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### Workforce Aging and the Labour Market Opportunities of Youth: Evidence from Canada

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# **Workforce Aging and the Labour Market Opportunities of Youth: Evidence from Canada**

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## **Abstract**

In this study, we investigate whether an aging workforce affects the job opportunities of youth. Provincial data from the 1976-2013 Labour Force Surveys and a fixed-effects model is used to estimate the effect of the share of the adult male labour force that is aged 55 to 69 on the employment and unemployment rates of men aged 25 to 29. We estimate effects on other labour market outcomes including wages and school enrolment, and other samples of younger men and women. There is no evidence to suggest that a growing share of older workers negatively affects the decisions or outcomes of youth in the labour market. To the contrary, there is weak evidence to suggest an aging population has a positive effect on the labour market outcomes of youth.

**JEL:** J11, J21

**Keywords:** Population aging, employment, unemployment, youth

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## 1. Introduction

Post-recession it is common to hear concerns that youth, facing high unemployment rates, are unable to find good job opportunities. Historically, youth have experienced higher unemployment rates than older workers (Bernard, 2013). In the context of an aging workforce dominated by the baby boom generation and delayed retirement, there appears a general concern that older workers are filling jobs that would otherwise be held by youth.<sup>1</sup> In response, policy makers may contemplate policies designed to alleviate the concerns of youth in an aging workforce.<sup>2</sup> Examples of such policies exist in other countries: for example the U.K. had run the Job Release Scheme (JRS) for over a decade, providing incentives for older workers to retire early.<sup>3</sup> Such arguments also appear to drive retirement policy in China (Munnell and Wu, 2013).

Can we expect such policies to improve job opportunities for youth? Such policy proposals are generally criticized as lacking a theoretical foundation. A direct trade-off between jobs for older and younger workers would require new and experienced workers to be perfect substitutes in a labour market with a fixed number of jobs. Economists commonly refer to this view of the market as relying on the “lump of labour fallacy”, which is quickly dismissed as the number of jobs in the economy is clearly not fixed. One can conceive of several ways, however, that the demographic structure of the labour market could influence the outcomes of youth. Young and old workers may be imperfect substitutes, or even complements, as

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<sup>1</sup> These concerns are often expressed or implied in the popular media, see for example Kirby (2014), CBC News (2013).

<sup>2</sup> For example, in a 2014 study of Youth Employment by the Canadian House of Commons Committee on Finance, several Members of Parliaments questioned whether they should be concerned with the impacts of baby boomers and their retirement on youth unemployment. Examples can be found at <http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=6485525&Language=E&Mode=1&Parl=41&Ses=2>.

<sup>3</sup> The JRS program is described in Banks et al. (2010). Other examples are offered in Gruber, Milligan and Wise (2010).

inputs in the production process.<sup>4</sup> The relative supply of each age group's labour may then affect each other's employment and wage outcomes. To improve their competitiveness in a skills market characterized by high average on-the-job experience, young people may choose to obtain more formal education and stay in school longer. Given the lifecycle profile of earnings, older workers often represent a large portion of aggregate demand. In this context, we might expect the share of the labour force represented by older workers to have some effect on the employment and wage outcomes of youth. It is theoretically ambiguous, however, whether a net effect should be positive or negative.

There are several studies that have investigated this relationship between older and younger workers' labour market outcomes. Using Canadian data, Baker and Milligan (2010) found national employment rates of the elderly (aged 55 to 64) had no significant effect on the unemployment, employment or school attendance of youth (aged 20-24). Similar country-level analyses of other European countries and the US offer similar conclusions (see Gruber and Wise 2010). Studies that have examined early retirement incentives more closely have not found evidence to suggest earlier retirements will have positive effects on youth (Banks et al. 2010, Jousten et al. 2010). Kalwij et al. (2010) estimated dynamic models of youth employment using a panel of OECD countries and similarly found no evidence to suggest the young and old are substitutes. They do find weak evidence of complementarities of employment across age groups. Gruber, Milligan and Wise (2010) also examined a panel of 12 OECD countries and found evidence of complementarities across age groups. Munnell and Wu (2013) examine state-level outcomes in the U.S. from 1977-2011 and find no evidence that increasing the employment of older persons reduces job opportunities or wages of youth.

In this study we contribute to this literature by examining more rigorously the Canadian experience for youth. We construct a panel data set of youth labour market outcomes and workforce demographics in each province over the years 1976-2013 using the Labour Force

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<sup>4</sup> This is also suggested by Baker et al. (2010). Card and Lemieux (2001) provide evidence that workers of different ages are imperfect substitutes, however the broader evidence is less conclusive (Kalwij, Kapteyn and De Vos, 2010, offer a review).

