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## **What is an Alternative to the Minimum Wage in Canada?: A Comprehensive Literature Review of Price Floors and Welfare Systems in Canada**

George Agia<sup>1</sup>

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**Abstract**

*This paper analyzes the research on price floors and welfare systems in Canada through a qualitative and quantitative framework to ensure its validity. It examines the current effects of the minimum wage and offers critical insight into a refined form of welfare known as the “Negative Income Tax” that can assist policymakers in implementing the most effective welfare policy. The author argues that the minimum wage negatively affects the economy as it produces a wide variety of externalities, one being that it can result in higher unemployment among low-skilled workers and young people (Campolieti et al., 2006). The minimum wage is a price floor, meaning the government can impose a price above the current market equilibrium wherein demand and supply intersect. Thus, the author suggests that Canada should adopt a Negative Income Tax (NIT) policy that would not result in the same externalities as the minimum wage, as this policy is not a price floor. One notable phenomenon of pursuing an NIT is that it substantially increases the productivity of single parents receiving welfare (Riddell & Riddell, 2021).*

**Keywords:** *price floors, minimum wage, externalities, welfare systems, unemployment, elasticity*

**1.0 Introduction**

Many economic scholars worldwide argue that the minimum wage is not a viable solution to poverty, especially due to the negative externalities associated with the policy, such as increases in unemployment (Brochu & Green, 2013). Firms behave as cost-minimizers and rational entities, prompting them to establish new strategies to maximize profits. Considering that the minimum wage can increase the firms’ labour costs, they will, in turn, engage in actions that can negatively affect the economy, like not hiring new workers and increasing product prices (Campolieti et al., 2006). To mitigate this phenomenon, the author believes that the government should propose a policy targeted at the impoverished, which will increase productivity and overall work activity, especially among single parents on welfare. For example, researchers discovered that an NIT increased single-parent work hours on welfare. The precise increase was roughly 35%, which amounted to an additional 135 work hours in a year (Riddell & Riddell, 2021).

Moreover, the NIT policy would be less costly than the Universal Basic Income (UBI) model, as it targets only those under a certain income threshold. Hence, no wealthy individual will have the opportunity to receive monthly government transfers, which is simply not the case for UBI. Essentially, since every citizen would be eligible for UBI as it is a universal program, this form of welfare will cause an unnecessary increase in government expenditures. In the United States, for example, it is estimated that an NIT program will cost between \$539 billion to \$1.09 trillion using four different cost estimators (Jarow 2020). Concerning UBI, assuming an annual \$12,000 government transfer for over 300 million Americans, this program would cost more than \$3.6 trillion (Amadeo, 2022). A similar phenomenon will occur in Canada, given the nature of these two particular policies (ex: a universal v.s a targeted approach).

