November 2018

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The Contribution of Full-time Students to the Canadian Unemployment Rate, 1976-2017

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CSLS Research Report 2018-06

November

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Abstract

This report analyzes the relationship between full-time students aged 15 to 24 and unemployment in Canada for the 1976-2017 period. Over the past 4 decades, the stock of unemployed full-time students has increased by 87 thousand, from 43 thousand in 1976 to 130 thousand in 2017. As a result, the share of the total unemployment represented by full-time students has increased from 5.7 percent in 1976 to 10.4 percent in 2016. Full-time students did not participate in a secular decline in the unemployment rate to the extent experienced by the majority in the Canadian labour force from the mid 1990s. This led full-time students to become an increasingly important factor in driving the total unemployment rate in Canada. Our analysis shows that excluding full-time students from the labour force results in a lower Canadian unemployment rate in 2017, 6.0 percent instead of 6.3 percent. The lion's share of the difference in the unemployment rate is a result of excluding 15 to 19 year olds pursuing full-time studies, a demographic which often face less economic hardship but are nonetheless allotted an identical weighting in the unemployment rate as unemployed adults. Moreover, the contribution of full-time students to the unemployment rate has increased over six fold during the 1976-2017 period.

The Contribution of Full-time Students to the Canadian Unemployment Rate, 1976-2017

I. Introduction

This report analyzes the relationship between full-time students aged 15 to 24 and unemployment in Canada for the 1976-2017 period. Over the 1976-2017 period, the stock of unemployed full-time students between the ages of 15 and 24 had grown by almost 90 thousand, from 43 thousand in 1976 to 130 thousand in 2017.[1] Over the same period, non-full-time student youth unemployment *decreased* from 305 thousand to 172 thousand.[2] This indicates that the youth labour market outcomes in Canada was increasingly linked to full-time students looking for part-time positions.

Indeed, in 1976 full-time students accounted for 5.7 percent of total Canadian unemployment but the proportion reaches 10.4 percent in 2017. This contrasts to the downward trend for the share of non-full-time student youths in the total unemployment. It has decreased from 41.3 percent in 1976 to 13.9 percent in 2017. The analysis of this report shows that excluding full-time students from the labour force results in a lower Canadian unemployment rate (by 0.33 percentage points) in 2017. The impact of full-time students on the unemployment rate has increased over six fold during the 1976-2017 period, rising dramatically between 1995 and 1997 (**Chart 1**).

Moreover, we find that the lion's share of the 0.33 percentage points is a result of excluding 15 to 19 year olds pursuing full-time studies, a group which often takes part-time jobs while pursuing a high school diploma but are nonetheless allotted an identical weighting in the unemployment rate to unemployed adults. Among the full-time students between 15 and 19, we show that the share of females in the total impact had increased substantially following the 1995-1997. Their share in explaining the total impact remained as large as that of males in the same age group. When analyzing by province, Ontario remained as the largest contributor to the total unemployment in Canada.

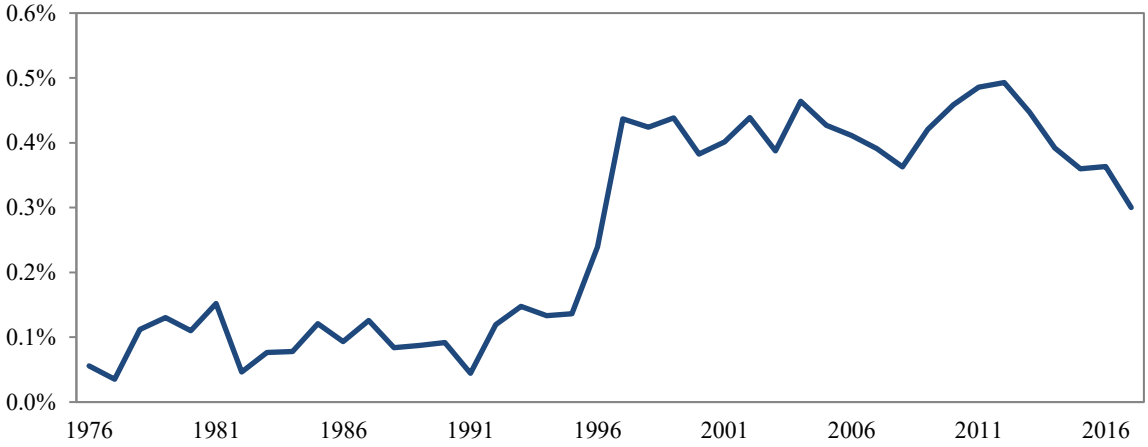
One important observation is that 75 percent of the 87 thousand increase in the stock of unemployed full-time students occurred before the mid 1990s. Other segments in the labour force in Canada experienced a very similar increase in unemployment. Hence, full-time students contributed to the total unemployment to only a negligible extent during

[1]In this report, we only consider full-time students between the ages of 15 and 24 during the school year (September-April). However, we are aware that full-time students may be over 24 and this group could be responsible for some share in total unemployment in Canada.
[2]See Table 20 in Appendix B

the first half of our sample period. However, after the mid 1990s, full-time students did not participate in a secular decline in the unemployment rate to the extent experienced by the majority in the labour force. This implies that the large contribution from full-time students is more a recent phenomenon.

In this report, a special attention is devoted to the behavior of the aforementioned variables during 1995-1997 in pursuit of accounting for the sharp increase in the contribution of full-time students to the Canadian unemployment rate. By decomposing annual growth rates of the unemployment rate into those of unemployed workers and labour force for different demographic groups we find that the sudden increase in the contribution can be attributed to a large increase in full-time student unemployment rate during 1995-1997. During this period, non-full-time students and adults experienced declining unemployment rates.

Chart 1: Contribution of Unemployed Full-time Students to Canadian Unemployment Rate, 1976-2017



Source: CANSIM Table 282-0002, 282-0095.

The remainder of this report is divided into five sections. Section II describes the data employed in this paper, including the particularities inherent to data on full-time students. Section III discusses the evolution of the youth population, youth labour force participation as well as enrolment of young full-time students and unemployment rates. This section also provides our analysis based on decomposition of unemployment into labour force participation, educational enrolment, the unemployment rate, and the working age population. In section IV, we explore whether the impact of unemployed full-time students is significant across sex and province. In section V, we compare full-time students with other segments in the labour force. Section VI provides implications of our empirical findings. Section VII concludes.

II. Data

All data used in this paper were produced by Statistics Canada and publicly available through CANSIM Tables 282-0002 and 282-0095.Statistics on the labour market, including the working age population, labour force, and unemployment are annual data from the Labour Force Survey (LFS).

There are several characteristics unique to data on full-time students. First, labour market statistics are based on an eight-month average for the calendar year (i.e. January to April and September to December).[3] That is to say that the data excludes the summer months of May through August, since the labour market situation of students differs during this time period. For example, high school students tend to remain in school until late June, whereas most university students finish in late April, thereby losing their classification as full-time students. Second, by Statistics Canada's definition, full-time students currently attending school are not considered available for full-time work (Statistics Canada, 2016). These individuals are assumed to be looking for either summer work or a permanent job to start in the future, and are therefore not included in the labour supply. Thus, in the context of this report, full-time students are unemployed if they are both actively pursuing and available for part-time work. A student is considered to be available for work if they reported that they could have worked in the reference week had a suitable job been offered.

III. Variables Affecting Youth Unemployment

This section analyzes the four variables affecting full-time student unemployment; namely, the population of youth, enrolment rates, labour force participation rates of the full-time student, and the full-time student unemployment rate. By breaking down the number of unemployed students, it is possible to analyze the contribution of each of the four aforementioned variables to the total impact of unemployed students on the national unemployment rate.

The product of youth population, enrolment rate, the full-time student participation rate, and the full-time student unemployment rate is equal to the number of unemployed full-time students. More specifically, for a given population of youth, multiplying by the enrolment rate produces the population of full-time students. Of these students, a given

[3] This technical issue arises as labour market statistics for other groups are not based on an eight-month average resulting in inconsistency between our sample and the rest of the demographic groups. Further analysis is needed.

proportion decides to participate in the labour force. Of the individuals composing the student labour, some fraction is unemployed. The product of the student unemployment rate and the student labour force generates the stock of unemployed full-time students at a given point in time.

Working age population

Canadian demographics have evolved considerably over the 1976-2016 period. Canada's population was considerably smaller, younger and less educated in 1976 relative to its present state. In 1976, the working age population sat at 17.1 million compared to 29.9 million in 2017 (**Table 1**). The near doubling of the working age population was accompanied by a decrease in the number of youth between the ages of 15 and 24, falling from 4.6 million in 1976 to 4.4 million in 2017 (Table 1). This dramatic shift resulted in the decline in the proportion of the working age population represented by youth aged 15 to 24 from 26.7 percent in 1976 to 14.6 percent in 2017.

Table 1: Working Age Population (15+), Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
15 to 19 year olds	2,342	2,316	1,889	1,964	1,982	2,047	2,198	2,154	2,000	1,981
20 to 24 year olds	2,208	2,427	2,100	1,961	1,961	2,021	2,211	2,337	2,386	2,371
15 to 24 year olds	4,550	4,743	3,989	3,898	3,943	4,068	4,403	4,491	4,386	4,352
Total Population	17,058	18,814	20,899	22,960	23,247	24,090	26,824	28,283	29,587	29,901
Proportion of the working age population represented by youth (%)										
15 to 19 year olds	13.7	12.3	9.0	8.5	8.5	8.5	8.2	7.6	6.8	6.6
20 to 24 year olds	12.9	12.9	10.1	8.7	8.4	8.4	8.2	8.3	8.1	7.9
15 to 24 year olds	26.7	25.2	19.1	17.2	17.1	16.9	16.4	15.9	14.8	14.6

Source: CANSIM Table 282-0002.

