Working Income Tax Benefits, Minimum Wage, and Employment Transitions of Low-Skilled Workers: Evidence From Canada

Ratzanyel Rincón*
Vancouver School of Economics, University of British Columbia

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Abstract. This paper examines how the Workers Income Tax Benefit (WITB) —now called Canada Workers Benefit— and its interaction with the minimum wage affect the labour market transitions for low-skilled workers using Canadian data from 1979 to 2022. Exploiting provincial variation on the maximum real tax credit and real minimum wage rates, I find that higher WITB benefits are associated with lower separation and layoff rates of single-type workers with short job tenure, while the interaction between the WITB and the minimum wage mitigates these effects. Positive effects led by the WITB are found for hiring rates of single-type teenagers, young adults, and recently unemployed people, but the overall impact of the maximum benefits on singles' transition rate from out-of-the-labour force to in-the-labour force is negative. In contrast, family-type workers reduce their job-to-job transitions and increase their flow from out-of-labour force to in-labour force as the maximum WITB benefits increase. Importantly, the interaction between the two policies negatively affects the hiring rate of this group. Overall, these results indicate that the effects of the interaction between the WITB and the minimum wage counterbalance the direct effects of the WITB, and suggest that WITB benefits are insufficient to cover the associated costs of entering the workforce for some individuals in the target population.

Keywords. Wage subsidies, minimum wage, turnover.

JEL Classification: H24, J22, J38, J63.

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1. Introduction

There is a broad set of policies aimed at supporting low-income individuals and families, but they tend to be studied individually in the literature (Baker *et al.*, 2023; Bastian, 2020; Cengiz *et al.*, 2019; Chetty *et al.*, 2013; Eissa and Hoynes, 2006). In fact, there are good reasons to analyze their interaction. A prime example is a wage or earnings subsidy like the Earned Income Tax Credit (EITC) in the US and the Working Tax Credit (WTC) in the UK.[1] Nichols and Rothstein (2015) and Rothstein and Zipperer (2020) argue that because of potential tax incidence effects, the minimum wage could complement such programs, preventing employers from reducing wages and capturing part of the benefits directed to the target population. So, to properly assess the value of these policies as redistributive tools, we need first to understand how they interact and quantify the distortions they create in the labour market.

In this article, I analyze the effects of wage subsidy programs on labour market transitions of low-skilled workers and examine how these effects change under different minimum wage regimes. I focus on Canada, where the cross-province variation in both the minimum wage and the parameters of the wage subsidy program makes it an ideal setting for studying the interaction between these two policies. More precisely, I study the Workers Income Tax Benefit (WITB), a refundable tax credit introduced by the Canadian federal government in 2007. Similar to the EITC and WTC, the WITB aims to support low-income workers and incentivize insertion into the labour force by reducing the welfare wall faced by socially assisted people (Department of Finance, 2007). Even though WITB benefits were small initially, the parameters of the WITB were substantially enhanced in 2019 when the program was renamed the Canada Workers Benefit (CWB) (Department of Finance, 2018; Milligan, 2018). That year, the government distributed more than two billion Canadian dollars to over two million beneficiaries (Canada Revenue Agency, 2020). Starting in July 2023, automatic advance payments to potential CWB recipients will be delivered, easing access to the program and reflecting the government's interest in consolidating the CWB as a pillar of the Canadian safety net.[2]

To shed light on this question, I use the (non-public) master files of the Canadian Labour Force Survey (LFS) from 1979 to 2022, data on the yearly maximum refundable tax credit provided by the WITB and CWB (WITB hereafter), and monthly provincial minimum wage

[1]See Table 3 in Nichols and Rothstein (2015) for a list of similar programs in the OECD.

[2]As Baker *et al.* (2023) noted, there is limited evidence about the consequences of the WITB on the Canadian labour market. Scarth and Tang (2008) calibrate a two-factor model with low-skilled and internationally mobile capital to simulate and compare the WITB with an employment subsidy. Their simulation results yield similar effects for both policies, where the WITB decreases the unemployment rate and increases the average income of low-skilled workers. More recently, Annabi *et al.* (2013) analyze the effects of the WITB on labour supply, GDP and the income distribution using a general equilibrium microsimulation model. The authors find that the WITB increases the labour market participation of low- and medium-skilled single and lone-parent families. Finally, using a DID design, Hasan (2013) explores how the WITB affects eligible individuals' extensive and intensive margin decisions. He documents that, for singles without children below 19 and who are not full-time students, being in the eligible age range for the program is related to an increase in their probability of being employed (by up to 2 pp) and their hours of work per week (by up to 40 min).

rates. Importantly, the LFS offers a unique feature to study turnover. It contains a job tenure question that enables me to measure monthly employment transitions consistently since 1979. I follow Brochu and Green (2013), and compute the separation, quit, layoff, job-to-job, and hiring monthly rates of low-educated workers aged 19-59, covering the relevant part of the labour market for the WITB and the minimum wage policy. I also examine transitions in and out of the labour force, the growth of average hours of work per week, and average hourly earnings of these workers. Since the WITB benefits vary by family structure, I separately analyze two subsamples, one including only single people without eligible dependents, and the other including married, common law, or lone parents with eligible dependents. I use a DID research design with continuous treatment and different treatment timing, combining provincial variation across time on WITB real maximum benefits and real minimum wage rates to identify the effect on transition rates derived from the interaction between the two policies. My baseline econometric specification is a two-way fixed effects regression of the transition rates on the log of the maximum real WITB benefits, the log of the real minimum wage, their interaction, and other controls I explained below.

I find that the interaction between the maximum WITB benefits and the minimum wage is positively correlated with the separation rates of single workers with short job tenure and young family-type workers aged 15-18. This positive association attenuates the direct negative effect of the WITB on the corresponding separation rates. Among singles, women and young adults with job tenure lower than one year or six months are the most affected groups. A similar relationship is found between the layoff rate of single workers with short job tenure and the interaction of the two policies. As before, this positive effect offsets the negative impact of the WITB on the corresponding layoff rate. Conversely, for both family structures, the log average hourly earnings of low-skilled workers show a negative correlation with the interaction of the two policies, reducing the positive direct effect of the WITB on this outcome. The interaction term is also negatively related to the hiring rate of family-type individuals, where the effect on men is almost twice as large as for women. Overall, these results suggest that the effects of the interaction between the WITB and the minimum wage counterbalance the direct effects of the WITB.

Results in which the interaction term shows no significant effects also uncover interesting patterns. For instance, the transition rate from out-of-the-labour force to in-the-labour force of singles, especially their transition rate into unemployment, is negatively affected by the wage subsidy. In contrast, I document that higher WITB benefits are associated with an increase in family-type individuals' flows from outside to inside the labour force. Furthermore, the maximum WITB tax credit exhibits a positive association with the hiring rates of single-type teenagers, young adults, and recently unemployed individuals, but it induces a decline in family-type workers' job-to-job transitions. Lastly, regardless of family structure, there is no evidence that the WITB, or its interaction with the minimum wage, modify low-skilled workers' quitting behaviour, employment transitions to out-of-the-labour force, or intensive margin decisions.

The previous findings suggest that, for singles, the incentives provided by the wage subsidy contribute to achieving a more stable employment equilibrium for recently hired workers and promote the integration into employment of individuals with short unemployment spells. They also reflect that low-skilled workers with families decrease their job-to-job mobility in response to the decline in their hiring rate associated with high WITB benefits and high minimum wage regimes. However, unlike family types, the program's benefits are insufficient to cover the associated costs faced by a single-type individual who aims to enter the labour force but has been unemployed for an extended period.

Focusing on the effects on flows from outside to inside the labour force, I show that the baseline results for this transition rate are robust to dummying out the COVID-19 period and including a one-year lag of the maximum WITB real benefits instead of the contemporary maximum tax credit. In addition, I present a falsification test using a sample of highly educated individuals, finding no significant impacts of the WITB or its interaction with the minimum wage on their transition patterns into the workforce. On the other hand, when examining the labour supply response of single mothers, I document a stronger positive correlation between their flows from outside to inside the labour force and the WITB. In this case, the effect of the interaction between the two policies is statistically significant and also points in the opposite direction to the WITB effect.

The contribution of the paper is three-folded. First, by analyzing the WITB effects on the monthly labour market transition rates of potential beneficiaries, I complement the literature studying the impact of targeted tax credit programs on labour force participation (Chetty *et al.*, 2013; Eissa and Hoynes, 2006; Gregg *et al.*, 2009; Yang, 2018). One of the most studied policies in this literature is the EITC in the US, where the consensus used to be that the program effectively incentivizes single mothers to enter the labour market (Nichols and Rothstein, 2015). However, recent evidence has raised doubts about the EITC-related supply expansion for this group (Kleven, 2023). Secondly, I contribute to the discussion on the employment effects of the minimum wage and its interaction with tax policy (Lee and Saez, 2012; Rothstein and Zipperer, 2020) by documenting how the marginal employment effects of the WITB vary with respect to the provincial minimum wage. For the US, Neumark and Wascher (2011) find that high minimum wage regimes enhance the effects associated with the EITC on single mothers' employment and earnings, but the two policies can also lead to adverse effects on labour market outcomes of less-skilled men and women without children, highlighting the possibility of heterogeneous effects across diverse groups.

Lastly, the findings uncovered in this article speak also to the literature on the determinants of low-skilled workers' employment transitions (Wilson, 2020; Brochu *et al.*, 2023; Dube *et al.*, 2016). Here, a closely related article is Brochu and Green (2013), in which the authors explore quits, layoffs, and hires dynamics in Canada from 1979 to 2008 and document an interesting equilibrium where high minimum wage regimes are related to more job security (lower quit and layoff rates) but fewer new workers (lower hiring rates). The main difference between our studies is that they focus on the direct impact of minimum wage using a time period that covers only two years after the WITB was introduced, whereas the present study focuses on the effects of the WITB and its interaction with the minimum wage and analyzes sixteen years of data after the introduction of the WITB.

The rest of the paper is structured as follows. Section 2 describes the WITB program and revise its potential effects through the neoclassical framework. Section 3 describes the data, and section 4 explains the empirical strategy and provides the main results of the paper. Finally, section 5 concludes. Appendix A provides additional results for the group of single mothers.