Survey (LFS), focusing on young men aged 25 to 29. Using a fixed effects model, we estimate the effect of workforce aging – measured as the share of the adult male labour force aged 30-69 that is aged 55 to 69 – on youth unemployment, employment, wages, and school enrolment. Consistent with the previous literature, we find no evidence to suggest youth labour market outcomes would improve if fewer older individuals were active in the labour market. In contrast, there is weak evidence to support the notion that an aging workforce could have positive implications for young workers.

The paper is organized as follows. In the next section we discuss the variables we used and the construction of our data set. In section three we present trends in workforce aging and youth labour market outcomes. In section four we discuss our empirical strategy and then present our results in section five. Finally, we offer some concluding remarks.

## **2. Data**

We construct most of our provincial statistics using the public use microdata files of the Canadian Labour Force Survey (LFS) for the years 1976-2013. The LFS is Canada's main source for labour market statistics and is conducted monthly, collecting information on individuals' labour market activities and demographics. Key questions for labour force activity have not changed substantially since 1976. The questionnaire was redesigned in 1997 and added questions about wage rates and other select job characteristics. Statistics Canada's stratified multi-stage design allows for the calculation of reliable estimates at the provincial level within fairly narrow demographic groups.<sup>5</sup>

In this study, we focus on the unemployment rates of young men aged 25-29, which we measure using Statistics Canada's (2013) standard definition. We do not incorporate

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<sup>5</sup> For example, our smallest sample size for calculating unemployment rates of men aged 25-29 was 724 (representing PEI).

discouraged workers, who tend to represent a small portion of young men.<sup>6</sup> Measurement of employment rates will include individuals employed and on leave, which includes individuals on maternity and parental leave with job protection. Using data since 1997, we also consider (usual) hourly wage rates conditional on employment.

To characterize an aging workforce, we measure the percentage of the male labour force aged 30-54 that is between the ages of 55 and 69. The size of each age group in the provincial labour force is based on the survey weights available in the LFS, which are designed so that population estimates in each month will closely match those in the Canadian Census. We chose to use a measure that excludes those under age 30 so that changes in youth labour market decisions do not directly affect our measure of workforce aging. As an alternative measure, we also consider the percentage of the male population aged 30-54 that is between the ages of 55 and 69. This more generally captures population aging and not workforce aging.

We also consider the experiences of women aged 25-59 and the experiences of men and women aged 20-24. Furthermore, we make use of responses for current student status to create an indicator for full-time student status (in a university, college or CEGEP, or other post-secondary education) for those aged 20-24. The general trends toward higher education, delayed marriage and delayed fertility, however, make us reluctant to rely primarily on results based on young women and younger men. The experiences of young men aged 25-29, similar to other prime-age men, have changed less substantially since the 1970s.

We want to control for factors that vary across provinces differently over time. Our main indicator for the provinces' business cycle is the unemployment rate of men aged 30-54 within the province, based on LFS data.<sup>7</sup> In addition, we use provincial GDP growth rates to account

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<sup>6</sup> This varies substantially across provinces but is always quantitatively very small. From the LFS 1976-2013, we found 0.8% of men aged 25-29 not in the labour force in Newfoundland could be classified as discouraged worker while only 0.01% of non-participating men aged 25-29 in Alberta were discouraged workers.

<sup>7</sup> Cross and Bergevin (2012) offer a discussion of identifying business cycles in Canada.

