Labour Market Flows and Transitions in the US and Canada following COVID-19

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Abstract

The labour markets in both Canada and US experienced turmoil following the disruption caused by the COVID-19 pandemic. This paper compares recent changes in gross labour flows and worker transitions between the labour markets of the US and Canada during Covid. Exploiting the longitudinal dimension of the Current Population Survey from the US and the Labour Force Survey from Canada, I measure worker reallocation and transition probabilities in different labour force states. I find significant cross-country heterogeneity in worker flows in and out of some labour force states such as temporary unemployment and labour force marginal attachment.

Key Words: Labour Market Flows, Worker Reallocation, Non-Participation, Temporary Unemployment, Marginal Attachment

Acknowledgements

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1. INTRODUCTION

Since the beginning of the COVID-19 outbreak, labour markets around the world went through dramatic changes, as the early phase consisted of massive job losses and temporary separations between employers and workers, with strong rebounds immediately following the sudden shift in dynamics. This is particularly evident in two developed countries, namely the US and Canada. These two countries, in addition to being geographical neighbors, also enjoy a longstanding mutually beneficial trade relationship. The onset of the pandemic recession forced both to adapt to the myriad of social distancing restrictions as an effort to limit the outbreak, and this led to sizable changes in their labour markets. Although, in net terms, the changes are unsurprisingly synonymous to patterns from previous recessions, there have also been some interesting discoveries in worker reallocation flows across different employment states.

In my paper, I study gross labour flows and worker transitions and provide comparisons between the US and Canada. In assessing the impact of the pandemic shock on worker flows, I use estimates derived from monthly cross-sectional samples taken from the labour activity surveys from the two countries, Current Population Survey (CPS) in the US, and Labour Force Survey (LFS) in Canada. For time-series comparison, I use the three years immediately preceding the start of the pandemic as a pre-COVID level reference and I compare these with the monthly estimates taken in 2020 and 2021 to study the COVID-19 impact. In estimating the labour allocation process, one has to track the same individual to the next month in the surveys. As such, I take advantage of the panel features of both surveys to construct datasets and allow for the calculation of monthly worker flows.

In the analysis, I measure the changes in the flows and transitions across different labour force states and compare the results between the two countries. By further dividing the main employment states, the comparisons show some interesting patterns as both labour markets struggle to recover back to the pre-COVID levels. Canada's worker flows are observed to exhibit more volatile seasonality in the COVID period, and larger variability is observed in the participation flows compared to the US. Non-Participation is also presented as an ongoing issue, and I find that the unemployed population in the US labour force has significantly higher probability of transitioning out of the labour force, more than double in both pre-COVID and during COVID times, compared to the Canadian labour force.

This paper is organized as follows: Section 2 provides a review of recent developing literature on how COVID-19 affects labour markets of the US and Canada. Section 3 describes the surveys utilized for flow computation as well as definitions of labour force states and subsets to be studied. Section 4 compares the aggregate dynamics in the two countries, mainly focusing on the general trends in key statistics, also acting as a motivating factor for the worker reallocation study . In Section 5, I discuss the empirical results of the gross labour flows and worker transitional probabilities across different employment states, and I conclude with a few remarks in Section 6.

2. LITERATURE REVIEW

Before the COVID-19 pandemic, there has been a significant contribution of literature towards the study of fluctuations and cyclicality in unemployment and non-participation in both the US and Canada. Darby et al. (1986) leads the study of cyclical unemployment and notes that during the times of recession in the US, the variation in the flows into unemployment dominates the cyclical changes in unemployment. However, later research contradicts this finding, as seen in Elsby et al. (2009). They argue that the fluctuations in the job finding probability explain the variation in unemployment, thus suggesting that the outflows of unemployment are the main culprit of the cyclical variation. Shimer (2012) also agrees that outflows lead cyclicality, and his research shows that in recessions, unemployment outflows are largely procyclical while inflows are found to be countercyclical.

Campolieti (2011) extends the literature further into Canada and studies the fluctuations of unemployment, focusing on the early Canadian recessions in the 1990s, by decomposing flow hazards for transitions between employment and unemployment. The paper finds that in Canada, flows into unemployment are countercyclical and flows out of unemployment are procyclical. Elsby et al. (2015) also appear to confirm the same result in the US while noting that the countercyclicality of unemployment inflow has more impact on the variation in the unemployment rate.

Barnichon & Figura (2015) explore the non-participant group in the US labour market and discover heterogeneity across non-participants that changes over time. As the share of non-participants who want work declines, this decreases both unemployment rate and participation rate, which the study has found, in the past 20 years. Using a difference-in-difference strategy,

they try to identify the effects of welfare reform on the low-income mothers, who are typically out of the labour force but reported desire to participate in the labour force. They find that non-participants who want a job usually enter the labour force most often through unemployment, and this share contributes mostly to the fluctuations within the US labour force participation. Cajner et al. (2021) also study the cyclicality of the labour force participation rate, and they suggest that the recovery of the participation from business cycle shocks takes some time due to the stickiness of workers making choices on their labour force status. It is found that flows from non-participation to employment go through a significant decline as a response to the shock, but they return to their pre-shock levels only after the unemployment rate has fully recovered.

Since the beginning of the pandemic in early 2020, more research has been done to assess the impact of COVID-19 on the labour market conditions in both the US and Canada. In Canada, the COVID-19 has taken a toll in the labour market and exhibits fairly similar responses to the US. Having said this, Canada is seen to exhibit more volatile patterns in job loss and some literature aimed to provide more insight into it.

Immediately following the pandemic, Lemieux et al. (2020) look into changes in employment and aggregate hours worked in the Canadian labour market, mainly in the first and second quarters of 2020. They find that aggregate hours fell by 32% and employment fell 15% in the second quarter. Koebel & Pohler (2020) also explores how COVID-19 has affected Canadian workers' actual hours by comparing pre- and post- shutdown results along with the usual hours worked and find that the bottom earning quartile experienced the most negative shock in hours worked. Although these initial reports may not be that surprising given the severity of the abrupt pandemic recession, this gives ground to more substantive research towards the Canadian labour market dynamics in the following months.

Brochu et al. (2020) study worker flows and trajectories in Canada following the pandemic through longitudinal analysis of the labour force survey using date up to the mid-year of 2020. They argue that the Canadian labour market recovery is not as simple as it seems and hides heterogenous features as the rebound in employment is only fueled mostly by temporary layoff workers, thus making it more difficult for workers who lose jobs before the pandemic to regain employment. In addition, they also find that older job losers were more likely to leave the labour force regardless of whether they have a chance to regain employment in the recovery phase, and

younger individuals were less likely to enter the labour force following the pandemic. But in a more recent paper, Jones et al. (2022) finds that the widespread application of temporary layoffs in early 2020 has declined quickly in the economic rebound along with strong measures of labour demand and notes that Canada's recovery from COVID-19 has been much stronger compared to previous recessions.

The initial research on the pandemic has been extensive in the US as well. Cowan (2020) looks into worker transitions in the US in the very early stages of COVID-19, particularly focusing on whether there is any correlation between specific transitions and individuals' characteristics such as age, gender, disability etc. Forsythe (2020) also contributes with an early look into the US labour market following COVID-19, but instead focusing more on aggregate flows across industry and occupation. Forsythe et al. (2020) investigates the COVID-19 effect on the US economy further by measuring labour demand through vacancy posting and unemployment insurance claims, and also by analyzing market tightness using Search and Match modelling. They see a sharp drop in market tightness due to the sudden movements in the temporary layoff group along with contractions in job postings and spikes in UI claims, which is fairly similar to Canada's results from Brochu et al. (2020) and Jones et al. (2022).

In a more disaggregated study into the COVID-19 effect in the US, Cortes & Forsythe (2021) look into the distributional consequences of the COVID-19 pandemic impact on the different aspects of employment, namely wage disparity, job losses, and displacement probability among races and genders. A key contribution of their paper is that they rely on longitudinal analysis of labour market flows and transitions and find that during times of recession, older workers retire faster and creates substantial excess flows from employment towards nonparticipation, and many individuals did not immediately search for new employment after leaving the current job. Albanesi & Kim (2021) study the late COVID-19 effect on the US labour market due to differences in occupation, family, and gender. The paper studies differences in supply-side employment during business cycles by using a comparison between the Great Recession and the recent pandemic recession and uses regression approach to analyze how gender differences impact employment changes. Looking at the gross flows of labour in the US, they find that flows from employment to non-participation flows more than double during the pandemic with large gender gaps contributed mostly by women with children.

Although there are plenty of literature that studies labour markets in the US and Canada separately, few of them compare these two countries side by side. The authors Stephen Jones and Craig Riddell have worked together since the 1990s to study the comparison of gross labour market flows between the US and Canada.

In the very early studies, Jones (1993) documents the seasonal properties of the Canadian labour market in his paper. He stresses that classification errors, which arise when people are wrongly misclassified into different employment states, can contribute to the highly seasonal nature of the gross worker flows in Canada and thus spuriously affect the transitional probabilities. Riddell (2018) summarizes in his paper that Canada has undergone milder recessions compared to the US but notes that the Canadian labour market has been undergoing substantial reallocation due to income inequality and job polarization. Jones & Riddell (1998) find that in the early 1980s, the US and Canada enjoys many similarities, including seasonal and cyclical features, in the behavior of gross flows and associated hazards. They note that the rise in the unemployment gap between the US and Canada contributed to the movements within the nonemployment states, especially in the transitions between the unemployed and non-participation.

In a more recent paper, Jones & Riddell (2019) compares the changes in unemployment, marginal labour attachment and participation between the US and Canada in the 1976-2015 period. They state that the changing nature of non-employed in both countries have played a key role in the direction and magnitude of changes in the aggregate unemployment rate, and this affects the changes in the labour force participation rate. In the existing research that Jones & Riddell have done recently, they have yet to compare the COVID-19 impact on the labour markets in the two countries. Perhaps, in a small contribution, my paper aims to extend their comparative analysis up to the most recent data following COVID-19, and focus on the similarities and differences between the flows and transitions since the beginning of the pandemic.

3. DATA

The analysis of flows and transitions in this paper requires the application of the CPS (for the US) and LFS (for Canada). In the US, IPUMS holds integrated data of the CPS and this publicly available data allows for the tracking of the labour force statuses of survey respondents over time. In the case of Canada, however, one cannot compute labour market flows with the

public release LFS files. This requires the use of confidential LFS files as this contains variables to link information from the same respondents over time, and these variables are suppressed in the public use files.[1] I use monthly surveys from January 2017 to June 2022. As a reference for pre-COVID data, I include the three years preceding the beginning of COVID-19 in 2020, starting from 2017.[2] The study period also captures the full event of the COVID-19 pandemic and the ongoing recovery phase, up to the latest month available at the time of this research.

In the US, official labour force information is measured in the CPS which is administered by the US Census Bureau. The CPS interviews about 60,000 households each month from all 50 states, including the district of Columbia. The CPS also has a minimum age requirement for its target population and excludes full time armed force members and people who are institutionalized. Only respondents above the age of 16 are asked questions related to labour force status. In addition to collecting standard labour force data from the households, the CPS also ask questions related to income and extracurricular work activity.

The CPS has a 4-8-4 sampling scheme where the households are surveyed consecutively for four months, with an eight month break in between and then return for another four consecutive months. The fact that the individuals in these households are reinterviewed in subsequent months is critical for my analysis because to calculate a flow or transition one needs to know which labour state they are at in the reference month and which state they are at in the following month.