2. WITB Background and Theoretical Implications

2.1. *Program Description*

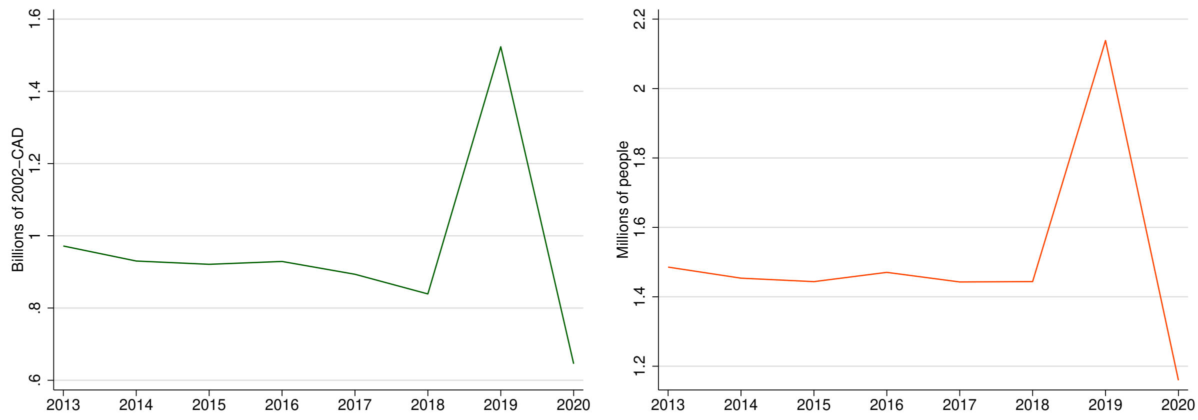
The Working Income Tax Benefit (WITB) was introduced in 2007 by the Canadian federal government to support low-income workers through a refundable tax benefit with the objective of strengthening their incentives to stay employed, encouraging individuals to enter the workforce, and lowering the welfare wall –the reduction in after-tax resources derived from entering the workforce– for socially assisted families (Department of Finance, 2007; Scarth and Tang, 2008). Single individuals, couples, and lone-parent families could apply for WITB benefits provided that their annual income tax return reflects employment income above 3,000 CAD, adjusted family net income below a given upper bound, and they meet the following eligibility conditions (He and Fox, 2019):

1. being 19 years of age or older, or under the age of 19 but with a spouse or common-law partner or eligible dependent,
2. being a Canadian resident for income tax purposes,
3. not being a full-time student or have been in prison for 90 days or more during the year.[3]

For the 2019 tax year, the federal government modified the WITB parameters, enhancing its benefits and renaming it as the Canada Workers Benefit (CWB). Compared to the WITB, the CWB substantially increased the maximum tax credit a worker can receive and the income level at which the benefits are phased out. It also improved the program's scope by automatically determining whether tax filers are eligible to get the benefits (Department of Finance, 2018). As a result, the take-up rate of the program (among tax filers) was increased from 95% in 2015 to 100% in 2019 (Office of the Auditor General of Canada, 2022).

Figure 1 shows the assessed credit (in real terms) and the number of beneficiaries by the program between tax years 2013 and 2020. Before its enhancement in 2019, the real spending on the WITB displays a decreasing trend, going from almost one billion in 2013 to 840 million of 2002-CAD in 2018, a reduction equivalent to 14%. In contrast, the introduction of the CWB increased the cost of the policy by 82% between 2018 and 2019, transferring

[3]Eligible dependents are own or spouse's or common-law partner's child under 19 years old that are not eligible for the WITB but live with an eligible person throughout the year.



(A) Real spending (B) Number of recipients

FIGURE 1. WITB and CWB coverage between tax years 2013 and 2020.

Notes: This figure reports the WITB-CWB yearly real spending (in billions of 2002-CAD), and the corresponding number of beneficiaries (in millions), from tax year 2013 to tax year 2020. *Source:* Canada Revenue Agency (2020).

more than 500 million extra of 2002-CAD to low-income workers in 2019.[4] However, the decline in the number of CWB recipients in 2020 due to the COVID-19 pandemic severely affected the amount assessed that year. On average, 1.5 million people benefited each year from the WITB and CWB between 2013 and 2020, with 2019 and 2020 being the years with the largest (2.1 million recipients) and the smallest (1.2 million recipients) coverage, respectively. These numbers imply an average real tax credit of 630 2002-CAD during this period.

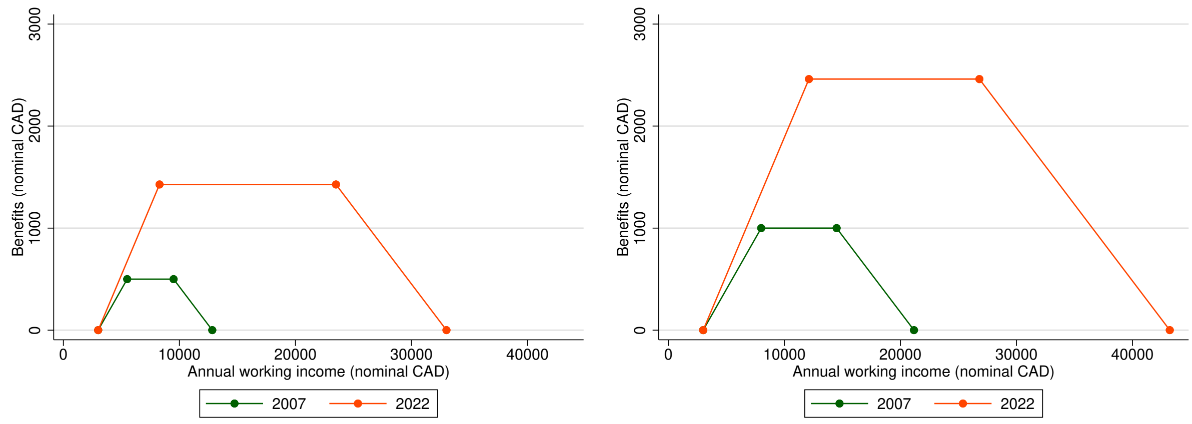
Similar to the Earned Income Tax Credit (EITC) in the US, the WITB and CWB benefits follow a trapezoidal shape with respect to working income, characterized by the phase-in, plateau, and phase-out stages.[5] However, unlike its US counterpart, the maximum tax credit provided by the WITB and CWB varies by family structure rather than number of children in the household. The two main family structures used by most provinces are *singles* and *families*, where the former encompasses single persons without eligible dependents and the latter covers married or common-law couples with or without eligible dependants and single parents with eligible dependents.[6]

Figure 2 depicts the nominal benefits schemes adopted by most provinces in 2007 and 2022 as a function of (nominal) employment income and family type. As the green line of panel A shows, the phase-in of the 2007-WITB offered single individuals a 20% tax credit for each dollar over 3,000 CAD until they reached the maximum benefit of 500 CAD at a

[4]In terms of total monetary transfers, the CWB is still small compared to other Canadian social programs. For instance, in the 2019 tax year, the Canada Child Benefit (CCB) delivered more than 25 billion CAD, whereas CWB assessed only 2 billion CAD.

[5]Strictly speaking, the phase-in of the benefits depends on working income, whereas the adjusted family net income (including employment income and other sources of earnings minus deductions like childcare expenses or universal child care benefits) determines the phase-out.

[6]Quebec is the only province that has specified different benefits for families with children, families without children, single individuals with children, and single individuals without children.



(A) Singles

(B) Families

FIGURE 2. WITB and CWB benefits for the 2007 and 2022 tax years by family structure.

Notes: This figure displays the structure of the WITB and CWB benefits (in nominal CAD) for singles and families adopted by most provinces on tax years 2007 and 2022. Quebec and British Columbia follow a different WITB scheme in 2007, and Alberta and Quebec also use different CWB parameters in 2022. *Source:* Canada Revenue Agency's archived T1 tax forms.

working income of 5,500 CAD. After that point, single workers kept receiving the maximum benefits along the plateau until their employment income exceeded 9,500 CAD, where the phase-out stage started. For each dollar above 9,500 CAD, the maximum benefit was then reduced at a 15% rate, and benefits entirely fade out at 12,833 CAD. The program renewal resulted in single workers facing a higher phase-in rate (27%), maximum benefit (1,428 CAD), and phase-out endpoint (33,015 CAD) in 2022, representing a growth of 110% in the maximum real refundable amount from 2007 to 2022.

On the other hand, panel B in Figure 2 illustrates that more financial aid is provided to family-type workers, where the maximum benefits and phase-out endpoints are almost twice as large as the parameters for single individuals. However, the growth (in real terms) of families' maximum refundable tax credit between 2007 and 2022 is lower (81%). To put a simple example, in the province of Saskatchewan, a full-time worker in a lone-parent family earning the 2022 minimum wage would get an annual income of 27,040 CAD (13 CAD per hour × 40 hours per week × 52 weeks per year), positioning the family income at the beginning of the phase-out stage of the CWB benefits. In contrast, a similar family where the head of the household works part-time would earn 20,280 CAD (13 CAD per hour × 30 hours per week × 52 weeks per year) annually, entitling them to access the maximum refundable tax credit provided by the program in that year.

Although the WITB and CWB are federal programs, provinces and territories are allowed to modify their parameters to fit their social safety systems better. In particular, Alberta, British Columbia, and Quebec have made province-specific changes to the program's design (Department of Finance, 2018), leading to annual provincial heterogeneity in the maximum refundable tax credit. I exploit province-time variation in this parameter to identify the effect of the WITB and CWB on low-skilled workers' employment transitions, so in Section

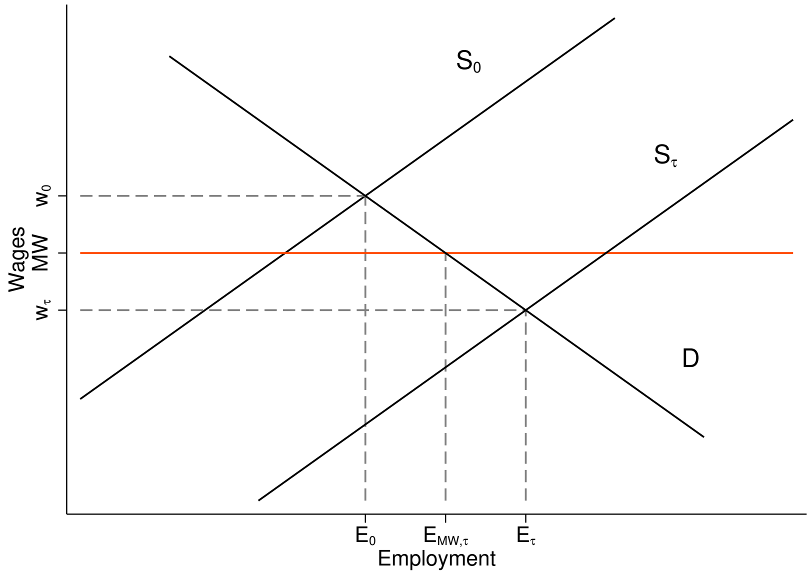


FIGURE 3. Interaction between the WITB and minimum wage in the Neoclassical Model.

Notes: This figure illustrates how employment and wages change in equilibrium in the presence of the WITB and the minimum wage using a static neoclassical model. *Source:* Rothstein and Zipperer (2020).

3 I provide further details about this variable. Also, from now on, I will refer to the WITB as a general program implicitly encompassing the CWB unless otherwise stated.

2.2. *Theoretical Predictions and Interaction with the Minimum Wage*

The neoclassical model of labour supply and demand shown in Figure 3 has been used in the literature as the workhorse framework to illustrate the potential effects of supply-oriented wage subsidies like the WITB (Rothstein, 2010; Neumark and Wascher, 2011; Rothstein and Zipperer, 2020). In such a model, the incentives derived from the refundable tax credit induce a supply expansion (S_0 to S_τ) in the labour market of low-skilled workers, leading to a decrease in the equilibrium wage (w_0 to w_τ) and an increase in employment (E_0 to E_τ).[7] Importantly, the subsidy burden borne by workers will then depend on the elasticities of supply and demand since the wage reduction prevents them from fully capturing the program's benefits and allows employers to grab a portion of the credit spending. In this scenario, a binding minimum wage (orange line) complements the tax credit by constraining employers' ability to reduce wages and thus reallocating a higher share of the benefits to the workers. Nevertheless, a high minimum wage also limits job opportunities for low-skilled workers due to higher costs faced by employers, reducing the equilibrium amount of employment ($E_{MW,\tau} < E_\tau$).

[7]The increase in labour supply associated with the WITB can be rationalized by analyzing the individual optimal decisions of people outside the labour force. For these individuals, the introduction of the WITB modifies their budget constraint in such a way that some of them would change their optimal number of hours of work, from zero to a positive amount, drawing them into the labour market.