Figure 1.0

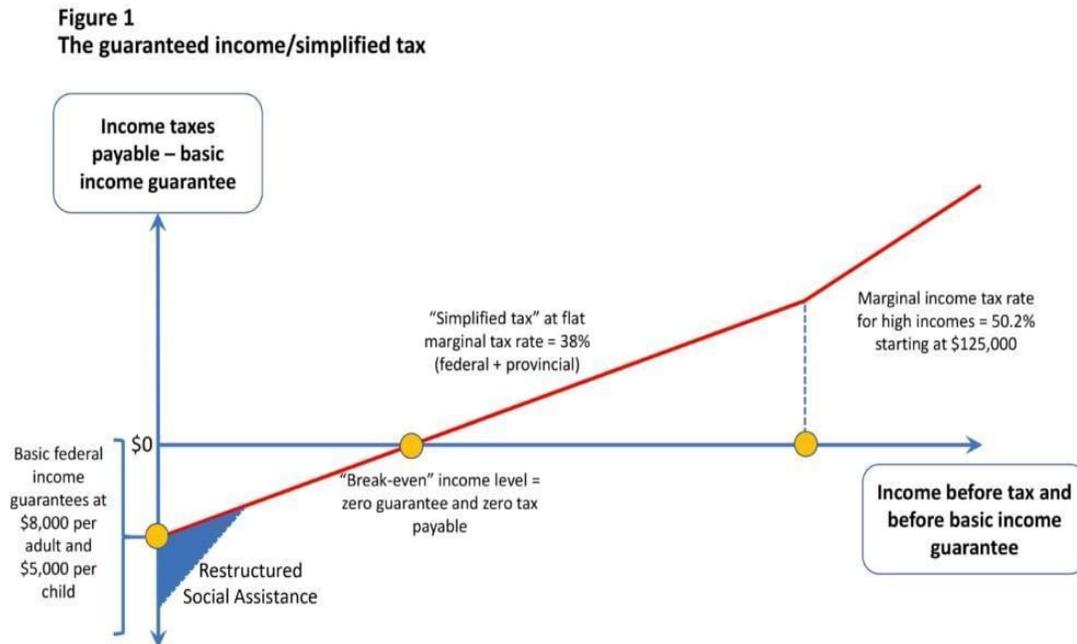


Figure 1.0 (Wolfson, 2021) shows how an NIT would function as a welfare mechanism in our economy. The most important factor that the NIT considers is your income. For example, individuals who make below the break-even income level are entitled to receive basic federal income, in this case, \$8,000 per adult and \$5,000 per child. However, once an individual reaches the break-even income level point, they are no longer eligible to receive a federal income, though they do not have any taxes payable. As the individual's income increases, so do

their taxes payable, which will reach roughly 50.2% as a marginal income tax for high-income earners starting at \$125,000 (Wolfson, 2021). An NIT is particularly meaningful because its benefits are not associated with employment, contrasting the minimum wage, which is only valuable to those individuals who earn it through employment.

Additionally, there was a finding by a Berkeley researcher which suggests that an NIT would force employers to bid up wages as it can make workers more selective when searching for employment. Thus, while an NIT can discourage work for certain individuals, it will incentivize firms to increase their wages without a government-driven price floor, such as the minimum wage. An NIT could provide \$1.39 in benefits for every \$1 government expenditure on this policy (Rothstein, 2009).

## **2.0 What are the Current Effects of the Minimum Wage in Canada's Labour Market?**

The data suggest that particularly among low-educated workers, lower job separation rates and lower hiring rates occur in Canada, especially in times with low inflation, as it produces an effect that would reduce the value of a currency. Sometimes nominal minimum wages are not adjusted to the current level of inflation, which is the ideal scenario for the average firm since it costs them less regarding labour expenses (Brochu & Green, 2013). Lower hiring rates can lead to unemployment among Canadian workers as there would be no incentive for the firm to hire them, as training and development is a costly program. In addition, an increase in the minimum wage will further disincentive firms to bear the costs of both training and increased labour costs (Brochu & Green, 2013). Researchers argue that increasing the minimum wage led to adverse consequences like a substantial increase in unemployment among teenagers, who often receive the minimum wage due to their lack of experience in the labour force (Campolieti et al., 2006).

## **3.0 Quantitative Analysis of the Minimum Wage and the Negative Income Tax**

Regarding the minimum wage, the researchers utilized data from the April Labour Force Survey results from 1981 to 1997. The primary research design in this journal consists of a baseline regression equation:  $E_{it} = \alpha + \beta_1 MW_{it} + \beta_2 MW_{it-1} + \beta_3 X_{it} + \beta_4 Region_i + \beta_5 Year_t + \epsilon_{it}$ , where E refers to the employment-population ratio for a certain age group, in this case,

teenagers. While the author outlined the region (Canada), it refers to the specific year. Moreover, MW is the minimum wage variable in this study to the average wage of workers aged 16 to 64. X is the vector of these control variables, and the regions and years are sets of regional data within provinces in Canada. Lastly, this equation is estimated separately among three samples of young workers: teenagers, young adults, and youth. In a revised equation:  $E_{it} = \alpha + \beta_1 FBit + \beta_2 FBit-1 + \beta_3 X_{it} + \beta_4 Region_i + \beta_5 Year_t + \epsilon_{it}$ , the “fraction below” captures the proportion of the youth popular that is potentially affected by the minimum wage change (Campolieti et al., 2006).