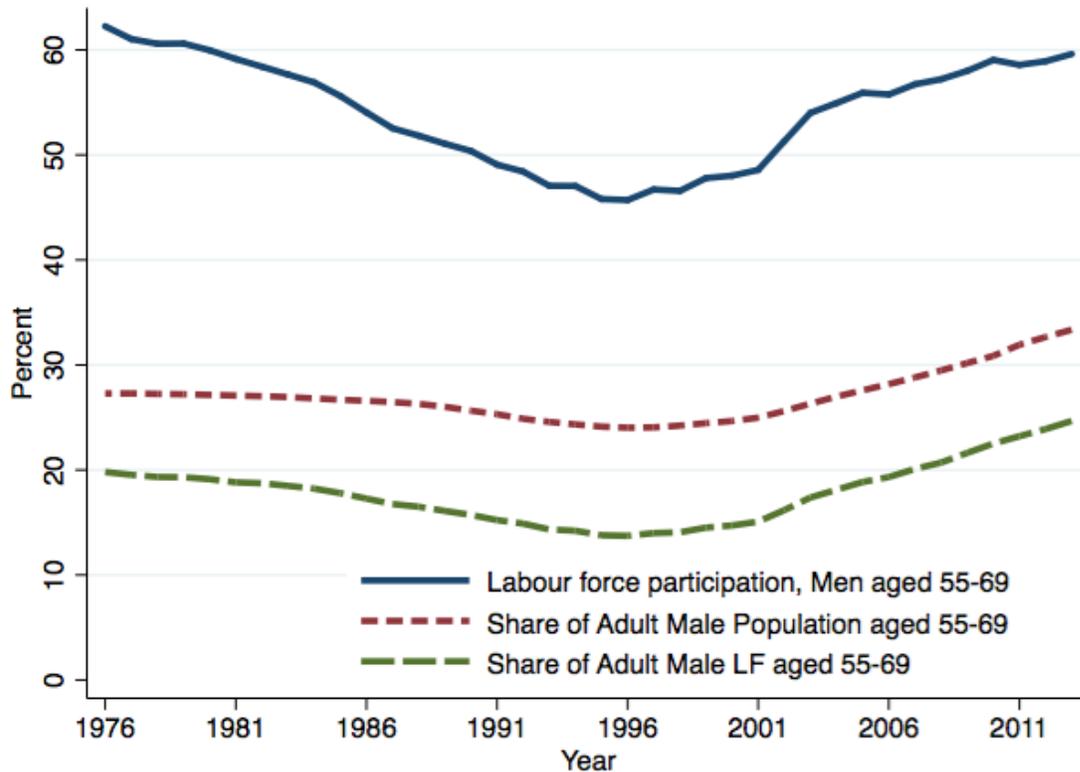
for the business cycle, however this reduces the years available for analysis to 1982-2012.<sup>8</sup> We have also constructed a the share of employment among men aged 30-54 that is in manufacturing industries to represent changes in the province's industrial structure over time. To capture general trends toward higher education, we include the portion of the population (15 and over) that has completed a university degree (B.A. or higher).

### **3. Trends**

The population has aged steadily for several decades now. In 1976, the median age of men in the population was only 27.2 years, but then rose to 39.4 years in 2013. In part this reflects an increase in the life expectancy of Canadians at birth. More recently, however, it also reflects the aging of the baby boom generation and this has in part driven trends toward an aging workforce. In Figure 1, we see that the share of the adult population (aged 30-69) that was aged 55-69 actually fell for two decades from 1976 to 1996 as the baby boom generation represented the younger part of the working age population. The early baby boomers (born 1945) start turning 55 in the year 2000, however, and we see a steady increase in the share of the population over 55.

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<sup>8</sup> Based on Statistics Canada CANSIM Table 384-0038.



**Figure 1. Aging of the Male Workforce, 1976-2013.**

Notes: For the purposes of this study, adult male population refers to men aged 30-69.

Source: Authors' tabulations from the Labour Force Survey.

The tendency to work at older ages has also changed (Figure 1). In 1976, 62 percent of men aged 55-69 participated in the labour force. This fell to only 46% in 1995, but then older men's participation increased to 60% in 2013. Note that the experience of women is fairly different, as older women's participation rates were fairly steady until the mid-1990s and then increased thereafter (see Schirle, 2008).

These two trends – population aging and greater participation in the workforce – have resulted in a substantial increase in the portion of the adult workforce that is aged 55-69 since the mid-1990s. In 1996, 13.7 percent of the adult male workforce (30-69) was aged 55-69. In 2013, 24.7 percent were aged 55-69 (see Table 1).

**Table 1.**

## Descriptive Statistics

	1976	2013	All Years <sup>a</sup>
Men aged 25-29			
Unemployment rate (%)	6.3	8.4	9.5
Employment rate (%)	88.5	80.8	82.7
Participation rate (%)	94.4	88.2	91.3
Avg. Wage (2002\$)	-	19.0	17.4
Women aged 25-29			
Unemployment rate (%)	8.5	6.9	8.4
Employment rate (%)	52.4	75.8	70.3
Participation rate (%)	57.3	81.4	76.6
Avg. Wage (2002\$)	-	17.0	15.7
Men aged 20-24			
Unemployment rate (%)	10.9	12.0	13.6
Employment rate (%)	76.4	68.3	70.8
Participation rate (%)	85.8	77.5	81.8
Avg. Wage (2002\$)		13.0	12.3
In school full time (%)	12.8	26.1	19.6
Adults aged 30-69:			
Male LF, share aged 55-69 (%)	19.8	24.7	17.9
Female LF, share aged 55-69 (%)	16.7	23.4	14.9
Male Pop., share aged 55-69 (%)	27.3	33.4	27.1
Female Pop., share aged 55-69 (%)	29.1	34.2	28.3
Unemployment rate, men aged 30-54 (%)	3.9	5.8	6.6
Share Manufacturing (%)	23.2	15.4	20.4
University degree (%)	7.2	22.7	14.5