The LFS in Canada is very similar to the CPS in terms of collecting information regarding employment status. The LFS selects 54,000 households through sampling across Canada each month from all 10 provinces.[3] The LFS also has minimum age requirement for questions related to labour force status. Individuals aged 15 and over are considered to be in the working age

[1]Statistics Canada has internal-use files which contains tracking variables to link the labour force information of the same survey respondent over time. This is imperative in the calculation of flows as the longitudinal dimension of the LFS data is a key requirement in the analysis. The access for this internal data is generally restricted to the public and only made available to researchers in the Research Data Centres in Canada.

[2]This pre-COVID period can also be seen as relatively stable, as mentioned in Jones et al. (2022), and provides a decent reference point to compare the effects of COVID-19 in both countries.

[3]The public LFS data excludes individuals living in the territories outside the 10 provinces. They are not included in the target population and also are not considered in the official employment statistics.

population and their detailed employment information is collected. Full-time armed force members as well as the institutionalized are excluded out of the target population. Unlike the CPS, the households participating in the LFS are surveyed continuously for six months without any breaks and thus follows individuals longer consecutively than in the US. As part of the sample rotation, one-sixth of the sample in the LFS is replaced by incoming households from similar areas every month.

To provide a more consistent analysis of the comparison, a similar set of sample restrictions are imposed in both the CPS and LFS datasets. The samples are age-restricted from 20 to 64 with only civilian household members included.[4] For my analysis, I rely on two-month mini panels so that individuals appear in at least two consecutive months after the restriction. For the panels to be balanced, I further impose panel-related restrictions in both the CPS and LFS. I drop from the sample those individuals that are in the outgoing rotation and those in the incoming rotation. The intuition behind this is that individuals in these groups will only be in the survey for one month within the period of interest and therefore, are not relevant in the estimation of worker flows. I also drop individuals absent in the data who are classified as non-response, as some may have left the dwelling and thus are not followed for consecutive months.

In studying the flows and transitions, it is imperative that the labour market states are clearly defined so as to understand the changes in the overall dynamics when comparing between the US and Canada. Workers typically fall into three main labour market states: Employed (E), Unemployed (U), or Out of the Labour Force (O). For the purpose of diving deeper into the analysis, these three states will be further divided into subsets. In the employed state, the worker can be either employed and at work (W) or could be employed but absent from work (A). Absent in this context means the workers responded as not reporting for work in the survey reference week. If workers are unemployed, they could either fall into two different subsets: Temporarily laid off from work, but expecting recall from same employer (T), or Search unemployment (S), where workers are unemployed participants of the labour force actively searching for work in the market.

[4]This particular age restriction is selected as a means to compare the results with existing studies from Brochu et al. (2020) and Lemieux et al. (2020). Although individuals in the military are included in the surveys in both the US and Canada, their labour market information is not collected as they are not part of the target population.

Lastly, for those reported to be out of the labour force, they are considered strictly as not actively participating in the labour market, in both the CPS and LFS. However, Jones & Riddell (2019) found that there is a clear and distinguishable characteristic in the non-participant group, where some individuals reportedly desired work even though they are not actively searching. There people are classified as marginally attached to the labour force, while the remaining non-participants are not attached to the labour force at all. Their paper also shows that recently in both the US and Canada, there is clear distinction in the marginally attached group, and thus for my analysis, the out of labour force (O) will be further divided into marginally attached (M) and non-attached (H), to identify important changes in the dynamics of such subsets following COVID-19.

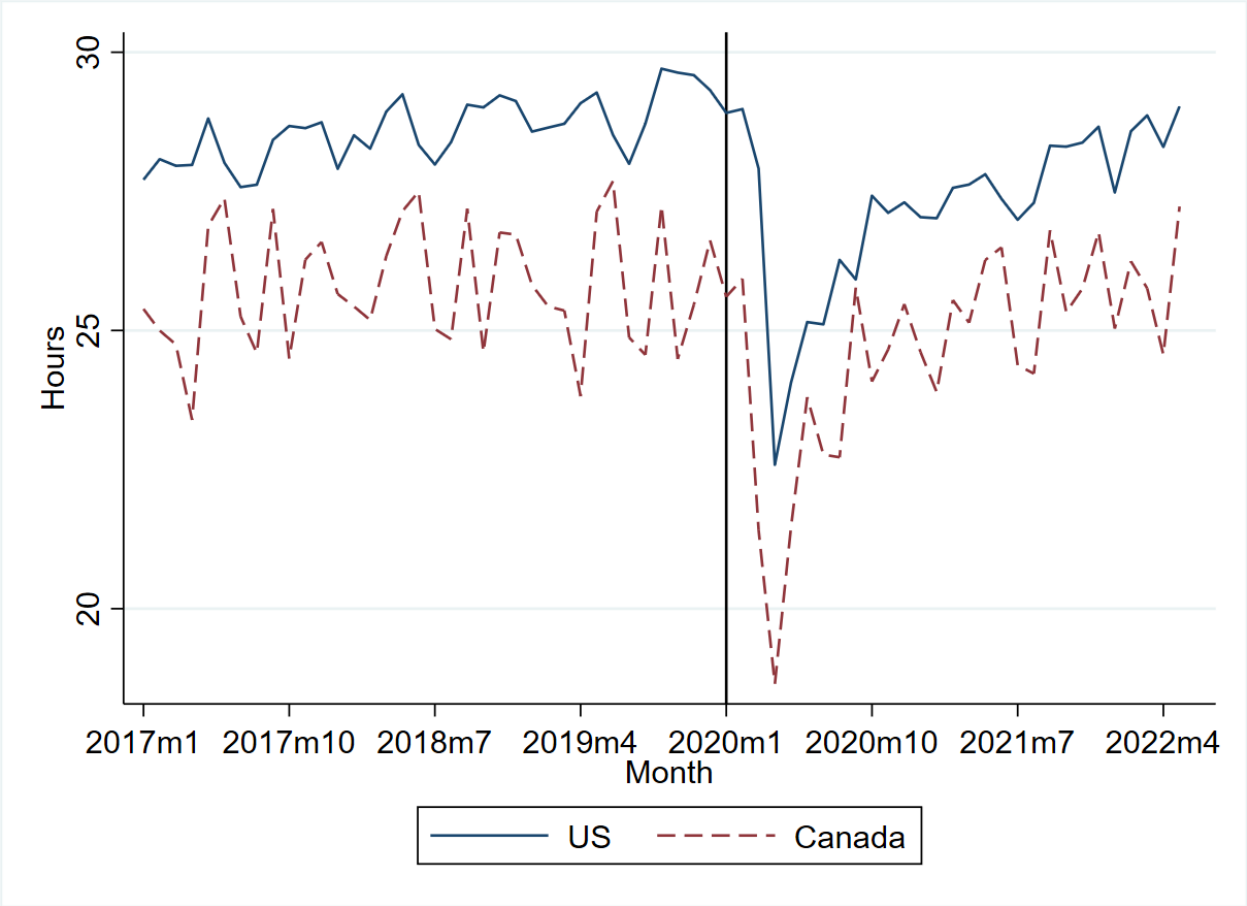
4. COMPARISON OF LABOUR FORCE AGGREGATES

In this section, I explore similarities and differences between the key aggregate movements in the labour markets of the US and Canada before and after the advent of COVID-19.

Perhaps, the most important comparison between the aggregate movements of the two labour markets could be at the intensive margin, where the actual hours worked are measured. Figure 1 compares the hours-to-population ratio between the US and Canada. It shows that the US labour market has higher average hours worked compared to Canada in both pre- and post-COVID periods. In the beginning of the pandemic, both countries see a dramatic drop in the average hours for the first quarter of 2020. There is substantial similarity in the way the two labour markets recover in terms of working hours, as both countries see a sharp reversal at the end of 2020. In Canada, the average hours recover gradually with a small upward trend in 2021, and eventually rising quickly back up to the pre-COVID hours in 2022. This is similar to the US trend, with the exception of Canada exhibiting more volatile seasonal patterns.

Figure 2 presents the employment rate (employment-to-working-population ratio), which is seen to be slightly higher in Canada, roughly around 2 percentage points above the US rate, with both countries hovering around 75% in the pre-COVID period. After the first quarter of 2020, the rates expectedly plummet down to around 65% for both countries, due to the COVID effect of workforce restrictions and layoffs. One particular difference is that in the following months, Canada's employment rate rebounds at a faster rate than the US, widening the usual gap between

Figure 1: Actual Hours Worked to Working Age Population Ratio in US and Canada

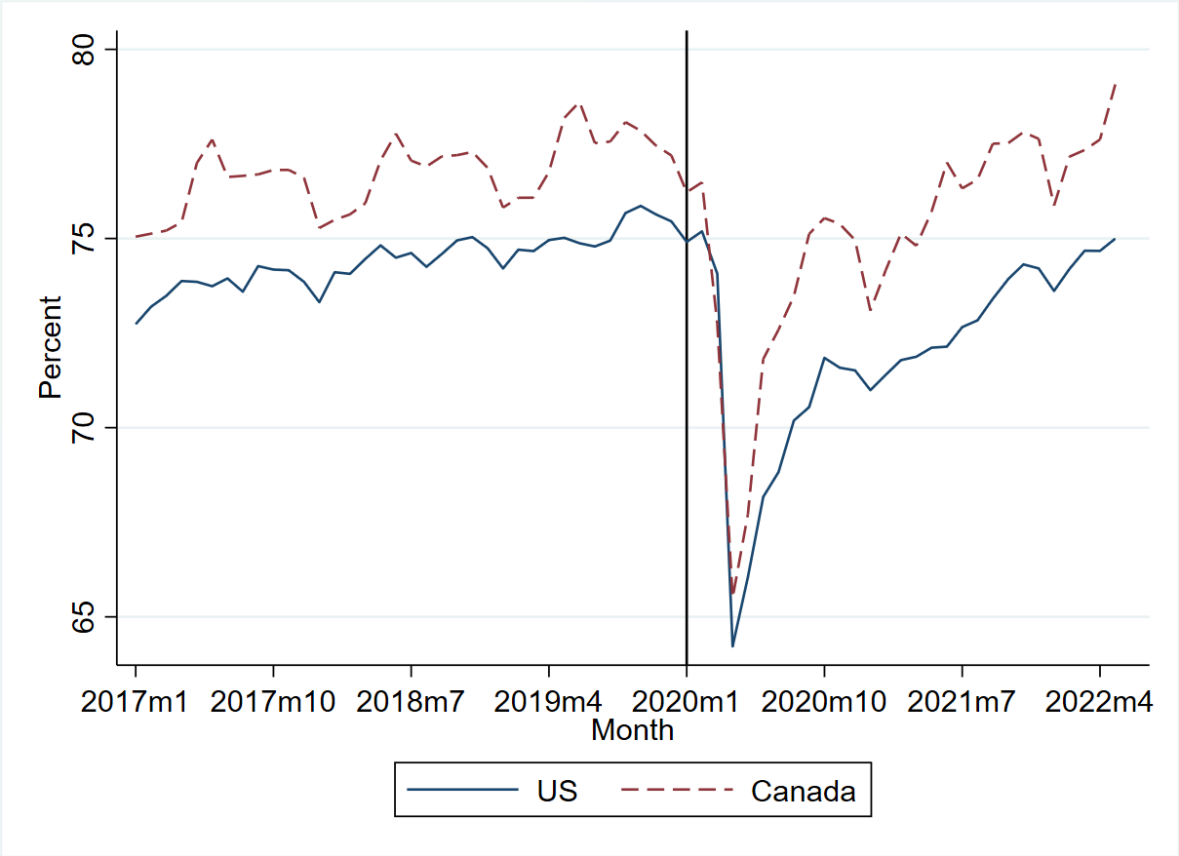


Note: Author's estimates using data from the CPS and LFS. Monthly samples of individuals aged 20 to 64, excluding full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

the two rates, with Canada approaching 80% in the latest quarter of 2022, while the US struggles to recover back to its pre-COVID level of around 75%.