In what follows, I formalize these ideas in the WITB context using the model developed in Nichols and Rothstein (2015) and derive testable predictions that will serve as a reference point while interpreting the empirical results. Let w be the pre-tax wage rate in the labour market for low-skilled workers and denote by $\tau \in [0,1]$ the WITB subsidy rate for each dollar earned. I assume that all workers in this market are eligible and receive the wage subsidy, and their labour supply depends on post-subsidy wage $(1+\tau)w$ as follows

$$S_\tau = \alpha((1+\tau)w)^\sigma,$$

with $\alpha, \sigma > 0$, and σ denoting the labour supply elasticity. Similarly, I consider a labour demand given by

$$D = \beta w^{-\eta},$$

with $\beta, \eta > 0$, and $-\eta$ representing the labour demand elasticity. Notice that these isoelastic demand and supply functions correctly replicate the right shift in supply illustrated in Figure 3 after the WITB introduction. According to this model, the wage rate and employment level of equilibrium are

$$w_\tau = \left(\frac{\beta^{\frac{1}{\sigma}}}{\alpha^{\frac{1}{\sigma}}(1+\tau)}\right)^{\frac{\sigma}{\sigma+\eta}}, \tag{1}$$

and,

$$E_\tau = \left(\beta^{\frac{1}{\eta}}\alpha^{\frac{1}{\sigma}}(1+\tau)\right)^{\frac{\sigma\eta}{\sigma+\eta}}. \tag{2}$$

Condition (1) implies that $w_\tau < w_0$, whenever there is a positive subsidy rate. Furthermore, worker's total earnings without the WITB (w_0), with the WITB ($(1+\tau)w_\tau$), and with the WITB but without a reduction in wages ($(1+\tau)w_0$), are related as follows

$$w_0 < (1+\tau)w_\tau < (1+\tau)w_0.$$

I.e., in monetary terms, low-skilled employees are better off with the WITB than without it, but they would have been way better if wages had not been adjusted downwards.

The reason behind this result is that employers capture a portion $\frac{\sigma}{\sigma+\eta}$ from the benefits so that recipients only receive a fraction $\frac{\eta}{\sigma+\eta}$ for each dollar spent on the program (Nichols and Rothstein, 2015). In this model, the ratio between the elasticities of demand and supply $\left(\frac{\eta}{\sigma}\right)$ determines who benefits the most from the refundable tax credit, where the agent with the more elastic response usually bears less of the incidence of the subsidy. For instance, employers capture all the benefits under a perfectly elastic supply and an elastic demand ($\sigma \to \infty$ and $\eta > 0$), whereas the workers' share is equal to one under a highly inelastic supply and an elastic demand ($\sigma \to 0$ and $\eta > 0$).

Now, let's consider a minimum wage rate equal to MW. In the non-binding case ($MW < w_\tau$), all the equilibrium quantities remain the same. On the other hand, if the policy is binding ($MW > w_\tau$), each worker would increase her total earnings by $(1+\tau)(MW - w_\tau)$, reducing the amount captured by employers. The trade-off here is that the employment of equilibrium would be reduced from E_τ to $E_{MW,\tau}$ $(= \beta MW^{-\eta})$ as a consequence of the cost increase faced by employers. Therefore, in the presence of the WITB, the neoclassical model predicts that provinces with high binding minimum wage regimes will experience relatively higher wages and lower employment levels for low-skilled workers than provinces implementing low non-binding minimum wage rates. In other words, the marginal effect of a WITB expansion on employment is non-increasing on the minimum wage, and the marginal effect of a WITB expansion on wages is non-decreasing on the minimum wage. Even though these neoclassical implications are silent about low-skilled workers' turnover (since the model is static), they can be used to infer that an active WITB policy combined with a movement from a low to a high minimum wage regime will lead to a rise in the separation rate, and a decline in the hiring rate in the short-run.

Yet, the neoclassical framework has several limitations that affect the extent to which these conclusions can be extrapolated to the real world. First, the decrease in employment derived from a larger minimum wage rate is not empirically supported in the literature in general (Cengiz *et al.*, 2019; Card and Krueger, 1994; Green, 2015). Secondly, the model relies on the assumption that the wage subsidy induces a right shift in the supply of low-skilled workers, but the EITC literature suggests that, in the best scenario, only a subgroup of the target population (single mothers) increases their labour force participation due to the programs' incentives (Nichols and Rothstein, 2015; Kleven, 2023). Lastly, potential recipients might face frictions like unawareness or difficulties in issuing taxes that hinder the claim of benefits, making the perfect take-up assumption unrealistic.

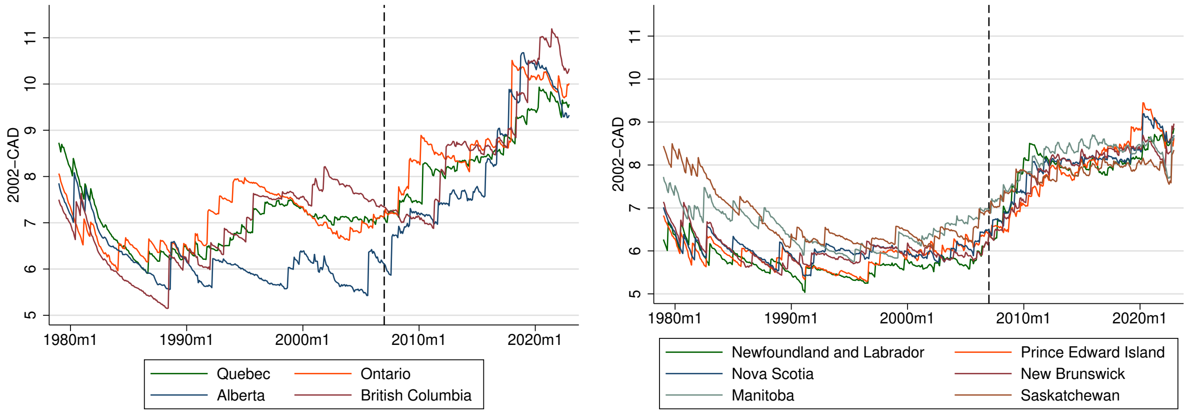
3. Data

This section presents the three main data sources used in the empirical analysis. I first describe the provincial minimum wage data, followed by an overview of the WITB data, and finally, I go over the Canadian LFS and how the transition rates are constructed from the survey.

To obtain the first key independent variable of the study, I take the hourly provincial minimum wage rates reported by the federal government from January 1979 to December 2022 and deflate them by the province-specific Consumer Price Index (with 2002 as the base year).[8] This dataset covers a total of 314 nominal minimum wage changes across the ten provinces, with an average increase (in nominal terms) of 5.2%, a median of 4%, and a maximum rise of 23% occurred in British Columbia in July 1988.

Figure 4 displays the provincial variation in the real minimum wage between 1979 and 2022, where, in general, the largest provinces in terms of area (Quebec, Ontario, Alberta, and British Columbia) exhibit more heterogeneity and higher minimum wage rates than the smallest provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, Manitoba, and Saskatchewan). Throughout the analyzed period, the average

[8] In months with a minimum wage change, the value that prevails is the one in force until the 15th of the month.



(A) Largest provinces

(B) Smallest provinces

FIGURE 4. Monthly real minimum wage rates by province in Canada between 1979 and 2022.

Notes: This figure shows the evolution of the monthly provincial real minimum wage rates (in 2002-CAD) from January 1979 to December 2022, reporting the value in force until the 15th of each month. The dashed line indicates the year of the introduction of the WITB. *Source:* Government of Canada minimum wage database.

real value of the minimum wage grew 22% in the largest provinces, going from 8 to 9.8 2002-CAD per hour. In contrast, in the smallest provinces, the corresponding growth was only 20%, jumping from 7.2 to 8.7 2002-CAD per hour.

Furthermore, the real minimum wage rates in the smallest provinces exhibit a U-shaped pattern between 1979 and 2011, followed by a steady behaviour around 8 2002-CAD per hour until the onset of the COVID-19 pandemic in 2019, where they decreased about one 2002-CAD per hour. By the end of 2022, the minimum wage had not yet fully recovered its pre-pandemic real value in most of these provinces. In contrast, the largest provinces show less similar behaviour over time. For instance, between 2005 and 2010, British Columbia experienced a steady decline in its real minimum wage, while Ontario kept raising the real value of its minimum wage during this period. Lastly, as highlighted by the dashed vertical lines in panels A and B, the WITB was introduced when the real minimum wage in the smallest provinces was around 6.6 2002-CAD and was undergoing a rising pattern, whereas the largest provinces adopted the wage subsidy policy under a decreasing/flat trend at an average real value of 6.9 2002-CAD.

The second explanatory variable comes from one of the WITB parameters: the maximum real refundable tax credit per year. As mentioned in Section 2, the federal government suggests a baseline amount for the program's maximum benefits but gives the provinces the opportunity to modify this parameter according to their particular needs. For each year between 2007 and 2022, I collect data on the maximum refundable tax credit by province and family structure from the archived T1 tax forms, and then transform the series to a monthly basis by assigning the maximum WITB benefits for a specific year to all months within that corresponding year.[9] Lastly, I deflate these nominal variables using the province-specific monthly CPI (base 2002) as with the minimum wage data, and extend them back to January 1979, setting a zero log maximum benefit in those periods without the WITB program.

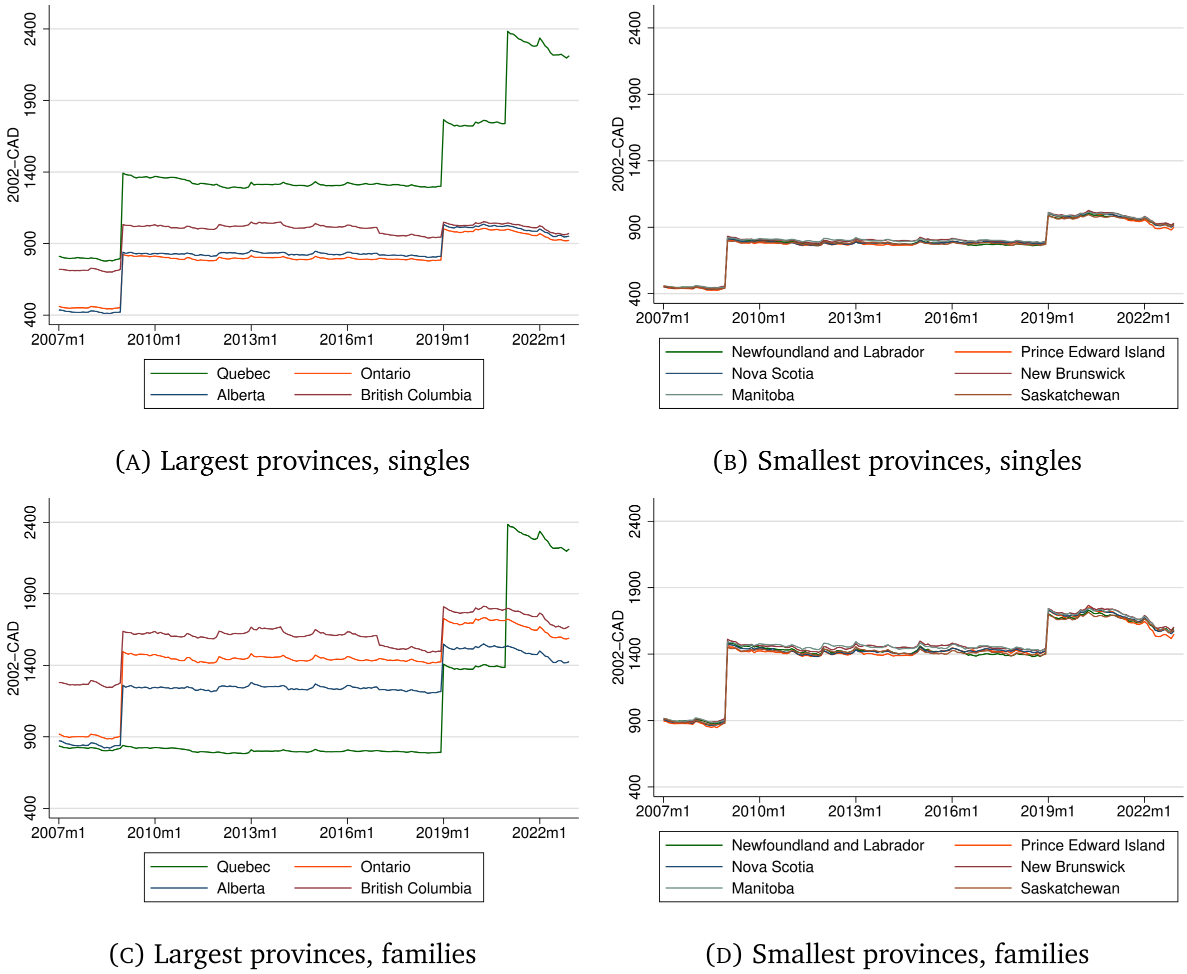
Figure 5 presents the evolution of the WITB maximum real benefits by province and workers' family structure since 2007. For single individuals, panels A and B show that all heterogeneity comes from the largest provinces, particularly British Columbia and Quebec. Except for those two regions, most provinces went from providing a maximum tax credit of 453 to 922 2002-CAD (a 103% increase) for low-income single workers between 2007 and 2022. They also experienced two major expansions in this variable, one of 84% in 2009 and the second of 28% when the CWB was introduced in 2019. On the other hand, at the beginning of 2007, single workers could access WITB benefits of up to 766 2002-CAD in Quebec and British Columbia, and by the end of 2022, the CWB in these two provinces offered a maximum of 2,212 and 970 2002-CAD in benefits for these workers (a growth of 172% and 35% since 2007), respectively. Besides being the province with the largest WITB expansions in terms of single workers' maximum benefits, Quebec is the only region that implemented an extra increase during the COVID-19 pandemic, going from 1,738 to 2,384 2002-CAD (an expansion of 37%) between December 2020 and January 2021.

