Report for Nova Scotia Government & General Employees Union on the Impact of Increases in Consumer Price Index on Purchasing Power

Casey Warman

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Contents

1 Introduction

In this report, I examine the impact recent and future price increases have on the purchasing power of Nova Scotia Government & General Employees Union (NSGEU) employees. Some of the key aspects that are focused on include:

- What happened to purchasing power over the period covered by the previous agreement?
- What is the economic health of the Nova Scotia labour market in terms of key indicators?
- What might happen to prices over the period covered by the new collective agreement?
- What would happen to purchasing power if the Nova Scotia Council of Healthcare Unions is used as guidance versus the proposal submitted by the NSGEU?

Some of the key findings and takeaways from the analysis are:

1. Loss in real income during 2015-2021 agreement.
   (a) An adjustment in April 2021 of an additional 3% increase is required to adjust end of period salaries for inflation.
   (b) Even with such an adjustment, there would still be a loss in total earnings over the previous contract.
2. Nova Scotia labour market and economic indicators have returned to pre-pandemic levels.
3. Inflation is currently very high but should slowly decline.
   - Bank of Canada pledging to get inflation back to 2%.
   - External factors may make this hard to fully achieve in the short run.
4. Under the latest Nova Scotia Council Healthcare Union agreement, NSGEU employees would see a large decrease in real earnings.
5. The NSGEU proposal would do a better job mitigating the loss in purchasing power.

2 2015 to 2021 Civil Service Master Agreement

In this section, I examine what has happened to purchasing power over the course of the previous agreement, which covered April 1^{st}, 2015 to March 31^{st}, 2021. The analysis of prices uses the *All items* Consumer Price Index (CPI) for Nova Scotia.

2.1 Comparison of Economic Increases and Price Increases

Table 1 shows what has happened to overall price levels relative to earnings during the period covered by the previous NSGEU Civil Service Master Agreement. Prices and earnings are normalized to $100 in the start period. This would be equivalent to normalizing the base period CPI to April 1^{st}, 2015.

In the first two fiscal years of the agreement, while inflation was low, there were no increases in nominal earnings, and so real earnings declined slightly. While there were economic adjustments in the subsequent periods, inflation tended to grow more than the adjustments, further eroding real earnings. By the end period, prices had grown by 9.9%, while earnings had only increased by 6.7%. Therefore, approximately an additional 3% increase would be required to keep the end period 2021 earnings equivalent to the 2021 inflation adjusted earnings.

Table 1: 2015 to 2021, Consumer Price Index for Nova Scotia and Economic Increases.

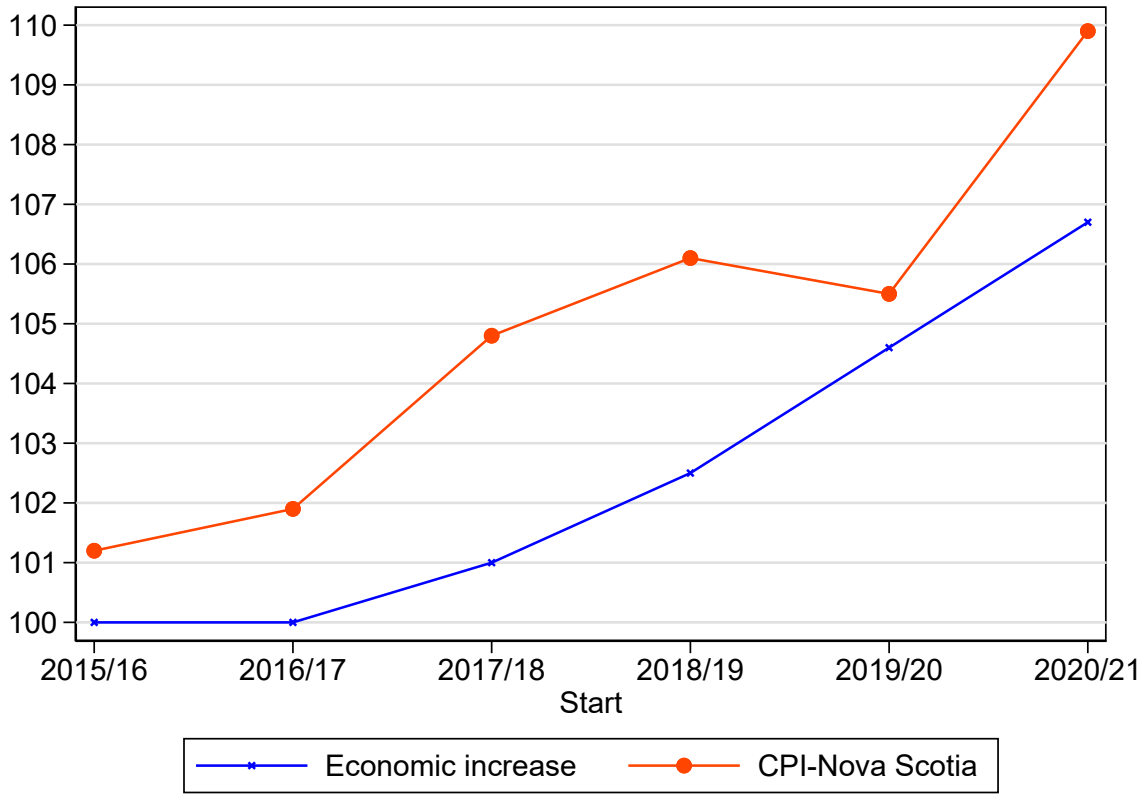
Fiscal period	CPI	Actual earnings	Inflation	Economic increases	Value of $100[1]	Required adjustment
2015-2016	101.2	100.0	1.2	0.0	$98.9	
2016-2017	101.9	100.0	0.8	0.0	$98.1	
2017-2018	104.8	101.0	2.8	1.0	$96.4	
2018-2019	106.1	102.5	1.3	1.5	$96.6	
2019-2020	105.5	104.6	-0.6	2.0	$99.1	
2020-2021	109.9	106.7	4.2	2.0	$97.1	3%[2]

Notes: Author's calculations from CPI data for Nova Scotia from Cansim Table: 18-10-0004-01. Inflation is for the April to April growth in CPI. 1. How much would $100 in April 2015 be worth at the end of a given fiscal period. 2. Required increase in April 2021 to maintain end of period salary. Calculation: $(\frac{109.9-106.7}{106.7}) \times 100\% = 3\%$.