The results of employing this regression in the research study concerning the control variables are that a higher prime-age male unemployment rate is associated with lower youth employment, conveying that there is sensitivity (or an elasticity) to the youth cohort when the unemployment levels are lower for prime-age male individuals (Campolieti et al., 2006). Thus, since there is a correlation between increases in the minimum wage and the unemployment levels, younger workers, such as teenagers, will endure the negative externalities associated with a price floor policy. In addition, another externality that emerges is that minimum wage increases result in smaller wage increases for full-time workers aged 16 to 24. Essentially, a minimum wage increases the unemployment levels for younger workers and further reduces their ability to earn higher wages. The output of this regression is in **Appendix 1**.

In the second article concerning the impact of the minimum wage on labour market transitions, the researchers employed a regression analysis using provincial wage data from 1979 to 2008. The regression equation is as follows:

$$y_{p,t}^g = \alpha^g + \sum_{k=0}^K \beta_k^g \log(\text{real min. wage})_{p,t-12k} + \mathbf{x}_{p,t} \gamma^g + \epsilon_{p,t}^g$$

$y_{p,t}$  refers to the dependent variable and the  $\log(\text{real min. wage})_{p,t}$  is the natural log of the real minimum wages in province  $p$  and period  $t$ . Additionally, similar to the previous regression equation,  $X_{p,t}$  is the vector control which includes a whole set of provincial dummies, the dummy variable equaling 1 if there are any evident changes in the minimum wage during each month. Lastly, the  $K$  variable represents 0 if there are no lags and 1 if the minimum wage lags by a year; lag refers to a fixed amount of passing time (Brochu & Green, 2013).

The output of the regression equation conveys that a 10% increase in the real minimum wage led to a statistically significant 0.0035 decrease in the separation rate for workers with a high school degree or with those with less education who have worked under the same employer for less than one year (Brochu & Green, 2013). While this number may appear insignificant, these changes are at the monthly level, not the annual level, meaning that there would be even larger effects on an annual basis. The output of this regression is visible in **Appendix 2**.

The other vital component of the regression tests the layoff rate when the minimum alters and suggests that the minimum wage coefficient is negative while also being highly statistically significant and roughly  $\frac{3}{4}$  of the size of the effect of the overall separation rate (Brochu & Green, 2013). Thus, even though job separation and layoff rates decline as the government increases the minimum wage, the same researchers note that the minimum wage impact would lead to a 0.76% decrease in the employment rate for the educated aged 15-54, assuming a 10% minimum wage increase. In addition, concerning teenagers, a 10% minimum wage increase led to a 1.7% decline in their employment rate (Brochu & Green, 2013). Essentially, firms would be less willing to hire new applicants due to their increased labour costs, but they are willing to keep their current workers since training new workers will require additional costs. However, firms do not account for the increasing populations in their respective countries, leading to increased unemployment rates.

Regarding the Negative Income Tax article, the data relevant to Canada is ‘The Mincome Experiment’, a joint federal-provincial initiative in Manitoba from 1974 to 1978. Researchers employed surveys and regression analysis to conduct this experiment. Using a relatively small sample size of  $N = 123$ , there were some issues regarding separating workers and welfare recipients (Riddell & Riddell, 2021). The regression equation is as follows:

$$Hours_{it} = \alpha + \beta_1 (Treatment\ Group_i) + \beta_2 (Post\ NIT\ Offer_t) + \beta_3 (Treatment\ Group * Post\ NIT\ Offer_{it}) + \phi_i + \varepsilon_{it} \quad (1)$$

$\phi_i$  Refers to the fixed effects of the experiment, which includes certain interactions between the study and the *Post NIT Offer*, enabling the researchers to visualize different data slopes. *Post*

*NIT Offer* means after the individuals received a Negative Income Tax stipend. Lastly, the researchers estimate the data by separating the survey candidates by race and sometimes combining them (Riddell & Riddell, 2021).

Concerning the results of this regression, for single parents receiving welfare, the researchers found a 35% increase in work hours (Riddell & Riddell, 2021). Essentially, the Negative Income Tax policy increased more hours worked as it complemented the labour productivity of single parents on welfare. Thus, there is a positive labour supply response to this welfare system. Previous research implied that there would be a negative labour supply response as an NIT would reduce productivity directly due to the government transfers. While the category of single parents on welfare may appear like a niche group, a 35% increase in work hours is exceptionally high. Precisely, a 35% increase in work hours amounted to an additional 14 work hours per month, which would be roughly 150 hours annualized (Riddell & Riddell, 2021). For perspective, a 35% increase in work hours can amount to significant increases in productivity, suggesting that our economy will grow rapidly. A government transfer, such as an NIT, can aid single parents on welfare in becoming more productive. They will have the greater purchasing power to invest in services that enable them to work longer (ex: child daycare centres). The output of this regression is in **Appendix 3**.