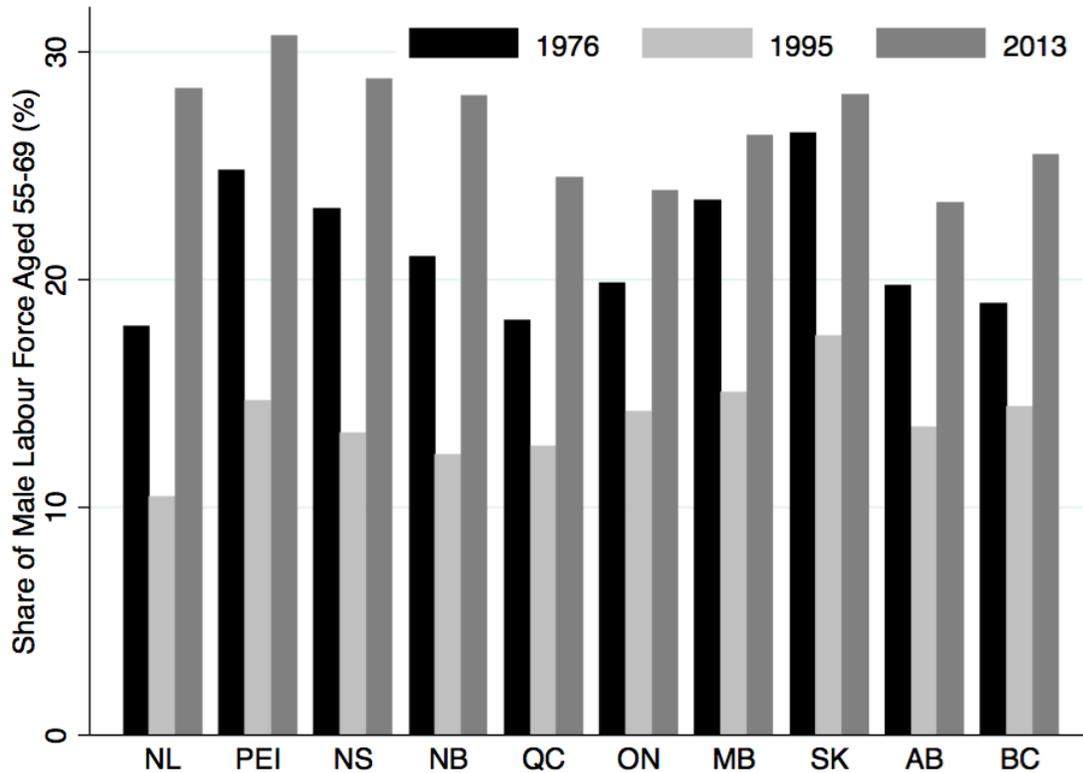
Notes: Based on population-weighted averages across provinces, derived from the LFS.

a. For all statistics other than wages, there are 380 provincial observations 1976-2013. For mean wages, there are 170 observations 1997-2013.

Source: Authors' tabulations from the Labour Force Survey.

In Figure 2, we show that the trends in workforce aging are not the same across provinces. For example, in 1976 and 1995, Newfoundland had one of the youngest workforces (with the lowest share aged 55-69). However in 2013, they are among the provinces with the oldest labour force participants. In contrast, Ontario was among those with the oldest workforces in

the mid-1990s and in 2013 had one of the youngest. Alberta, having been historically near the Canadian average, has the youngest workforce in 2013.