Comparing panels C and D with A and B in Figure 5, one can easily see that most provinces (with the exception of Quebec) deliver a higher ceiling for WITB benefits of family-type than for single workers. As before, the heterogeneity in the maximum refundable tax credit for families is driven by the largest provinces, especially Alberta, British Columbia and Quebec. On the contrary, the smallest regions follow Ontario's path of maximum wage subsidy from 920 to 1,590 2002-CAD (a 73% increase) between 2007 and 2022, with two expansions just as the maximum benefits of single workers, the first in 2009 and the second in 2019. Interestingly, the period of 2009-2021 in Quebec is characterized by higher maximum benefits for single-type than for family-type workers, suggesting that other provincial social programs, like the Canada Child Benefit (CCB), might complement the WITB to a greater extent in this region.

Finally, for the dependent variables, I follow Brochu and Green (2013) and use the (non-public) master files of the LFS to construct the labour market transition rates for low-skilled workers from January 1979 to December 2022. This rotating panel survey interviews around 50,000 households every month aiming to measure the state of the Canadian labour market, and it is usually employed to calculate the national and provincial unemployment rates.[10] To focus on the relevant part of the labour market for the WITB and the minimum wage policy, I restrict my sample to include individuals between 19 and 59 years old (unless otherwise explicitly stated), with an educational level of high school or lower, and exclude

[9] For family-type individuals in Quebec, I take the maximum benefits corresponding to its "Family with children" category.

[10] The sample rotation of the LFS replaces the households after completing a six-month stay in the survey. Therefore, one-sixth of the LFS sample is renewed every month.



(A) Largest provinces, singles

(B) Smallest provinces, singles

(C) Largest provinces, families

(D) Smallest provinces, families

FIGURE 5. Monthly maximum real tax credit by province and family type between 2007 and 2022.

Notes: This figure shows the evolution of the maximum refundable real tax credit (in 2002-CAD) provided by the WITB-CWB across provinces and family structures from January 2007 to December 2022. The maximum benefits for families in Quebec reflect the maximum tax credit for the category "Family with children." *Source:* Canada Revenue Agency's archived T1 tax forms.

full-time students, self-employed workers, and those in the military. Since the WITB benefits vary by family structure, I also separate observations into two subsamples according to their reported marital status and number of children. First, I define the group of single-type individuals as those either single, separated, widow or divorced without children under 19 years old. Secondly, the family-type group includes married or common-law individuals, or lone-parents who are single, separated, widow, or divorced with children under 19 years old.[11]

The unique household identifier (HHLDID) combined with the individual number within the household (LINE) in the LFS master files allows me to link observations from one month to the next and create individual-level panels between two consecutive months, which can then be used to compute the employment transition rates for each province, month, and

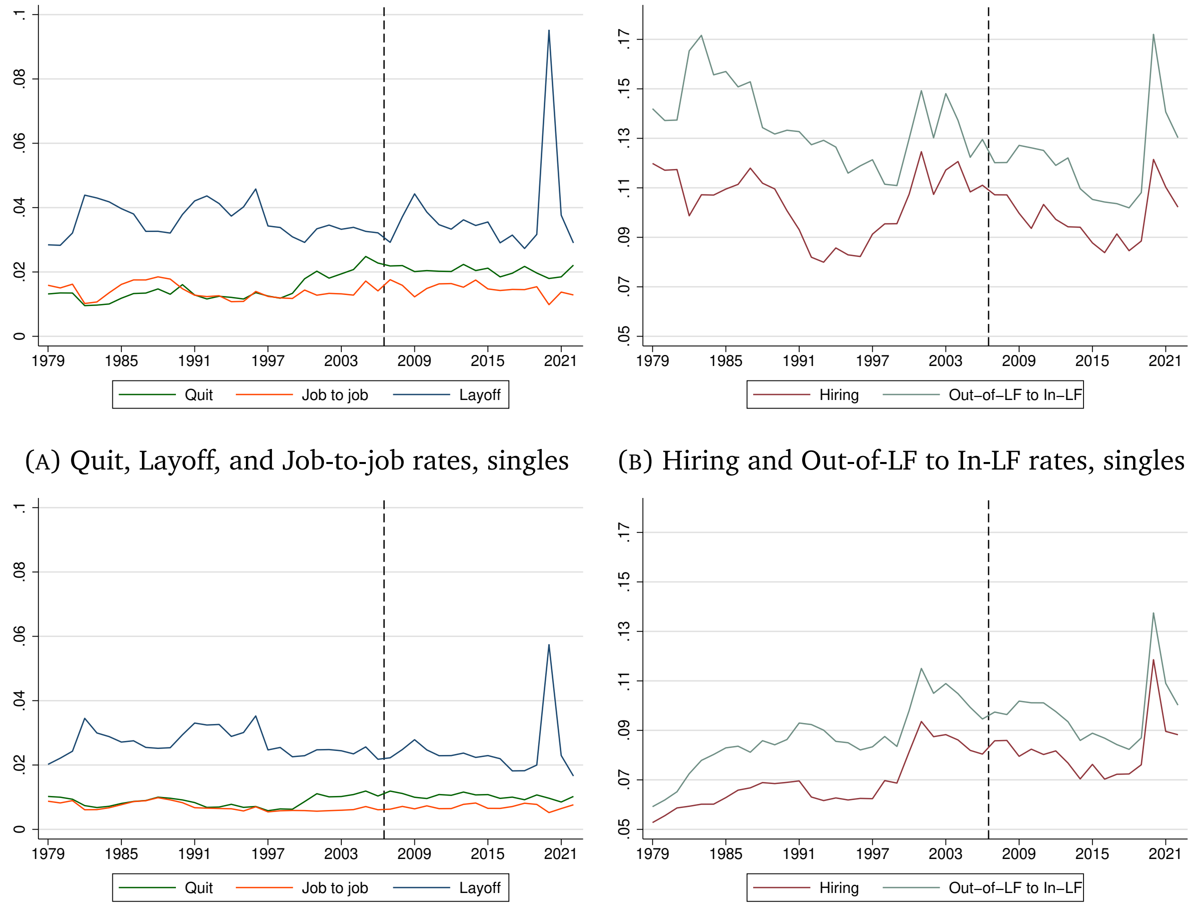
[11] The variable recording the number of children in the LFS only captures this information for the reference person and her spouse, so lone parents who are offsprings of the head of the household, live in the same house as the reference person, and have a kid under 19 are classified as single-type individuals.

family structure.[12] Following Brochu and Green (2013), I calculate the separation, quit, layoff, job-to-job, and hiring rates using the job tenure variable in the LFS. More precisely, the separation rate in month t is defined as the share of workers (those with a positive job tenure) at t that either change employer (job tenure lower than one month) or are not working anymore (null job tenure) in month $t+1$. Additionally, the quit rate at t is defined as the fraction of workers at t who are not working at $t+1$ and answered that they quit their previous job in the LFS questionnaire. The layoff rate at time t is defined in the same way as the quit rate, except that the respondent's reason for the separation is a layoff instead of quitting, and the job-to-job rate in t is calculated as the percentage of workers who switch jobs between t and $t+1$. Regarding the hiring rate in month t, I define it as the share of non-employed people at t that become employed in month $t+1$. Finally, the transition rates from out of the labour force (Out-of-LF) to unemployed (UN)/in the labour force (In-LF), and vice versa, are defined using the labour force status variable. For instance, the Out-of-LF to In-LF transition rate in month t is determined as the proportion of individuals that are not in the labour force at t but change their working status to either employed or unemployed in $t+1$. I compute all the previous transition rates for two groups, single and family-type individuals, to link them to the WITB data and estimate each regression on both subsamples separately.

Figure 6 depicts the annual transition rates for single and family-type people between 19 and 59 years old in Canada from 1979 to 2022. For single low-skilled workers, panel A suggests that, the main reason (out of the three options considered) they are separated from their jobs is a layoff, followed by quitting, and lastly, job switching, with average rates equal to 3.7, 1.7, and 1.4%, respectively. Moreover, their quit rate closely follows their job-to-job rate in the period 1979-1998, where the former increased by 0.2 pp, leading to an average gap of 0.6 pp between those rates until 2022. During the COVID-19 pandemic, the layoff rate of single workers increased 169% with respect to their average layoff rate in the previous years (3.5%), and by 2022, it has returned to its pre-pandemic level. On the other hand, panel C shows that employment transitions of family-type workers follow single workers' trends but are, on average, 1.1, 0.8, and 0.7 pp less likely to be laid off, quit, and transition to other jobs than singles, respectively. According to these numbers, during the pandemic, out of every 1000 single workers aged 19-59, 95 were laid off, whereas only 57 out of 1000 family-type workers in the same age group experienced layoffs.

Panel B shows an average hiring rate of 10.2%, and an average Out-of-LF to In-LF transition rate of 13.1%, for single individuals between 19 and 59 years old. According to panel D, these rates are 2.8 and 4 pp lower for family-type people on average. Interestingly, the pattern of these rates differs across groups from 1979 to the early 2000s, following a decreasing trend for singles and an increasing trend for family-type individuals, whereafter both groups experience a decreasing path until the onset of the pandemic. Notably, in 2020, the massive

[12] Importantly, the LFS tracks dwellings rather than individuals, so if a person changes her residence, she falls outside the survey's scope. See Brochu (2021) for a detailed description on how to construct unique individual identifiers using the LFS master files.



(A) Quit, Layoff, and Job-to-job rates, singles

(B) Hiring and Out-of-LF to In-LF rates, singles

(C) Quit, Layoff, and Job-to-job rates, families

(D) Hiring and Out-of-LF to In-LF rates, families

FIGURE 6. Yearly transition rates in Canada for low-skilled individuals, aged 19-59, by family type between 1979 and 2022.