2.2 Distinction of Equalizing End of Period Earnings versus Total Earnings.

While Section 2.1 indicates that an additional adjustment of 3% in April 2021 would have brought the end period salary in line with the end period price level, it is important to highlight that this adjustment would still fail to account for the loss in total earnings over the period covered by the previous agreement. The essential idea of this issue can be seen in Figure 1.

Figure 1: Consumer Price Index for Nova Scotia versus Economic increases for NSGEU contract: Prices outpace Economic increases



Notes: Author's calculations from CPI data for Nova Scotia from Cansim Table: 18-10-0004-01.

Figure 1 shows the CPI in Nova Scotia, as well as what has happened to relative earnings. Both are relative to April 1^{st}, 2015. Values in the start period are normalized to 100. The distance between the lines for the CPI in Nova Scotia and the Economic increases is always greater than zero and widens over much of the period. This indicates

falling purchasing power in terms of end of fiscal period earnings. There is a small gap by the end of the first period, and this grows over the next three fiscal periods. While the gap shrinks with the deflation occurring during the initial part of the Covid-19 recession, the gap further extends in the last fiscal year due to both domestic and international inflationary factors.

2.3 Loss in Monthly and Total Earnings

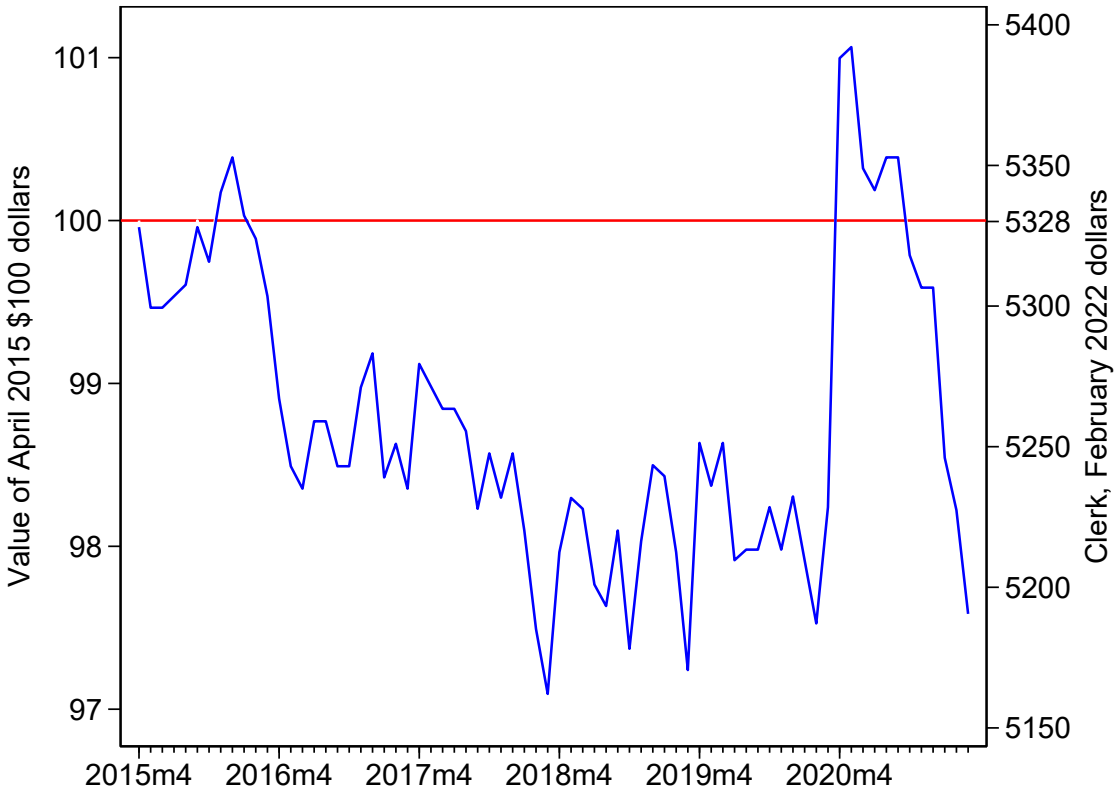
While Figure 1 illustrates what has happened to end of fiscal period purchasing power, with the monthly realized CPI, we can more accurately calculate the impact on real total earnings over the period of the previous agreement. Figure 2 takes into consideration the timing of the price changes and economic adjustments/nominal earning increases. The figure is set up as follows:

- The y-axis on the left shows what happens to $100 over the period covered by the previous agreement.
- The horizontal red line shows the value required to stay on par with initial period earnings.
- The y-axis on the right gives an example: the real monthly earnings of a Clerk (with the pay grade of CL 25-V) are presented.
  - The $100 is scaled up to the equivalent of monthly earnings.
  - Values are adjusted to represent February 2022 prices.

Some key points that can be learned from Figure 2 are:

1. The initial value of $100 in earnings declines during the contract.
2. Only for a few months during the six years, would the nominal $100 be above the initial period value.
3. Most months during the sample, money loses value and is only worth between $97 and $99.
4. The example with the Clerk indicates how large the impact is for employees.
5. In the worse months, workers took home around $150 less than the real start period monthly earnings.
   - The $150 is equivalent to around 3% less than start period earnings.