Enrolment

Despite the decline in the number of Canadian youth, the population of full-time students increased during the period under study. The number of full-time students rose from 1.85 million in 1976 to 2.55 million in 2017, a gain of roughly 700 thousand (**Table 2**). Of the 700 thousand additional students, 591 thousand were aged between 20 and 24,

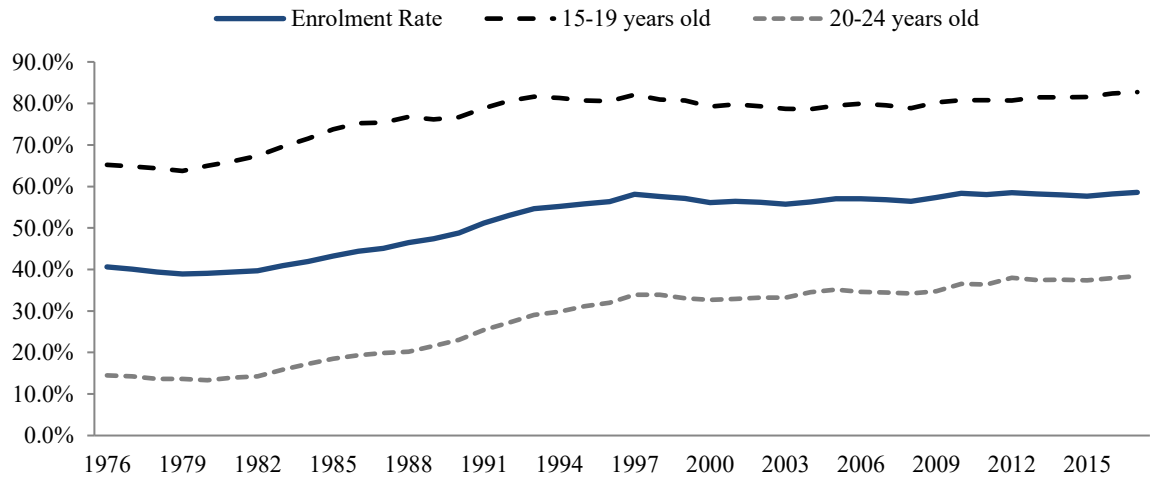
Table 2: Full-time Student Enrolment, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
15 to 19 year olds	1,527	1,530	1,439	1,563	1,627	1,622	1,729	1,739	1,648	1,639
20 to 24 year olds	320	338	453	611	666	661	757	888	905	911
15 to 24 year olds	1,848	1,868	1,892	2,174	2,292	2,283	2,486	2,626	2,554	2,550
Full-time student enrolment rates (%)										
15 to 19 year olds	65.2	66.1	76.2	80.7	82.1	79.2	78.8	80.7	82.4	82.7
20 to 24 year olds	14.5	13.9	21.6	31.2	34.0	32.7	34.2	38.0	37.9	38.4
15 to 24 year olds	40.6	39.4	47.4	55.8	58.1	56.1	56.5	58.5	58.2	58.6

Source: CANSIM Table 282-0095.

The proportion of youth enrolled in full-time studies increased from 40.6 percent in 1976 to 58.6 percent in 2017. Enrolment rates increased the most for youth between 20 and 24, rising from 14.5 percent in 1976 to 38.4 percent in 2017, a 23.9 percentage point gain. This is in contrast to a 17.5 percentage point increase for youth between 15 and 19 (from 65.2 percent to 82.7 percent).

Chart 2: Youth Full-time Study Enrollment Rates, 1976-2017



Source: CANSIM Table 282-0095.

Chart 2 depicts the progression of the youth enrolment rate over the 1976-2017 period. It should be noted that the 1980-1997 period witnessed a sharp increase in educational enrolment, rising from 40.6 percent in 1976 to 58.1 percent in 1997. While enrolment rates appear to have stabilized since 1997, they have risen from 32.0 percent to

38.4 percent (total gain of 6.4 percentage points) among those between the ages of 20 to 24 years old. Teenage enrolment rates, on the other hand, have risen just 0.6 percentage points (from 82.1 percent to 82.7 percent).

Labour force participation

In 1976, the labour force was composed of 10.49 million individuals, 27.6 percent of which were between the ages of 15 and 24. By 2017, the labour force effectively doubled to 19.66 million workers, but the share of workers accounted for by youth halved to 14.1 percent (**Table 3**).

Table 3: Composition of the Canadian Labour Force, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Youth Labour Force	2,892	3,285	2,839	2,462	2,424	2,620	2,965	2,852	2,795	2,782
Full-time Student LF	524	660	859	853	876	968	1,163	1,113	1,090	1,091
Non-full-time Student LF	2,368	2,624	1,980	1,609	1,548	1,652	1,803	1,739	1,705	1,691
Total Labour Force	10,491	12,236	14,057	14,689	15,081	15,842	18,122	18,810	19,441	19,663
Full-time student labour force										
15 to 19 year olds	434	551	666	588	582	658	775	673	637	639
20 to 24 year olds	90	109	194	265	294	310	388	440	453	452
15 to 24 year olds	524	660	859	853	876	968	1,163	1,113	1,090	1,091
Labour force participation rate of full-time students (%)										
15 to 19 year olds	28.4	36.0	46.3	37.6	35.8	40.5	44.8	38.7	38.6	39.0
20 to 24 year olds	27.9	32.2	42.7	43.4	44.2	46.9	51.2	49.6	50.1	49.7
15 to 24 year olds	28.3	35.3	45.4	39.2	38.2	42.4	46.8	42.4	42.7	42.8
Labour force participation rate of non-full-time students (%)										
15 to 19 year olds	80.6	84.0	82.9	78.4	78.1	78.0	81.3	78.0	78.3	78.1
20 to 24 year olds	83.3	86.6	89.1	87.0	87.3	87.7	88.6	88.0	87.8	88.0
15 to 24 year olds	82.5	85.9	87.8	85.1	85.3	85.4	86.9	85.8	86.0	86.1
Proportion of the labour force represented by full-time students (%)										
15 to 19 year olds	4.1	4.5	4.7	4.0	3.9	4.2	4.3	3.6	3.3	3.2
20 to 24 year olds	0.9	0.9	1.4	1.8	2.0	2.0	2.1	2.3	2.3	2.3
15 to 24 year olds	5.0	5.4	6.1	5.8	5.9	6.1	6.4	5.9	5.6	5.5
Proportion of the youth labour force represented by full-time students (%)										
15 to 19 year olds	36.7	42.0	59.5	61.0	62.3	62.0	63.1	62.8	64.9	65.2
20 to 24 year olds	5.2	5.5	11.3	17.7	19.8	19.9	22.3	24.7	25.0	25.1
15 to 24 year olds	18.1	20.1	30.3	34.7	36.1	36.9	39.2	39.0	39.0	39.2

Source: CANSIM Table 282-0002, 282-0095.

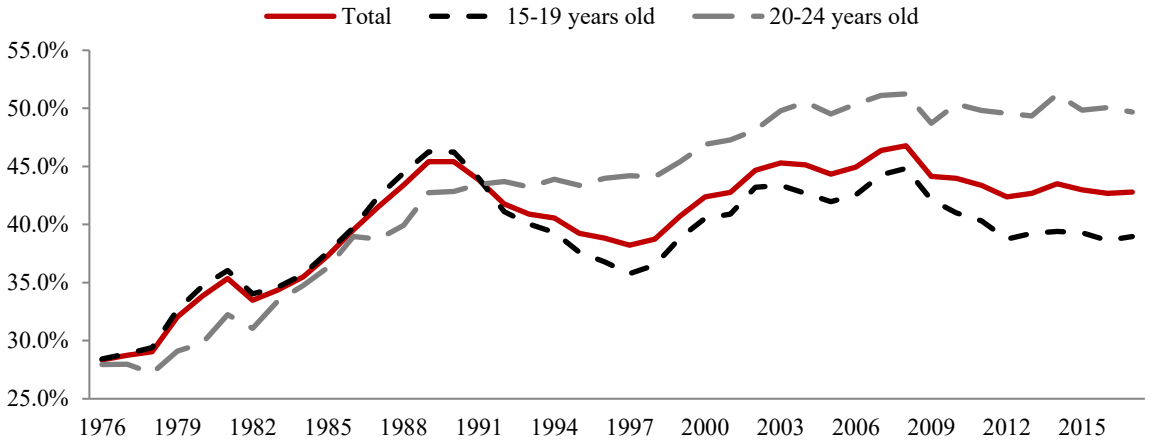
Note that the number of youth participating in the labour force declined from 2.89 million in 1976 to 2.78 million in 2017. This decline occurred in unison with the contraction of the youth population, and as such the youth labour force participation rate

(LFPR) has remained constant over the 1976-2016 period, rising modestly from 63.6 percent in 1976 to 63.9 percent in 2017—a gain of 0.3 percentage points—in contrast to the greater than four percentage point increase witnessed for entire Canadian labour market.[4]

As an obvious result of increasing enrolment rates between 1976 and 2017 student labour force has expanded considerably. During this period, 567 thousand full-time students joined the labour force: roughly 200 thousand teenagers (15-19 year olds) and 360 thousand young adults (20-24 year olds).This increase ultimately doubled the student labour force, rising from 524 thousand in 1976 to 1,091 thousand by 2017. The LFPR for youth enrolled as full-time students rose 14.5 percentage points, from 28.3 percent in 1976 to 42.8 percent in 2017. This contrasts to the 0.3 point gain in LFPR for the total youth population. The most substantial increase was witnessed for full-time students between 20 and 24 years old, whose labour force participation rate rose 21.8 percentage points and reached 49.7 percent as of 2017 (**Chart 3**). It should be noted that the 1995-1997 period was characterized by a divergence between LFPR rates between the two youth groups (15-19 year olds and 20-24 year olds). While the participation rate declined from 37.6 percent to 35.8 percent for students between the ages of 15 and 19 years old, the participation rate rose modestly by 0.8 percentage points for students between 20 and 24 years old. Another important divergence should be noted. Unlike the labour force formed by full-time students, the labour force of non-full-time student youth has shrunk from 2703 thousand to 1802 thousand over the whole sample period. Along with the greater extent of decline in total non-full-time student youth population, this has resulted in higher LFPR over time. Non-full-time student LFPR rose from 82.5 percent in 1976 to 86.1 percent in 2017 (**Table 20** in Appendix B). This 3.6 percentage point increase, compared with the 14.5 point increase among students, indicates that the youth labour force is increasingly driven by full-time students.

[4]The Canadian LFPR rose from 61.5 percent in 1976 to 65.8 percent in 2017.

Chart 3: Youth Full-time LFPR Rates, 1976-2017



Source: CANSIM Table 282-0095.

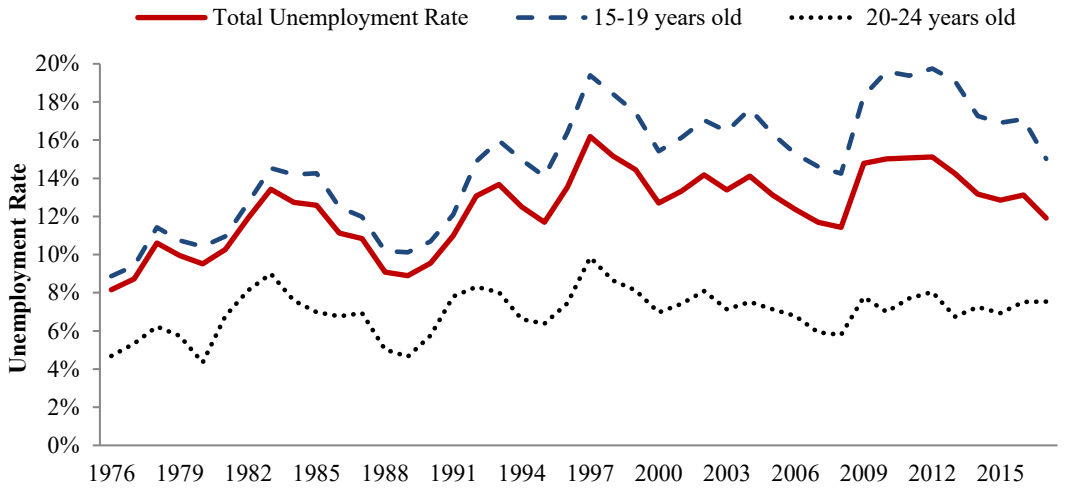
Thus, a narrative surrounding the relationship between Canadian demographics and full-time students has been established. Despite the doubling of Canada's working-age population, the number of youth between 15 and 24 has declined by 4.4 percent. In spite of this decline, the number of full-time students has increased by 38.0 percent as a result of higher post-secondary enrolment. With high labour force participation rates, the share of students in the Canadian labour force did not fall. In 2017, youth enrolled as full-time students accounted for 5.5 percent of the Canadian labour force and 10.6 percent of the working age population, in contrast to forming 5.0 percent of the Canadian labour force and 12.2 percent of the working age population in 1976. Meanwhile, the role of non-full-time student youth in the Canadian labour force has become less significant over time as the labour force formed by them has declined by 13.4 percentage points over the past four decades.