Notes: This figure reports the annual transition rates (quits, layoffs, job-to-job, hiring, and flows from outside to inside the workforce) of low-educated individuals aged 19-59 by family structure from 1979 to 2022. Each annual estimate is the result of dividing the total number of people that change employment status between two consecutive months in the given year over the total number of people linked in the two-month panels in that year. The dashed line indicates the year of the introduction of the WITB. *Source:* Author's own calculations using information from the LFS master files.

layoffs and rehirings caused by the pandemic led to a peak in the annual hiring rate and flows from outside to inside the labour force. Finally, although the introduction of the WITB in 2007 (indicated by the dashed lines in Figure 6) does not appear to generate substantial changes in the labour market transitions of potential low-skilled recipients, there may be other factors, such as the world financial crisis or other provincial policies, masking the real effect of the program. In the next section, I explain the empirical strategy used to test these relationships more rigorously and alleviate, to some extent, these caveats.

4. Empirical Strategy and Results

To examine the effects induced by the WITB on turnover rates of low-skilled individuals and how they interact with the minimum wage, I exploit cross-sectional and time variation in the provincial increases of the maximum WITB benefits and the minimum wage rates, and estimate the following two-way fixed effects (TWFE) regression for each subsample $g \in \{\text{singles, families}\}$:

$$y^g_{p,t} = \gamma^g_p + \delta^g_t + \beta^g_1 \log(\text{MW}_{p,t}) + \beta^g_2 \log(\text{WITB}^g_{p,t}) \\ + \beta^g_3 \log(\text{WITB}^g_{p,t}) \times \log(\text{MW}_{p,t}) + X^T_{p,t}\lambda^g + \varepsilon^g_{p,t}, \quad (3)$$

where p denotes provinces, and t time periods in year-month units. $y^g_{p,t}$ is one of the outcomes of interest in province p and period t for type-g individuals. $\text{MW}_{p,t}$ is the real minimum wage rate in province p at time t. $\text{WITB}^g_{p,t}$ is the maximum real refundable tax credit provided by the WITB in province p and period t for family structure g. γ^g_p and δ^g_t are province and time fixed effects, respectively. $X_{p,t}$ are provincial-level time-varying controls, including the log number of COVID-19 cases and a dummy variable indicating whether there is an increase in the nominal minimum wage between consecutive periods, and $\varepsilon^g_{p,t}$ is the error term. I cluster standard errors at the province level and weight the regression with the inverse of the number of observations used to compute $y^g_{p,t}$.[13] In equation (3), the coefficients of interest are β^g_2 and β^g_3, where

$$\frac{\beta^g_2}{10} + \frac{\beta^g_3}{10} \times \log(\text{MW}_{p,t}),$$

represents the change in $y^g_{p,t}$ due to a *ceteris paribus* ten percent expansion in the provincial maximum WITB benefits for type-g individuals. Furthermore, the minimum wage policy reinforces the effect of the WITB if the signs of β^g_2 and β^g_3 are the same, and cancels it out otherwise.[14]

Table 1 shows the first set of results analyzing the relationship between the WITB, its interaction with the minimum wage, and the separation rate of low-educated workers by job tenure, family structure, and gender. As shown by the estimates in columns (1) and (2), when considering all levels of job tenure, I find no evidence of significant effects of the wage subsidy program, or its interaction with the minimum wage, on the separation rate of women, men, or both genders. On the other hand, looking at single workers with less than one year of tenure, results in column (3) of panel A suggest that WITB benefits have a negative and statistically significant direct effect on their separation rate, just like the minimum wage policy. Moreover, for the same type of workers, the coefficient of the interaction of both policies is positive and statistically significant, reflecting that high minimum wage regimes attenuate the direct effect of the WITB on their separation rate. For family-type employees with less than one year on the job, column (4) of panel A shows that the relationship

[13]Applying a standard error correction for few clusters yields similar results. See Brochu and Green (2013).

[14]As shown in Callaway *et al.* (2021), to identify an overall average causal response using a TWFE regression in a DID research design with multiple time periods, different treatment timing, and continuous treatment, one needs to impose a strong parallel trends assumption and rule out treatment effect dynamics and heterogeneous causal responses. Thus, to the extent that these assumptions seem too strong for the Canadian setting presented here, my preferred interpretation of the coefficients in equation (3) is as correlations rather than causal parameters. Future versions of the paper will incorporate causal estimates exploiting a different research design to complement the current results.

TABLE 1. WITB and minimum wage effects on separation rates of low-skilled workers by job tenure.

	All tenure		< 1 Year		< 6 Months		6-11 Months	
	Singles (1)	Families (2)	Singles (3)	Families (4)	Singles (5)	Families (6)	Singles (7)	Families (8)
Panel A: Both genders								
log(MW)	-0.0161	-0.0082	-0.0400*	-0.0481*	-0.0490**	-0.0532*	-0.0026	-0.0175
	(0.011)	(0.010)	(0.018)	(0.024)	(0.021)	(0.028)	(0.018)	(0.016)
log(WITB)	-0.0225	-0.0034	-0.0522*	-0.0273	-0.0660**	-0.0359	-0.0151	-0.0030
	(0.017)	(0.008)	(0.023)	(0.019)	(0.024)	(0.022)	(0.018)	(0.011)
log(WITB) × log(MW)	0.0073	0.0023	0.0179**	0.0108	0.0232**	0.0126	0.0044	0.0021
	(0.005)	(0.004)	(0.007)	(0.008)	(0.008)	(0.009)	(0.006)	(0.006)
Panel B: Females								
log(MW)	-0.0193*	-0.0097	-0.0410***	-0.0401**	-0.0485***	-0.0488**	-0.0107	-0.0079
	(0.009)	(0.010)	(0.009)	(0.016)	(0.009)	(0.021)	(0.013)	(0.009)
log(WITB)	-0.0224	0.0012	-0.0550***	-0.0202	-0.0762***	-0.0364	-0.0131	0.0110
	(0.013)	(0.012)	(0.015)	(0.023)	(0.015)	(0.025)	(0.013)	(0.016)
log(WITB) × log(MW)	0.0059	0.0031	0.0150**	0.0105	0.0227***	0.0170	0.0009	-0.0030
	(0.005)	(0.005)	(0.006)	(0.009)	(0.006)	(0.011)	(0.004)	(0.006)
Panel C: Males								
log(MW)	-0.0128	-0.0083	-0.0402	-0.0550	-0.0509*	-0.0539	0.0015	-0.0298
	(0.013)	(0.010)	(0.022)	(0.035)	(0.027)	(0.039)	(0.022)	(0.029)
log(WITB)	-0.0228	-0.0067	-0.0489	-0.0333	-0.0585*	-0.0333	-0.0152	-0.0198
	(0.019)	(0.005)	(0.027)	(0.020)	(0.029)	(0.026)	(0.023)	(0.012)
log(WITB) × log(MW)	0.0074	0.0016	0.0179*	0.0113	0.0223**	0.0087	0.0051	0.0090
	(0.006)	(0.003)	(0.008)	(0.009)	(0.009)	(0.008)	(0.007)	(0.008)
Observations in A	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
Observations in B	5,270	5,270	5,270	5,270	5,270	5,270	5,240	5,260
Observations in C	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5260
R-squared in A	0.645	0.720	0.561	0.696	0.485	0.635	0.351	0.489
R-squared in B	0.501	0.634	0.362	0.572	0.307	0.516	0.205	0.325
R-squared in C	0.591	0.691	0.516	0.645	0.436	0.557	0.322	0.475

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variable is the share of workers with job tenure k in month t that either change employer or are not working anymore in month $t+1$. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals aged 19-59, and then low-skilled family-type individuals aged 19-59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

between their separation rate and the wage subsidy is statistically insignificant. In addition, columns (5)-(8) of panel A reveal that these effects are stronger among single workers with less than six months of job tenure. Comparing the effects across genders, the estimates in columns (3)-(8) in panels B and C suggest that single women with short job tenure (< 1 year or < 6 months) drive the results for single workers, whereas weakly statistically significant effects are found only for men with job tenure lower than six months.

These estimates imply that, among workers with job tenure of less than six months, a 10% increase in the 2022 maximum real WITB benefits of, for instance, British Columbia (from 970 to 1067 2002-CAD), would generate a decrease of 0.0023 in the separation rate of single female workers, while for men the reduction in their separation rate would be only 0.0006. Although these effects seem small, the cumulative annual effects are substantial. For instance, taking the average monthly separation rate for single female workers with job tenure of less than six months in 2022 (which is approximately 0.14), the probability that one of these workers will continue in the job for a year (assuming an equal probability of separation in each month) equals 0.164. After the ten percent increase in the WITB benefits of British Columbia, the annual job-continuation probability for this group will rise to 0.169, equivalent to a 3% increase. This effect is even larger in provinces with low minimum wage regimes.

In Table 2, I disaggregate the effects on separation rates by age groups and job tenure. Results in panel A present the estimates for individuals between 15 and 18, where on one side, family-type workers within this age group are eligible for the WITB, but on the other side, single-type workers are not.[15] In line with the WITB eligibility criteria, columns (1) and (2) in this panel suggest that the maximum tax refundable credit matters only for the separation rate of family-type young workers. A 10% expansion in the WITB benefits for such workers will imply a statistically significant reduction of 0.0174, and an increase of 0.007 for each log point in the real minimum wage, in their separation rate. In other words, similar to the results in Table 1, I find that high minimum wage rates offset the negative impact of the WITB on the separation rate of these workers. This pattern remains when looking into workers with job tenure lower than one year and six months, although the interaction term between the policies is no longer statistically significant. For workers with job tenure between six and eleven months, there is no evidence of significant effects for both family structures, but this may be due to a lack of statistical power for family-type young workers.

Panel B in Table 2 presents the results for young adults aged 19-29, an age range where all low-skilled workers become potential WITB recipients. The main results in this panel suggest that, unlike young single workers, the wage subsidy program reduces the separation rate of young single adult workers with short job tenure, whereas its interaction with the minimum wage dilutes this reduction. On the other hand, I find weak evidence supporting a negative impact of the WITB on the separation rate of family-type workers in this age group. Lastly, panel C shows that for adults older than 30, no statistically significant relationship is found between their separation rate and the WITB parameters. These results tell us that, among people aged 19-59, single young adults are the most affected group by the WITB program in terms of separation rates, an insight consistent with the decreasing trend of the distribution of WITB beneficiaries with respect to age reported in He and Fox (2019).

So far, the results in which the interaction of the WITB and the minimum wage plays an important role present a consistent pattern: the direct effect of the wage subsidy program is

[15] An important point while analyzing low-skilled teenagers between 15 and 18 is that they might become high-skilled in the future, so their results might not be fully comparable to those for elder low-skilled groups. I address part of this concern by excluding full-time students from my sample.

TABLE 2. WITB and minimum wage effects on separation rates of low-skilled workers by job tenure and age group.