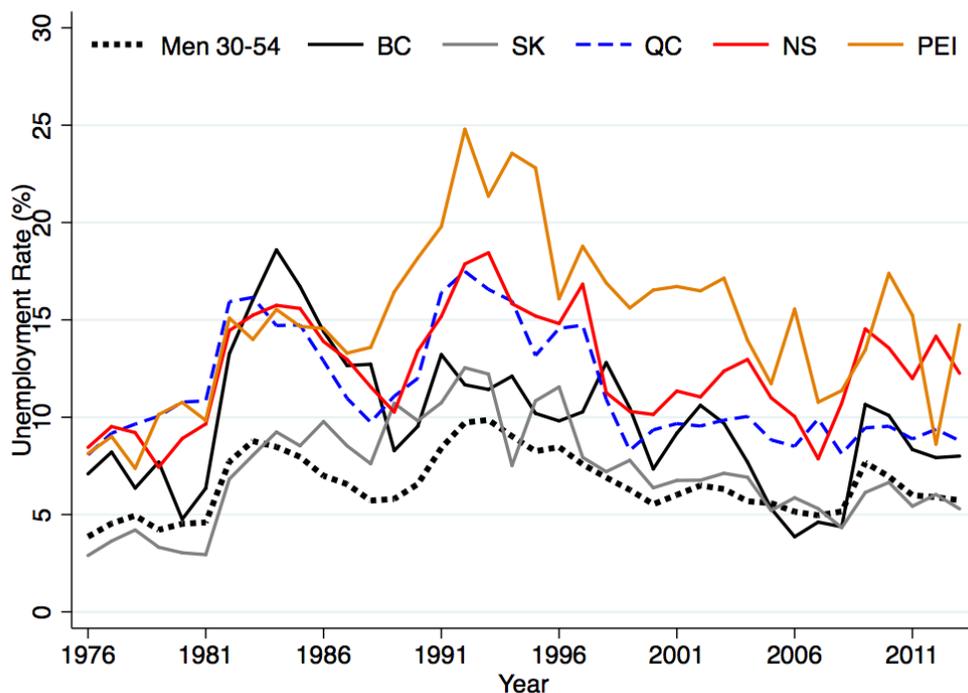


**Figure 2. Share of labour force aged 55-69, by Province, 1976, 1995, and 2013.**

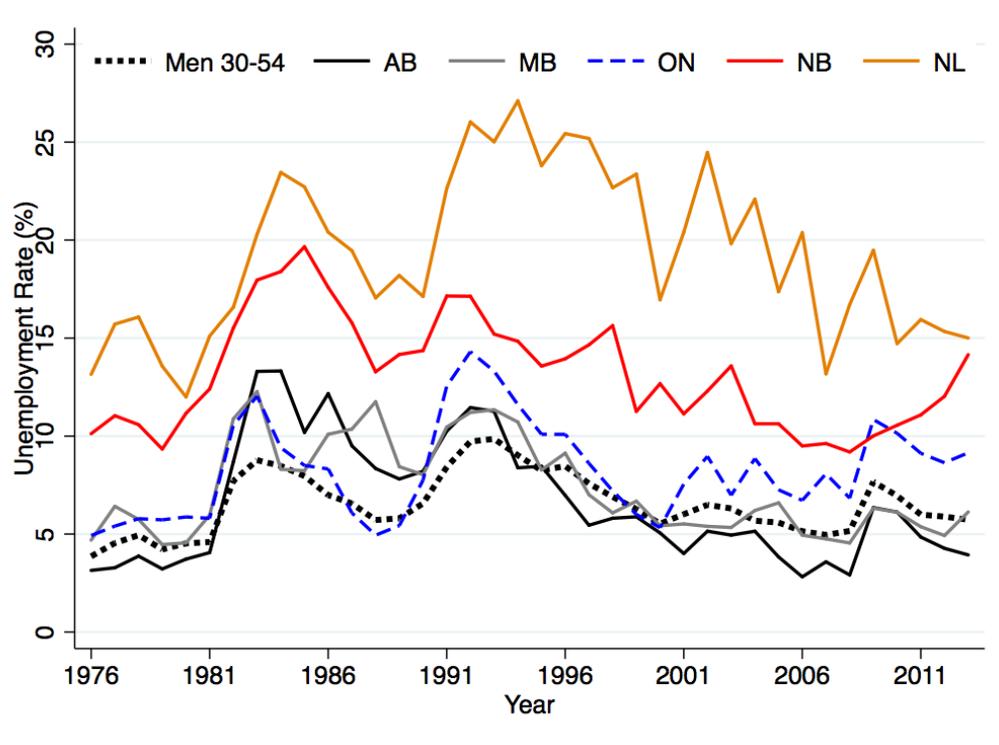
Source: Authors' tabulations from the Labour Force Survey.

There is not a clear relationship between trends in the unemployment rates of young men aged 25-29 and the share of the labour force that is over age 55, as was plotted in Figure 1. In Figure 3, we plot trends in provincial unemployment rates of young men aged 25-29 over the 1976-2013 period, alongside the Canadian unemployment rate of men aged 30-54. While youth unemployment rates are normally higher than the unemployment rates of older men (see also Bernard 2013), most variation in youth unemployment over time follows the general business cycle. Youth unemployment was highest in the mid-1990s for most provinces, though British Columbia and Alberta youth experienced the highest unemployment rates in the early

1980s. Given that peak youth unemployment in the mid-1990s corresponding to the recessionary period aligns with the low-point in participation rates among older men, there is a clear need to control for business cycle fluctuations in the analysis. Notice that changes in youth unemployment year-to-year are not identical across provinces. For example, while Newfoundland (NL) youth unemployment rates peaked in 1994 and then very slowly and generally declined thereafter.<sup>9</sup> In Alberta youth unemployment rates peaked in 1992, reached a low point by 1999, and then increased thereafter. Quebec's youth unemployment similarly declined quickly over the 1990s and remained steady after 1999.