Employing a neoclassical growth model with heterogeneous agents, which is used to examine the effects of an NIT, researchers found that increasing the demogrant-to-output ratio (ex: increasing the unconditional income transfer paid to individuals and families) resulted in a substantial decrease in both absolute and relative poverty (Angyridis & Thompson, 2016). When the ratio is roughly 19.7% with a flat tax rate of 50.9%, relative poverty is eliminated, conveying the benefits of an NIT. Essentially, increases in the demogrant-output ratio between 0% and 20% would reduce the overall inequality within the economy (Angyridis & Thompson, 2016).

Lastly, in a simplified version, utilizing various quantitative exercises, we can model a general equilibrium life-cycle economy by  $J$  heterogeneous overlapping generations. We assume that the agents deal with life uncertainty and idiosyncratic risk (a type of investment risk). The first factor is the environment. Every agent shares an identical utility function while valuing the

expected discounted stream of consumption and leisure (Lopez-Daneri, 2016). The equation is as follows:

$$\sum_{j=1}^J \beta^{j-1} \left( \prod_{i=1}^j s_j \right) u(c_{j,t}, l_{j,t}),$$

J refers to the age, and t refers to the time period. While  $c_{j,t}$  and  $l_{j,t}$  refers to consumption and labour (Lopez-Daneri, 2016).

The second assumption is that agents are born without any assets. The agents are endowed with one asset at a time during their working lives. They receive competitive wages of  $w_t$ , while their labour productivity is characterized as a first-order Markov process. The equations are the following:

$$\ln e(\omega, j) = \gamma_j + \theta^j + \pi_j^i + \varphi_j^i,$$

where

$$\pi_j^i = \rho \pi_{j-1}^i + \varepsilon_j^i, \quad \text{with } \varepsilon_j^i \sim N(0, \sigma_\varepsilon^2) \quad \text{and } \pi_0^i \equiv 0 \quad \forall i,$$

together with  $\varphi_j^i \sim N(0, \sigma_\varphi^2)$  and  $\theta^i \sim N(0, \sigma_\theta^2)$ . (Lopez-Daneri, 2016).

The third component concerns firms and technology. We utilize the classic Cobb-Douglas production equation, which represents the technological relationship between the inputs of labour and capital. The equation is denoted as the following:

$$Y_t = K_t^\alpha (A_t L_t)^{1-\alpha}$$

. Where  $K_t$  represents aggregate capital and  $L_t$  represents aggregate labour (Lopez-Daneri, 2016).

There are also certain assumptions regarding taxation and the agents' recursive information; however, for simplicity, I included the first three. The results of these quantitative exercises suggest that the average annual individual consumption gain is approximately 2.1%, signifying that an NIT could increase aggregate demand (Lopez-Daneri, 2016). The output of these equations is in **Appendix 4**.