	All tenure		< 1 Year		< 6 Months		6-11 Months	
	Singles (1)	Families (2)	Singles (3)	Families (4)	Singles (5)	Families (6)	Singles (7)	Families (8)
Panel A: 15-18 years old								
log(MW)	-0.0399**	-0.0429	-0.0482***	0.0076	-0.0546**	-0.0956	0.0037	0.0923
	(0.016)	(0.056)	(0.014)	(0.061)	(0.018)	(0.074)	(0.032)	(0.081)
log(WITB)	-0.0229	-0.1736***	-0.0169	-0.1559***	-0.0195	-0.1298*	-0.0091	-0.0202
	(0.013)	(0.043)	(0.015)	(0.040)	(0.016)	(0.070)	(0.030)	(0.063)
log(WITB) × log(MW)	0.0127	0.0701***	0.0134	0.0322	0.0175	0.0086	0.0014	-0.0082
	(0.007)	(0.010)	(0.008)	(0.021)	(0.010)	(0.038)	(0.008)	(0.028)
Panel B: 19-29 years old								
log(MW)	-0.0256*	-0.0093	-0.0461**	-0.0324*	-0.0540**	-0.0515*	-0.0097	0.0059
	(0.012)	(0.009)	(0.018)	(0.017)	(0.023)	(0.026)	(0.013)	(0.008)
log(WITB)	-0.0305	-0.0245*	-0.0636**	-0.0545*	-0.0847**	-0.0616*	-0.0157	-0.0317
	(0.019)	(0.012)	(0.025)	(0.027)	(0.028)	(0.033)	(0.018)	(0.021)
log(WITB) × log(MW)	0.0102	0.0065	0.0217**	0.0155	0.0280**	0.0141	0.0063	0.0099
	(0.006)	(0.006)	(0.008)	(0.010)	(0.010)	(0.011)	(0.005)	(0.009)
Panel C: 30-59 years old								
log(MW)	0.0015	-0.0090	-0.0125	-0.0563*	-0.0229	-0.0534	0.0181	-0.0318
	(0.010)	(0.011)	(0.018)	(0.029)	(0.022)	(0.033)	(0.031)	(0.020)
log(WITB)	-0.0050	-0.0001	-0.0110	-0.0204	-0.0066	-0.0287	-0.0062	0.0035
	(0.014)	(0.007)	(0.026)	(0.018)	(0.025)	(0.020)	(0.028)	(0.012)
log(WITB) × log(MW)	0.0021	0.0017	0.0079	0.0102	0.0090	0.0124	0.0033	0.0009
	(0.004)	(0.004)	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.006)
Observations in A	5,270	3,410	5,260	3,040	5,220	2,510	4,990	1,550
Observations in B	5,270	5,270	5,270	5,260	5,270	5,230	5,270	5,190
Observations in C	5,270	5,270	5,270	5,270	5,270	5,270	5,200	5,270
R-squared in A	0.379	0.182	0.356	0.193	0.307	0.209	0.174	0.272
R-squared in B	0.592	0.483	0.514	0.442	0.449	0.387	0.295	0.239
R-squared in C	0.498	0.714	0.362	0.678	0.272	0.600	0.246	0.485

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variable is the share of workers with job tenure k in month t that either change employer or are not working anymore in month $t+1$. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals, and then low-skilled family-type individuals. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

offset as the minimum wage increases. Such a pattern aligns with one of the predictions of the neoclassical model discussed in Section 2, where, in the presence of the WITB, binding high minimum wage regimes should generate an increase in the separation rate relative to a scenario with a non-binding low minimum wage. The reason behind this result boils down to employers' ability to reduce wages when the WITB is introduced, so, to shed light on this puzzle, I next examine how the maximum WITB benefits and the minimum wage coevolve with workers' log average hourly earnings from 1997 to 2022.[16]

[16]In this case, the period of analysis does not start in 1979 because the variable in the LFS capturing the hourly earnings is phased in by the end of 1996.

TABLE 3. WITB and minimum wage relationship with log average hourly earnings of low-skilled workers.

	All tenure		New hires	
	Singles (1)	Families (2)	Singles (3)	Families (4)
log(MW)	0.4520***	0.2632**	0.4970**	0.3836***
	(0.121)	(0.094)	(0.164)	(0.068)
log(WITB)	0.2480**	0.1198***	0.2618**	0.0769**
	(0.092)	(0.033)	(0.083)	(0.026)
log(WITB) × log(MW)	-0.0787**	-0.0524**	-0.0793***	-0.0478***
	(0.026)	(0.020)	(0.020)	(0.014)
Observations	3,120	3,120	3,120	3,120
R-squared	0.895	0.937	0.577	0.624

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variable in columns (1) and (2) is workers' log average hourly real earnings in month t. Columns (3) and (4) take as dependent variable the log average hourly real earnings in month $t+1$ of individuals unemployed at t who are hired in $t+1$. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals aged 19-59, and then low-skilled family-type individuals aged 19-59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1997-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

Estimates in Table 3 are shown for workers with all levels of job tenure (columns (1) and (2)) and new hires (columns (3) and (4)).[17] Three main results stand out in this table. First, regardless of employment duration or family structure, average hourly earnings show a positive and highly statistically significant correlation with the minimum wage, but also with the maximum WITB benefits. The latter finding differs from the conclusion of the neoclassical model where the right shift in supply generates a reduction in the equilibrium wage. Secondly, the coefficient of the interaction between the policies indicates that the minimum wage diminishes the positive marginal effect of the WITB on workers' average hourly earnings. In contrast, according to the neoclassical model, an expansion of the wage subsidy with high minimum wage regimes that are (ex post) binding would generate a smaller decrease in the equilibrium wage than with a low minimum wage regime that is not (ex post) binding. I.e., the minimum wage would affect non-negatively the marginal effect of the WITB under this model. Finally, effects are larger in magnitude for singles than for family-type workers in both samples. In short, there is not a clear consensus between the wage predictions of the neoclassical model and the empirical findings for low-skilled workers' average hourly earnings. In the final part of this section I empirically tests the

[17]The earnings question in the LFS is asked only once, during the first interview. In the follow-up visits, the working income data is modified only if the respondent has changed her job since the last interview (Brochu *et al.*, 2023). Thus, to alleviate misreporting concerns in the results of columns (1) and (2) of Table 3, I also present estimates using the sample of new hires in columns (3) and (4).

TABLE 4. WITB and minimum wage effects on quits, layoffs, and job-to-job transition rates of low-skilled workers by job tenure.

	All tenure		< 1 Year		< 6 Months		6-11 Months	
	Singles (1)	Families (2)	Singles (3)	Families (4)	Singles (5)	Families (6)	Singles (7)	Families (8)
Panel A: Quits								
log(MW)	-0.0016	0.0019	-0.0028	-0.0016	-0.0023	-0.0004	-0.0001	-0.0018
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)
log(WITB)	-0.0011	0.0014	-0.0003	0.0018	0.0002	-0.0011	0.0012	0.0049
	(0.003)	(0.002)	(0.004)	(0.003)	(0.006)	(0.004)	(0.002)	(0.005)
log(WITB) × log(MW)	0.0010	-0.0006	0.0018	-0.0021	0.0020	-0.0025*	0.0009	-0.0019
	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.001)	(0.002)
Panel B: Layoffs								
log(MW)	-0.0127**	-0.0120	-0.0268**	-0.0404*	-0.0338**	-0.0458	-0.0014	-0.0166
	(0.005)	(0.008)	(0.010)	(0.021)	(0.014)	(0.027)	(0.009)	(0.011)
log(WITB)	-0.0256**	-0.0034	-0.0593**	-0.0189	-0.0784***	-0.0231	-0.0216	-0.0033
	(0.011)	(0.006)	(0.019)	(0.019)	(0.020)	(0.021)	(0.017)	(0.011)
log(WITB) × log(MW)	0.0061	0.0021	0.0135*	0.0100	0.0177**	0.0124*	0.0038	0.0025
	(0.004)	(0.003)	(0.007)	(0.006)	(0.007)	(0.006)	(0.005)	(0.004)
Panel C: Job-to-job transitions								
log(MW)	-0.0077*	-0.0017	-0.0182**	-0.0104**	-0.0233**	-0.0124*	-0.0058	-0.0023
	(0.003)	(0.002)	(0.008)	(0.004)	(0.009)	(0.006)	(0.006)	(0.004)
log(WITB)	0.0027	-0.0027**	0.0057	-0.0111***	0.0117**	-0.0119**	0.0009	-0.0062
	(0.002)	(0.001)	(0.004)	(0.003)	(0.004)	(0.005)	(0.005)	(0.004)
log(WITB) × log(MW)	0.0008	0.0006	0.0025	0.0024*	0.0026	0.0016	0.0007	0.0016
	(0.001)	(0.000)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Observations in A	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
Observations in B	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
Observations in C	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
R-squared in A	0.549	0.431	0.440	0.297	0.384	0.283	0.233	0.181
R-squared in B	0.694	0.760	0.658	0.759	0.601	0.721	0.455	0.585
R-squared in C	0.421	0.457	0.327	0.316	0.297	0.291	0.162	0.147

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variables in panels A, B, and C are the share of workers with job tenure k in month t that separated from their job in month $t+1$ due to a quit, layoff, or job switch, respectively. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals aged 19-59, and then low-skilled family-type individuals aged 19-59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

premise used in the neoclassical model in which the WITB incentivizes the inclusion of new people into the labour force.

In Table 4, I further examine the channels through which the WITB affects the separation rates. The results in panel A indicate that the maximum WITB benefits and their interaction with the minimum wage have virtually no influence on the quitting behaviour of low-skilled workers. Conversely, odd columns in panel B show that the maximum refundable tax credit for single-type workers is negatively associated with their layoff rate, and this relationship becomes stronger and highly statistically significant as their job tenure decreases. In terms of magnitude, the direct effect of the WITB on layoffs for these workers is twice as large as the corresponding direct effect of the minimum wage. For singles with low job tenures, I also find that the effect of the interaction between the WITB and the minimum wage is statistically significant and goes in the opposite direction to the direct effect of the wage subsidy program. It is worth mentioning that, for single low-skilled workers with less than six months on the job, a 10% increase in the minimum wage will reduce their layoff rate by 0.0034 in the absence of any WITB benefits. Nonetheless, with the average maximum WITB benefits provided by most provinces for these workers in 2022 (922 2002-CAD), the 10% increase in the minimum wage will lead to an increase in their layoff rate equal to 0.009.

Although no statistically significant results are observed for layoffs of family-type workers in panel B of Table 4, panel C shows a statistically significant reduction in their job-to-job transition rate associated with the WITB. In addition, I find little evidence that the WITB alters the job-switching patterns of single employees, and if anything, it encourages employment change for those with job tenure under six months. Interestingly, the coefficient of the interaction WITB-minimum wage is not statistically significant for most specifications using job-to-job transition rates as the main dependent variable.

Moving to other relevant outcomes, Table 5 lays out the results for hiring rates by gender, age group, and unemployment duration. The odd columns in panel A show that, independently of gender, there is no evidence of a statistically significant relationship between the wage subsidy program, or its interaction with the minimum wage, and hiring rates of single individuals. On the other hand, the even columns in the same panel reflect that the interaction between the WITB and the minimum wage policy is negatively associated with the hiring rate of family-type individuals, where the effect for men is twice as large as for women. This is consistent with the gender-differentiated minimum wage effects in hiring rates documented in Brochu and Green (2013). Panel B shows that the WITB has a positive and statistically significant connection with the hiring rate of single teenagers and young adults, but there is limited evidence of a significant effect on the hiring rates of family-type individuals. Surprisingly, the WITB positively correlates with the hiring rate of single ineligible individuals aged 15-18, as opposed to the finding with the separation rate in Table 2. Moreover, the effect of the policy interaction only plays an important role for unemployed adults aged 30-59 and points in the opposite direction to the direct effect of the WITB. Finally, positive and significant WITB effects are also observed in panel C for the sample of single individuals who have been unemployed for less than six months or between six and eleven months. The interaction term between the policies is relevant only for families with an unemployment duration lower than six months and singles with an unemployment duration between six and eleven months, where its coefficient imply a reduction of the direct positive impact of the program on hiring rates.

