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Cohort size and youth earnings: Evidence from a quasi-experiment ☆

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HIGHLIGHTS

- I study the impact of the 2003 Ontario 'double cohort' on youth wages.
- This labour supply shock depressed wages of recent high-school graduates by 5 to 9%.
- The shock mainly affected the bottom of the wage distribution.
- The shock affected the likelihood to have a 'bad' job.
- The shock affected the employment status of recent high-school graduates modestly.

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ABSTRACT

In this paper, I use data from the Canadian Labour Force Surveys (LFS), and the 2001 and 2006 Canadian Censuses to estimate the impact of an important labour supply shock on the earnings of young high-school graduates. The abolition of Ontario's Grade 13 generated a very large cohort of high-school graduates that simultaneously entered the Ontario labour market, generating a sudden increase in the labour supply. This provides a rare occasion to measure the impact of cohort size on earnings without the supply shock being possibly confounded with unobserved trends—a recurring problem in the literature. The Census findings suggest that the effect of the supply shock is statistically and economically important, depressing weekly earnings by 5 to 9%. The findings from the Census are supported by the LFS results that suggest that the immediate impact of the supply shock—measured about six months after high-school graduation—is also important.

1. Introduction

Economists have studied the effects of cohort size on youth economic outcomes extensively following the entrance of baby boomers onto the labour market and the associated worsening of the youth labour market situation. Since cohort size does not vary substantially from one year to the next, studies (e.g., Welch, 1979; Berger, 1985, 1989; Dooley, 1986; Macunovich, 1999; Korenman and Neumark, 2000) have focused on long-term (typically 8–25 years) variations in cohort size.[1] One problem with this strategy is that it is hard to isolate cohort size effects from other unobserved trends that are unrelated to demographics. This could explain why, for instance, in the 1980s the situation of youth in the United States worsened while demographic conditions should have improved it (Korenman and Neumark, 2000).

The 1997 Ontario secondary school reform allows me to shed light on how well the labour market can absorb a sudden influx of workers. In particular, this reform provides a rare occasion to measure the impact of cohort size on youth earnings without having to worry about the supply shock being confounded with unobserved trends. Following the abolition of Grade 13, two cohorts of high school graduates simultaneously entered the labour market in 2003, creating a large and sudden increase in youth labour supply. Compared to 2001, the number of high school graduates increased by more than 30% in 2003.

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[1] See Korenman and Neumark (2000) and Brunello (2010) for extensive reviews of the literature on cohort size and youth labour markets.

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The Ontario supply shock can, in terms of its intensity, be compared to an immigration shock. Since Card's seminal 1990 paper, a series of studies (e.g., Hunt, 1992; Carrington and Lima, 1996; Friedberg, 2001; Glitz, 2012) have used important political changes as quasi-experiments to measure the impact of immigration supply shocks on local labour markets. Overall, the findings from these studies suggest that immigration supply shocks have, at most, a modest impact on natives (Friedberg and Hunt, 1995).[2]

One advantage of using such quasi-experiments (over the use of cross-section analysis) is that it can mitigate, at least in part, self-selection issues such as the possibility that immigrants settle in booming labour markets if immigration is politically motivated, as opposed to economically motivated (Friedberg and Hunt, 1995). But, although helpful in understanding the effect of immigration inflows on local labour markets, these studies can only shed limited light on the potential effects of exogenous increases of local workers, particularly if local workers and immigrants are poor substitutes.[3] One advantage of the supply shock studied in this paper is that it is composed of potential workers *almost identical* to what would be referred to in the immigration literature as 'native workers'. This study can therefore inform us on the capacity of the labour market to absorb supply shocks without having skills or preferences playing any confounding role in the determination of the outcome of interest. Another critical aspect of the supply shock studied in this paper is that it is less likely to be contaminated by a simultaneous labour demand shock than, say, an immigration supply shock. Ontario workers were already living and consuming in the local area, and as such, their entry into the workforce probably had a lesser impact on product demand (and thus on labour demand) as the arrival of new immigrants.