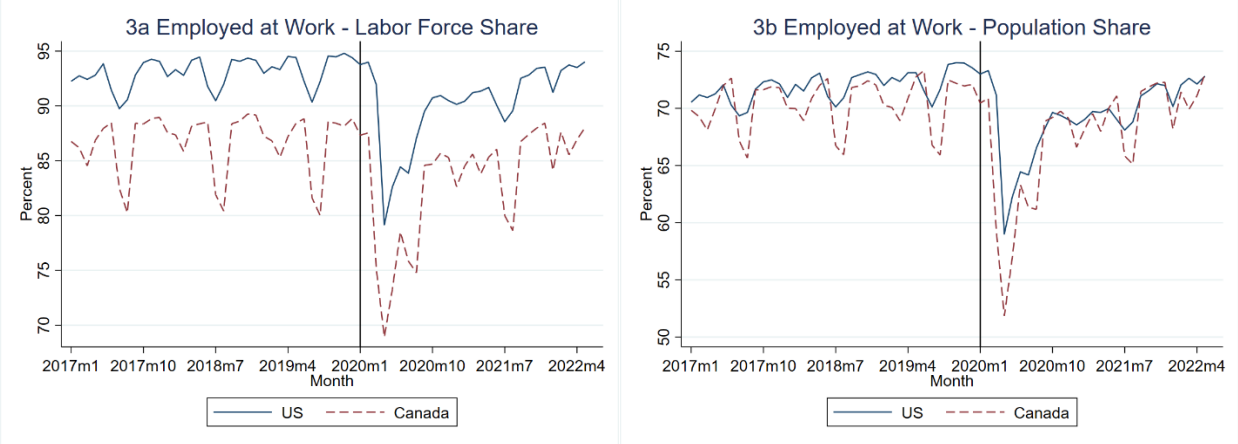
In an extensive look into the employment levels, I provide two additional ratios: the employed-at-work subset of the employed relative (i) to the labour force and (ii) to the total working population. Figure 3 presents these two results side by side. Comparing the employed-at-work relative to labour force between the two countries, I find that there is a consistent gap with the US having a higher employed-at-work ratio, and interestingly, the gap widens to about 10% in early 2020. In contrast, in the employed-at-work-to-working-population ratio, both countries have much closer levels, around 70%, with almost no gap in between. The employed-working population in Canada sees a much lower dip than the US in early 2020, which contrasts the movement seen in the employment rate where the US rate falls lower than Canada. This suggests

Figure 2: Employment Rate in US and Canada



Note: Author's estimates using data from the CPS and LFS. Monthly samples of individuals aged 20 to 64, excluding full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

Figure 3: Share of Employed at Work in US and Canada

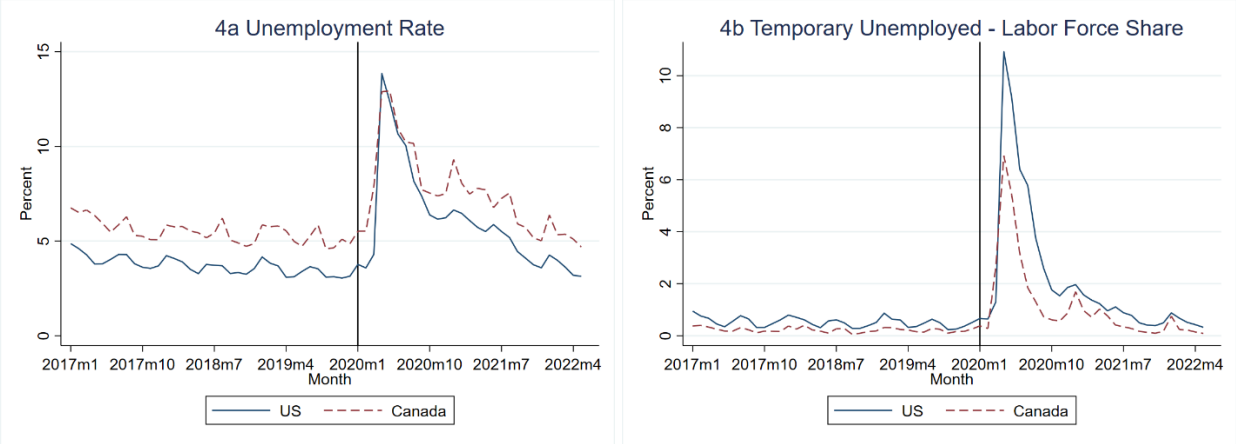


Note: Author's estimates using data from the CPS and LFS. (Population in 3b refers to working age population) Monthly samples of individuals aged 20 to 64, excluding full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

that Canada may have a lower employed-at-work population, and subsequently a higher absent-worker-to-population ratio compared to the US.

The movements in the unemployment rate mirror the employment rate in similar patterns in both the US and Canada, as seen in Figure 4. Although both countries share fairly similar trends, there is a small gap between them as seen again in the unemployment rate, with Canada about 2 percentage points higher than the US in the pre-COVID period. The beginning of the pandemic sees both rates spiking above 10% before gradually falling below to their pre-COVID levels. One interesting feature is that although the employment rate and unemployment rate are usually higher in Canada compared to the US, unemployment rates for both approach to the same level in the first quarter of 2020, at the height of pandemic. I also compare the temporarily unemployed population relative to the labour force between the two countries, shown in Figure 4b, and find that while both were around 1% before 2020, the pandemic sees the US temporary unemployed share rise well above 10 % and Canada rising to around 6.5%. This striking difference puzzles the fact that unemployment rate for both countries increased to the same level during the pandemic. As explained with the participation rates, Canada's temporary unemployed share can be understated due to the fact that people who had been furloughed were thought to be non-participants while they should have been categorized as unemployed.

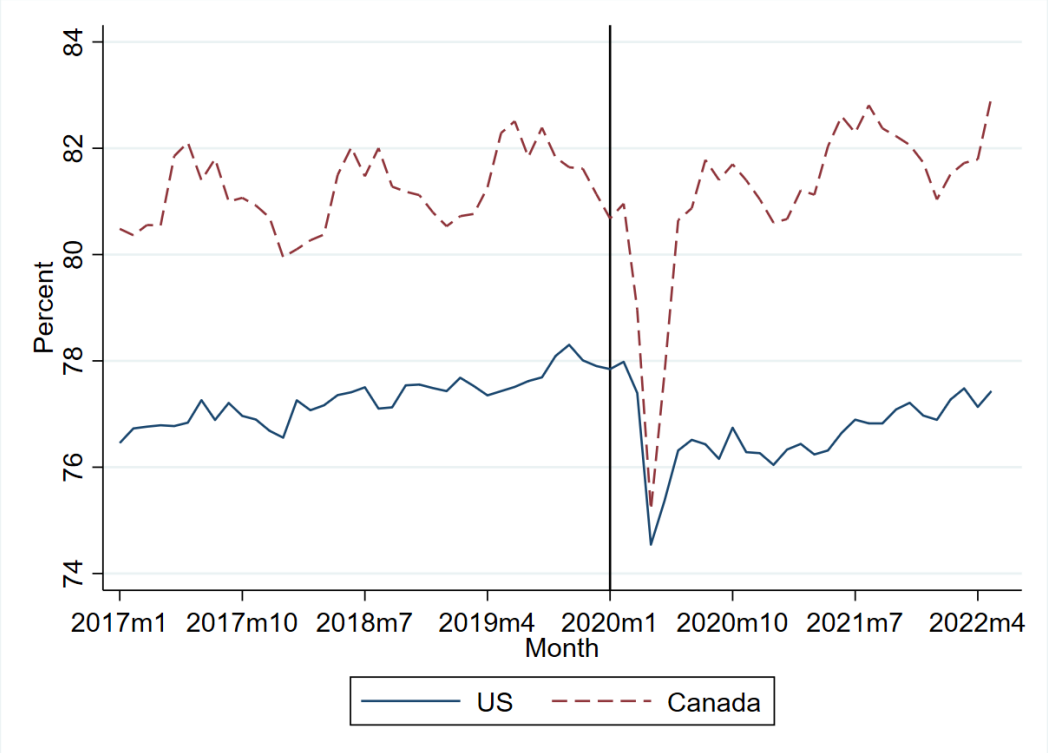
Figure 4: Unemployment Rate and Temporary Unemployed Share in US and Canada



Note: Author's estimates using data from the CPS and LFS. Monthly samples of individuals aged 20 to 64, excluding full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

As we can see from Figure 5, there is a significant gap present in the labour force participation rates between Canada and the US, roughly at a 5 percent level. In pre-COVID times, the US participation rate can be seen hovering between 76-78% while Canada ranges higher between 80-82%. While an upward trend can be seen in both, Canada's participation rate is seen to be more volatile with possible acute effects of seasonality. Once the pandemic starts, both participation rates see a drop, but notably, Canada's participation rate drops much more dramatically down to around 75%, near the same level that the US participation rate drops to. Jones et al. (2022) explains that there is a possible misclassification in that people who immediately lost jobs during the start of the pandemic were categorized as out of the labour force, since they were temporarily furloughed and expected to be recalled, and thus, were neither looking for a job nor listed as unemployed. This can also explain the sudden reversal following the first quarter of 2020, where Canada saw its participation rate going back to its pre-COVID level, and even moving slightly above in 2022. Compared to Canada, the US has a milder drop in the participation rate in early 2020, and gradually recovers back to its usual level.

Figure 5: Labour Force Participation Rate in US and Canada



Note: Author's estimates using data from the CPS and LFS. Monthly samples of individuals aged 20 to 64, excluding full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

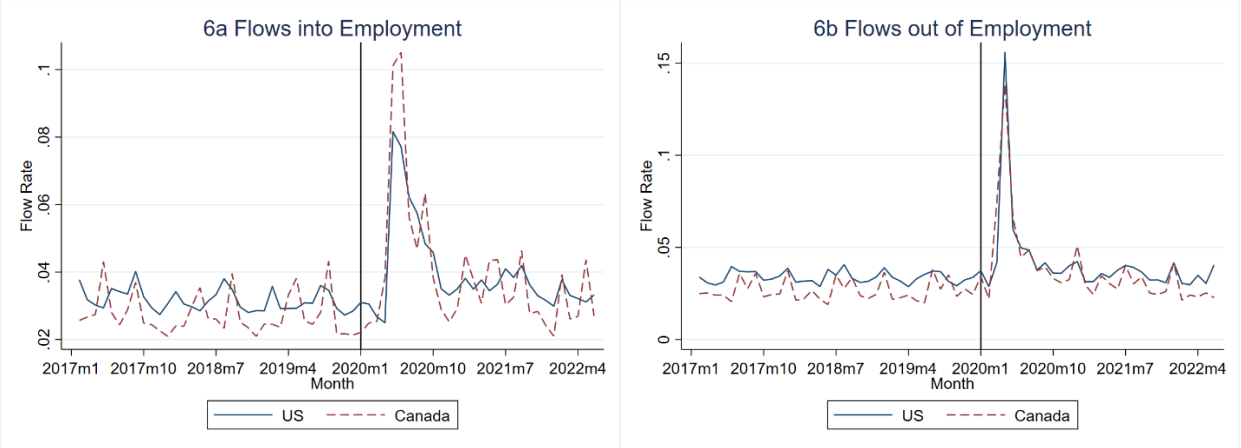
5. COMPARISON OF FLOWS AND TRANSITIONS

5.1 AGGREGATE FLOW RATES

I examine the flows in and out of the three main employment states and provide some insight on the comparisons between the two labour markets. For the flow analysis, I use the longitudinal dimension of both the CPS and LFS to estimate monthly aggregate worker flows in and out of the three main employment states, covering the period from January 2017 to June 2022. Aggregate flows are estimated by constructing panel datasets from the surveys which track the same individuals over time. The flow rate is presented as a ratio of the flow estimate from the initial state in period *t-1* to the destination state in period *t* divided by the stock of the initial state in period *t-1*. (See Appendix A1 for more details)