Figure 2: Real value of $100s and Real Monthly earnings for Clerks, CL25-V

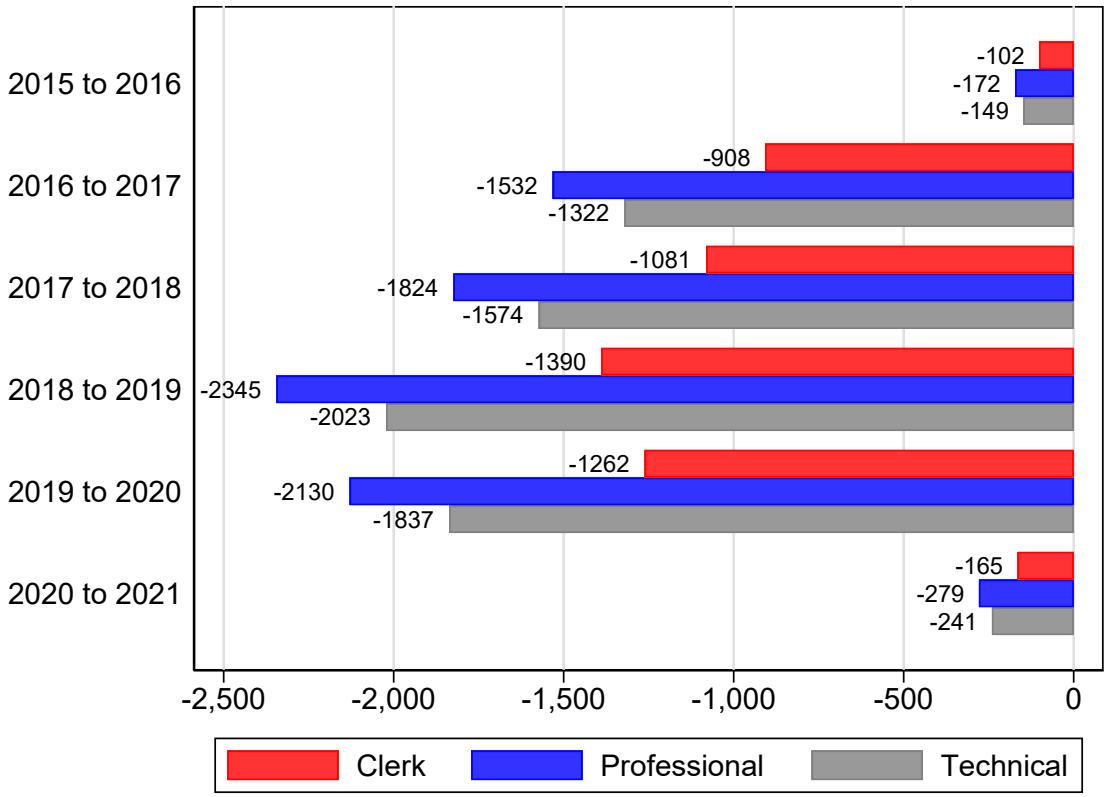


Notes: Author's calculations from CPI data for Nova Scotia from Cansim Table: 18-10-0004-01. Right y-axis adjusted to February 2022 Dollars using All items Nova Scotia CPI.

In Figure 3, real earnings relative to the start period earnings are annualized for each fiscal period. Values for this exercise are shown in February 2022 dollars. This would be equivalent to adding all the values above the horizontal red line in Figure 2 and subtracting the values below this line for each fiscal period. In addition to the values for Clerks (with pay grade of CL 25-V), which are presented in Figure 2, the values for Professional employees (with pay grade of PR 20-V) and Technical employees (with pay grade of TR 30-V) are also presented. While the losses in the first and last fiscal year are relatively small, the losses in earnings in the middle years are substantial. Over the six-year period of the contract, the before income tax total loss in earnings would be equivalent to:

- Clerk: **$4,908**
- Professional: **$8,283**
- Technical: **$7,144**

Figure 3: Losses for Example Classifications by Fiscal Year



Notes: Author's calculations from CPI data for Nova Scotia from Cansim Table: 18-10-0004-01. Adjusted to February 2022 Dollars using All items Nova Scotia CPI. Clerks with pay grade of CL 25-V; Professional employees with pay grade of PR 20-V; and Technical employees with pay grade of TR 30-V

3 Overview of Nova Scotia's Economy

Section 2 illustrates how purchasing power of employees declined over the past agreement and demonstrates that there were realized losses in real earnings. In this section, I examine the health of Nova Scotia's economy. This will provide guidance related to the fiscal capacity of the province. Overall, the economic pictures can be summarized as:

1. There was a large drop in employment and increase in unemployment during the Covid-19 recession.
2. The economy has returned to full-employment.
3. Given the strong economic recovery, the Bank of Canada has shifted away from targeting economic growth to focusing on inflation.

3.1 Key Labour Force Characteristics

Although Nova Scotia's economy and labour force were heavily impacted by the Covid-19, most economic indicators suggest that, while the Covid-19 recession had a large initial impact, this was short lived.

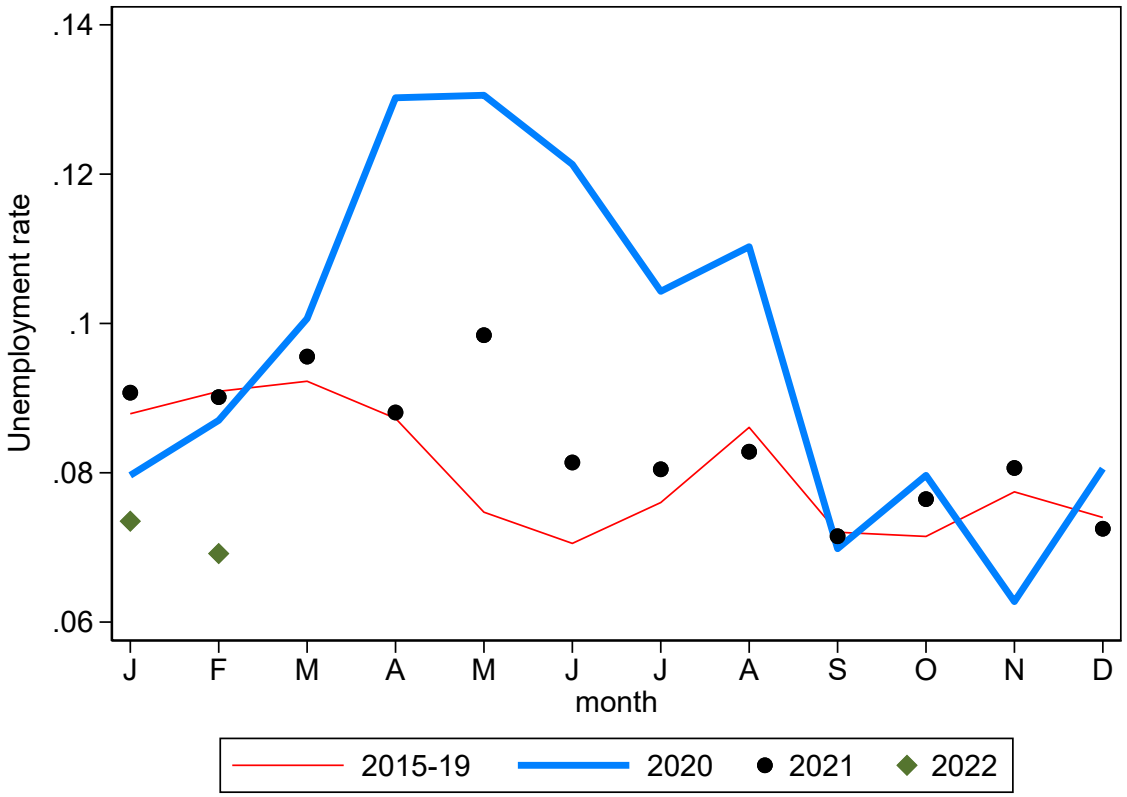
I present what has happened to the unemployment and employment rates as key indicators of the health of the economy. The figures follow the same patterns and show monthly values for the following:

- Thin line: 2015-2019 Monthly averages
- Thick line: 2020
- Circles: 2021
- Diamonds: 2022

Figure 4 shows what happened to unemployment from 2015 to February 2022. The unemployment rate is the fraction of workers that are in the labour force who do not have a job (but are actively looking). The 2015 to 2019 monthly averages, in addition to indicating what happened during the first part of the 2015-2021 contract, also provide a comparison group with which to base what happened during the Covid-19 recession, and whether the labour market has recovered. In terms of the key features of unemployment during this period:

1. In January 2020, the unemployment rate was below the 2015-2019 average.
2. The unemployment rate increased rapidly during March and April 2020.
3. The unemployment rate subsequently declined. By the end of 2020, the unemployment rate hovered around contemporary pre-Covid-19 recession rates.
4. In the early part of 2022, the unemployment rate is below pre-Covid-19 recession levels.
5. The patterns are similar for youth unemployment (see Appendix Figure A.1) and when the analysis is restricted to prime age workers (see Appendix Figure A.2).

Figure 4: Unemployment Rate in Nova Scotia, Aged 15+



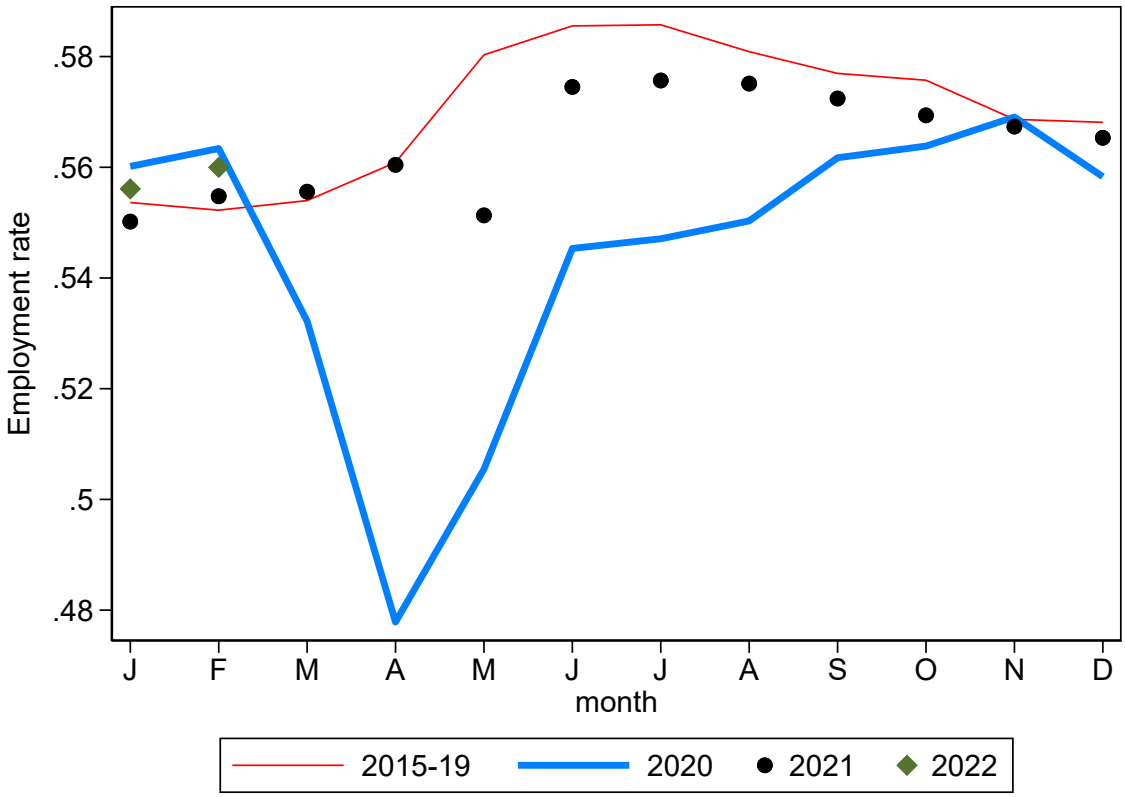
Notes: Authors calculation from the Labour Force Survey. Unemployment rate is calculated as the number of people unemployed relative to the labour force. The sample is restricted to people aged 15+.

While the unemployment rate is often seen as a key indicator of the health of the economy, it may undercount true unemployment if there is a high degree of discouraged workers.[1] Therefore, the employment rate is also presented. The employment rate is the fraction of the total population that is employed. From Figure 5, we can see that the employment rate indicates similar conclusions to what was seen for the unemployment rate.

1. There was a substantial drop in the employment rate during the first few months of the Covid-19 recession.
2. Employment recovered during the second half of 2020.
3. The employment rate is now back to similar pre-Covid-19 levels.