<sup>9</sup> Note that standard errors for unemployment rates are slightly larger in Newfoundland and PEI than, for example, Ontario, as the sample sizes are smaller.



**Figure 3. Provincial unemployment rates of men aged 25-29 and National unemployment rates of men aged 30-54, 1976-2013.**

Source: Authors' tabulations from the Labour Force Survey

In Table 1, the descriptive statistics point to other aspects of the labour market that have also changed over time. As a general trend, the participation and employment rates of young women have increased. The employment rate of Canadian women aged 25-29 was 52 percent in 1976 and reached 76 percent in 2013. The broader experience of young women has changed substantially since the 1970s. While hourly wage information is not available in earlier years of our data, we know from Baker and Drolet (2010) that the female-wage ratio for those working full time at ages 25-34 has increased from about 0.8 in the early 1980s to 0.9 since the early 2000s. Furthermore, we've seen the fertility rates of young women drop steadily since the 1970s (see Milan 2013). These historical developments for young women make an assessment of their labour market outcomes more complex and difficult to interpret relative to an assessment of young men.

In Table 1 we also see that the portion of the population with a university degree has increased substantially from 1976 (7.2 percent) to 2013 (22.7 percent). This reflects a general trend in higher educational attainment that varies across provinces. As individuals pursued higher education, Galarneau, Morissette and Usalcas (2013) have shown that young people have delayed making a definitive entry to the labour market. This broad trend, that we can expect to be driven by several factors apart from the aging workforce, makes an analysis youth labour market outcomes more complex, particularly among those under age 25. As in Table 1, we see that the employment rates of young men aged 20-24 declined by 8 percentage points from 1976-2013, and the portion in school full time increased by 13 percentage points over the same period.

Finally, note that the general structure of the economy and employment has changed substantially over time. There has been an overall decline in the share of men that are employed. Among young men aged 25-29, the employment rate has declined from 88.5 percent in 1976 to 80.8 percent in 2013 (Table 1). This reflects in part a general trend for men in Canada, as the employment rates of men aged 25-54 fell from 90.4 percent in 1976 to 85.1 percent in 2013.<sup>10</sup> Alongside the change in employment, the share of men's employment that is in the manufacturing sector has fallen from 23 percent in 1976 to 15 percent in 2013. The change in structure varies substantially across provinces. For example, Ontario's manufacturing share fell from 29 percent in 1976 to 18 percent in 2013 while Saskatchewan's share increased from 6 percent in 1976 to 9 percent in 2013.<sup>11</sup>

Overall, it appears the labour market experience of youth varies substantially over time and across provinces. There has been a general trend toward workforce aging since the mid-1990s, reflecting both the aging of the baby boom generation and an increasing likelihood to work at older ages. In assessing whether workforce aging has impacted youth labour markets, it is

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<sup>10</sup> Employment rates of men from Statistics Canada CANSIM Table 282-0002.

<sup>11</sup> Authors' estimates from the LFS.

important to account for general labour market trends that vary across provinces including trends toward higher education and the changing industrial structure of the economy.

#### 4. Empirical Strategy

We estimate the relationship between workforce aging and youth labour market outcomes using a panel data model that allows for province- and year-specific intercepts ( $\rho_p$  and  $\tau_t$ ) and province-specific trends ( $\delta_p t$ ). That is, our estimating equation is:

$$Y_{pt} = \alpha + \beta Aging_{pt} + \gamma X_{pt} + \rho_p + \tau_t + \delta_p t + \varepsilon_{pt} \quad (1)$$

where  $Y_{pt}$  is the youth outcome of interest (unemployment, employment or log wages) in province  $p$  and year  $t$ . The variable  $Aging_{pt}$  is the share of the labour force aged 30-69 that is aged 55-69. The province specific intercepts ( $\rho_p$ ) account for general differences in youth employment across provinces that may or may not be related to workforce demographics. Year effects ( $\tau_t$ ) account for year-to-year changes in youth outcomes that are common to all provinces. Provincial trends are included ( $\delta_p t$ ) as a linear trend.