Looking at the flows out of employment, shown in Figure 6b, the pre-COVID separation rate in the US is seen to be stable and slightly above 3% while Canada stays closely below at the 2.5% level. Unsurprisingly, the pandemic caused massive job losses and layoffs and thus drove up both outflows following March 2020, to around 15%. This, however, is followed by a sharp reversal with the separation flows going back down to its pre-COVID by around the end of the second quarter of 2020. The hiring rates also follow a similar pattern, as seen in Figure 6a. In the US, the inflow rate hovers around 3.3% and Canada around 2.6%. Employment inflows remain

Figure 6: Aggregate labour market flows into and out of Employment (Monthly)



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

relatively unchanged in 2020 first quarter, and this may allude to the fact that the hiring rate did not decline in the start of the pandemic. Both inflows soared around May 2020, approximately one month after the sudden rise in outflows, but notably, Canada's inflow rate has a sharper rise than the US right in the beginning of the recovery. The 1% annual average increase in the hiring rate in Canada, compared to a 0.5% increase in the US may also help explain Canada's steeper recovery in the employment rate, as discussed earlier in the aggregates section. In the recovery phase following mid-2020, the annual average flow rates for both hiring and separation grew slightly, with the US averaging 3.6% for hiring and 3.5% for separation, while Canada averages 3.5% and 3.1% respectively, rising above the 3 percent level since the start of the pandemic.

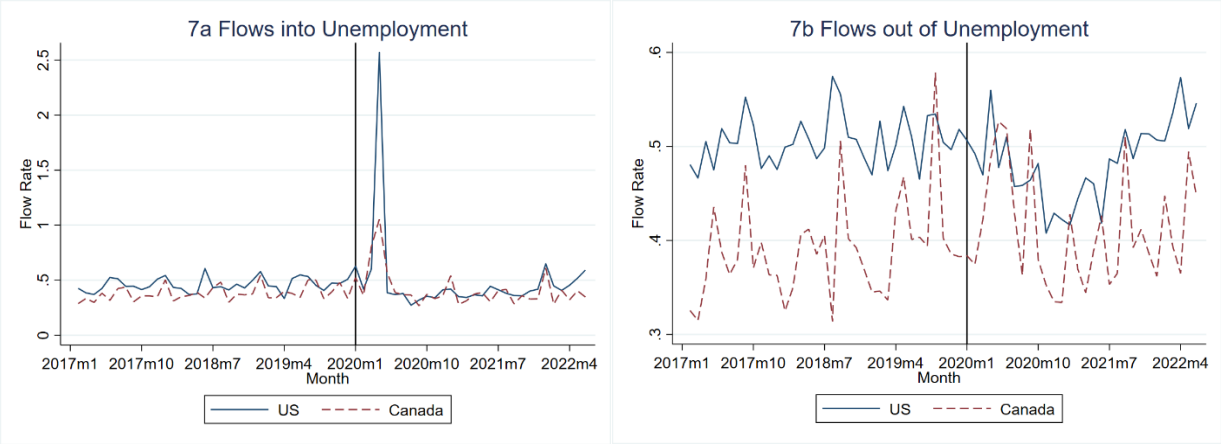
Table 1 : Monthly Aggregate Labour Market Flow Rates (%) (Annually Averaged)

	US				Canada			
	2018	2019	2020	2021	2018	2019	2020	2021
Employed								
Outflows	3.38%	3.35%	5.11%	3.53%	2.63%	2.68%	5.02%	3.14%
	(0.0010)	(0.0009)	(0.0098)	(0.0011)	(0.0017)	(0.0018)	(0.0092)	(0.0022)
Inflows	3.14%	3.07%	4.62%	3.66%	2.66%	2.75%	4.80%	3.49%
	(0.0009)	(0.0009)	(0.0056)	(0.0009)	(0.0016)	(0.0020)	(0.0083)	(0.0023)
Unemployed								
Outflows	51.11%	50.64%	47.62%	46.91%	38.59%	40.62%	42.43%	39.25%
	(0.0083)	(0.0076)	(0.0114)	(0.0108)	(0.0143)	(0.0190)	(0.0205)	(0.0139)
Inflows	45.26%	47.59%	58.75%	38.47%	38.17%	40.73%	48.00%	36.06%
	(0.0196)	(0.0193)	(0.1827)	(0.0097)	(0.0181)	(0.0225)	(0.0667)	(0.0210)
Non-Participation								
Outflows	9.53%	9.84%	11.30%	10.63%	9.81%	10.61%	15.12%	12.90%
	(0.0021)	(0.0022)	(0.0060)	(0.0021)	(0.0037)	(0.0047)	(0.0155)	(0.0059)
Inflows	11.08%	11.17%	12.93%	11.70%	9.92%	10.47%	15.67%	12.58%
	(0.0026)	(0.0016)	(0.0096)	(0.0026)	(0.0059)	(0.0064)	(0.0169)	(0.0054)

Note: Author's estimates using monthly matched samples from the CPS and LFS. Monthly inflows and outflows are averaged annually. Samples include individuals aged 20 to 64 and exclude full-time armed force members. Standard Errors are in parentheses. All estimations are weighted.

Figure 7 presents flows into and out of unemployment, which exhibits a moderately different behavior. The beginning of COVID-19 caused a massive rise in the unemployment inflows, as Canada saw a 100% increase, while the US had an astronomical 250% jump in the flows into unemployment. It is also important to note that, compared to employment flows, the flow rates here are noticeably much higher due to the fact that the unemployment stock (the

Figure 7: Aggregate labour market flows into and out of Unemployment (Monthly)

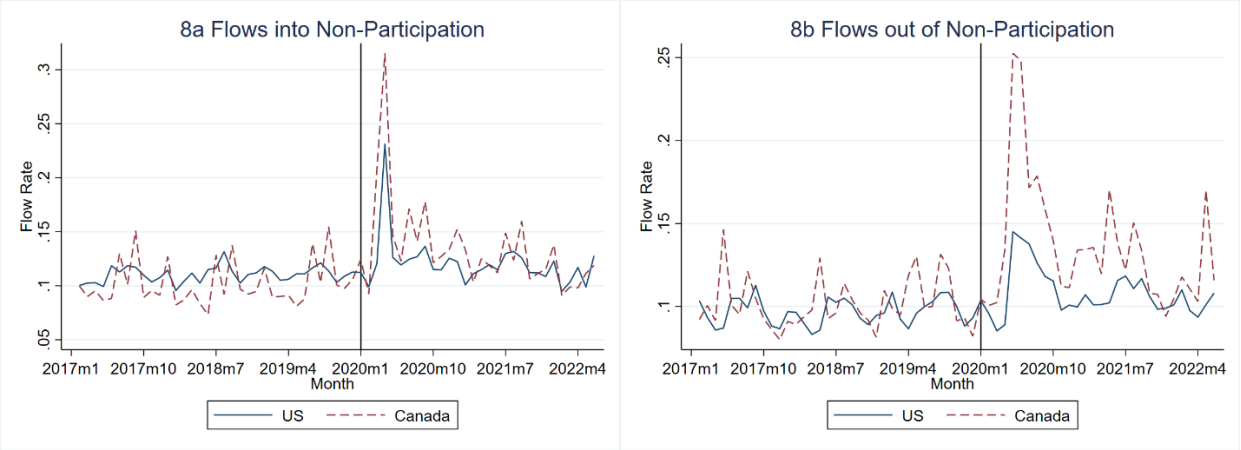


Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

denominator of the flow ratio) is very small relative to the total population of the employed in the labour markets. Similar to the employment flows, the unemployed inflows and outflows dropped back to its pre-COVID levels by mid-2020, which again suggests a swift recovery in both markets. It could also be suggested that the drop from the huge 250% spike in inflow attributes to the fact that although the US employment rate unusually rose above Canada's rate in the beginning of COVID-19, the US rate was able to drop back down quickly below Canada's level in the recovery period. In contrast, the unemployment outflows showed a muddy picture when comparing between the two countries. The US unemployed outflow is generally higher, but Canada's outflow rate is seen to be a lot more volatile.

Next, in Figure 8, I look at the aggregate flows into and out of the non-participation state, where individuals are classified as out of the labour force. Initially, the inflows into non-participation drift around the 10% level on average in both countries. Once the pandemic starts, we can see a sudden rise in the flows into the non-participant group. In Canada, the inflow rate reaches up to 31%, while the US goes up to 23%. In the flows out of non-participation, we see more seasonal volatility in Canada although its average is close to the US outflows. In the early 2020, however, Canada's outflow rate almost doubled the US outflow rate. This may explain the aggregate behavior seen earlier in the participation rate, where Canada sees a huge dip in participation down to the US level but was able to recover quickly right back up to its pre-COVID levels, and thus, this huge spike in the non-participation outflow may have contributed to Canada's

Figure 8: Aggregate labour market flows into and out of Non-Participation (Monthly)



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

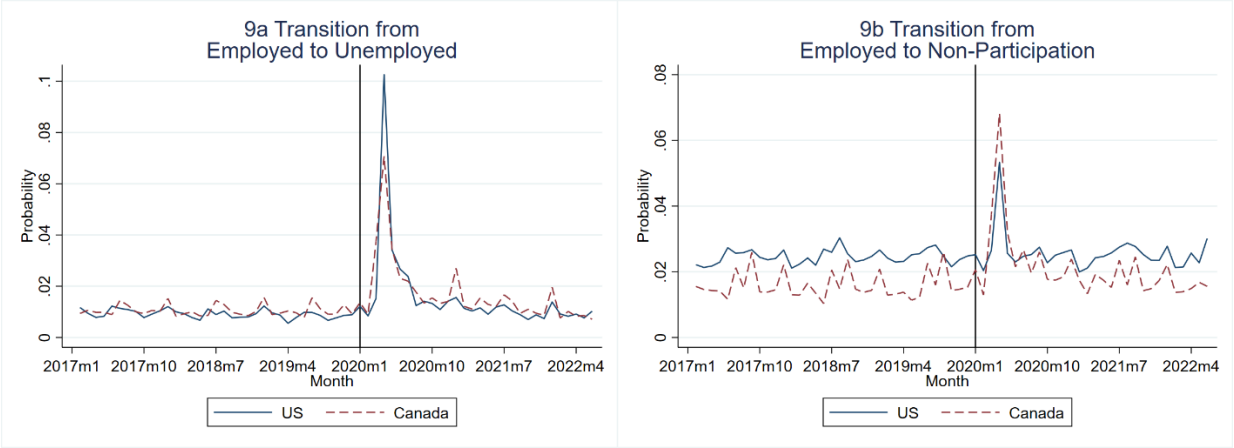
successful rebound. Moreover, in the beginning of the recovery, starting from around mid-2020, non-participation outflow rates in both countries see a slight increase compared to their initial levels, and we can also observe a small gap widening between Canada and the US, which could lead to more questions regarding whether this change in non-participation behavior could be due to the actual dynamic shift at the extensive margin or whether the differences in the classifications of the CPS and the LFS might have distorted the measurements of the population subsets in these different employment states.