[1] As outlined in Jones et al. (2020, 2021), the unemployment rate may have been understated during the initial part of the Covid-19 recession due to the unprecedentedly large increase in workers who were considered employed but were absent and marginally attached workers who were not in the labour force.

Figure 5: Employment Rate in Nova Scotia, Aged 15+



Notes: Authors calculation from the Labour Force Survey. Employment rate is calculated as the number of people employed (at work and away from work) relative to the population. The sample is restricted to people aged 15+.

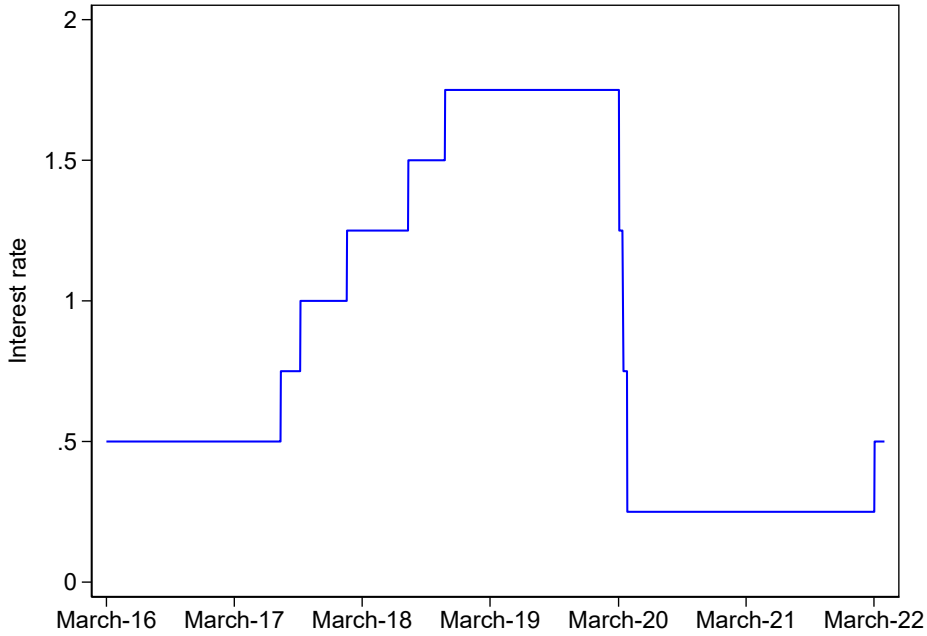
3.2 Inflation and Fiscal Outlook over the Next Contract Period

With the recovery of the Canadian economy, the Bank of Canada has shifted its attention away from stabilizing the economy and has returned to focusing on Inflation Targeting.

During the Covid-19 recession, the Bank of Canada pursued the following key policies to help stimulate the economy and help bring the economy out of the recession:

1. Substantially decrease the Policy Interest Rate from 1.75 at the beginning of March 2020 down to 0.25 by the end of the month. This can be seen in Figure 6.
2. Quantitative Easing: buy government bonds to increase the money supply and stimulate growth.

Figure 6: Large drop in Bank of Canada's Overnight rate during Covid-19 Recession and now Increasing



Notes: Author's calculations from the Bank of Canada Daily series V39079: Target for the overnight rate. https://www.bankofcanada.ca/rates/interest-rates/canadian-interest-rates/

With the economy starting to recover in the fall of 2020, the Quantitative Easing was slowed down. By October 2021, the Bank of Canada stopped Quantitative Easing. Between October 2021 and the winter of 2022, the Bank of Canada continued the reinvestment phase by mainly purchasing bonds to replace maturing bonds (see Macklem (2022)).

Given the economy has recovered to full employment and the fact that the annualized inflation rate has been exceptionally high over the past few months, at the beginning of March 2022, the Bank of Canada explicitly stated their policy shift away from targeting output back to targeting inflation. Specifically, they are reversing the policies undertaken during the Covid-19 recession and are:

1. Gradually increasing the Policy Interest Rate.
2. Beginning Quantitative Tightening: stop purchasing maturing bonds $\rightarrow$ 40% of bonds mature within next 2 years (see Macklem (2022)).

How much inflation decreases will depend on several key factors, including:

1. Inflation expectations

    - If people expect higher prices, then prices and wages will adjust to match the expected price increases. This will result in inflation equivalent to the anticipated inflation.
    - By being explicit about targeting inflation and having transparency through the key available policies: **1.** the Policy Interest Rate and **2.** the availability of the Bank of Canada's holdings of bond and the maturity schedule of their bond holdings, this will help lower inflation expectations.

2. Domestic sources of inflation

    - The increasing interest rate will dampen domestic demand and reduce many sources of domestic inflation.
    - Federal and provincial government fiscal stimulus and other policies may further aggravate inflation.