To capture non-linear trends that might be important within provinces, time-varying characteristics of the province are included ( $X_{pt}$ ). Here, we include business cycle indicators (the unemployment rate of men aged 30-54 and real GDP growth), the share of men employed in manufacturing, and the share of the population with a university degree. To note, all rates and portions in the panel data set are recorded as numbers between 0 and 100. When estimating the equation, we weight observations by the estimated population (sum of weights) in each province each year. Robust standard errors are provided, clustered at the province level.

Our main estimates focus on the unemployment rates of young men aged 25-29, and we also estimate the equation using employment rates, participation rates and log wages (since 1997) as dependent variables. Furthermore, we examine the labour market outcomes of women aged 25-29, and young men aged 20-24 (including their school enrolment decisions).

## 5. Results

Our results are presented in Tables 2-5. In Table 2, each column represents estimates based on a different specification of the estimating equation (progressively adding covariates). When only including province and year effects in the model, with no other control variables (column 1), an increase in the share of the labour force aged 55-69 by one percentage point is associated with a 0.73 percentage point reduction in the unemployment rate of men aged 25-29. Moving across columns, it is clear that provincial trends are important to account for, but the most important factor to control for is the business cycle. There is a statistically significant and positive relationship between the unemployment rates of men aged 30-54 and the unemployment rates of youth. Similarly, in column 6 of Table 2 we find a statistically significant relationship with GDP growth rates. Accounting for the provinces' business cycle, the estimated effect of an aging labour force on the unemployment rates of young men is statistically insignificant. Note in columns (6) and (7) that the size and sign of the estimate is sensitive to the years included in the analysis, but is statistically insignificant regardless of the years used.<sup>12</sup>

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<sup>12</sup> Estimates based on various temporal samples are available from the authors upon request. It appears that inclusion of years before 1982 resulted in the largest negative estimates.

**Table 2.**

Regression results, dependent variable: Unemployment rate of men aged 25-29

	1976-2013					1982-2012	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of LF aged 55-69	-0.731 (0.276)	-0.607 (0.268)	-0.125 (0.108)	-0.126 (0.107)	-0.127 (0.106)	0.003 (0.164)	-0.011 (0.174)
Unemp. rate male 30-54			1.136 (0.106)	1.137 (0.124)	1.136 (0.118)	1.182 (0.126)	1.138 (0.118)
Share manufacturing				0.005 (0.108)	0.004 (0.103)	0.009 (0.116)	0.019 (0.106)
Share university degree					0.022 (0.170)	0.027 (0.191)	-0.013 (0.175)
Real GDP Growth							-0.112 (0.047)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Trends	No	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses, clustered at the province level. Share of LF represents the share of the adult male labour force aged 30-69 that is aged 55-69.

Source: Authors' tabulations based on the Labour Force Survey.

**Table 3.**

Regression results, alternative dependent variables, young men.

Dependent Variable:	Men Aged 25-29			Men Aged 20-24			In School Full Time
	Employment (1)	Participation (2)	Wages (3)	Unemploy. (4)	Employment (5)	Participation (6)	
Share of LF aged 55-69	0.336 (0.269)	0.292 (0.219)	0.012 (0.007)	-0.083 (0.145)	0.387 (0.295)	0.419 (0.271)	-0.105 (0.153)
Unemp. rate male 30-54	-1.23 (0.112)	-0.212 (0.085)	-0.006 (0.003)	1.48 (0.200)	-1.696 (0.235)	-0.523 (0.102)	0.241 (0.080)
Share manufacturing	0.228 (0.106)	0.238 (0.108)	0.008 (0.004)	-0.165 (0.115)	0.373 (0.157)	0.266 (0.188)	-0.378 (0.114)
Share university degree	-0.036 (0.158)	-0.03 (0.063)	0.022 (0.008)	-0.177 (0.272)	-0.089 (0.351)	-0.29 (0.223)	0.071 (0.284)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses, clustered at the province level. Samples for columns 1,2,4-7 represent 1976-2013.

The sample for column 3 represents 1997-2013.

Source: Authors' tabulations based on the Labour Force Survey.

In Table 3, we consider other labour market outcomes of young men. While the share of the labour force aged 55-69 is positively correlated with the employment rates, participation rates, and wages of young men aged 25-29, the relationship is not statistically significant. The effect of an aging population on the outcomes of men aged 20-24 are provided in columns 4-7 of Table 3. While an increasing share of the labour force that is aged 55-69 is associated with lower unemployment, higher employment and reduced enrolment in full time education, the relationships are not statistically significant.