The last set of results are presented in Table 6. In panel A, columns (1) and (2), I first analyze the flows of low-skilled individuals from outside to inside the labour force.[18] Here,

[18] An individual is classified as being in the labour force if she is either employed, or unemployed but is actively looking for a job, in a temporary layoff, or will start a job in the future.

TABLE 5. WITB and minimum wage effects on hiring rates of low-skilled workers by gender, age group, and unemployment duration.

	(1) Singles	(2) Families	(3) Singles	(4) Families	(5) Singles	(6) Families
	Both genders		Males		Females	
Panel A: Hirings by gender						
log(MW)	-0.0167	-0.0198	-0.0201	-0.0209	-0.0066	-0.0090
	(0.020)	(0.016)	(0.021)	(0.033)	(0.021)	(0.014)
log(WITB)	0.0311	0.0060	0.0380	0.0148	0.0187	0.0108
	(0.018)	(0.006)	(0.023)	(0.011)	(0.012)	(0.007)
log(WITB) × log(MW)	-0.0043	-0.0077**	-0.0070	-0.0138**	-0.0022	-0.0070**
	(0.004)	(0.003)	(0.005)	(0.005)	(0.006)	(0.002)
	15-18		19-29		30-59	
Panel B: Hirings by age group						
log(MW)	-0.0508	-0.0560	-0.0287	-0.0121	-0.0019	-0.0211
	(0.047)	(0.040)	(0.038)	(0.023)	(0.014)	(0.016)
log(WITB)	0.0778***	0.0620	0.0510**	-0.0030	0.0229*	0.0075
	(0.022)	(0.044)	(0.022)	(0.031)	(0.011)	(0.007)
log(WITB) × log(MW)	-0.0008	-0.0192	-0.0055	-0.0058	-0.0055**	-0.0076**
	(0.008)	(0.022)	(0.008)	(0.005)	(0.002)	(0.003)
	< 1 Year		< 6 Months		6-11 Months	
Panel C: Hirings by unemployment duration						
log(MW)	-0.0010	0.0004	-0.0316	-0.0408**	0.0114	-0.0201
	(0.011)	(0.004)	(0.038)	(0.017)	(0.035)	(0.033)
log(WITB)	0.0040	0.0057	0.0607**	-0.0140	0.0530***	0.0138
	(0.004)	(0.006)	(0.022)	(0.012)	(0.010)	(0.014)
log(WITB) × log(MW)	-0.0001	-0.0010	-0.0055	-0.0113**	-0.0124*	-0.0063
	(0.002)	(0.001)	(0.006)	(0.005)	(0.007)	(0.006)
Observations in A	5,270	5,270	5,270	5,270	5,270	5,270
Observations in B	5,270	3,780	5,270	5,270	5,270	5,270
Observations in C	5,270	5,270	5,270	5,270	5,270	5,270
R-squared in A	0.591	0.584	0.564	0.551	0.397	0.569
R-squared in B	0.369	0.174	0.549	0.362	0.418	0.584
R-squared in C	0.355	0.525	0.591	0.660	0.482	0.567

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variable is the share of non-employed individuals in month t that become employed in month $t+1$. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals, and then low-skilled family-type individuals. Individuals considered in panel A and C are between 19 and 59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

I document a positive and statistically significant association between the maximum WITB

TABLE 6. WITB and minimum wage effects on out-of-labour force to in-labour force related transition rates and hours of work of low-skilled workers.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Singles	Families	Singles	Families	Singles	Families	Singles	Families
	Out-of-LF to In-LF		Out-of-LF to UN		In-LF to Out-of-LF		UN to Out-of-LF	
Panel A: Out of the labour force related transitions								
log(MW)	-0.0374	-0.0275*	-0.0206	-0.0146	-0.0090	-0.0101	-0.0150	-0.0155
	(0.020)	(0.014)	(0.022)	(0.010)	(0.015)	(0.010)	(0.051)	(0.041)
log(WITB)	-0.0374**	0.0146**	-0.0319***	0.0147	-0.0307	-0.0046	-0.0539	0.0056
	(0.012)	(0.006)	(0.010)	(0.011)	(0.017)	(0.010)	(0.042)	(0.041)
log(WITB) × log(MW)	0.0061*	-0.0022	0.0016	-0.0031	0.0073	0.0058	0.0158	0.0196
	(0.003)	(0.002)	(0.003)	(0.003)	(0.005)	(0.004)	(0.013)	(0.014)
	All tenure		$<$ 1 Year		$<$ 6 Months		6-11 Months	
Panel B: Growth of average hours of work per week								
log(MW)	-0.0045*	0.0005	-0.0089*	0.0035	-0.0036	-0.0005	-0.0137*	0.0108**
	(0.002)	(0.003)	(0.004)	(0.007)	(0.006)	(0.009)	(0.006)	(0.004)
log(WITB)	-0.0024	0.0001	0.0029	0.0026	0.0086	-0.0003	-0.0019	0.0106*
	(0.004)	(0.001)	(0.007)	(0.004)	(0.007)	(0.008)	(0.011)	(0.005)
log(WITB) × log(MW)	0.0018	0.0003	0.0023	0.0009	-0.0013	0.0024	0.0054	-0.0020
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.004)	(0.002)
Observations in A	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
Observations in B	5,270	5,270	5,270	5,270	5,270	5,270	5,270	5,270
R-squared in A	0.458	0.633	0.415	0.562	0.644	0.721	0.380	0.361
R-squared in B	0.750	0.785	0.597	0.654	0.520	0.576	0.463	0.562

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variables in panel A are the fraction of people out of the labour force at t that enter the labour force in $t+1$, the share of individuals out of the labour force in month t that become unemployed in month $t+1$, and the transition rates in the opposite direction. In panel B, the dependent variable is the growth of employees' average hours of work per week. Each regression is estimated on two subsamples separetely, first using low-skilled single-type individuals aged 19-59, and then low-skilled family-type individuals aged 19-59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

benefits and the transition rate into the labour force for family type individuals, but a negative and statistically significant relationship for single-type individuals. This latter result differs from the traditional assumption of supply expansion used in the neoclassical framework and highlights the heterogeneous reactions among individuals exposed to the WITB. These estimates imply that a ten percent increase in the 2022 WITB benefits of, for instance, British Columbia, will induce an increase of 3%, and a decrease of 2%, in the probability of remaining outside the labour force throughout the year for singles, and family-type individuals, respectively. Moreover, estimates in columns (3) and (4) suggest that the reduction in labour force entry by singles is driven by a decline in the transition rate from out of the labour force to unemployment, whereas the promotion of entry into the labour force for family individuals seems to be driven by movements into employment. Secondly, columns (5) through (8) suggest that the wage subsidy program does not significantly alter people's

TABLE 7. Robustness checks for the effects of the WITB and minimum wage on out-of-labour force to in-labour force transition rates.

	Baseline		Dummy out Covid		One-year lag		Highly educated		Single mothers
	Singles	Families	Singles	Families	Singles	Families	Singles	Families	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log(MW)	-0.0374	-0.0275*	-0.0381	-0.0279*	-0.0374	-0.0266*	0.0009	-0.0058	-0.0177
	(0.020)	(0.014)	(0.021)	(0.014)	(0.020)	(0.014)	(0.073)	(0.022)	(0.024)
log(WITB)	-0.0374**	0.0146**	-0.0309*	0.0150**			-0.0310	-0.0095	0.0323**
	(0.012)	(0.006)	(0.016)	(0.006)			(0.026)	(0.013)	(0.014)
log(WITB) × log(MW)	0.0061*	-0.0022	0.0044	-0.0019			-0.0002	0.0009	-0.0144**
	(0.003)	(0.002)	(0.004)	(0.002)			(0.009)	(0.005)	(0.005)
$\log(WITB_{-12})$					-0.0371**	0.0127**			
					(0.012)	(0.005)			
$\log(WITB_{-12}) \times \log(MW)$					0.0059*	-0.0027			
					(0.003)	(0.002)			
Observations	5,270	5,270	5,270	5,270	5,270	5,270	5,190	5,270	5,260
R-squared	0.458	0.633	0.472	0.641	0.457	0.633	0.213	0.421	0.235

Notes: The dependent variable in all specifications is the fraction of people out of the labour force at t that enter the labour force in $t+1$. Columns (1) and (2) show the baseline OLS results from the TWFE regression in (3). Columns (3) and (4) add interactions between each main independent variable and dummies for each time period since January 2020. Columns (5) and (6) use a one-year lag of WITB real benefits as main independent variable instead of the contemporary real maximum WITB tax credit. Columns (7) and (8) use the sample of highly skilled individuals (those with at least a Bachelor's degree), and column (9) restricts the sample to single mothers aged 15-59. Results in columns (1) through (6), and column (9), are based on low-skilled people. Except for the case of single mothers in column (9), each regression is estimated on two subsamples separetely, first using single-type individuals aged 19-59, and then family-type individuals aged 19-59. Standard errors clustered at the province level are in parentheses. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.

transitions to out of the labour force for both single and family-type individuals. Notably, there is little evidence that the interaction of the WITB with the minimum wage plays a significant role in these transition rates. Finally, panel B explores changes in the growth of employees' average hours of work per week. Regardless of workers' job tenure level or family structure, I find virtually no evidence that the WITB, or its interaction with the minimum wage, modify the intensive margin decisions of low-skilled workers.

4.1. *Robustness Checks*

Table 7 shows the robustness exercises for the effects of the WITB and its interaction with the minimum wage on transition rates from outside to inside the labour force. The results on this variable are of particular interest because of its close connection to one of the main WITB objectives: to encourage the insertion of socially assisted people into the workforce. To facilitate the comparison, columns (1) and (2) show the baseline correlations presented in Table 6, where a negative relationship is found for low-skilled single-type individuals and a positive effect is documented for low-skilled family individuals.

Despite controlling for the number of COVID-19 cases in the main econometric specification, a natural caveat is the presence of other confounding factors derived from the COVID-19 pandemic (e.g. the Canada Emergency Wage Subsidy (CEWS) or the Canada Emergency Response Benefit (CERB)). To check whether these factors are driving the results, I add to the regression model (3) interactions between the main independent variables and time dummies for each period since January 2020. The results in columns (3) and (4) show that, except for the interaction term in the regression for singles, the effects of the WITB remain significant and close to the baseline estimates after dummying out the pandemic period, with the effect of the WITB on singles being slightly less negative than in column (1).

In addition, employment decisions in year t might respond to the incentives created by the WITB benefits received in that same year and not to the refundable tax credit people might get in the following year $t+1$ (Wilson, 2020; Nichols and Rothstein, 2015; Yang, 2018). To explore how the results change under the scenario of an ex-post response to the program, in columns (5) and (6) I present the estimates for the baseline TWFE regression using a one-year lag of WITB real benefits as the main independent variable instead of the contemporary maximum tax credit. For both family structures, the estimated WITB effects are similar to the baseline results, suggesting that current and future benefits matter for potential WITB recipients' decisions to join the workforce. Columns (7) and (8) show the results of a falsification test using the sample of individuals aged 19-59 with at least a Bachelor's degree. As expected, regardless of family structure, there is no evidence of a significant association between the maximum WITB credit, or its interaction with the minimum wage, and the transition patterns from outside to inside the labour force of highly educated individuals.

