of the population)

- paid workers aged 16 to 65
- full time (30+ hours/week)
- full year (50+ weeks/year)
Socio-Economic Characteristics about Immigrants and Natives

• Immigrants are:
  - older
  - more educated (substantial rise)
  - more likely to be married
  - more likely to cluster in Toronto & Vancouver
  - less likely to live in a non-CMA
Table 1. Statistical Summary of Natives and Immigrants: 1991, 1996, 2001 Censuses

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Log weekly wage</td>
<td>6.35</td>
<td>6.35</td>
<td>6.35</td>
<td>6.31</td>
<td>6.36</td>
<td>6.31</td>
</tr>
<tr>
<td>Average Age</td>
<td>37.8</td>
<td>42.22</td>
<td>39.22</td>
<td>42.67</td>
<td>39.8</td>
<td>43.25</td>
</tr>
<tr>
<td>Male</td>
<td>0.59</td>
<td>0.59</td>
<td>0.58</td>
<td>0.58</td>
<td>0.57</td>
<td>0.56</td>
</tr>
<tr>
<td>Married</td>
<td>0.71</td>
<td>0.77</td>
<td>0.71</td>
<td>0.76</td>
<td>0.69</td>
<td>0.75</td>
</tr>
<tr>
<td><strong>CMA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montreal</td>
<td>0.13</td>
<td>0.1</td>
<td>0.12</td>
<td>0.1</td>
<td>0.12</td>
<td>0.1</td>
</tr>
<tr>
<td>Toronto</td>
<td>0.12</td>
<td>0.4</td>
<td>0.12</td>
<td>0.4</td>
<td>0.11</td>
<td>0.42</td>
</tr>
<tr>
<td>Vancouver</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.11</td>
<td>0.05</td>
<td>0.12</td>
</tr>
<tr>
<td>Other CMAs</td>
<td>0.32</td>
<td>0.26</td>
<td>0.32</td>
<td>0.26</td>
<td>0.33</td>
<td>0.25</td>
</tr>
<tr>
<td>Non-CMA</td>
<td>0.38</td>
<td>0.13</td>
<td>0.39</td>
<td>0.13</td>
<td>0.38</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Educational Attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>0.24</td>
<td>0.27</td>
<td>0.2</td>
<td>0.22</td>
<td>0.18</td>
<td>0.2</td>
</tr>
<tr>
<td>High school diploma</td>
<td>0.33</td>
<td>0.27</td>
<td>0.31</td>
<td>0.25</td>
<td>0.3</td>
<td>0.25</td>
</tr>
<tr>
<td>Certificate</td>
<td>0.27</td>
<td>0.26</td>
<td>0.3</td>
<td>0.28</td>
<td>0.32</td>
<td>0.28</td>
</tr>
<tr>
<td>University</td>
<td>0.16</td>
<td>0.21</td>
<td>0.2</td>
<td>0.25</td>
<td>0.2</td>
<td>0.28</td>
</tr>
</tbody>
</table>
Variables to Categorize Sub-Markets

• Area variables:
  - Census metropolitan area (CMA) (19)
  - Province (10)

• Skill variables:
  - Educational Attainment (4)
  - Occupation (14)
Figure 3. Changes in Adjusted Mean Log Weekly Wages ($\Delta \theta$) of Natives against $\Delta (M/N)$ over Education-CMA Groups for 1991-1996 and 1996-2001 Intervals
Figure 4. Changes in Adjusted Mean Log Weekly Wages ($\Delta \theta$) of Natives against $\Delta (M/N)$ over Education-CMA Groups for 1991 - 2001 Interval
Table 4. OLS Estimates of $\gamma$, Two-Stage Regressions over Education-CMA Sub-Markets