Unemployment

Total youth unemployment declined from 358 thousand to 323 thousand over the period 1976 – 2017 while the full-time student unemployment rose from 43 thousand to 130 thousand. In terms of percentages, total youth unemployment rates decreased from 12.4 percent in 1976 to 11.6 percent in 2017; however, full-time student unemployment rates rose from 8.2 percent in 1976 to 11.9 percent in 2016, a 45 percent increase over the 1976-2017 period (**Chart 4**). Moreover, unemployment rates for students between 15 and 19 years old increased sharply, rising from 8.9 percent to 15.0 percent, compared to the 60 percent gain (from 4.7 percent to 7.5 percent) in the unemployment rate for full-time students between 20 and 24 years old. This is in contrast to non-full-time students and adults (>24) (**Table 20** in Appendix B). The unemployment rate for non-full-time students declined slightly over the same period although the rate had remained quite high during the

mid 1990s. Specifically, the rate decreased from 13.7 percent in 1976 to 11.1 percent in 2016.

Chart 4: Youth Full-time Student Unemployment Rates, 1976-2017



Source: CANSIM Table 282-0002, 282-0095.

During the 1995-1997 period, the unemployment rate for full-time students rose from 11.7 percent to 16.2 percent, the highest rate of unemployment witnessed over the sample period. The surge in unemployment rate over the 1995-1997 period partly assists in explaining the substantial increase in the contribution of unemployed full-time students to the Canadian unemployment rate (**Table 4**).

Table 4: Canadian Unemployment, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Total Unemployment	744	931	1061	1394	1372	1082	1112	1372	1361	1247
Total Youth Unemployment	358	420	311	365	394	322	344	412	366	323
15 to 19 year olds (FT students)	39	60	67	83	113	101	110	133	109	95
20 to 24 year olds (FT students)	4	7	9	17	29	22	23	35	34	34
15 to 24 year olds (FT students)	43	67	79	100	142	123	133	168	143	130
Unemployment rate (%)										
Total Unemployment Rate	7.1	7.6	7.5	9.5	9.1	6.8	6.1	7.3	7.0	6.3
Total Youth Unemployment Rate	12.4	12.8	10.9	14.8	16.3	12.7	11.6	14.4	13.1	11.6
15 to 19 year olds (FT students)	8.9	11.0	10.1	14.1	19.4	15.4	14.2	19.8	17.1	15.0
20 to 24 year olds (FT students)	4.7	6.8	4.6	6.4	9.9	7.0	5.8	8.0	7.5	7.5
15 to 24 year olds (FT students)	8.2	10.3	8.9	11.7	16.2	12.7	11.4	15.1	13.1	11.9
Proportion of youth unemployment represented by full-time students (%)										

15 to 19 year olds	20.9	28.8	47.1	48.5	56.5	58.1	58.1	61.7	62.4	61.7
20 to 24 year olds	2.4	3.5	5.4	8.7	14.9	13.7	14.6	18.0	17.8	20.3
15 to 24 year olds	11.9	16.2	24.6	27.3	36.0	37.1	38.6	40.9	39.0	40.2
Proportion of total unemployment represented by full-time students (%)										
15 to 19 year olds	5.2	6.5	6.4	5.9	8.2	9.4	9.9	9.7	8.0	7.7
20 to 24 year olds	0.6	0.8	0.8	1.2	2.1	2.0	2.0	2.6	2.5	2.7
15 to 24 year olds	5.7	7.3	7.2	7.2	10.3	11.4	11.9	12.3	10.5	10.4

Source: CANSIM Tables 282-0002, 282-0095

Consequently, over the 1976-2017 period, there was an increase of 87 thousand unemployed full-time students (68.7 percent of which were aged between 15 and 19 years old). Note that non-full-time student youth unemployment actually decreased from 305 thousand to 172 thousand over the same period (**Table 20** in Appendix B). Hence, the additional 87 thousand unemployed full-time students means that the students were forming an increasing large share of youth unemployment. In 1976, full-time students accounted for 11.9 percent of total youth unemployment while forming 40.2 percent of the total youth unemployment in 2017. Similarly, full-time students accounted for 5.7 percent of total Canadian unemployment; this contrasts to forming 10.4 percent of Canadian unemployment in 2017.

To determine the overall impact of unemployed full-time students on the Canadian unemployment rate, the unemployment rate was recalculated by removing unemployed full-time students from both the unemployed and the labour force. In 1976, excluding 15 to 19 year old students reduced the unemployment rate from 7.09 percent to 7.01 percent; excluding university age students resulted in a slight increase to the unemployment rate (from 7.09 percent to 7.11 percent).Solely excluding full-time students between 20 and 24 raised the adjusted unemployment rate because university aged full-time students had a lower unemployment rate than the total unemployment rate (4.7 percent vs. 7.1 percent, respectively).

In aggregate, the exclusion of full-time students reduced the unemployment rate by 0.06 percentage points, from 7.09 percent to 7.03 percent in 1976. Interestingly, the contribution grew substantially over the 1976-2017 period. As of 2017, full-time students contribute 0.33 percentage points to the Canadian unemployment rate. In other words, the Canadian unemployment in 2016 would have been 6.01 percent instead of 6.34 percent had full-time unemployed students been excluded from the labour force (**Table 5**).

Table 5: Unemployment Rate, Including and Excluding Full-time Students (%), Selected Years

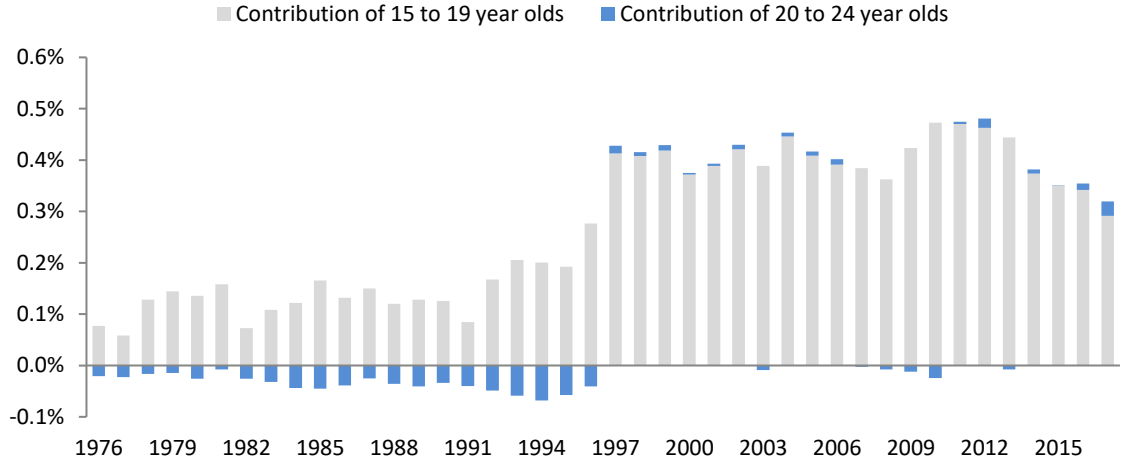
Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Including FT Students	7.09	7.61	7.55	9.49	9.10	6.83	6.14	7.29	7.00	6.34
Excluding FT (15 to 19)	7.01	7.45	7.42	9.30	8.69	6.46	5.77	6.83	6.66	6.05
Difference	0.08	0.16	0.13	0.19	0.41	0.37	0.36	0.46	0.34	0.29

Excluding FT (20 to 24)	7.11	7.61	7.59	9.55	9.09	6.83	6.14	7.27	6.99	6.31
Difference	-0.02	-0.01	-0.04	-0.06	0.01	0.00	-0.01	0.02	0.01	0.03
Excluding FT (15 to 24)	7.03	7.46	7.46	9.35	8.66	6.45	5.77	6.80	6.64	6.01
Difference	0.06	0.15	0.09	0.14	0.44	0.38	0.37	0.49	0.36	0.33

Source: CANSIM Tables 282-0002, 282-0095

It should be noted that unemployed full-time students between ages of 15 and 19 can explain most of the impact on the total unemployment rate over the sample period. For example, the 0.33 percentage point impact in 2017 is 88 percent accounted for by unemployed full-time students between the ages of 15 and 19 (**Chart 5**).

Chart 5: Contribution of full-time students to Canada's unemployment rate, 1976-2017



Source: CANSIM Table 282-0002, 282-0095.

Decomposition

By breaking down the number of unemployed students into the working age population, enrolment rate, unemployment rate, and labour force participation rate, it is possible to analyze the contribution of each of the four aforementioned variables to unemployment. The following identity is proposed:

$$Unemployed_{FTS} = \frac{Labour\ force_{FTS}}{WAP_{FTS}} \times \frac{Unemployed_{FTS}}{Labour\ force_{FTS}} \times \frac{WAP_{FTS}}{WAP} \times WAP \quad (1)$$

$$Unemployed_{FTS} = LFPR_{FTS} \times UR_{FTS} \times ER_{FTS} \times WAP \quad (2)$$

where $Unemployed_{FTS}$ is the number of unemployed full-time students, $Labourforce_{FTS}$

is the full-time student labour force, WAP_{FTS} and WAP are the full-time student and working age population, respectively. These numbers are all for youths between the ages of 15 and 24 years old. As a result, the working age population is equal to the total youth population. In addition, all number do not reflect students outside of that age bracket.

The identity proposed in equation (1) is equal to the product of the labour force participation rate ($LFPR_{FTS}$), unemployment rate (UR_{FTS}), enrolment rate (ER_{FTS}) and total youth working age population, as seen in equation (2).**Table 6** presents the decomposition for selected years. In 1976, the working age population of youth was 4.55 million. Of these individuals, 40.6 percent enrolled in full-time studies. Of those who enrolled in full-time studies, 28.3 percent participated in the labour force and 8.2 percent of said students were unemployed. The product of these numbers equals the stock of unemployed full-time students—43,000—in 1976.