3. International sources of inflation

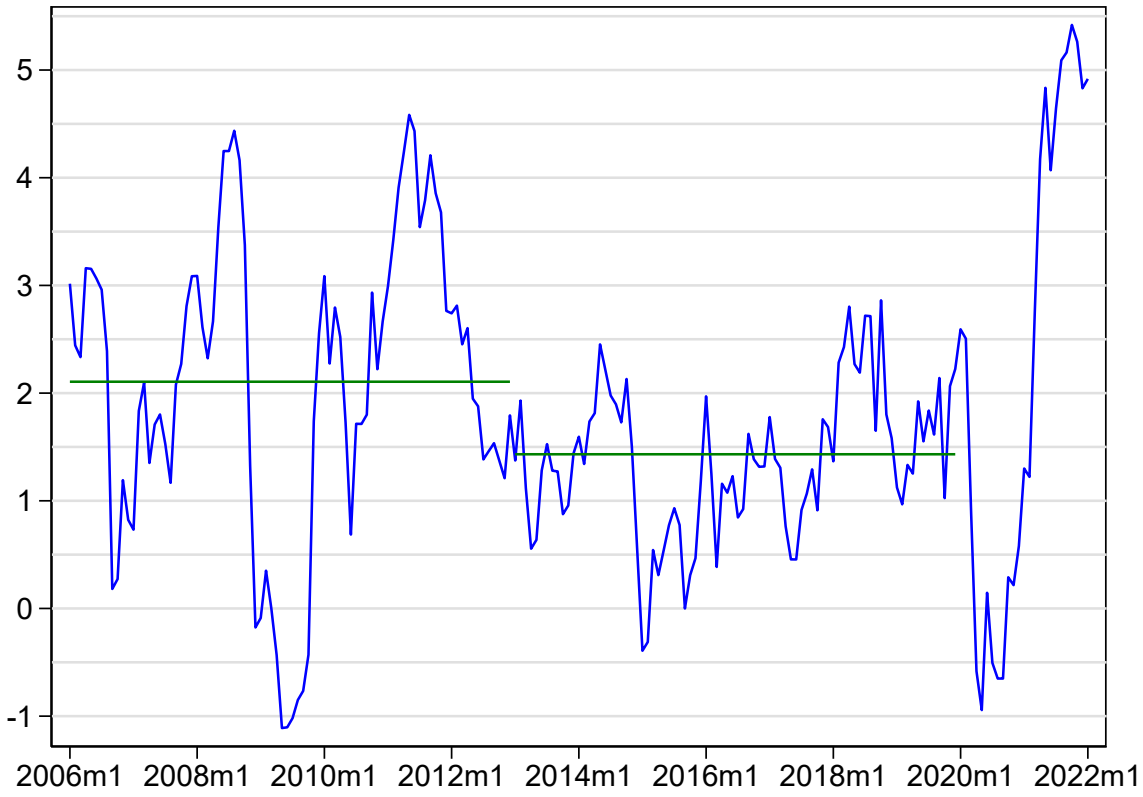
    - During lockdowns and periods of perceived Covid-19 transmission risk, there was a shift away from local services to imported goods, and there were supply chain issues with many imported goods. With the reopening of the Nova Scotian economy from lockdowns, there is a slight shift back to local services.
    - However, some goods we import are still experiencing supply chain issues.

Overall,

- With the increase in interest rates and decreasing growth of the money supply, inflation will start to decline over the next several months.
- It will take time to obtain the 2% target.
- Several factors make it difficult to fully predict the speed at which inflation will reach 2%.

    1. International issues such as the war in Ukraine, oil prices, and how Canada/U.S. react in terms of domestic energy production. Other supply chain issues may feed inflation.
    2. Housing $\rightarrow$ the increasing interest rates should help slow housing price growth in Nova Scotia, while the increase in immigration and cross-provincial migration may intensify demand for accommodations.

Figure 7: Inflation for Nova Scotia, 2006 to February 2022



Notes: Author's calculations from CPI data for Nova Scotia from Cansim Table: 18-10-0004-01.

Figure 7 outlines what has happened to monthly inflation rates in Nova Scotia from January 2006 to February 2022. The green vertical lines show the mean inflation for 2006 to 2012 and 2013 to 2019. The period from 2013 to the year prior to the Covid-19 recession, the inflation rate, while it does have some seasonal aspects, is generally below 2% and averages around 1.5%. The period between 2006 and 2012, there are large fluctuations in inflation, partially as a result of the deflationary pressure of the Great Recession, and then the inflationary period during the recovery. Over this period, average inflation is around 2%. Two things are worth noting for the period during and after the Great Recession that may inform the Covid-19 period.

1. It took some time to get towards inflation targeting levels from the 2011 peak of around 4.5%.
2. The current peak from the post-Covid-19 recession inflation is higher than the post-Great Recession peak.

While the causes and pressures from the Great Recession are different than those of the Covid-19 period, it is worth noting that it took approximately a year to approach 2% inflation. A key difference is that several of the causes of inflation during 2021 and early 2022, such as high gas prices, are still present and may persist.

4 Inflation and Maintaining Purchasing Power over the Next Agreement

In this section, the proposed NSGEU Economic increases are examined under several different inflation scenarios. As well, these values are compared to the Economic increases adopted under the recently negotiated Nova Scotia Council of Healthcare Unions collective agreement for employees of the Nova Scotia Health Authority and the IWK.

In Table 2, some potential inflation scenarios are outlined. Given the period of unique political and economic uncertainty, there is a wide range of potential inflation rates. For the 2021-2022 fiscal period, this is set at around 5%. In the second and third years, the different scenarios partially reflect the uncertainty in terms of how effective the Bank of Canada's ability to reduce inflation back to 2% will be, as well as potential international pressures.

Table 2: Various Inflation Scenarios for Fiscal Periods from 2021 to 2024.

Fiscal period	Very high	High	Moderate	Low	Very low
2021-2022	5.5%	5%	5%	5%	5%
2022-2023	6%	5%	4%	3.5%	2.5%
2024-2025	5%	5%	3%	2%	1.8%

- Very high: Extreme case where issues such supply chain disruptions and oil shortages worsen over the next fiscal period.
- High: Stay in current situation or a mix of some downward pressure domestically due to the interest rate increases and reduction in the growth of the money supply but worsening international supply chain issues.
- Moderate: Both international and domestic inflationary pressures decline over the next two fiscal periods and inflation targeting is generally successful.

- Low: Inflationary targeting reduces domestic pressures over the 2022-23 fiscal year and international pressures decline as well over this period.
- Very low: Inflationary targeting quickly reduces domestic pressures over the early part of the 2022-23 fiscal and international pressures subsidy quickly.

In Table 3, these inflation scenarios are examined under both the case where the Healthcare agreement is applied to NSGEU employees, as well as the NSGEU proposal. It shows how much \$100 in April 1^{st}, 2021 would be worth at the end of each fiscal period.

Given the explicit and transparent inflation targeting by the Bank of Canada, the most likely scenario is somewhere between the Moderate and Low categories. However, we are in an unprecedented time in terms of international factors, so it is difficult to determine with certainty.

Overall, the Healthcare agreement fails to maintain purchasing power under any scenario. The Healthcare agreement was agreed to in June 2021, at a point in which it was not fully apparent that inflation would increase so much during the second half of 2021 and into 2022. While inflation had started to increase in the two months prior to the agreement, it was not clear if this inflation was just transitory or would be persistent for more than a few months.[2] Since then, there have been political and economic changes that have resulted in higher and more persistent inflation.