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No control</td>
<td>Area</td>
<td>Education</td>
<td>Area + Education</td>
</tr>
<tr>
<td>Census 1991-1996</td>
<td>0.207</td>
<td>0.007</td>
<td>0.293</td>
<td>0.129</td>
</tr>
<tr>
<td></td>
<td>(0.160)</td>
<td>(0.191)</td>
<td>(0.166)</td>
<td>(0.204)</td>
</tr>
<tr>
<td>Census 1996 - 2001</td>
<td>-0.075</td>
<td>-0.182</td>
<td>-0.119</td>
<td>-0.327</td>
</tr>
<tr>
<td></td>
<td>(0.143)</td>
<td>(0.197)</td>
<td>(0.150)</td>
<td>(0.218)</td>
</tr>
<tr>
<td>Census 1991 - 2001</td>
<td>0.098</td>
<td>-0.158</td>
<td>0.099</td>
<td>-0.199</td>
</tr>
<tr>
<td></td>
<td>(0.124)</td>
<td>(0.183)</td>
<td>(0.125)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>1991-1996 and</td>
<td>0.071</td>
<td>-0.046</td>
<td>0.071</td>
<td>-0.053</td>
</tr>
<tr>
<td>1996-2002 pooled</td>
<td>(0.106)</td>
<td>(0.137)</td>
<td>(0.107)</td>
<td>(0.139)</td>
</tr>
</tbody>
</table>

Recall:

$$\Delta \theta = \gamma \Delta (M/N) + \eta \Delta Y + \text{SKILL} + \text{AREA} + u$$
Endogeneity of Immigrant Location Decision

- **Problem**: immigrants attracted to cities with a booming economy and high earnings
  - immigrant density depends on the equilibrium wages
  - OLS estimates biased upwards

- **Solution**: an instrumental variable (IV) = the existing immigrant-native ratio \((M/N)_{t-1}\)
  - New entrants tend to live in areas where there is a large stock of immigrants with the same ethnicity
Table 5. IV Estimates of Two-Stage Regressions over Education-CMA Sub-Markets

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No control</td>
<td>Area</td>
<td>Education</td>
<td>Area + Education</td>
</tr>
<tr>
<td>Census 1991-1996</td>
<td>0.804</td>
<td>0.304</td>
<td>0.798</td>
<td>0.100</td>
</tr>
<tr>
<td></td>
<td>(0.343)* #</td>
<td>(0.679)</td>
<td>(0.335)*</td>
<td>(0.700)</td>
</tr>
<tr>
<td>Census 1996 - 2001</td>
<td>0.541</td>
<td>0.190</td>
<td>0.543</td>
<td>0.264</td>
</tr>
<tr>
<td></td>
<td>(0.339)* #</td>
<td>(1.479)</td>
<td>(0.348) #</td>
<td>(0.943)</td>
</tr>
<tr>
<td>Census 1991 - 2001</td>
<td>0.707</td>
<td>0.555</td>
<td>0.700</td>
<td>0.061</td>
</tr>
<tr>
<td></td>
<td>(0.232)* #</td>
<td>(0.993)</td>
<td>(0.233)* #</td>
<td>(1.759)</td>
</tr>
<tr>
<td>1991-1996 and</td>
<td>0.660</td>
<td>0.144</td>
<td>0.667</td>
<td>1.830</td>
</tr>
<tr>
<td>1996-2002 pooled</td>
<td>(0.236)*</td>
<td>(2.275)</td>
<td>(0.241)*</td>
<td>(11.967)</td>
</tr>
</tbody>
</table>
Sensitivity Tests

• Divide the labour market by
  - Occupation & CMA:
    OLS: insignificantly negative
    IV: insignificantly negative or nearly zero
  
  - Education & Province:
    OLS: insignificant
    IV: insignificantly negative or significantly positive
  
  - Education & Occupation
    OLS: insignificant
    IV: vary in sign, mostly positive
Conclusion

- Analysis of the impact of immigration on native-born wage growth using a two-stage regression method;

- Empirical results indicate that the increasing immigrant inflows did not adversely affect native wage growth rates;

- Results are robust to different categorization of sub-labour markets.