Table 6: Decomposition of Unemployed Full-time Students, Aged 15 to 24, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Youth Population (000s)	4,550	4,743	3,989	3,898	3,943	4,068	4,403	4,491	4,386	4,353
Enrolment Rate (%)	40.6	39.4	47.4	55.8	58.1	56.1	56.5	58.5	58.2	58.6
Participation Rate (%)	28.3	35.3	45.4	39.2	38.2	42.4	46.8	42.4	42.7	42.8
Unemployment Rate (%)	8.2	10.3	8.9	11.7	16.2	12.7	11.4	15.1	13.1	11.9
Unemployed (000s)	43	68	76	100	142	123	133	168	143	130

Source: CANSIM Tables 282-0002, 282-0095.

Several stylized facts are clear. Over the 1976-2017 period, the working age population of youth declined from 4.55 million to 4.35 million. Being a multiplicative identity, the decline in the working age population contributed negatively to the rising pool of full-time student unemployment. Over the same period, enrolment rates rose from 40.6 percent to 58.6 percent. Despite having risen by 18.0 percentage points, the lion's share of the gains in enrolment rates occurred prior to 1995 (by 1995, the enrolment had reached 55.8 percent). This makes the enrolment rate an unlikely candidate in explaining the rapid rise in significance of full-time student unemployment on the unemployment rate during the 1995-1997 period. Similarly, full-time student labour force participation rates dramatically increased between 1976 and 2017. However, the majority of the gains were realized prior to 1995; in fact, participation rates reached 45.4 percent in 1989, higher than the enrolment rate of 42.8 percent in 2017. Despite their limited ability in explaining the full-time student unemployment phenomenon which occurred between 1995 and 1997, both enrolment and participation rates are variables contributing to the long-term trend. It

appears as though the most likely explanation for the phenomenon is the evolution of the full-time student unemployment rate, which rose from 8.2 percent in 1976 to 11.9 percent in 2017. Moreover, between 1995 and 1997, the unemployment rate ascended from 11.7 percent to 16.2 percent, a 4.5 percentage point gain over just two years. Note that the unemployment rate for non-full-time students and adults (>24) had declined during 1995-1997 (**Table 20** in Appendix B).

Quantifying the impact of each variable

One method of quantifying the significance of each of the four variables under consideration has been counterfactuals. For example, what would unemployment have been in 2016 had all variables except the unemployment rate remained constant at 1976 levels? Counterfactuals were produced for each of the four variables and can be found in **Table 7**. Each row provides data on what unemployment would have been had all other variables except for the variable of interest been held constant.

Table 7: Counterfactuals, Aged 15 to 24, Selected Years

Year	Δ*	1976	1981	1995	1997	2000	2008	2012	2016	2017	Δ
Youth Population (000s)	-164	43	45	37	37	38	41	42	41	41	-2
Enrolment Rate (%)	17.6	43	41	59	61	59	59	62	61	62	19
Participation Rate (%)	14.3	43	53	59	58	64	70	64	64	65	22
Unemployment Rate (%)	5.0	43	54	61	85	67	60	79	69	62	19
Actual Unemployment (000s)		43	68	100	142	123	133	168	143	130	87

Note: Δ is the counterfactual change in unemployment between 1976 and 2016. Δ* denotes the actual change in variable of interest. The change in the youth population is in thousands. The change in the enrolment, participation, and unemployment rate is in percentage points. Source: CANSIM Tables 282-0002, 282-0095.

By holding all variables constant except the working age population, the total change in unemployed full-time students would have been a net decline of two thousand individuals between 1976 and 2017. Similarly, by holding all variables constant except the full-time student unemployment rate, there would have been a net increase of 22 thousand unemployed full-time students between 1976 and 2017. Note that the difference in unemployed between 1995 and 1997 is largest when holding all variables except the full-time student unemployment rate constant, suggesting that the 4.5 percentage point increase in the unemployment rate during the 1995-1997 period was a primary driving factor of the increased impact of unemployed full-time students on the total unemployment rate.

IV. By gender and province

Gender

This section of the paper explores the question of whether gender is a factor in the contribution of full-time students to the Canadian unemployment rate. In doing so, the component variables of the unemployment decomposition (the youth working age population, enrolment rate, participation rate, and unemployment rate) are analyzed for both male and female full-time students. **Table 8** illustrates the evolution of both the female and male working age population over the 1976-2017 period. Unsurprisingly, both series are roughly equal throughout across time; however, it should be noted that the male working age population aged 15 to 24 has, on average, been larger by about 78 thousand over the sample period. Also note that working age population for females has decreased by more than that for males over the period. There has been a 59 thousand reduction in the male working age population; we have 139 thousand decrease for females.

Table 8: Female and Male Working Age Population, By Sex, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017	Δ (76`- 17`)
Males											
15 to 19 year olds	1,189	1,179	966	995	1,017	1,051	1,117	1,106	1,028	1,018	-171
20 to 24 year olds	1,104	1,216	1,061	993	995	1,030	1,121	1,181	1,220	1,216	112
15 to 24 year olds	2,293	2,396	2,028	1,988	2,012	2,081	2,238	2,286	2,249	2,234	-59
Females											
15 to 19 year olds	1,153	1,137	923	943	965	996	1,075	1,049	972	963	-190
20 to 24 year olds	1,105	1,211	1,039	968	966	991	1,090	1,156	1,166	1,156	51
15 to 24 year olds	2,258	2,348	1,962	1,911	1,931	1,987	2,165	2,205	2,138	2,119	-139

Source: CANSIM Tables 282-0002, 282-0095.

Unlike the demographic trends that have taken place over the period in question, educational enrolment has evolved considerably. The most notable is the enrolment for post-secondary education for female. In 1976, just 129 thousand females aged 20 to 24 enrolled as a full-time student. Over the past four decades, that number has risen to 491 thousand (**Table 9**). Similarly, the enrolment rate for the same group rose from 11.7 percent in 1976 to 42.5 percent in 2017.

Table 9: Full-time Student Enrolment Rates (%) and Enrolment, By Sex, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Female										
15 to 19 year olds	741	753	715	768	808	809	873	869	828	818
20 to 24 year olds	129	145	214	301	341	346	416	469	487	491
15 to 24 year olds	870	898	929	1,069	1,149	1,155	1,289	1,339	1,314	1,309
Females										
15 to 19 year olds	64.3	66.3	77.5	81.5	83.7	81.2	71.1	82.9	85.1	84.9
20 to 24 year olds	11.7	12.0	20.6	31.1	35.3	35.0	38.2	40.6	41.7	42.5

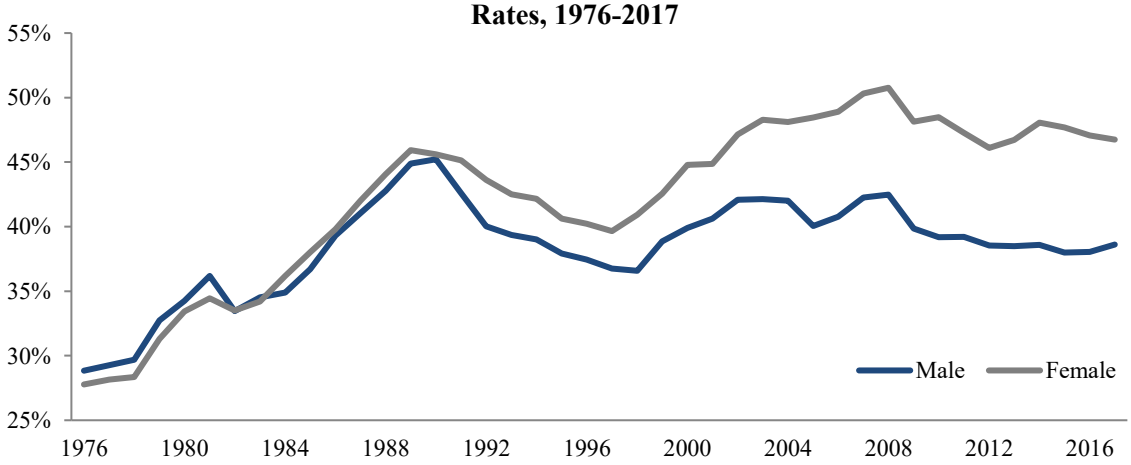
15 to 24 year olds	38.5	38.3	47.4	56.0	59.5	58.1	59.5	60.7	61.5	61.8
Full-time student enrolment, thousands										
Males										
15 to 19 year olds	786	777	725	795	819	814	856	869	821	821
20 to 24 year olds	191	193	239	310	325	315	341	418	419	419
15 to 24 year olds	977	970	963	1,105	1,144	1,128	1,197	1,288	1,240	1,240
Male										
15 to 19 year olds	66.1	65.9	75.0	79.9	80.5	77.4	76.6	78.6	79.8	80.7
20 to 24 year olds	17.3	15.9	22.5	31.2	32.6	30.5	30.4	35.4	34.3	34.5
15 to 24 year olds	42.6	40.5	47.5	55.6	56.8	54.2	53.5	56.3	55.1	53.2

Source: CANSIM Tables 282-0002, 282-0095.

Conversely, male enrolment for those aged 20 to 24 have risen from 191 thousand (17.3 percent) to 419 thousand (34.5 percent) over the same period. Although less pronounced, a similar narrative is true for teenage youth. Enrolment rates for females aged 15 to 19 have risen from 64.3 percent to 84.9 percent, a gain of 20.6 percentage points; alternatively, male enrolment rates have risen from 66.1 percent to 80.7 percent for a total gain of 14.6 percentage points. The acceleration of female educational enrolment has resulted in a larger number of female youth pursuing full-time studies relative to male youth pursuing full-time studies, despite the fact that the population of male youth has on average been slightly larger than the population of female youth.

The evolution of labour force participation has mirrored that of educational enrolment. Whereas female participation began 1976 at a lower rate than male participation, female youth labour force participation has since surpassed male youth labour force participation (**Chart 7**).**Table 10** provides the full-time student labour force participation rates for both males and females aged 15 to 24.

Chart 7: Full-time Student Female and Male Labour Force Participation Rates, 1976-2017



Source: CANSIM Table 282-0002, 282-0095

Table 10: Full-time Student Labour Force, By Sex, 15 to 24 Year Olds, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Male (15 to 19)	230	289	335	291	283	314	348	306	287	292
Male (20 to 24)	52	62	98	128	137	163	160	190	185	187
Male (15 to 24)	282	351	433	419	420	450	509	496	472	479
Female (15 to 19)	204	262	331	297	298	343	427	367	350	347
Female (20 to 24)	38	47	96	137	157	174	228	250	269	265
Female (15 to 24)	242	310	427	434	456	517	654	617	619	612
Total	524	660	859	853	876	968	1,163	1,113	1,090	1,091
Full-time student labour force participation rate (%), 15 to 24 years old										
Male (15 to 19)	29.3	37.2	46.2	36.6	34.6	38.6	40.7	35.2	35.0	35.5
Male (20 to 24)	27.0	32.1	41.0	41.4	42.2	43.2	47.0	45.5	44.1	44.6
Male (15 to 24)	28.8	36.2	44.9	37.9	36.8	39.9	42.5	38.5	38.0	38.6
Female (15 to 19)	27.5	34.8	46.3	38.7	36.9	42.5	48.9	42.3	42.3	42.4
Female (20 to 24)	29.4	32.4	44.6	45.5	46.1	50.2	54.7	53.2	55.2	54.0
Female (15 to 24)	27.8	34.5	45.9	40.6	39.7	44.8	50.8	46.1	47.1	46.7
Total	28.3	35.3	45.4	39.2	38.2	42.4	46.8	42.4	42.7	42.8
Proportion of full-time student labour force represented by each sex (%)										
Male	53.8	53.2	50.4	49.1	47.9	46.5	43.8	44.6	43.3	43.9
Female	46.2	46.8	49.6	50.9	52.1	53.5	46.2	55.4	56.7	56.1

Source: CANSIM Table 282-0095.