I take advantage of two sources of information to estimate the impact of the double cohort on youth earnings. First, I use the 2001 and 2006 Canadian Census master files, which allow me to observe youth earnings shortly before and after the double cohort. The Canadian Censuses are very useful to estimate the effect of cohort size for at least two reasons: 1) the richness of the data renders it possible to get a measure of weekly earnings—something that is crucial if we are interested in the effect of cohort size on the price of labour—, and 2) it is the largest Canadian data set available to researchers. The large sample size makes precise estimations possible, even for very small subsamples of the Canadian population (like Ontario high-school graduates born in 1984). The second source of data used in this paper consists of the December 2001 and 2003 Labour Force Survey (LFS) master files. The LFS contains rich information on individuals' labour market conditions (e.g., hourly and weekly wages), and by observing individual earnings over an even shorter period surrounding the double cohort, it allows me to further mitigate the potential impacts of other unrelated shocks that could affect youth earnings.

My results show that a supply shock like the one created by the double cohort can significantly affect labour market outcomes. The Census results suggest that the Ontario double cohort decreased weekly wages of workers who recently graduated from high school by between 5 and 9%. Moreover, the magnitude of the estimated impact increases as the control group is further away in age from the treatment group. This indicates that workers close in age to the double-cohort graduates may have been affected by the supply shock as well. The double cohort also affected the likelihood to be working full time and for a full year. By taking this last finding into account, I estimate the supply shock effect on wages to be between −3 and −17% (based on 'extreme-scenario' assumptions about whose work status was affected by the supply shock). The Census findings are corroborated by the LFS results, which indicate that the immediate (six months after the shock) impact of the double cohort was to depress wages by 9 to 20%. This last finding should be interpreted with caution, as the analysed sample size is relatively small.

As some studies (e.g., Borjas et al., 1996, 1997; Borjas, 2003, 2006; Boustan et al., 2010) suggest that native workers might move away from regions with significant in-migration, I also investigate whether young Ontario workers moved out of the province in reaction to the double cohort. I do not find any evidence of out-migration from young Ontario workers.

The impact of the double cohort is concentrated at the bottom of the wage distribution. I find that the double cohort increased the proportions of young workers taking 'bad' jobs, and depressed wages conditional on having a 'bad' job. My findings suggest important spillover effects, as I find that young Ontario high school dropouts were also negatively affected by the double cohort. Finally, the effect of the double cohort seems to persist, as there is still evidence of a significant negative impact on wages eight years after the double cohort graduated from high school.

The next section describes the Ontario double cohort and its potential consequences for the estimation of the cohort size effect. I describe the two sources of data used in this paper in Section 3. The estimation strategy is presented in Section 4. Section 5 presents the findings from the Census data followed by the findings from the LFS. In Section 6, I tackle a number of identification issues, while I investigate some potential mechanisms through which the double cohort affected wages in Section 7. Finally, I investigate the potential persistence of the double cohort effect and whether there is evidence of spillover effects in Sections 8 and 9 concludes.

2. The Ontario double cohort and labour supply

In 1997, the provincial government of Ontario announced an important reform to its secondary school system. The centrepiece of this reform was the compression of the curriculum from five to four years. This compression was motivated by: 1) the desire to bring the length of Ontario's curriculum into line with most surrounding provinces—prior to this reform, students from all provinces except for Ontario and Quebec used to graduate from secondary school after Grade 12; and 2) the hope of lowering the cost of its educational system. The reform was implemented shortly after its announcement: the first cohort of the new curriculum started high school (Grade 9) in September 1999. These students were expected to graduate from high school after four years (after Grade 12) instead of five. An inevitable consequence of this reform was that, in 2003, both the first cohort from the new curriculum and the last cohort from the old curriculum graduated from high school in the same year, creating a drastic increase in the number of high school graduates. This large cohort of high school graduates was known as Ontario's double cohort. Since students graduate from secondary school almost simultaneously across the province, one would expect the labour supply shock caused by the double cohort to be important and concentrated within a short time span.

Fig. 1 shows the number of recent high school graduates aged 17 to 19 between 1998 and 2006 for Ontario and the Rest-of-Canada (henceforth RoC).[4] The number of recent graduates jumped by 34.1% (from 91,291 to 122,406) between 2001 and 2003 in Ontario, while

[2] One exception is Glitz (2012) who looks at the impact of the important inflow of immigrants to Germany following the fall of the Berlin Wall. Although he does not find evidence of a negative impact on wages, he does find that the immigration inflow affected the employment-to-labour-force rate.

[3] See Card (2009), Peri (2011), and Ottaviano and Peri (2012) for evidence of imperfect substitutability between natives and immigrants.

[4] Recent high school graduates are individuals who had graduated from secondary school at the time of their first LFS interview but who were attending school full time in the previous March. See the online Appendix B for a detailed description of the data used to construct Fig. 1.