Finally, I examine the effects on the labour market transition rates of low-skilled single mothers aged 15-59, a group that has received particular attention in the EITC literature (Eissa and Hoynes, 2006; Nichols and Rothstein, 2015; Kleven, 2023).[19] In line with my baseline results for families, I find that higher WITB benefits are associated with a direct positive and statistically significant effect on single mothers' labour force participation. Nonetheless, the negative coefficient of the interaction term indicates that high minimum wage regimes diminish this positive labour supply response. Interestingly, the magnitude of the direct effect in this group is more than double that for the baseline estimates of family-type individuals, reflecting the relevance of the wage subsidy program for this group. To further explore the reaction of low-skilled single mothers to WITB incentives, Table A1 in Appendix A shows the results for additional transition rates and intensive margin decisions. Consistent with the findings for family-type individuals, single mothers' separations, layoffs,

[19]Typically, the data variation used in the EITC literature to identify the effect on single mothers' extensive margin decisions comes from comparing changes in the employment rate of single mothers versus changes in employment rates of childless single women who were not originally affected by the program or its expansion. In contrast, my research design exploits the variation left in single mothers' transition rates, the WITB maximum credit, and the minimum wage after subtracting the corresponding within-province and within-time variation, so our estimates are not directly comparable.

and hours of work are not significantly affected by the WITB or its interaction with the minimum wage, and their hiring rate is negatively associated with the interaction between the two policies. However, in contrast to family-type results, there are no statistically significant effects observed in the job-switching behaviour of single mothers, and there is some evidence indicating a positive impact of the WITB, which diminishes as the minimum wage increases, on the quitting behaviour of this group. Lastly, estimates in column (6) of Table A1 suggest that the positive direct effect of the WITB on single mothers' labour force participation is driven by movements into employment, whereas the interaction WITB-minimum wage tends to decrease their insertion into unemployment.

5. Conclusion

In this paper, I investigate how the WITB and its interaction with the minimum wage affect the labour market transitions of low-skilled workers. To answer this question, I combine data on the maximum refundable tax credit provided by the WITB, minimum wage rates, and the Canadian LFS from 1979 to 2022, and exploit cross-sectional and time variation in the provincial changes of real WITB benefits and minimum wage regimes. I employ a two-way fixed effects specification and, following the WITB benefits structure, estimate it separately using employment transitions for two relevant groups: single and family-type individuals aged 19-59.

I document heterogeneous effects induced by the WITB across family structures. For single-type workers with job tenure levels lower than one year or six months, I find a negative relationship between their separation rate and the maximum WITB benefits, which is mitigated by the minimum wage. This effect is mainly driven by females and young adults. Examining the separation channels among single workers, their layoff rate exhibits a negative and statistically significant association with the maximum tax credit. Stronger effects on layoff rates are found for singles with short job tenure, where the interaction between the two policies attenuates the direct impact of the WITB. Higher WITB benefits are also connected to a higher probability of job switching among single workers with less than six months of job tenure. Looking at other outcomes, positive and significant effects associated with the WITB are observed for hiring rates of single teenagers, young adults, and individuals who have been unemployed for less than six months or between six and eleven months. Nevertheless, the transition rate from out-of-the-labour force to in-the-labour force of singles, particularly their transition rate into unemployment, is negatively influenced by the maximum tax credit.

Conversely, for family-type workers, I find that high maximum WITB benefits are associated with a reduction in their job-to-job transition rate and an increase in their flows from out-of-the-labour force to in-the-labour force. Interestingly, the maximum wage subsidy only displays a negative and highly statistically significant correlation with the separation rates of family-type teenagers between 15 and 18, with the effect of the interaction WITB-minimum wage pointing in the opposite direction. Moreover, this interaction term is negatively correlated with the hiring rate of family-type individuals, where the effect is stronger for men than for women and is concentrated on people with unemployment spells shorter than six months. Finally, I do not find evidence supporting that the maximum WITB tax credit, or its interaction with the minimum wage, alters low-skilled workers' quitting behaviour, employment transitions to out of the labour force, or intensive margin decisions.

These findings indicate that the combined effect of the WITB and the minimum wage tend to offset the direct impact of the WITB. Seen through the lenses of the neoclassical framework, the increasing marginal effect of the WITB, with respect to the minimum wage, on the separation rate of low-tenure single workers is consistent with the predictions of the model. However, the neoclassical conclusion about wage reduction and its premise about labour supply expansion are not fully supported by the empirical findings in this paper. The next steps of the project should be directed towards developing a theoretical framework that rationalizes most of the previous empirical results and provides valuable insights about the economic incentives faced by each agent in the economy. Analyzing how WITB benefits are spent, uncovering whether the WITB tax credit enhances the welfare and educational effects of the CCB on children of recipients, and exploring the economic behaviour of firms with workers receiving the wage subsidy are also fruitful avenues for future research.

References

ANNABI, N., BOUDRIBILA, Y. and HARVEY, S. (2013). Labour Supply and Income Distribution Effects of the Working Income Tax Benefit: A General Equilibrium Microsimulation Analysis. *IZA Journal of Labor Policy*, **2** (1), 1–33.

BAKER, M., MESSACAR, D. and STABILE, M. (2023). Effects of Child Tax Benefits on Poverty and Labor Supply: Evidence from the Canada Child Benefit and Universal Child Care Benefit. *Journal of Labor Economics*, **41** (4), 000–000.

BASTIAN, J. (2020). The Rise of Working Mothers and the 1975 Earned Income Tax Credit. *American Economic Journal: Economic Policy*, **12** (3), 44–75.

BROCHU, P. (2021). A Researcher's Guide to the Labour Force Survey: Its Evolution and the Choice of Public Use versus Master Files. *Canadian Public Policy*, **47** (3), 335–357.

— and GREEN, D. (2013). The Impact of Minimum Wages on Labour Market Transitions. *The Economic Journal*, **123** (573), 1203–1235.

—, GREEN, D. A., LEMIEUX, T. and TOWNSEND, J. (2023). The Minimum Wage, Turnover, and the Shape of the Wage Distribution. *mimeo*, pp. 1–62.

CALLAWAY, B., GOODMAN-BACON, A. and SANT'ANNA, P. H. C. (2021). Difference-in-Differences with a Continuous Treatment. *arXiv:2107.02637*, pp. 1–74.

CANADA REVENUE AGENCY (2020). Canada Workers Benefit Statistics.

CARD, D. and KRUEGER, A. B. (1994). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review*, **84** (4), 772–793.

CENGIZ, D., DUBE, A., LINDNER, A. and ZIPPERER, B. (2019). The Effect of Minimum Wages on Low-Wage Jobs. *The Quarterly Journal of Economics*, **134** (3), 1405–1454.

CHETTY, R., FRIEDMAN, J. N. and SAEZ, E. (2013). Using Differences in Knowledge across Neighborhoods to Uncover the Impacts of the EITC on Earnings. *American Economic Review*, **103** (7), 2683–2721.

DEPARTMENT OF FINANCE (2007). The Budget Plan 2007. *Ottawa: Department of Finance*, pp. 1–477.

DEPARTMENT OF FINANCE (2018). The Budget Plan 2018. *Ottawa: Department of Finance*, pp. 1–367.

DUBE, A., LESTER, T. W. and REICH, M. (2016). Minimum Wage Shocks, Employment Flows, and Labor Market Frictions. *Journal of Labor Economics*, **34** (3), 663–704.

EISSA, N. and HOYNES, H. W. (2006). Behavioral Responses to Taxes: Lessons from the EITC and Labor Supply. *Tax Policy and the Economy*, **20**, 73–110.

GREEN, D. A. (2015). The Case for Increasing the Minimum Wage. What Does the Academic Literature Tell Us? *Canadian Centre for Policy Alternatives*, pp. 1–12.

GREGG, P., HARKNESS, S. and SMITH, S. (2009). Welfare Reform and Lone Parents in the UK. *The Economic Journal*, **119** (535), F38–F65.

HASAN, S. (2013). Labour Supply Response to the Working Income Tax Benefit (WITB): A Difference-In-Differences Approach. *Simon Fraser University Research Repository*, pp. 1–40.

HE, J. and FOX, D. (2019). Working Income Tax Benefit Recipients in Canada. *Statistics Canada Income Research Paper Series*, **No. 75F0002M**, 1–14.

KLEVEN, H. (2023). The EITC and the Extensive Margin: A Reappraisal. *National Bureau of Economic Research Working Paper Series*, **No. 26405**, 1–202.

LEE, D. and SAEZ, E. (2012). Optimal Minimum Wage Policy in Competitive Labor Markets. *Journal of Public Economics*, **96** (9-10), 739–749.

MILLIGAN, K. (2018). FINA Testimony: Canada Workers Benefit.

NEUMARK, D. and WASCHER, W. (2011). Does a Higher Minimum Wage Enhance the Effectiveness of the Earned Income Tax Credit? *ILR Review*, **64** (4), 712–746.

NICHOLS, A. and ROTHSTEIN, J. (2015). The Earned Income Tax Credit (EITC). *National Bureau of Economic Research Working Paper Series*, **No. 21211**, 1–81.

OFFICE OF THE AUDITOR GENERAL OF CANADA (2022). Access to Benefits for Hard-to-Reach Populations. *Reports of the Auditor General of Canada to the Parliament of Canada*, pp. 1–27.

ROTHSTEIN, J. (2010). Is the EITC as Good as an NIT? Conditional Cash Transfers and Tax Incidence. *American Economic Journal: Economic Policy*, **2** (1), 177–208.

— and ZIPPERER, B. (2020). The EITC and Minimum Wage Work Together to Reduce Poverty and Raise Incomes. *Economic Policy Institute*, pp. 1–10.

SCARTH, W. and TANG, L. (2008). An Evaluation of the Working Income Tax Benefit. *Canadian Public Policy*, **34** (1), 25–36.

WILSON, R. (2020). The EITC and Employment Transitions: Labor Force Attachment and Annual Exit. *National Tax Journal*, **73** (1), 11–46.

YANG, T. T. (2018). Family Labor Supply and the Timing of Cash Transfers. *Journal of Human Resources*, **53** (2), 445–473.

Appendix A. Additional Results for Single Mothers

TABLE A1. WITB and minimum wage effects on transition rates for low-skilled single mothers.

	(1) Separation	(2) Quit	(3) Layoff	(4) Job-to-job	(5) Hiring	(6) Out-of-LF to UN	(7) Hours worked
log(MW)	-0.0135	0.0060**	-0.0173	-0.0028	-0.0092	-0.0073	0.0093
	(0.015)	(0.002)	(0.011)	(0.003)	(0.022)	(0.022)	(0.008)
log(WITB)	0.0113	0.0089*	0.0035	-0.0036	0.0116	0.0209	-0.0021
	(0.011)	(0.005)	(0.008)	(0.003)	(0.010)	(0.018)	(0.006)
log(WITB) × log(MW)	-0.0021	-0.0035*	0.0029	0.0001	-0.0067*	-0.0129**	-0.0021
	(0.005)	(0.002)	(0.003)	(0.001)	(0.003)	(0.005)	(0.002)
Observations	5,270	5,270	5,270	5,270	5,270	5,260	5,270
R-squared	0.232	0.168	0.260	0.144	0.284	0.183	0.505

Notes: OLS estimates from the TWFE specification in (3) are reported in each cell with standard errors clustered at the province level in parentheses. The dependent variable in column (1) is the share of workers in month t that either change employer or are not working anymore in month $t+1$. The dependent variables in columns (2), (3), and (4) are the share of workers in month t that separated from their job in month $t+1$ due to a quit, layoff, or job switch, respectively. The dependent variable in column (5) is the share of low-skilled non-employed individuals in month t that become employed in month $t+1$. Lastly, the dependent variables in columns (6) and (7) are the share of people out of the labour force in month t that become unemployed in month $t+1$, and the growth of employees' average hours of work per week, respectively. The sample is restricted to low-skilled single mothers aged 15-59. The inverse of the number of observations used to compute the corresponding province-month data point in the dependent variable is utilized as weight in all specifications. The period of analysis is 1979-2022. Sample sizes are rounded according to the Canadian Research Data Centre vetting rules. *, **, *** indicate significance at the 10, 5, and 1% levels.