The expansion of female enrolment and participation rates has had the effect of producing a full-time student labour force of which 56.1 percent is represented by female students. For those aged 20 to 24, 58.6 percent of the labour force is female.

Differences also exist between female and male full-time student unemployment rates. In 1976, both female and male full-time students experienced an unemployment rate that was approximately equal. Since 1976, teenage males classified as full-time students have maintained a significantly higher unemployment rate. In 2017, the unemployment rate for male full-time students aged 15 to 19 was 4.9 percentage points higher than that of female full-time students of the same age. For example, in 2012, the difference was 5.9 percentage points. On average, unemployment rates for male teens enrolled in full-time studies are 3.3 percentage points higher than their female equivalents. Unemployment rates for university aged male students are also higher—by an average of 2.7 percentage points (**Table 11**).

Table 11: Full-time Student Unemployment Rates (%), By Sex, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017

Males										
15 to 19 year olds	9.0	12.0	12.0	15.9	21.1	16.4	15.8	23.0	19.4	17.7
20 to 24 year olds	4.8	7.6	5.8	7.9	11.9	8.4	7.4	9.7	8.8	10.0
15 to 24 year olds	8.2	11.2	10.6	13.4	18.1	14.0	13.2	17.9	15.3	14.7
Females										
15 to 19 year olds	8.7	9.8	8.2	12.3	17.7	14.5	13.0	17.1	15.2	12.8
20 to 24 year olds	4.5	5.9	3.4	4.9	8.1	5.8	4.6	6.8	6.6	5.8
15 to 24 year olds	8.1	9.2	7.1	10.0	14.4	11.6	10.1	12.9	11.4	9.7
*Difference***										
15 to 19 year olds	0.3	2.2	3.8	3.6	3.4	1.9	2.8	5.9	4.3	4.9
20 to 24 year olds	0.3	2.7	2.4	3.0	3.8	2.6	2.8	2.9	2.2	4.2
15 to 24 year olds	0.1	3.0	3.5	3.4	3.6	2.4	3.1	5.0	3.9	5.0

Source: CANSIM Tables 282-0002, 282-0095.
**Equal to the difference between the respective female and male unemployment rates.

Although we observe lower unemployment rates for females, the growing female labour force has resulted in the pool of unemployed full-time students becoming more equally composed of females and males. From 1976 to 1996, females made up 43.7 percent of the unemployed full-time students on average, while they made up 47.8 percent between 1997 and 2017 (**Table 12**).

Table 12: Full-time Student Unemployment, By Sex, 15 to 24 Year Olds, Thousands, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Male (15 to 19)	21	35	40	46	60	52	55	70	56	52
Male (20 to 24)	0	5	6	10	16	11	12	18	16	19
Male (15 to 24)	23	39	46	56	76	63	67	89	72	70
Female (15 to 19)	18	26	27	37	53	50	55	63	53	44
Female (20 to 24)	2	3	3	7	13	10	11	17	18	15
Female (15 to 24)	20	29	30	43	66	60	66	80	71	60
Total	43	68	76	100	142	123	133	168	143	130
Proportion of full-time student unemployment represented by each sex (%)										
Male	54.3	57.9	60.3	56.5	53.8	51.3	50.5	52.6	50.5	54.2
Female	45.7	42.1	39.7	43.5	46.2	48.7	49.5	47.4	49.5	45.8

Source: CANSIM Tables 282-0002, 282-0095.

In decomposing the impact of unemployed full-time students on the total unemployment rate by sex, the analysis suggests that males have historically contributed more to the impact of unemployed students on the unemployment rate than did females (**Table 13**). Over the 1976-2016 period, the share of the impact explained by male, full-time student unemployment has varied substantially. In 1982, males accounted for 127 percent of the impact, contributing 0.06 percentage points to a total impact of 0.05 points (female full-time students contributed negatively to the total unemployment rate in 1982, resulting in a lower total unemployment rate by 0.01 percentage points). In 2017, males

accounted for 75 percent of the impact, contributing 0.21 percentage points out of a total impact of 0.33 percentage points.

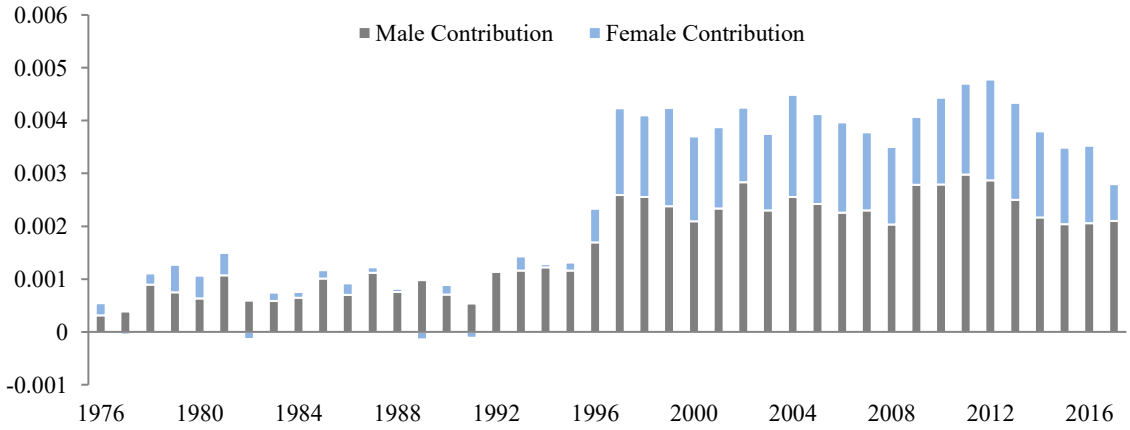
Table 13: Contribution to the Total Impact of Full-time Student Unemployment on the Unemployment Rate, By Sex, 15 to 24 Year Olds, Percentage Points, Selected Years

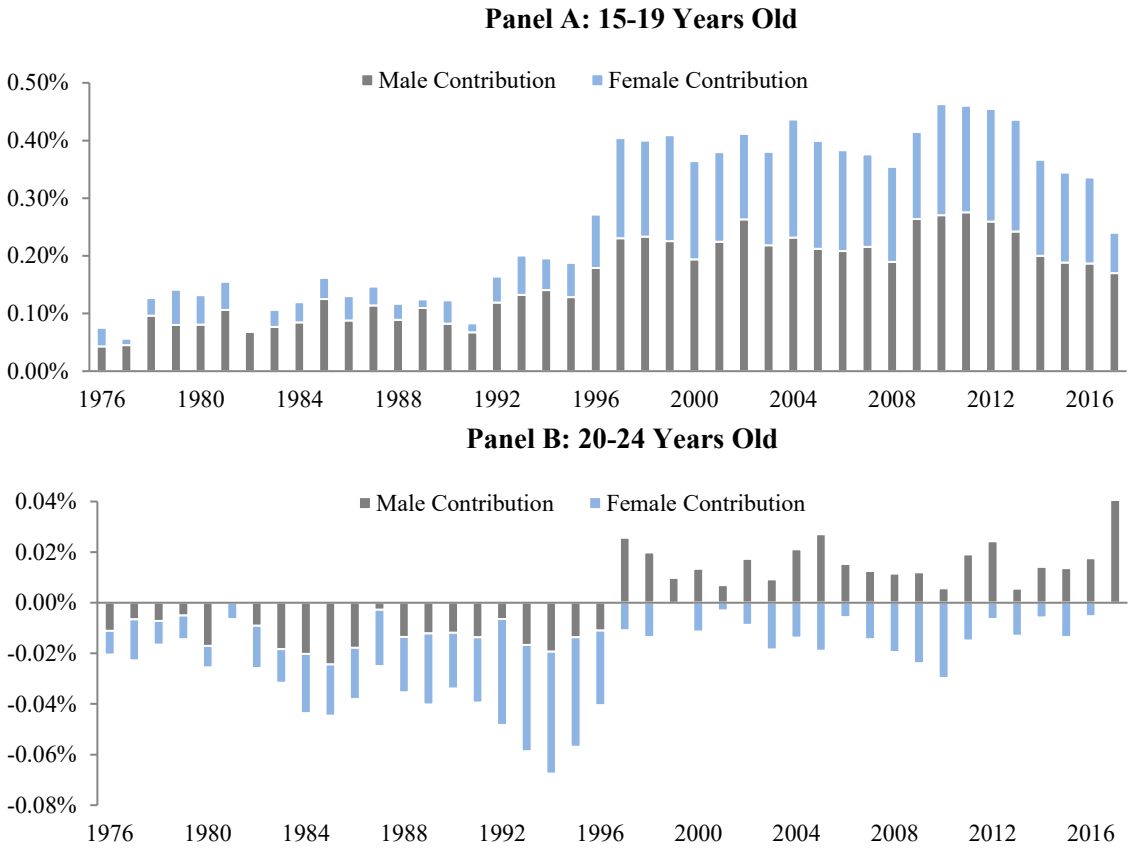
Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Male (15 to 19)	0.04	0.11	0.11	0.13	0.23	0.19	0.19	0.26	0.19	0.17
Male (20 to 24)	-0.01	0.00	-0.01	-0.01	0.03	0.01	0.01	0.02	0.02	0.04
Male (15 to 24)	0.03	0.11	0.10	0.12	0.26	0.21	0.20	0.29	0.21	0.21
Female (15 to 19)	0.03	0.05	0.01	0.06	0.17	0.17	0.16	0.20	0.15	0.07
Female (20 to 24)	-0.01	-0.01	-0.03	-0.04	-0.01	-0.01	-0.02	-0.01	-0.01	0.00
Female (15 to 24)	0.02	0.04	-0.01	0.02	0.16	0.16	0.15	0.19	0.15	0.07
Total	0.06	0.15	0.09	0.14	0.44	0.38	0.36	0.49	0.36	0.29
Proportion of full-time student unemployment impact represented by each sex (%)										
Male	56.4	70.5	112.0	85.1	59.2	54.8	56.0	58.2	56.7	75.0
Female	43.6	29.5	-12.0	14.9	40.8	45.2	44.0	41.8	43.3	25.0

Source: CANSIM Tables 282-0002, 282-0095.