5.2 TRANSITION RATES

Although the aggregate flow rates provide a useful commentary on key dynamics in the labour markets, it is also important to study the composition of these inflows and outflows to understand the movements in the smaller subsets of labour force status, and how each of them contributes to the overall shift in the aggregates. In this section, I first present transition rates between three main states, employed, unemployed and non-participation. Afterwards, I decompose the flow rates to analyze the probabilities of workers transitioning into subsets of all the labour force states.

First, I show the two monthly transition rates in Figure 9, (i) from employed to unemployed, and (ii) from employed to non-participation. As seen previously, in comparing the aggregate employment outflows, the US separation rate is slightly higher than Canada, excluding

Figure 9: Transition Probabilities from Employment (Monthly)

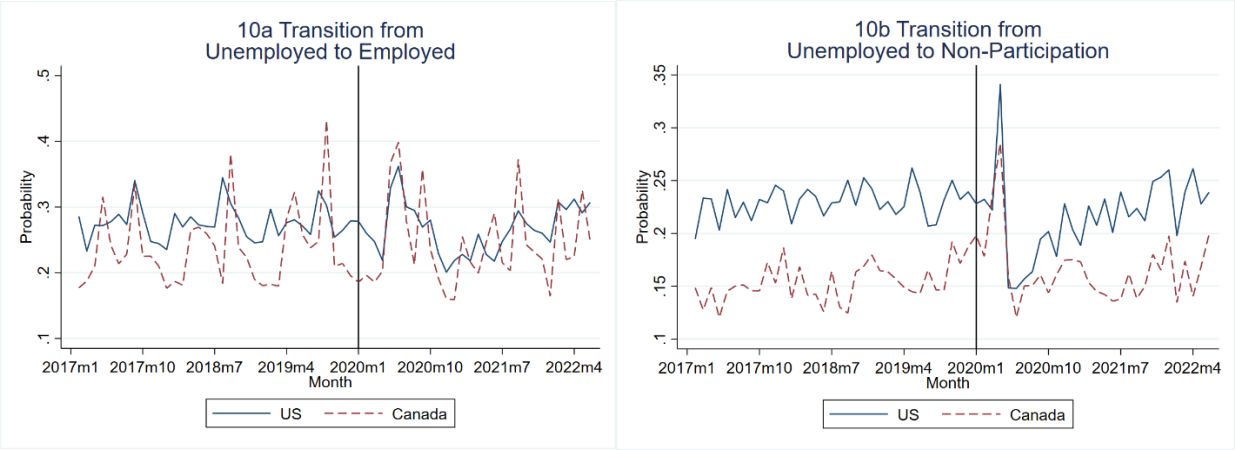


Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

the first and second quarters of 2020. In the transition rate from employed to unemployed, the probabilities between the two countries are almost the same, while transitions from employed to non-participation shows a significant gap between the two countries. This indicates the US has a higher separation rate due to its workers having a higher probability of moving from employed into the non-participation category. Furthermore, the sudden increase in the separation rate during early 2020 has different compositions in the two countries. In the US, the separation flow has been mostly dominated by employed to unemployed transition, while in Canada, the employed to non-participation transition contributed more to the outflow.

The transition rate from unemployed to employed, as seen in Figure 10, exhibits an interesting feature. While it is apparent that Canada has more volatility, the probability of unemployed getting hired did not exhibit abnormal behavior in early 2020. This suggests that the usual hiring rate for people who are unemployed and actively searching has not been affected by the onset of the pandemic. In the transition from unemployed to non-participation, however, the US probability is seen to be notably higher than Canada. The gap slight narrowed in at the beginning of the pandemic, with both probabilities going up above 30%, but eventually widened again after in 2021. This is interesting given that most workers who lost their job during COVID-19 were able to find a job soon after, and this sudden spike in the out-of-labour-force probability could be due to the fact these furloughed workers have been categorized as non-participants since they were expecting a recall, and therefore, were not searching for a job.

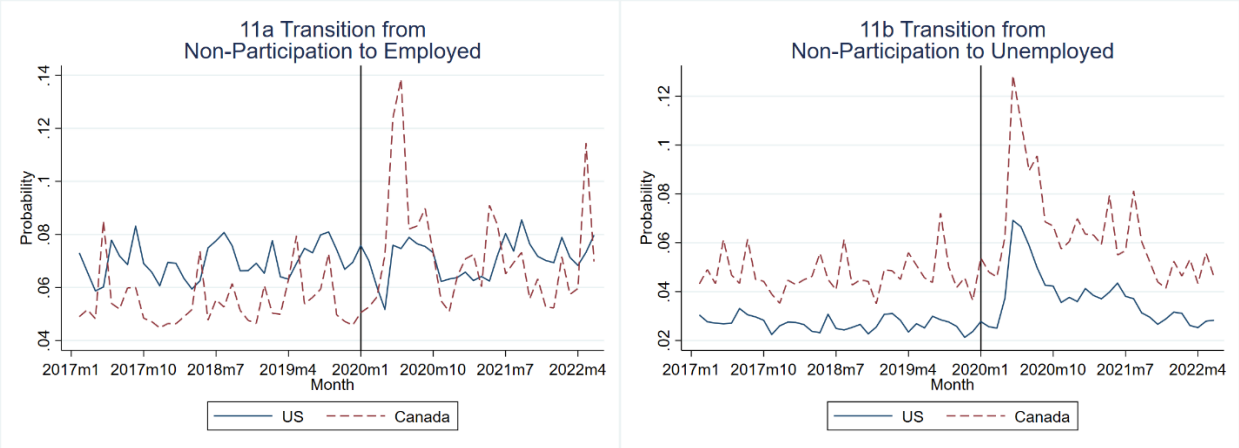
Figure 10: Transition Probabilities from Unemployment (Monthly)



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

Next, I show the probabilities of transitioning from non-participation into employed and unemployed in Figure 11. It appears that in Canada, people who were out of the labour force during COVID-19 eagerly participated back following the recovery phase, as we see a huge spike in participation probabilities into both the employed and unemployed categories. This could also explain the steep rise in Canada's labour force participation rate during the recovery. Generally, in the US, non-participants tend to have a higher probability of getting hired after participation, while the chance of non-participants flowing into unemployment is greater in Canada.

Figure 11: Transition Probabilities from Non-Participation (Monthly)



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

After decomposing the three main labour force states into smaller subsets, I calculate the monthly transition rates and then table the annual average values of the US and Canada for the years 2018 to 2021. (For more graphical detail of transitions between subsets, see Appendix A2.) I first present the transitional probabilities between employment and subsets of non-employment in Table 2. Looking at the transitions from employed to subsets of non-employment, it appears that all of them have very low probabilities, which is consistent with existing literature since most workers remain employed over time and flow back into the employment state. The annual averages of 2018 and 2019 are given for comparison with the COVID-19 levels. The average transition rate from temporary layoff to employment is slightly higher in the US than Canada. During 2020, both went above 1%. Canada's average in 2021 remained higher around 0.3%, which is around the same level as the US rate. Naturally, the average transition rates from search unemployed to employed are a little higher in Canada compared to the US. What is interesting is that in the US, the search to employed transition rate remains around the pre-COVID level even in 2020 and 2021, while Canada sees a slight increase following COVID-19. The probabilities of employed people flowing into the two subsets of non-participation also see low rates for both the US and Canada. The transition into marginally attached non-participants appears to be more likely in Canada, while in the US, participants tend to flow right into non-attachment, a 2% average compared to Canada's 1%.

In contrast, the transitions from subsets of non-employment into employment shows a different picture. The average transition rate of temporary unemployed to employed is very high compared to the other subsets, which is expected, since temporarily laid off workers generally regain employment and therefore remain most attached to the employed pool. Search entrants have a roughly half chance of gaining employment compared to temporary laid off workers. But one key finding is that in the US, temporary unemployed transition to employment has not fully recovered yet compared to Canada. Also expectedly, the marginally attached group has a much higher transition rate than non-attached, as they show more desire to gain employment and the trends for both subsets remain the same before and after COVID-19.

Since the unemployed pool is small relative to the total labour force in both countries, the transition rates in the unemployed state have more variability between the two countries. Table 3 presents transitional probabilities between the unemployed state and the subsets of employed and

Table 2 : Monthly Transition Probabilities - Employed (%) (Annually Averaged)

	US				Canada			
Transition from Employed to	2018	2019	2020	2021	2018	2019	2020	2021
Temporary Unemployment	0.29%	0.30%	1.73%	0.37%	0.13%	0.13%	1.12%	0.30%
	(0.0003)	(0.0003)	(0.0073)	(0.0005)	(0.0002)	(0.0002)	(0.0044)	(0.0009)
Search Unemployment	0.62%	0.57%	0.67%	0.67%	0.80%	0.83%	1.13%	0.91%
	(0.0002)	(0.0002)	(0.0004)	(0.0003)	(0.0005)	(0.0006)	(0.0007)	(0.0006)
Marginally Attached	0.37%	0.36%	0.67%	0.46%	0.43%	0.44%	1.21%	0.60%
	(0.0002)	(0.0002)	(0.0013)	(0.0003)	(0.0006)	(0.0006)	(0.0031)	(0.0007)
Non-Attached	2.10%	2.13%	2.05%	2.03%	1.15%	1.17%	1.44%	1.21%
	(0.0006)	(0.0004)	(0.0012)	(0.0007)	(0.0009)	(0.0011)	(0.0014)	(0.0008)
Transition to Employed from								
Temporary Unemployment	52.49%	55.41%	36.62%	43.01%	49.65%	46.46%	41.05%	49.50%
	(0.0289)	(0.0262)	(0.0088)	(0.0258)	(0.0424)	(0.0340)	(0.0301)	(0.0337)
Search Unemployment	23.76%	23.34%	19.76%	20.89%	19.64%	20.90%	17.96%	18.97%
	(0.0055)	(0.0052)	(0.0099)	(0.0083)	(0.0104)	(0.0139)	(0.0120)	(0.0104)
Marginally Attached	16.21%	16.13%	15.72%	16.17%	14.60%	15.50%	18.21%	17.43%
	(0.0038)	(0.0060)	(0.0058)	(0.0063)	(0.0121)	(0.0154)	(0.0167)	(0.0109)
Non-Attached	6.30%	6.52%	6.05%	6.22%	4.11%	4.52%	5.26%	5.03%
	(0.0017)	(0.0015)	(0.0020)	(0.0021)	(0.0012)	(0.0017)	(0.0037)	(0.0018)

Note: Author's estimates using monthly matched samples from the CPS and LFS. Monthly transition probabilities are averaged annually. Samples include individuals aged 20 to 64 and exclude full-time armed force members. Standard Errors are in parentheses. All estimations are weighted.

non-participation. Unemployed workers have a higher chance of moving into the employed at work group in the US than in Canada, and during 2020, there is a significant difference of 4% average between the two countries. But in 2021, the US sees a decrease in the transition while Canada shows a slight increase. Perhaps, a more interesting finding is in the transitions from unemployed to the non-participant categories. There is a significant difference between the US and Canada in the flows from unemployed to the non-attachment group, with the US transition almost twice as high compared to Canada. There seems to be some connection with the literature where in the US, older workers tend to move into permanent retirement once they become unemployed. But the fact that, this transition in the US is two times higher than Canada is an unexpected finding. It seems workers in Canada tend to express more desire to return to employment even if they were not actively searching for a variety of reasons.