Under the High or Very High inflation scenarios, for both the Healthcare sector parameters and the NSGEU proposal, there is significant erosion in terms of purchasing power. However, the NSGEU proposal better accounts for the inflation. If there is Low or Very Low inflation, with the NSGEU proposal, and a Cost-of-Living Adjustment (COLA) of 1.5% at the end of the third fiscal year, this would get at or close to the initial purchasing power (see the last row of Table 3). Since the NSGEU proposal also suggests a fourth year using COLA, and the Healthcare agreement is for three years, a fourth year is not presented in Tables 2 or 3.

[2]Monthly inflation was 1.3% in March, 4.2% in April, and 4.8% in May.

Table 3: 2021 to 2024, Economic Increases and $100 under different inflation scenarios.

Fiscal period		Economics increase	Level of inflation[1] Very high	High	Moderate	Low	Very low
Health sector agreement							
2021-2022	Year 1	1.5%	96.2	96.7	96.7	96.7	96.7
2022-2023	Year 2	1.5%	92.1	93.4	94.3	94.8	95.7
2024-2025	Year 3	1.5% +1%	89.9	91.2	93.9	95.3	96.4
NSGEU proposal							
2021-2022	Year 1	1.5%	96.2	96.7	96.7	96.7	96.7
2022-2023	Year 2	4%	94.4	95.7	96.7	97.1	98.1
2024-2025	Year 3	1.5% + 1%	92.1	93.5	96.2	97.6	98.8
2024-2025[2]	Year 3	1.5% + 1% + 1.5%	93.5	94.9	97.6	99.1	100.2

Notes: 1. How much would $100 in April 2021 be worth at the end of each fiscal period under the given proposed increase. 2. With end of year additional COLA of 1.5%.

Table 4 outlines some potential scenarios of Economic increases to ensure that purchasing power is equalized by the end of the third fiscal period. In all cases Panels B., C., and D., a 1.5% Economic increase is used in the first fiscal year, which matches the NSGEU proposal.

1. Panel A. shows the potential inflation rates under the different inflation scenarios (from Table 2).
2. Panel B. shows what would be required to match initial earnings under the Very Low inflation world by the end of the second fiscal year (6%) and then the Economic increase required in fiscal year three to maintain real purchasing power.
3. Panel C. shows under the NSGEU proposal for fiscal years one and two (1.5% and 4%), what would be required in the third fiscal year to match initial earnings.
4. Panel D. shows what Economic increase would be required in fiscal year two to catch up by year two and then maintain purchasing power in year three.

Table 4: Required Economic Increases (%) under Different Inflation Scenarios.

Fiscal period	Very high	High	Moderate	Low	Very low
A. Required to match inflation					
2021-2022	5.5	5	5	5	5
2022-2023	6	5	4	3.5	2.5
2024-2025	5	5	3	2	1.8
B. With 1.5% year 1					
2021-2022	1.5	1.5	1.5	1.5	1.5
2022-2023	6.0	6.0	6.0	6.0	6.0
2024-2025	9.1	7.6	4.5	3.0	1.8
C. With 1.5% year 1 and 4% in year 2					
2021-2022	1.5	1.5	1.5	1.5	1.5
2022-2023	4.0	4.0	4.0	4.0	4.0
2024-2025	11.2	9.7	6.6	5.0	3.8
D. 1.5% year 1, catch up by year 2					
2021-2022	1.5	1.5	1.5	1.5	1.5
2022-2023	10.2	8.6	7.6	7.1	6.0
2024-2025	5.0	5.0	3.0	2.0	1.8

Given that the proposal requests a four-year contract with the final year having a COLA provision, the Economic increases in the second and third fiscal years do not need to be as steep as those in Table 4 to get end of contract purchasing power back to the start period value. However, it should be reiterated, as was illustrated in Section 2.3, having end of period earnings equalized to the real start of period earnings can still result in losses of earnings over the contract period.

5 Conclusions and Key Takeaways

1. There was a drop in purchasing power during the April 2015 to March 2021 agreement.
    - A further 3% increase on top of the final period wage adjustment would have been required to equalize the end of contract period purchasing power.
    - Even if the end of contract period purchasing power had been reached, there would have been losses in terms of total earnings. Losses over the contracted period for the example classifications were between approximately five and seven thousand dollars.
2. The Nova Scotian economy has recovered and is back to full employment.
3. Inflation has increased greatly over the past year.
    - Given that output is back to full-employment levels, the Bank of Canada is now targeting inflation rather than output.
    - The Bank of Canada has explicit and transparent policy to bring inflation back to 2%
    - Internal inflationary pressures may partially mitigate the ability of the Bank of Canada to quickly reach the 2% goal.
4. The purchasing power of the NSGEU employees would decline if the Economic increases from the Nova Scotia Council of Healthcare Unions agreement are applied to the NSGEU agreement being currently negotiated.
5. The proposal submitted by the NSGEU would maintain end of fiscal period purchasing power under Low or Very low levels of inflation outlined in Table 2.

Recommendations/Overview

1. If international pressures decline, inflation will likely be between the Moderate to Low levels of inflation outlined in Table 2.
2. Given the uncertainty in the current inflation environment, COLA adjustments are recommended.
3. The NSGEU's four-year proposal with COLA in years 3 and 4 is reasonable. Purchasing power in the first year of the deal will be eroded and there is a potential loss in total real earnings over the contract. However, the proposal will help reach purchasing power by the end period.