Of note is the substantial increase in the share of female unemployment in the total impact during the 1995-1997 period. Between 1995 and 2017, the average impact of female, full-time student unemployment on the total unemployment rate (0.153 percentage points) is 11-fold higher than the impact prior for the 1976-1994 period (0.014 percentage points) (**Chart 8**). The impact of male, full-time student unemployment also increased from 1995 to 1997 to a similar extent, roughly doubling from 0.12 percentage points to 0.26 percentage points. However, the increase in the share of male unemployment in the total impact is smaller relative to the extent observed in female unemployment.

Chart 8: Impact of Female and Male Full-time Student Unemployment on the Unemployment Rate, 1976-2017





Source: CANSIM Table 282-0002, 282-0095

Panel B and **Panel C** illustrate the impact of female and male full-time student unemployment on the unemployment rate for 15 to 19 and 20 to 24, respectively. **Panel B** demonstrates that full-time students between the ages of 15 and 19 account for nearly all of the impact of unemployed to the total unemployment rate. Moreover, the impact is always positive for both sexes. However, the impact of female teenagers is substantially smaller prior to 1997. From 1995 to 1997, the share of female in the total impact of 15 to 19 years old students increased significantly. Over the sample period, the female contribution has grown from an average of 0.03 percentage points over 1976 to 1981 to 0.14 percentage points on average for 2013 to 2017. The male contribution has also expanded considerably, though not to the same extent as the female contribution.

The impact of unemployed full-time students between the ages of 20 and 24 is much less significant. **Panel C** illustrates that prior to 1997, both male and female 20 to 24 year olds contributed negatively to the impact of unemployed full-time students on the total unemployment rate. Although this has since reversed in the case of males, it continues to hold for unemployed female students. Note that the period leading up to 1997 was characterized by a downward trend in the contribution of unemployed females aged 20 to 24. From 1987 to 1994, the contribution declined from -0.02 percentage points to -0.05

percentage points. This trend was broken in 1995 and the contribution of females rose from -0.05 percentage points in 1995 to -0.01 percentage points in 1997. This result is partly responsible for the large increase in the impact of unemployed full-time students on the total unemployment rate.

Several stylized facts can be derived from the analysis. First, the overall impact of unemployed full-time students on the total unemployment rate has grown over time for both males and females. That said, the female contribution has experienced greater growth in relative terms than the male contribution. Second, males account for a greater share of the total impact than females. This has been true over the entirety of the 1976-2017 period. Third, the lion's share of the impact for both males and females is a result of unemployed full-time students between the ages of 15 and 19. Indeed, the female contribution for those students aged between 20 and 24 is consistently negative due to their below-average unemployment rates. Although the male contribution for full-time students aged 20 to 24 is positive, it is small in magnitude. Finally, the substantial increase in the impact of unemployed students on the total unemployment rate between 1995 and 1997 can be primarily attributed to the sudden transition of female, full-time student labour market outcomes contributing very little (or negatively) to the total unemployment rate towards a state of contributing roughly 40 percent of the overall impact.

Provinces

This section of the paper explores whether the impact of unemployed full-time students on the total unemployment rate is consistent throughout all provinces. A similar methodology is applied in the provincial analysis as is done at the national level. A recalculated unemployment rate is produced for each province by first removing unemployed full-time students from the number of unemployed and then adjusting the labour force to account for the loss of full-time students. The modified unemployment rate is then subtracted from the provincial unemployment rate to arrive at the impact of unemployed full-time students on the provincial unemployment rate. This section also decomposes the national impact into provincial contributions.

Table 14 provides data on the impact of unemployed full-time students on provincial unemployment rates. It should be noted that the impact varies quite considerably across provinces; moreover, the phenomena tends to be more significant in central Canada. In 2016, the impact of excluding unemployed full-time students from the labour force would have lowered Newfoundland's unemployed by 0.02 percentage points and lowered P.E.I.'s unemployment rate by 0.03 percentage points—hardly significant results. However, the impact's significance is clearly evident in provinces such as Ontario

and Manitoba. The adjusted unemployment rate in 2016 was 0.48 and 0.47 percentage points lower than the provincial unemployment rate in Ontario and Manitoba, respectively.

Table 14: Impact of Unemployed Full-time Students on Provincial Unemployment Rate, Percentage Points, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Newfoundland	-0.10	0.01	-0.12	-0.25	-0.09	-0.04	0.12	0.16	-0.02	0.07
PEI	-0.37	-0.41	-0.37	-0.39	-0.23	0.25	0.20	0.30	0.03	0.10
Nova Scotia	0.11	0.00	0.03	-0.01	0.45	0.53	0.45	0.45	0.38	0.55
New Brunswick	-0.19	-0.10	-0.06	0.04	0.27	0.20	0.36	0.44	0.14	0.23
Quebec	-0.02	0.01	-0.01	0.01	0.31	0.18	0.21	0.44	0.31	0.27
Ontario	0.14	0.33	0.21	0.25	0.59	0.50	0.49	0.63	0.48	0.40
Manitoba	0.13	0.25	0.22	0.27	0.44	0.43	0.51	0.53	0.47	0.45
Saskatchewan	0.01	0.18	0.12	0.16	0.25	0.27	0.38	0.38	0.38	0.33
Alberta	0.21	0.12	0.11	0.20	0.46	0.45	0.25	0.35	0.28	0.32
BC	0.11	0.21	0.13	0.10	0.44	0.46	0.29	0.34	0.27	0.22
Canada	0.06	0.15	0.09	0.14	0.44	0.38	0.36	0.49	0.36	0.33

Source: CANSIM Tables 282-0002, 282-0095.

These results are consistent with the data provides in **Table 15**. Provinces with a relatively higher share of unemployment represented by full-time student unemployment are also those which have the largest impact on provincial unemployment rates. For example, just 5.4 percent of Newfoundland's unemployed are full-time students. On the other hand, over 11 percent of the unemployed in both Manitoba and Ontario are full-time students.

Table 15: Share of Provincial Unemployment Represented by Full-time Students (%), Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Newfoundland	0.8	1.7	2.6	2.1	3.1	4.1	5.6	5.9	4.7	5.4
PEI	2.3	1.7	3.4	3.0	3.8	8.1	8.4	8.7	5.7	6.3
Nova Scotia	6.0	5.8	6.7	5.8	9.3	12.0	11.8	10.5	9.4	12.0
New Brunswick	2.5	3.9	4.4	4.8	6.5	7.1	10.1	8.7	6.2	7.1
Quebec	3.0	3.9	4.8	5.6	7.8	7.6	9.4	12.1	10.6	10.7
Ontario	8.0	11.2	11.2	9.2	13.1	15.0	13.7	13.8	12.7	11.9
Manitoba	8.0	10.1	8.9	9.7	12.6	14.0	18.4	15.4	12.6	13.6
Saskatchewan	5.8	9.8	6.9	7.9	9.9	11.0	15.1	12.8	10.4	9.7
Alberta	11.7	8.1	7.1	7.9	13.0	14.4	12.1	12.0	7.8	8.4
BC	6.4	8.4	6.9	6.1	10.0	11.3	11.8	9.6	9.5	9.2
Canada	5.7	7.3	7.2	7.2	10.3	11.4	11.9	12.3	10.5	10.4

Source: CANSIM Tables 282-0002, 282-0095.

At a national level, the 0.33 impact of full-time student unemployment on the total unemployment rate can be decomposed into provincial contributions. It should be noted

that the contributions are a function of both the difference between the provincial and national unemployment rates, as well as the size of the province's labour market. In 2016, Ontario contributed 0.14 percentage points to the total impact, accounting for roughly 42% of the 0.33 percentage point total impact (**Table 14**). Despite Manitoba's significant provincial impact of 0.45 percentage points, it accounts for just 0.01 percentage points of the 0.33 percentage point total impact. Following Ontario, the second largest contribution is attributed to Quebec, whose relatively modest provincial impact coupled with a large labour market contributes 0.06 percentage points to the national impact.

Table 16: Impact of unemployed full-time students on national unemployment rate, Percentage Points, Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Newfoundland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
PEI	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Nova Scotia	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.02
New Brunswick	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.01
Quebec	0.01	0.03	0.02	0.03	0.10	0.07	0.07	0.11	0.07	0.06
Ontario	0.03	0.09	0.00	0.07	0.20	0.16	0.20	0.25	0.17	0.14
Manitoba	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
Saskatchewan	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Alberta	0.00	-0.01	0.01	0.01	0.03	0.04	0.01	0.03	0.04	0.05
BC	0.02	0.02	0.03	0.01	0.06	0.06	0.03	0.04	0.03	0.02
Canada	0.05	0.14	0.08	0.13	0.41	0.35	0.33	0.46	0.34	0.30

Source: CANSIM Tables 282-0002, 282-0095

V. Disaggregating full-time students and others

Our analysis by age group, gender, and province have implications for the trends *within* full-time students. However, focusing on within-group dynamics has little to say about how the contribution from the group has risen so much over time. Moreover, it is shown that there is a break in the mid 1990s when the role of full-time students in explaining the aggregate unemployment rate had suddenly become significant. Hence, we assess the labour market outcomes *across* different groups in the labour force based on the following two sub-periods: 1976-1996 and 1996-2016.[5]

In carrying out such analysis, it is useful to modify the discrete-time decomposition presented in equations (1) and (2) into a dynamic identity which accounts for the evolution of each variable in an additive expression. This way, the comparison between different groups becomes more straightforward. We can rewrite equation (2) in terms of an annual growth rate for each variable over the sample period.

$$g_1 = g_2 + g_3 + g_4 + g_5 \qquad (3)$$

[5]Equivalent statistics for the entire sample period (1976-2016) are given in Table A2 in Appendix B.

The derivation of (3) is given in **Appendix A**. In words, the annual growth rate of unemployed full-time students over the period 1976-2017 can be decomposed into the sum of the annual growth rates of LFPR, unemployment rate, enrolment rate, and youth population over the same period.

Table 17 reports annual growth rates of each variable for two 20-year sub-periods.[6] In general, we observe a clear difference in the trends for full-time students between the two sub-periods. Prior to 1996, there had been a more rapid growth in the full-time student labour force. From 1976 to 1996, the annual growth rate had been 2.46 percent, which is higher than 1.16 percent growth rate observed over the period 1996-2017. More importantly, the unemployment rate had grown at 2.54 percent annually during 1976-1996. However, it had *fallen* at 0.60 percent annually during 1996-2017.As a result, the stock of unemployed full-time students grew at 4.99 percent annually during the first half but grew more slowly at 0.56 percent annually during the second half. Thus, the 87 thousand increase in the unemployed full-time students was mostly driven by the development occurring during the first half of the past 4 decades. Specifically, the increase was driven by two factors: 1. a significant annual rate of expansion in their labour force as a result of high growth rates observed in the participation rate; 2. a high growth of the share of unemployed participants in their labour force. It should be pointed out that the full-time student participation rate has increased at a particularly faster rate than the other two groups. This alone can explain roughly 38.1 percent of the annual growth in the number of unemployed full-time students.