The transition averages are more significant around the employed absent group when workers transition from being absent to unemployed. The pandemic year, 2020, sees a spike in the average in both countries, for worker transitions from employed not working to unemployed. This transition remains slightly higher in 2021 compared to pre-COVID levels, and this is observed in both the US and Canada. In what appears to consistent with findings from Elsby et al. (2015), non-participants transitioning back into the labour force usually approach the unemployment pool first, and this is evident with the significantly high transition rates for both countries, compared to the non-attached group. What is interesting here is in the pandemic year 2020, the transitions from marginally attached to unemployment increased in both countries compared to pre-COVID levels. As discussed in some of the literature, there may be a very thin line between those classified as unemployed and the non-participants who remain attached. This is more likely in the case of furloughed workers being classified as non-participants, where they ended up not searching for new work as they expected recall, and so once, they become separated from their employers, they flow into unemployment. One other interpretation could be that, because marginally attached non-participants are discouraged from employment, there a high chance that they will first transition into the actively searching jobless state once they enter the labour force.

Finally, I present the transition probabilities between non-participation and the subsets of employment and non-employment in Table 4. The transitions from non-participation into employment is dominated by the flows into the employed working population. This transition is

Table 3 : Monthly Transition Probabilities - Unemployed (%) (Annually Averaged)

	US				Canada			
Transition from Unemployed to	2018	2019	2020	2021	2018	2019	2020	2021
Employed at Work	26.13%	25.83%	24.00%	22.92%	22.43%	23.67%	20.50%	21.86%
	(0.0080)	(0.0070)	(0.0133)	(0.0080)	(0.0169)	(0.0214)	(0.0205)	(0.0160)
Employed Absent	1.60%	1.76%	3.26%	1.89%	0.87%	0.86%	4.28%	1.91%
	(0.0020)	(0.0021)	(0.0051)	(0.0012)	(0.0009)	(0.0020)	(0.0093)	(0.0021)
Marginally Attached	7.56%	7.63%	7.74%	7.57%	6.65%	7.10%	9.69%	7.37%
	(0.0020)	(0.0022)	(0.0087)	(0.0027)	(0.0037)	(0.0034)	(0.0083)	(0.0037)
Non-Attached	15.82%	15.42%	12.62%	14.53%	8.64%	8.99%	7.96%	8.11%
	(0.0034)	(0.0047)	(0.0088)	(0.0055)	(0.0046)	(0.0034)	(0.0068)	(0.0044)
Transition to Unemployed from								
Employed at Work	0.86%	0.81%	2.08%	0.94%	0.99%	1.03%	1.90%	1.16%
	(0.0004)	(0.0005)	(0.0074)	(0.0006)	(0.0007)	(0.0008)	(0.0049)	(0.0014)
Employed Absent	2.62%	2.76%	8.13%	3.91%	1.63%	1.55%	5.09%	3.22%
	(0.0029)	(0.0030)	(0.0162)	(0.0052)	(0.0019)	(0.0016)	(0.0090)	(0.0032)
Marginally Attached	14.18%	14.62%	18.27%	15.50%	18.65%	18.65%	21.47%	19.63%
	(0.0053)	(0.0049)	(0.0104)	(0.0056)	(0.0098)	(0.0117)	(0.0114)	(0.0074)
Non-Attached	1.75%	1.85%	2.80%	2.41%	2.89%	3.19%	4.32%	3.79%
	(0.0005)	(0.0006)	(0.0026)	(0.0011)	(0.0010)	(0.0013)	(0.0038)	(0.0025)

Note: Author's estimates using monthly matched samples from the CPS and LFS. Monthly transition probabilities are averaged annually. Samples include individuals aged 20 to 64 and exclude full-time armed force members. Standard Errors are in parentheses. All estimations are weighted.

Table 4 : Monthly Transition Probabilities - Non-Participants (%) (Annually Averaged)

	US				Canada			
Transition from Non-Participation to	2018	2019	2020	2021	2018	2019	2020	2021
Employed at Work	6.36%	6.57%	6.16%	6.39%	4.04%	4.35%	5.02%	4.85%
	(0.0017)	(0.0016)	(0.0025)	(0.0021)	(0.0027)	(0.0031)	(0.0056)	(0.0032)
Employed Absent	0.59%	0.58%	0.82%	0.69%	1.20%	1.38%	2.71%	2.00%
	(0.0004)	(0.0005)	(0.0010)	(0.0004)	(0.0010)	(0.0011)	(0.0037)	(0.0012)
Temporary Unemployment	0.15%	0.15%	1.36%	0.41%	0.50%	0.53%	1.53%	0.72%
	(0.0001)	(0.0002)	(0.0035)	(0.0006)	(0.0015)	(0.0018)	(0.0038)	(0.0019)
Search Unemployment	2.42%	2.53%	2.96%	3.15%	4.06%	4.34%	5.86%	5.34%
	(0.0007)	(0.0008)	(0.0016)	(0.0010)	(0.0011)	(0.0013)	(0.0045)	(0.0024)
Transition to Non-Participation from								
Employed at Work	2.27%	2.27%	2.36%	2.22%	1.29%	1.30%	1.90%	1.33%
	(0.0008)	(0.0005)	(0.0025)	(0.0007)	(0.0013)	(0.0015)	(0.0040)	(0.0013)
Employed Absent	9.03%	9.42%	10.78%	9.91%	5.33%	5.32%	8.15%	7.05%
	(0.0054)	(0.0057)	(0.0050)	(0.0048)	(0.0033)	(0.0035)	(0.0052)	(0.0047)
Temporary Unemployment	14.56%	12.50%	14.66%	15.96%	10.94%	12.84%	18.82%	15.58%
	(0.0128)	(0.0091)	(0.0085)	(0.0074)	(0.0150)	(0.0139)	(0.0166)	(0.0170)
Search Unemployment	24.85%	24.72%	24.58%	23.36%	15.72%	16.55%	17.72%	15.67%
	(0.0039)	(0.0038)	(0.0164)	(0.0054)	(0.0060)	(0.0042)	(0.0132)	(0.0042)

Note: Author's estimates using monthly matched samples from the CPS and LFS. Monthly transition probabilities are averaged annually. Samples include individuals aged 20 to 64 and exclude full-time armed force members. Standard Errors are in parentheses. All estimations are weighted.

relatively higher in the US compared to Canada. Although it is expected for more people to reenter the workforce following COVID-19, the annual averages did not change much in 2020 and 2021, compared to the previous years. In flowing from outside the labour force back into it, there is a higher probability for these participants to first enter the search unemployed state than the temporary unemployed state. This is not surprising given the fact that the 'temporary' subset is relatively small compared to the Search subset within the unemployed state, and also given that non-participants usually look for new work first.

There are some heterogeneities among the subsets of the employed and unemployed as workers from these two states transition into non-participation. Absent workers are more likely to transition into non-participation than the at-work people, and this transition rate is significantly higher in the US. In Canada, the annual pre-COVID levels for transitions from absent to out of labour force average around 5% but in 2020, it increased to 8% and remained higher around 7% in 2021. One interpretation could be that in Canada, the share of absent workers who lost jobs during the pandemic and decided not to participation in the labour market anymore, are on the rise, and this could also explain the exodus of older workers from the labour market. Naturally, workers who lost jobs tend become discouraged and decide not to participate in the labour force anymore, and this can be seen in the high average transition rates from the two subsets of unemployed to the non-participation pool. Although transitions from temporary unemployed to non-participation underwent mild changes in the US, the change is more evident in Canada, where the probability increased to around 19% in 2020 from the 12% average in the pre-COVID period. The transition rate from search unemployment to out of the labour force is significantly higher in the US compared to Canada, while both countries showed very little change in the annual averages in response to COVID-19.

6. CONCLUSION

In this paper, I examine the similarities and differences of the COVID-19 pandemic effect on labour flows and transitions in both the US and Canadian labour markets. I compute these transitions using the longitudinal dimension of the CPS and LFS to obtain monthly flow estimates for comparison. The main focus of the study is to track changes across the transitions into subsets of the three main labour force states. Dividing employed, unemployed and non-participation into

smaller groups allow us to capture more heterogenous features of the flows and transitions in the two countries following the COVID-19 pandemic.

The empirical results suggest that there is a notable difference in the rate of recovery from COVID-19 in worker reallocations between the two labour markets. To summarize a few key findings: Flows into and out of employment are fairly similar while Canada is shown to have more volatile seasonal patterns. The US has higher aggregate flow rates into and out of unemployment, while Canada sees a larger shift in the non-participation flows following COVID-19. Notably, transitions from temporary unemployed to employed have been lower recently in the US compared to pre-COVID levels. The probability of unemployed workers flowing into non-participation, without any desire to return to the labour force, is significantly higher in the US, almost double the Canadian rate. In both countries, the share of transitions from marginally attached group to participation dominate the non-attached share in the non-participation category. The US also exhibits higher transition rates from the unemployed subsets to non-participation compared to Canada, in both pre-COVID and current levels.

Although it has only been two years since the COVID-19 outbreak, the results suggest that changes in the worker reallocation behaviors in the US and Canada contribute accordingly to the differences in their recovery phases. Going forward, further analysis such as decomposition of flows and transitions could provide more insight into the ongoing shifts in the dynamics of the worker mobility patterns in the two labour markets.

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A. APPENDIX

A1. Flows and Transitions Computations

Aggregate Flow Rates

Labor market flows are computed using panel datasets constructed from monthly samples of the CPS and LFS. The formulas for inflow and outflow rates are given as follows:

$$Inflows_t = \frac{\sum_i w_{i,t-1}\, I(\, X_{i,t-1} = 0,\ X_{i,t} = 1\,)}{\sum_i w_{i,t-1}\ I(\, X_{i,t-1} = 1\,)},$$

$$Outflows_t = \frac{\sum_i w_{i,t-1}\, I(\, X_{i,t-1} = 1,\ X_{i,t} = 0\,)}{\sum_i w_{i,t-1}\ I(\, X_{i,t-1} = 1\,)}.$$

$X_{i,t}$ is a dummy variable taking on a value of one if the individual *i* is in labor force status 'X' at period *t*, and zero otherwise. *I* is the indicator function which takes the value of one when the expression in parentheses is true, and zero otherwise. $w_{i,t}$ represents the survey weights of individual *i* in period *t*.