In Table 4 we offer estimates representing the effect of labour force aging on the outcomes of young women aged 25-29. Similar to those of young men, we do not find any statistically significant effect on young women's unemployment rates, employment rates, participation rates, wages, or school enrolment. Note that the estimates in Table 4 use the share of the male labour force that aged 55-69. We also estimated the equations using the share of the female labour force that is aged 55-69 and results were similar in magnitude and not statistically significant.<sup>13</sup>

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<sup>13</sup> Estimates are available from the authors upon request.

**Table 4.**

Regression results, young women

Dependent Variable:	Women Aged 25-29			Wages (4)	Women Aged 20-24
	Unemployment (1)	Employment (2)	Participation (3)		In School FT (5)
Share of LF aged 55-69	-0.290 (0.176)	0.137 (0.155)	-0.125 (0.196)	0.002 (0.010)	-0.063 (0.224)
Unemp. rate male 30-54	0.72 (0.059)	-0.639 (0.193)	-0.109 (0.198)	0.001 (0.005)	0.159 (0.104)
Share manufacturing	-0.029 (0.075)	-0.004 (0.262)	-0.01 (0.286)	0.01 (0.002)	-0.098 (0.154)
Share university degree	0.126 (0.233)	-0.357 (0.213)	-0.262 (0.147)	0.018 (0.005)	0.246 (0.271)
Province FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Province Trends	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses, clustered at the province level. Samples for columns 1-3,5 represent 1976-2013. The sample for column 4 represents 1997-2013.

Source: Authors' tabulations based on the Labour Force Survey.

**Table 5.**

Regression results, dependent variable: unemployment rate of men aged 25-29

	1976-2013					1982-2012	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of pop. aged 55-69	-0.562 (0.207)	-0.587 (0.206)	-0.215 (0.095)	-0.215 (0.094)	-0.216 (0.093)	-0.197 (0.152)	-0.154 (0.161)
Unemp. rate male 30-54			1.119 (0.114)	1.119 (0.135)	1.118 (0.129)	1.16 (0.131)	1.125 (0.125)
Share manufacturing				0.002 (0.110)	0.001 (0.105)	0.002 (0.107)	0.013 (0.100)
Share university degree					0.027 (0.180)	0.038 (0.208)	-0.005 (0.190)
Real GDP Growth							-0.106 (0.045)
Province FE	Yes						
Year FE	Yes						
Province Trends	No	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses, clustered at the province level. Share of population represents the share of the adult male population aged 30-69 that is aged 55-69.

Source: Authors' tabulations based on the Labour Force Survey.

Finally, in Table 5 we estimate the effect of population aging (measured as the share of the male population aged 30-69 that is aged 55-69) on the unemployment rates of men aged 25-29. Using this alternative measure and our full provincial panel from 1976-2013, we find that effect of population aging on youth unemployment is statistically significant. After accounting for the business cycle and provincial trends (column 5 in Table 5), our estimates indicate that a one percentage point increase in share of the population aged 55-69 is associated with a 0.22 percentage point reduction in unemployment rates among men aged 25-29. The result, however, is not robust to the sample period chosen. In columns (6) and (7) we estimate the same equation using the 1982-2012 sample period; the resulting coefficient is statistically insignificant.

Overall, the results offer us no evidence that an aging workforce has a negative impact on the labour market outcomes of young men and women. To the contrary, the coefficients are of the opposite sign that (if not statistically insignificant) would have suggested the aging workforce has a positive impact on the labour market outcomes of youth.

## **6. Concluding Remarks**

The estimates in this study contribute to the body of international evidence suggesting population aging has not had a negative effect on the labour market outcomes of young people. Consistent with other studies, there appears to be some evidence of a positive effect. This could reflect complementarities in the skills brought to the labour market by older and younger workers. It may also reflect a growth in aggregate demand that could occur as a larger portion of individuals reach a peak in their age-earnings profiles.

The evidence does not suggest that policy makers should not concern themselves with the functioning of youth labour markets. Although less dire than the situation in the United States, the most recent recession may have long-term negative effects on youth. Evidence in Oreopoulos et al (2012) suggested those graduating in a recession suffer persistent earnings

losses as they start their careers with lower paying employers. They also find more advantaged graduates have better mobility in the labour market and suffer less because they are better able to move to higher paying positions. This suggests that policies that reduce labour market frictions for youth (such as offering interprovincial migration assistance and better regional market information) could be beneficial. Moving forward, population aging more generally will result in substantial changes in the structure of the economy – perhaps placing a greater emphasis on the goods and services in greatest demand among seniors. While policies that attempt to reduce the share of the labour force represented by older workers may be ineffective, there is scope for preparing youth for a differently structured labour market in the future.

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