Table 17: Annual Growth Rates (%) for Different Demographic Groups over 1976-1996 and 1996-2016

	1976-1996				
	Population (1)	LFPR (2)	Labour Force (4)	Unemployment rate (5)	Unemployment (6)
Total	1.49	0.25	1.74	1.53	3.26
FT Students	0.89	1.57	2.46	2.54	4.99
Non-full-time students	-2.29	0.27	-2.02	1.04	-0.98
Adults (>24)	2.10	0.35	2.45	2.57	5.02
	1996-2017				
	Population (1)	LFPR (2)	Labour Force (3)	Unemployment rate (4)	Unemployment (5)
Total	1.27	0.08	1.35	-1.99	-0.64
FT Students	0.69	0.47	1.16	-0.60	0.56
Non-full-time students	0.25	0.09	0.34	-1.92	-1.58
Adults (>24)	1.41	0.07	1.48	-2.05	-0.57

Note: column (3) = column (1) + column (2); column (5) = column (3) + column (4) Source: CANSIM Tables 282-0002, 282-0095.

[6]In Table 17, we use a general version of the dynamic decomposition such that the annual growth rate of the unemployed workers is decomposed into the sum of the annual growth rates of LFPR, unemployment rate, and working age population. Equation (3) is valid only for full-time students as it decomposes the annual growth rate of the working age population into that of youth population and the enrolment rate.

Then, how can a more recent event of an increasingly large contribution from full-time students to the total unemployment rate be explained? Note that the contribution had increased by 0.19 percentage points during 1995-2017. This is in sharp contrast to 0.08 percentage point increase occurred during the first 20 years (**Table 5**). In other words, 70 percent of the increase in the contribution occurred after the mid 1990s. To answer this question, we must analyze the dynamics of the variables relative to other groups in the labour force. First, the extent of the growth in the stock of unemployed full-time students occurred during the first half is shared by the adult group. The adult group experienced 5.02 percent annual growth; this is essentially the same as 4.99 percent observed among full-time students. However, we see a divergence between the two groups during 1996-2017.While the number of unemployed full-time students grew at 0.56 percent annually, the number of unemployed adults *fell* at 0.57 percent annually.

What can explain the divergence? The labour force expanded roughly at the same rate annually for both full-time students and adults. However, we see a quite large difference in the unemployment rate between the two groups. Full-time students experienced a much slower decline in their unemployment rate. Specifically, the unemployment rate for full-time students fell at a much slower rate (-0.60 percent) annually than that for adults did (-2.05 percent)[7]. Such divergence observed during the second half seems to explain why the contribution from the unemployed full-time students increased substantially only after the mid 1990s.

In sum, the unemployed full-time students grew at a much faster rate before the mid 1990s. This can explain most of the 87 thousand increase (from 43 thousand to 130 thousand) in the unemployed full-time students during 1976-2017. Note that the number of unemployed full-time students already reached 116 thousand by 1996. However, such extent of growth was shared by the adult group, who formed a majority of the total labour force. Hence, their contribution to the total unemployment rate was not significant for the first half of the past 4 decades. However, after the mid 1990s, the growth rate in the number of unemployed full-time students outpaced those of the other groups. Full-time students did not participate in a secular decrease in the unemployment rate to the extent experienced by the majority in the Canadian labour force from the mid 1990s. This led full-time students to become an increasingly important factor in driving not only the youth unemployment but also the total unemployment rate in Canada.

VI. Implications

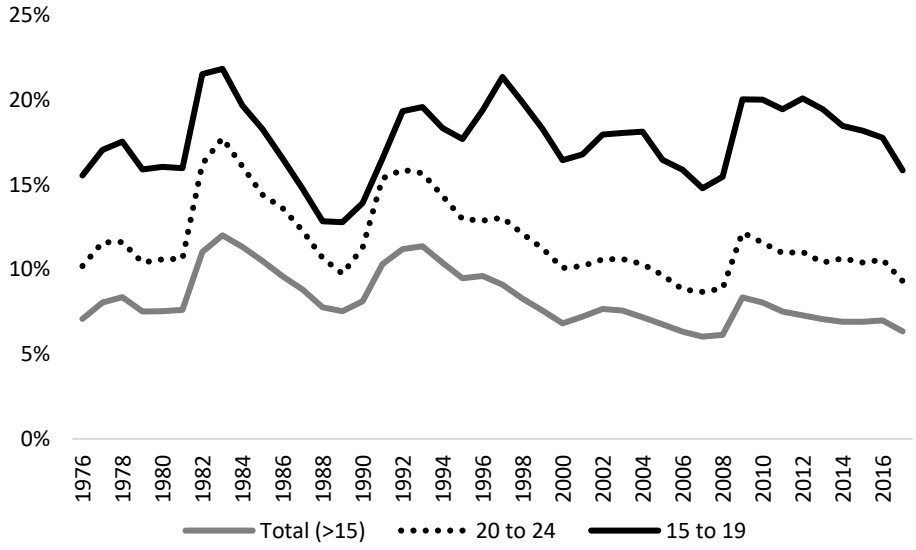
Are teenagers important when assessing the aggregate labour market outcomes?

Our analysis focused on a subset of the youth labour force: full-time students. Our results revealed that the lion's share in the contribution to the total unemployment can be

[7]During this period, the unemployment rate of full-time students had a small decline from 13.5 percent to 11.9 percent while that of adults fell from 8.5 percent to 5.5 percent.

attributed to teenagers (15-19 years old) attending school. The trend we observe for them is also found if we consider the total youth labour force (including both non-full-time students and students). **Chart 14** plots the unemployment rate for selected demographic groups.[8] The unemployment rate for teenagers often remained above 15 percent for the past 4 decades. More recently, the rate declined below 20 percent but this is still much higher than the aggregate unemployment rate (6.3 percent as of 2017). Poor labour market outcome of teenagers was not shared by young adults (20-24 years old).The unemployment rate of young adults remained below 15 percent most of the period during 1976-2016 although we saw the rate rising to as high as 17.8 percent in 1983 or 15.9 percent in 1992. More recently, the rate declined to the level closer to the total unemployment rate reaching 10.5 percent.

Chart 14: Unemployment Rate (1976-2017)



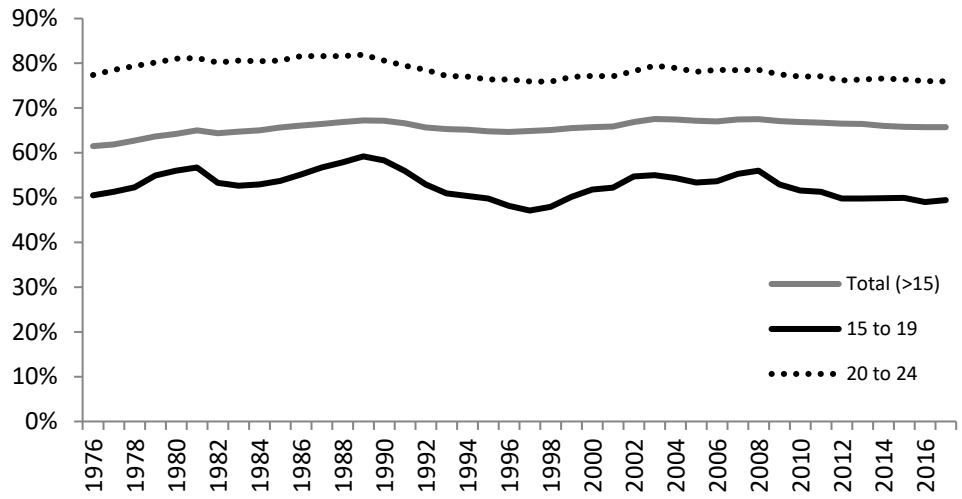
Source: CANSIM Tables 282-0002, 282-0095.

The labour market attachment of teenagers has been particularly weak. The labour force participation rate for teenagers has been quite stable hovering around 50 to 60 percent during 1976-2017 (**Chart 15**). This is much lower than the participation rate of young adults. Given that teenagers faced a persistently high unemployment rate (higher

[8]Each group includes both full-time students and non-full-time students.

than other demographic groups), it is questionable whether the group with such a weak labour market attachment should be given an equal weight in the labour market statistics.

Chart 15: Labour Force Participation Rate (1976-2017)



Source: CANSIM Tables 282-0002, 282-0095.

Consequences of poor labour market outcomes for teenagers may not be as serious as those for young adults (or those over 25 years old). A primary difference between teenagers and young adults is that teenagers are not in the transition to full-time career and less likely to form independent households. Moreover, most teenagers have always lived with their parents. According to Statistics Canada, 88 percent of them lived at home in 1981 and the share rose to 93 percent in 2011. Living with their parents provides them with a significant safety net. Thus, unemployment for them involves quite different psychological and economic costs.

Treating the unemployment of teenagers equally as other segments may be distorting when one assesses the overall unemployment in Canada. If the purpose of the unemployment rate is to measure economic hardship, then the current official unemployment rate seems too inclusive. It may be appropriate to focus more on those who form independent households or who are making transition to or already involved in a long-term career. The rationale would be that economic consequences of unemployment may be more serious if a person has young children or becomes unsuccessful in their long-term career.

In response to concerns that the official rate is too inclusive, Statistics Canada regularly publishes a series of eight supplementary measures. Broadly speaking, those measures take into account different hardship in relation to the duration of unemployment;

under-employment; those who waiting to start; and discouraged searchers. However, there is no supplementary rate that takes into account different economic hardship and weaker labour market attachment for teenagers despite the fact that their contribution to the total unemployment measure is not negligible at all.[9]

Including only those above 20 years old could be a good supplementary measure of unemployment. The group seem to make a representation of more coherent economic hardship regarding the labour market outcome. **Table 19** presents the supplementary unemployment rates (excluding 15-19) for selected years over 1976-2017. We can see that the rate tends to be lower than the official rate with the average difference being 0.73 percentage point. Note that the measure we suggest is to supplement the official measure of unemployment rate to help one assess the overall labour market.

Table 19: Alternative Unemployment Rate (excluding 15-19), percent, selected year.

	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
20 and over	6.0	6.6	7.1	8.9	8.3	6.1	5.5	6.5	6.4	5.8
15 and over	7.1	7.6	7.6	9.5	9.1	6.8	6.1	7.3	7.0	6.3
Difference	1.1	1.0	0.5	0.6	0.8	0.7	0.7	0.8	0.6	0.5

Source: CANSIM Tables 282-0002, 282-0095, 282-0086.