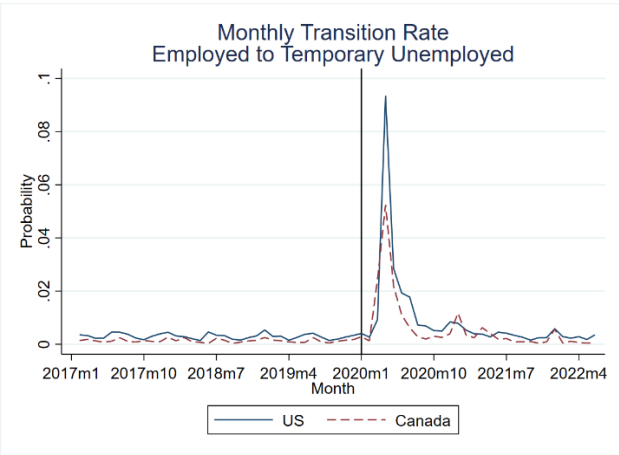
Transitional Probabilities

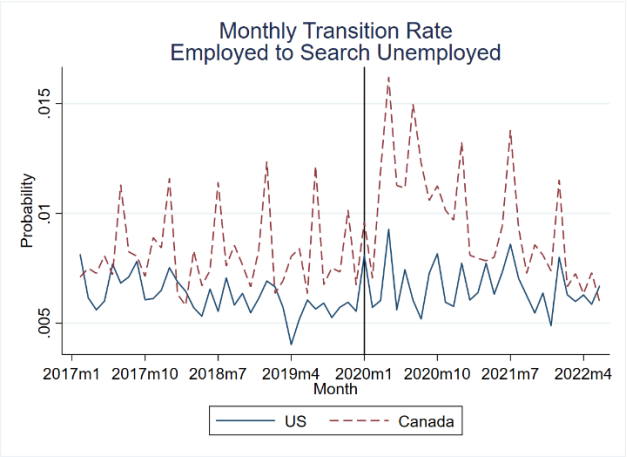
Transitional probabilities are calculated in the same way as flow rates are calculated. However, one slight difference is that, here, the outcome is the probability of an individual transitioning from labor force status 'X' to a different status 'Y'. Thus, the indicator function *I* takes on the value of one if an individual was in X state at period *t-1* and successfully transitions to Y state at period *t*. The transition rate formula is given as follows:

$$Transition\ Rate_t = \frac{\sum_i w_{i,t-1}\, I(\, X_{i,t-1}=1, Y_{i,t}=1\,)}{\sum_i w_{i,t-1}\, I(\, X_{i,t-1}=1\,)}.$$

A2. Figures

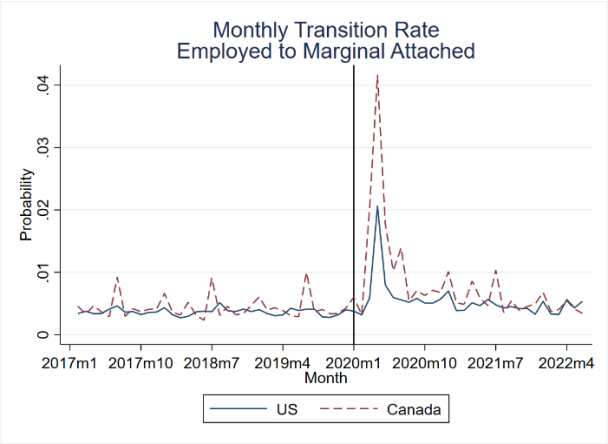
A2.1 : Transitions from employed to subsets of unemployed

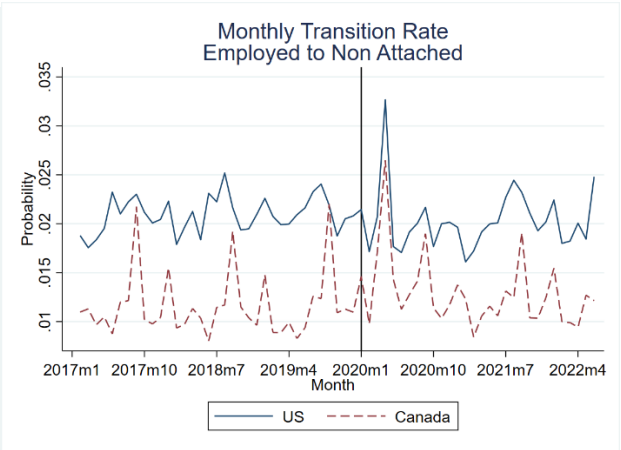




Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

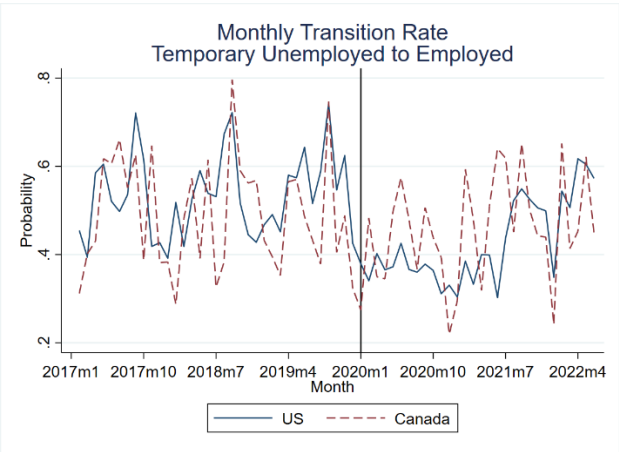
A2.2 : Transitions from employed to subsets of non-participation

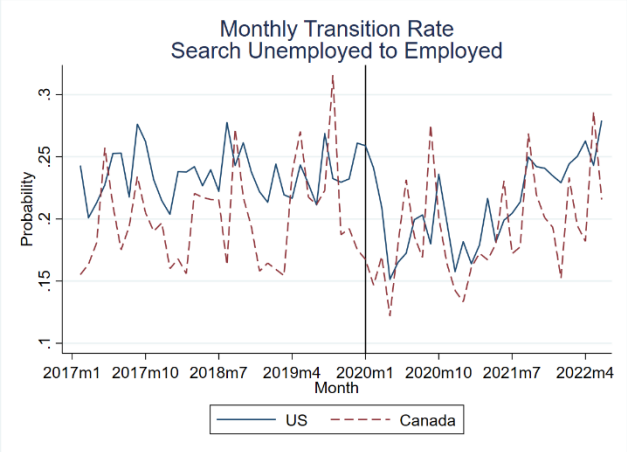




Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

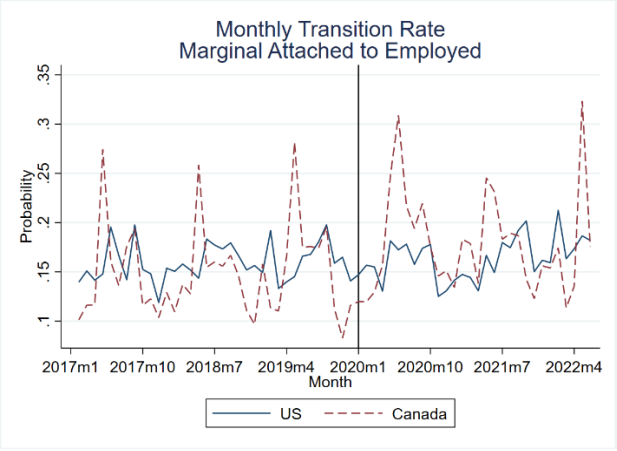
A2.3 : Transitions from subsets of unemployed to employed

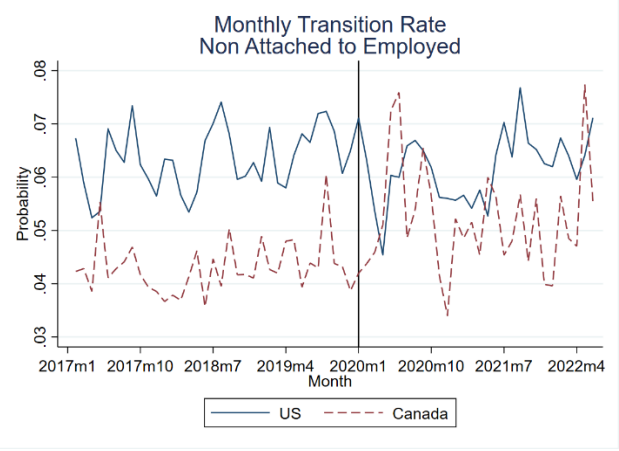




Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

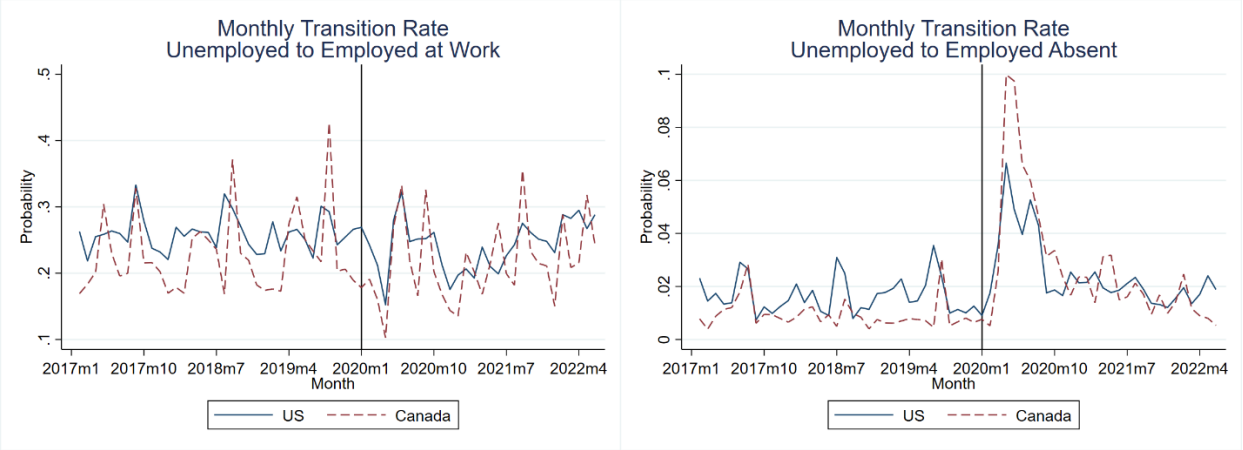
A2.4 : Transitions from subsets of non-participation to employed





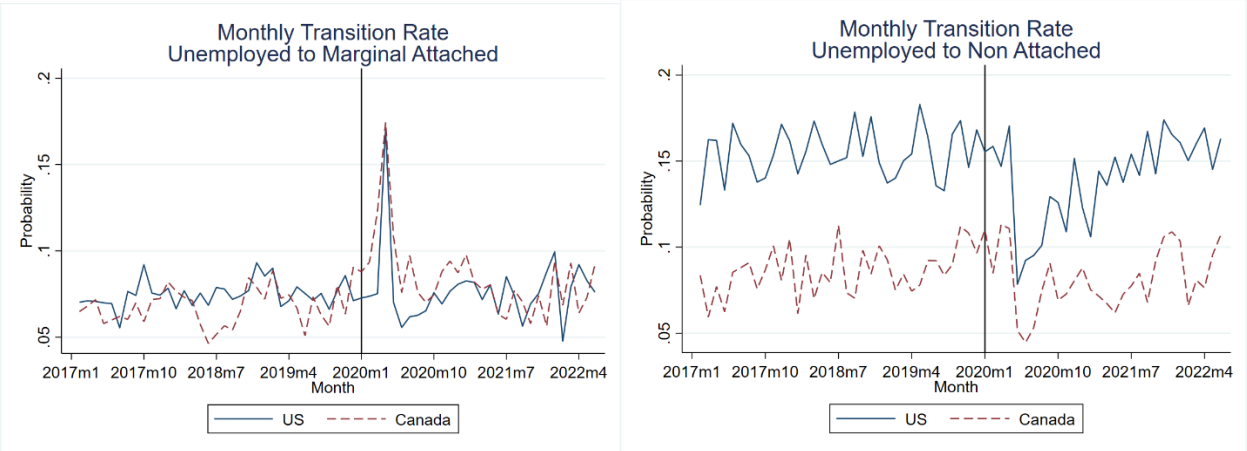
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.5 : Transitions from unemployed to subsets of employed