References

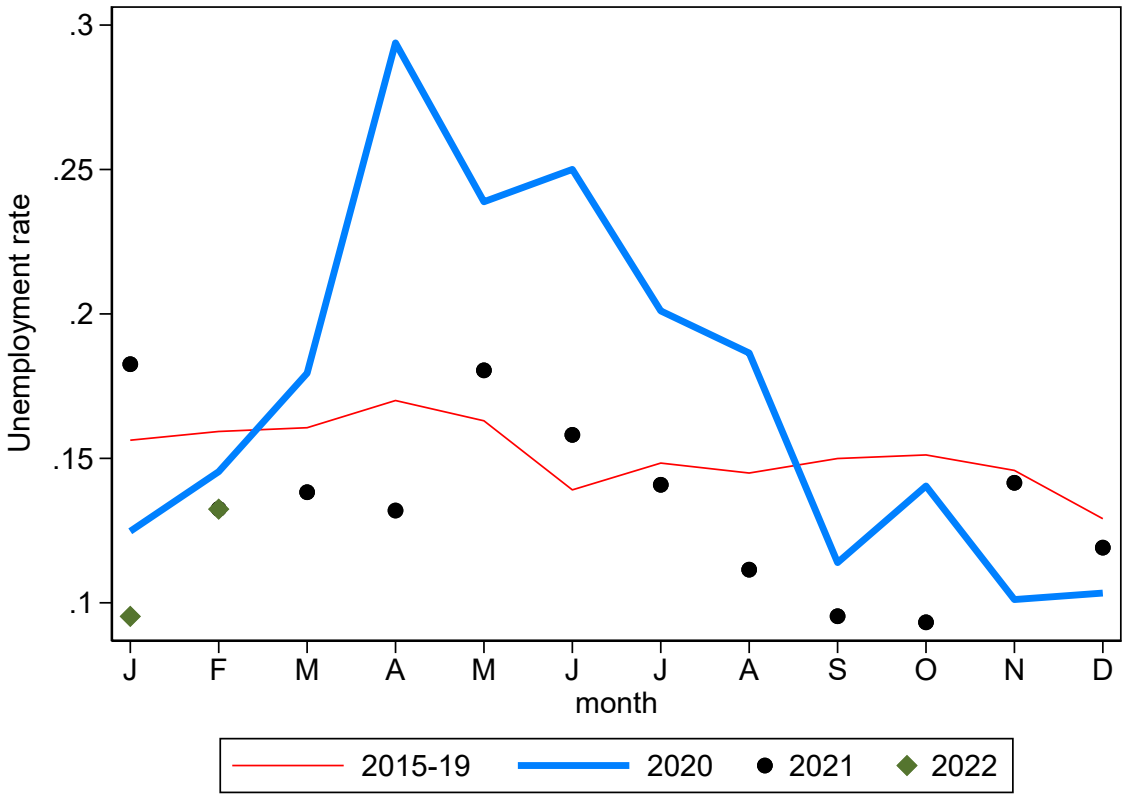
Jones, S. R., F. Lange, W. C. Riddell, and C. Warman (2020) "Waiting for Recovery: The Canadian Labour Market in June 2020," *Canadian Public Policy* 46(S2), S102–S118

——— (2021) "Canadian labour market dynamics during COVID-19," Technical report, National Bureau of Economic Research

Macklem, T. (2022) "Economic progress report: Controlling inflation," https://www.bankofcanada.ca/2022/03/speech-tiff-macklem-march-3-2022/, accessed on 2022-04-01

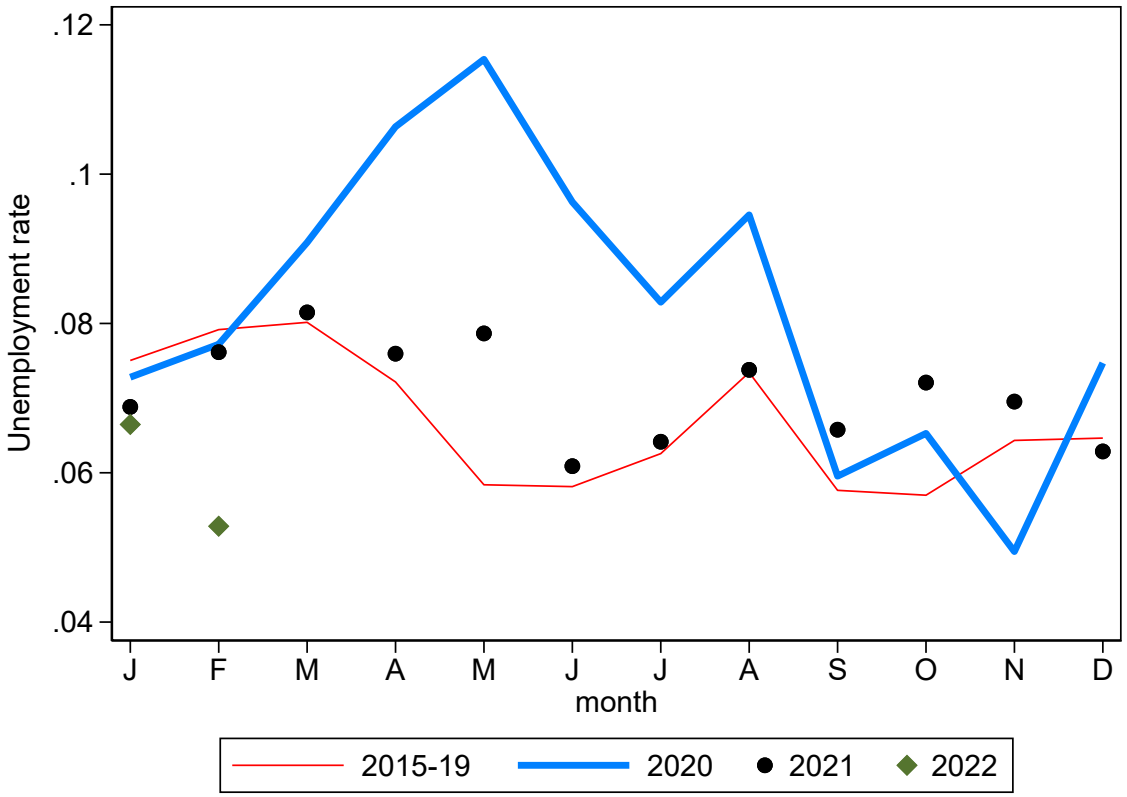
A Appendix

Figure A.1: Unemployment Rate in Nova Scotia, Aged 15 to 24



Notes: Authors calculation from the Labour Force Survey. Unemployment rate is calculated as the number of people unemployment relative to the labour force. The sample is restricted to people aged 15 to 24.

Figure A.2: Unemployment Rate in Nova Scotia, Aged 25 to 59



Notes: Authors calculation from the Labour Force Survey. Unemployment rate is calculated as the number of people unemployment relative to the labour force. The sample is restricted to people aged 25 to 59.