The issue of youth unemployment in Canada

In order to understand the increasing youth unemployment rate, it is important to study the effects of changing composition of the youth labour force. This way we can identify the subgroup that can explain most of the change in the youth unemployment rate. In the above, we show that teenagers are largely responsible for the high unemployment rate. Hence, an implication that naturally arises is that excluding teenagers would lead to lower youth unemployment rate. In this subsection, we focus on a different dimension: full-time students and non-full-time students. There has been a strong divergence between the two groups in the labour market and such divergence has an important policy implication for the youth unemployment.

The aggregate youth unemployment rate is simply a weighted average of the unemployment rates of full-time student and non-full-time student group. The aggregate rate would increase if the expanding segment has higher unemployment rates. The share of non-full-time students in the total youth labour force fell from 77.1 percent in 1976 to 55.8 percent in 2017. Moreover, the stock of unemployed non-full-time students decreased over the sample period. With the slightly falling non-full-time student labour force over the period, this has resulted in roughly the similar unemployment rates between 1976 and

[9]Cansim Table 282-0086 reports the 8 supplementary unemployment rates by sex and age group.

2017.[10] As a result, their share in the total unemployment decreased. Non-full-time students accounted for 41.0 percent of the total unemployment in 1976 but the share fell dramatically to 13.8 percent in 2017. Thus, the increase in the youth unemployment rate was mainly driven by the increase in the proportion of full-time students, who had increasingly higher unemployment rates over time. The proportion of full-time students in the total unemployment increased from 5.8 percent in 1976 to 10.4 percent in 2017.

The subgroup in the youth labour force that is likely to matter for the Canadian economy would be non-full-time students. They tend to look for full-time/permanent positions and hence provide more stable labour hours to the economy. Failing to obtain jobs for them has more serious consequences than full-time students failing to obtain part-time jobs. More income and labour hours are at stake if we have a larger number of unemployed non-full-time students. Another subset to be noted is those neither in employment nor in education or training (NEET). The most important ages are 20 to 24 year olds. At these ages, compulsory education would not affect the participation or unemployment. Also, the transition to a longer-term career is likely to occur during this stage. According to the NEET data from OECD, the proportion of 20-24 year-old NEET in the total population of the same age group has remained lower than the OECD average over time.[11] For example, the proportion of 20-24 year-old NEET was 14.9 percent in 2016. This is lower than the OECD average of 16.2 percent. More importantly, the proportion has decreased during the past 2 decades (from 17.8 percent in 1997 to 14.9 percent in 2016).[12]

Given that a recent high youth unemployment is driven mainly by full-time students and that the NEET proportion among 20-24 year-olds has declined, it can be argued that the high youth unemployment may not necessarily warrant a high priority among other economic and social issues in Canada. Any policy, if any, aiming to solve the problem should take into account the large share explained by full-time students. It should also be noted that any policy designed to improve the labour market outcomes for youths as a whole may induce reduced schooling as non-full-time students choose labour force participation over schooling.[13]

Although the *level* of the youth unemployment rate is currently much higher than the adult unemployment rate, most of the *increase* in unemployment rate occurred before 1996. However, we already saw that the majority in the labour market experienced a very

[10] See Table 20 in Appendix B.
[11] For 15-19 year-olds, the proportion has remained close to the OECD average.
[12] This is in contrast to the U.S. where the proportion has increased and remained higher than the proportion in Canada during this period.
[13] However, if the high unemployment rate for youths was due to factors specific to the cohorts forming the youth population, then it is possible that the high youth unemployment rate becomes a high unemployment rate of young adults in the future as they age. In this case, a policy may be highly warranted.

similar extent of growth in their unemployment rate during this period (**Table 17**).This implies that the labour market outcomes for youths were not particularly poor relative to other segments in the labour market. Hence, the unemployed youths during this earlier period (1976-1996) did not seem to warrant certain policies to help them.[14]

The notion of "unemployed" full-time students

There is a number of confusing cases in determining whether a particular group of young people should be included in the current labour force. One example is co-operative (co-op) students or students looking to start a co-op. Co-operative education is now an integral part of post-secondary education in Canada. In 1957, the first co-operative education program in Canada started at the University of Waterloo with an inaugural class of 75. This led to an unexpected success over time and co-op education began to expand substantially from 1970s. As a result, a significant portion of full-time students is looking to join co-operative programs to obtain co-op jobs at any given point in time. Also, a significant portion is currently working as co-op students. For example, according to Statistics Canada, more than 22 percent of all college graduates from the class of 2009-2010 completed a co-op program by 2010. However, it is clear from the LFS guide that full-time students looking for a co-op job are excluded from the current labour force.[15]

There are other complicating cases. One is full-time students looking for full-time positions with the intent of quitting school once they are employed. Another is full-time students looking to manage to do both school and full-time works. Whether these students should be considered as the current labour force is not so straightforward. Lastly, according to the labour force classification tree illustrated in the LFS guide, full-time students already working full-time are included in the labour force as employed workers although full-time students looking for full-time work are not part of the labour force.

Hence, the notion of "unemployed" for full-time students quite arbitrary in LFS. It may be useful to rely on the employment rate rather than the unemployment rate when one analyzes the labour market outcomes for full-time students.[16]

VII. Conclusion

[14]1984 was the year in which the youth unemployment rate had become a serious social problem in Canada. For example, all three major political parties during the 1984 federal election announced special programs for the youth unemployment as part of their election platforms.

[15]Is it not clear whether students currently working in co-op programs are included in the labour force by Statistics Canada.

[16]For example, Beaudry et al. (2000) rely on the employment rate of full-time students for a similar reason.

This report has analyzed unemployment outcomes for full-time students between the ages of 15 and 24. Unemployment was analyzed through four variables: the working age population, educational enrolment rates, labour force participation rates, and the full-time student unemployment rate. The analysis covered the 1976-2017 period. During this period, full-time students saw an 87 thousand increase in the number of unemployed workers. Interestingly, this increase occurred almost entirely during the first half of the sample period (1976-1996), with the number remaining somewhat stable at the 130-160 thousand level until today. The rapid growth in the number of unemployed workers was driven almost equally by a rapid growth in full-time student labour force and the unemployment rate.

In 1976, unemployed full-time students contributed just 0.06 percentage points to the total unemployment rate. However, in 2016, the same demographic contributed 0.33 percentage points to the total unemployment rate. Our results show that the lion's share of the impact can be attributed to students between the ages of 15 and 19, who account for 94 percent of the 0.33 percentage points.

In analyzing the data by gender, our results point to a growing overall impact of unemployed full-time students on the total unemployment for both males and females. That said, the female contribution has experienced greater growth in relative terms than the male contribution. Furthermore, the increase in the impact of unemployed students on the total unemployment rate between 1995 and 1997 can be attributed to the transition of female, full-time student unemployment rates contributing very little (or negatively) to the total unemployment rate in 1995 towards a state of contributing roughly 40 percent of the overall student impact in 1997.

At a provincial level, the contribution of unemployed full-time students to the total unemployment rate is largest in Ontario and Manitoba. The impact is insignificant in Eastern provinces such as Newfoundland and Prince Edward Island, where unemployed full-time students have no effect on the total unemployment rate, and modest in Western provinces such as British Columbia and Alberta. By decomposing the national impact of 0.33 percentage points into provincial components, our results suggest that approximately 0.12 percentage points of Canada's unemployment rate can be attributed to unemployed full-time students between 15 and 19 residing in Ontario.

A more fundamental factor driving the increased impact of student unemployment was the divergence that emerged after the mid 1990s of the unemployment rates of full-time students and the rest of the labour force. Despite the negative growth in the unemployment rate for all segments (including full-time students), full-time students did not experience the rate of decrease to the extent shared by other segments. This made full-time students the only group with an increasing number of unemployed during 1996-2017.

This is consistent with a permanently larger contribution from full-time students to the *total* unemployment rate after the mid 1990s.

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Appendix A: Derivation of Equation (3)

We can rewrite equation (2) in terms of an annual growth rate for each variable over the sample period. For a given variable, y at time t the following holds true.

$$y_T = y_t(1+g)^{T-t}$$

where $g$is a per-period growth rate from t to T.

Using equation (3) we can express each variable observed in 2016 in terms of its 1976 value multiplied by the corresponding constant annual growth rate over the 40-year period. Hence, equation (2) can be re-written as the following.

$$Unemployed_{1976}(1+g_1)^{40} = LFPR_{1976}(1+g_2)^{40} \times UR_{1976}(1+g_3)^{40}$$

$$\times ER_{1976}(1+g_4)^{40} \times WAP_{1976}(1+g_5)^{40}$$

Taking the natural log on both sides of the above equation, the expression becomes additive.

$$\ln(Unemployed_{1976}) + 40ln(1+g_1) = \ln(LFPR_{1976}) + 40ln(1+g_2) +$$

$$\ln(UR_{1976}) + 40ln(1+g_3) + \ln(ER_{1976}) + 40ln(1+g_4) + \ln(WAP_{1976}) + 40ln(1+g_5)$$

After cancelling out some terms on both sides the above expression is simplified as the following.

$$\ln(1+g_1) = \ln(1+g_2) + \ln(1+g_3) + \ln(1+g_4) + \ln(1+g_5)$$

Given that $g$is a small value, the following approximation is possible.

$$g_1 = g_2 + g_3 + g_4 + g_5$$

Appendix B: Additional Tables

Table 20: Labour Force Activities for Adults (>24) and Non-full-time students (15-24), Selected Years

Year	1976	1981	1989	1995	1997	2000	2008	2012	2016	2017
Working age population (thousand)										
Adult	12,507	14,071	16,909	18,761	19,303	20,021	22,421	23,792	25,200	25,549
Non-full-time student	2,703	2,875	2,097	1,724	1,651	1,785	1,918	1,864	1,833	1,803
Labour force (thousand)										
Adult	7,599	8,951	11,218	12,227	12,657	13,222	15,157	15,957	16,645	16,881
Non-full-time student	2,229	2,624	1,841	1,467	1,408	1,502	1,665	1,598	1,576	1,552
Labour force participation rate (%)										
Adult	60.8	63.6	66.3	65.2	65.6	66.0	67.6	67.1	66.1	66.1
Non-full-time student	82.5	85.9	87.8	85.1	85.3	85.4	86.9	85.8	86.0	86.1
Unemployment (thousand)										
Adult	385	511	750	1,029	978	750	768	960	994	923
Non-full-time student	305	356	227	241	223	191	193	217	200	172
Unemployment rate (%)										
Adult	5.1	5.7	6.7	8.4	7.7	5.7	5.1	6.0	6.0	5.5
Non-full-time student	13.7	14.4	12.3	16.4	15.8	12.5	11.6	14.0	12.7	11.1

Source: CANSIM Table 282-0002, 282-0095.

Table 21: Annual Growth Rates (%) for Different Demographic Groups over 1976-2016

	Unemployment Rate	Population	LFPR	Labour Force	Unemployment
Total					
FT student	0.91	0.79	1.01	1.81	2.75
Non-full-time student	-0.50	-0.98	0.10	-0.81	-1.38
Adult (>24)	0.18	1.76	0.20	1.97	2.15

Source: CANSIM Tables 282-0002, 282-0095.