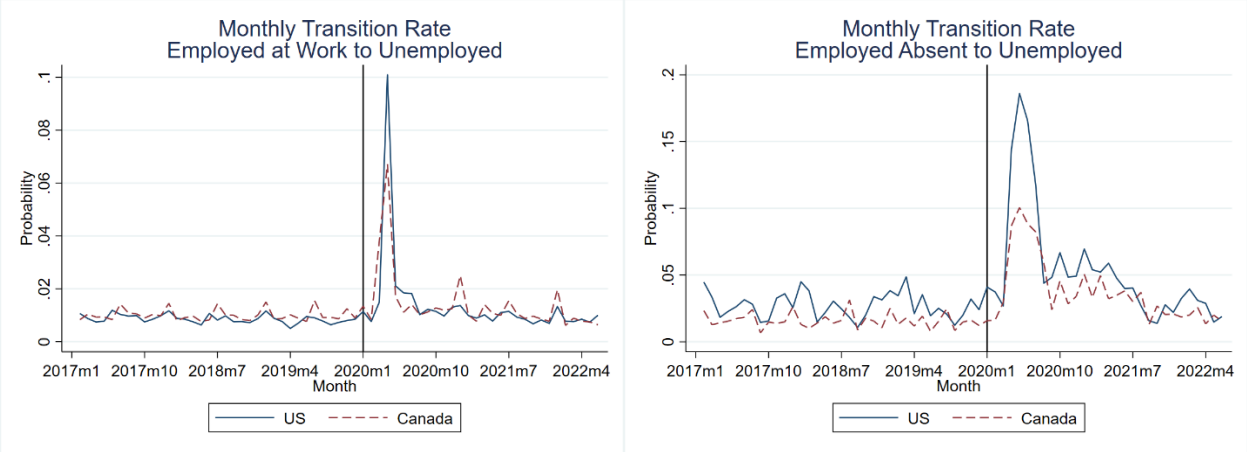
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.6 : Transitions from unemployed to subsets of non-participation



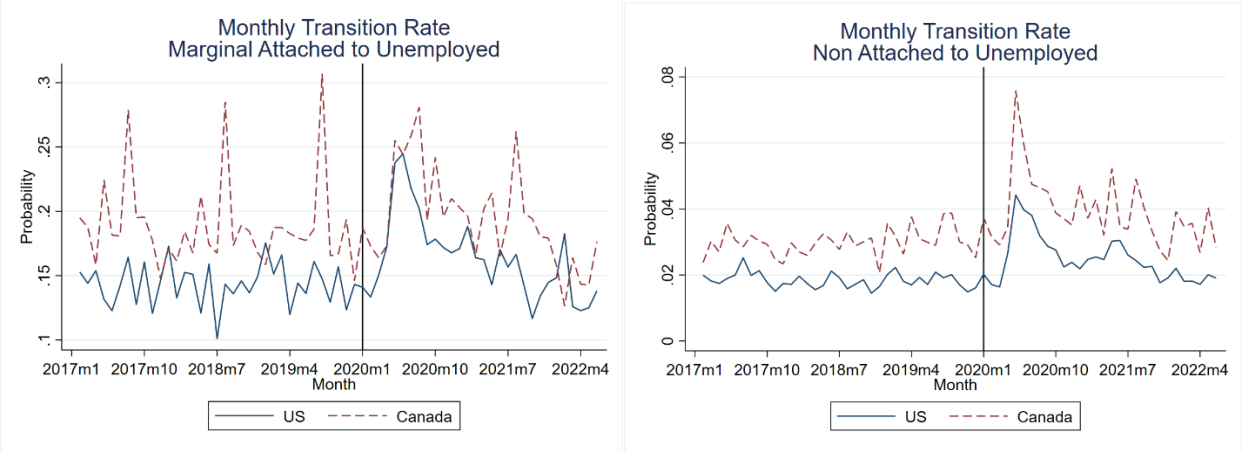
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.7 : Transitions from subsets of employed to unemployed



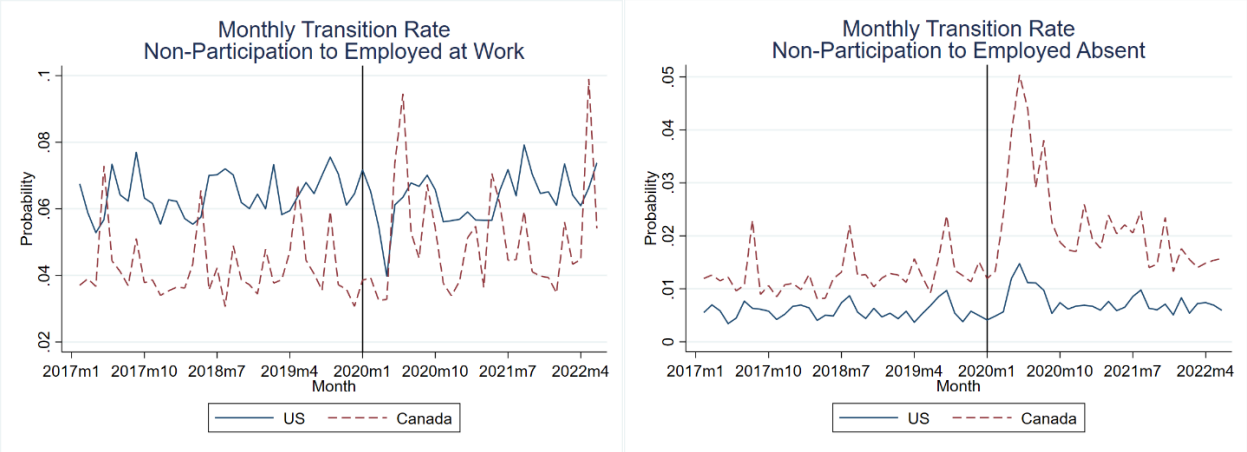
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.8 : Transitions from subsets of non-participation to unemployed



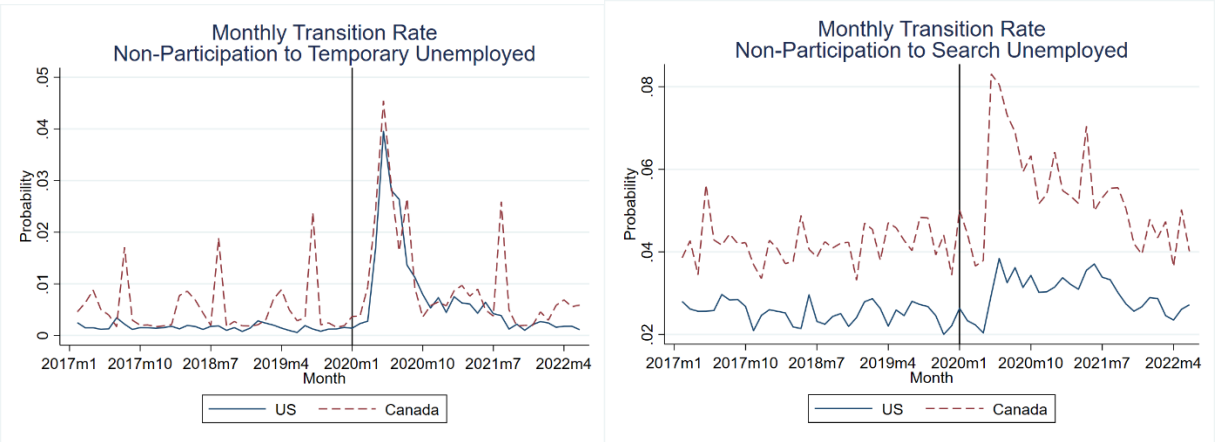
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.9 : Transitions from non-participation to subsets of employed



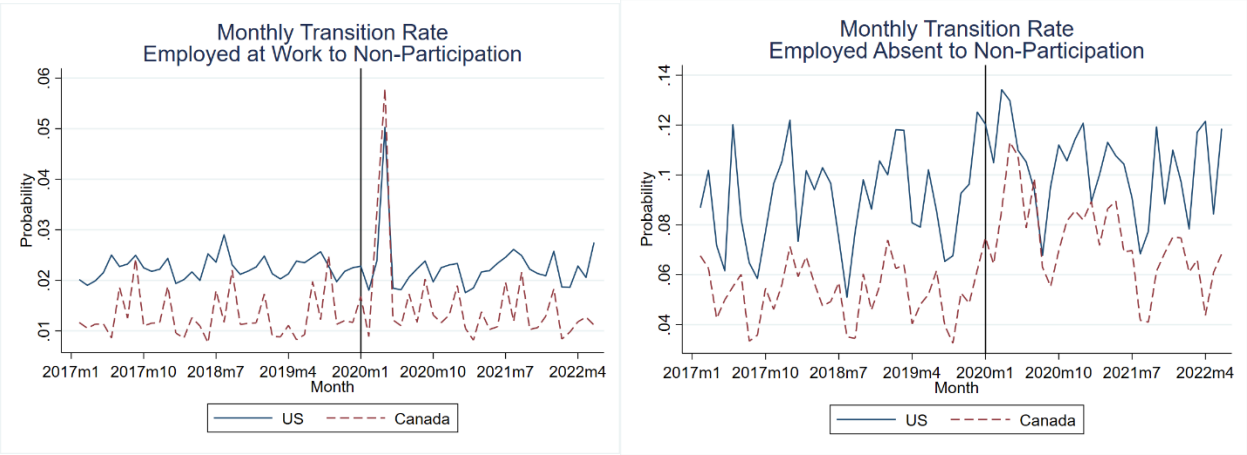
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.10 : Transitions from non-participation to subsets of unemployed



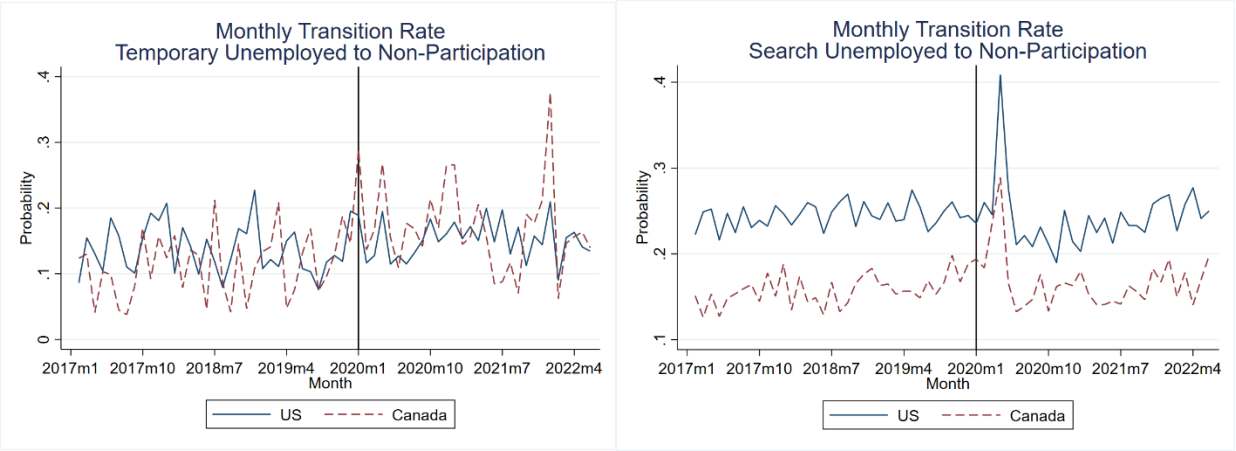
Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.11 : Transitions from subsets of employed to non-participation



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.

A2.12 : Transitions from subsets of unemployed to non-participation



Note: Author's estimates using monthly matched samples from the CPS and LFS. Samples include individuals aged 20 to 64 and exclude full-time armed force members. All estimations are weighted. The left side of the vertical line in the figure represents the pre-COVID period in the analysis.