#### **4.0 Analysis and Recommendations**

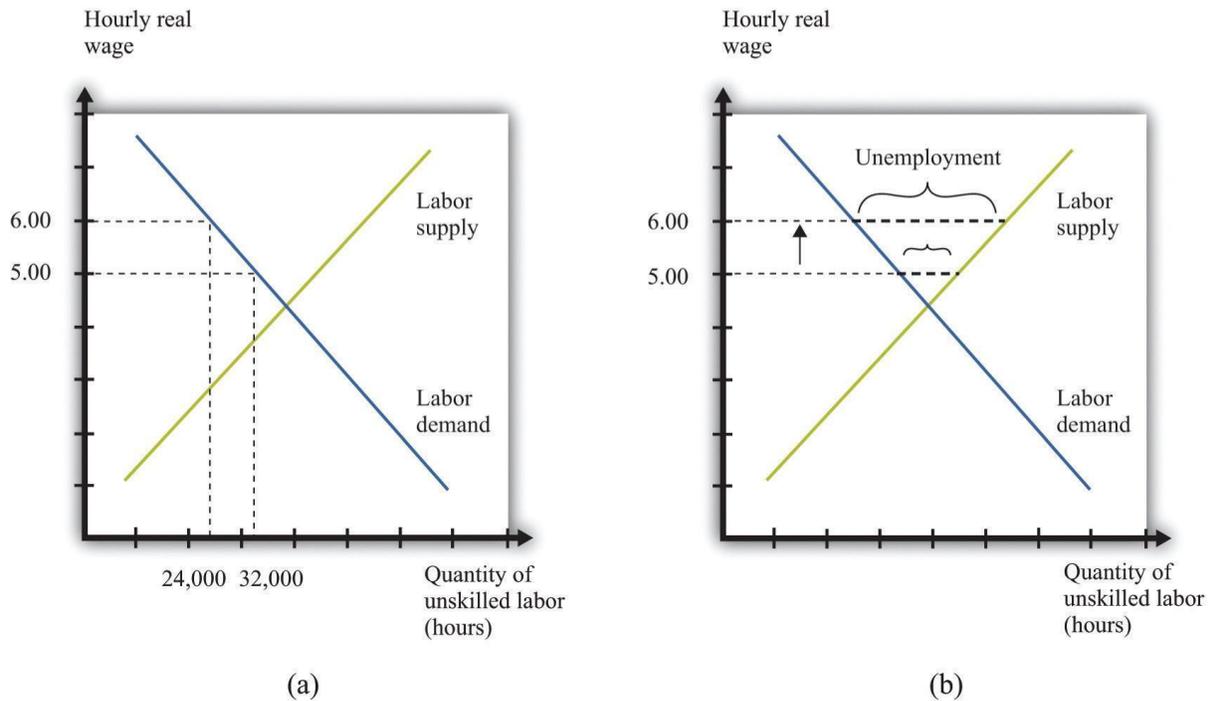
After gathering the data for these articles, the author suggests that the federal government in Canada should make an alternative compromise to the minimum wage; this alternative is a Negative Income Tax. The researchers convey the utility of implementing such a system from the experiments, a positive labour supply response to the NIT, particularly increased work activity and productivity. There was simply no compelling evidence on the front that an NIT would decrease labour productivity. In fact, there would be roughly a 35% increase in work hours for single parents on welfare, which falsifies the previous research on the NIT regarding productivity (Riddell & Riddell, 2021). An additional 150 hours of work for single parents on welfare are substantial. Moreover, because an NIT does not have the same mechanisms as a price floor, this will ensure the diminishment of any potential negative externality (Riddell & Riddell, 2021).

It is also important to note that the minimum wage has a negative elasticity between -0.17 to -0.44 among the youth, signifying that as prices increase, demand decreases. Elasticity refers to the change in aggregate demand for a good or service when the price changes. When the elasticity is negative, the demand will lower as you increase the price of something (ex: minimum wage). Thus, the firm will lower its demand for workers when the minimum wage grows, assuming a negative elasticity (Campolieti et al., 2006).

Figure 2.0 conveys the effects of a minimum wage on the demand and supply of labour (Cooper and John, 2011). For example, since the demand has a negative elasticity, the total demand for labour will decrease when the minimum wage increases by a certain amount, in this case, \$1.00. Moreover, workers will increase their demand in the labour market since they discern an increase in the minimum wage as a policy beneficial to them. However, from the firm's perspective, this policy will harm its profit-maximizing goal, thereby creating a form of market inefficiency (Cooper and John, 2011).

On the contrary, a positive elasticity implies that the demand will increase as prices increase, which is not the case in this example. Since an NIT is not associated with the market between firms and individuals, firms will have the incentive to hire workers.

Figure 2.0



Whether or not an NIT could substantially increase the aggregate demand of an economy is contingent on the state of the economy. For instance, during economic recessions, individuals will decrease their current consumption due to future uncertainty. Individuals spend money at a level in line with their expected long-term average income; economist Milton Friedman called this the “Permanent Income Hypothesis” (Kagan, 2021). Therefore, he argued that expansionary fiscal policy, such as government transfers, tends to be ineffective in increasing the aggregate demand during recessions, which policymakers should consider (Brock & Reeves, 2022). However, when individuals can precisely predict their long-term average income during normal states of the economy, a government transfer would be exceptionally more effective in increasing individuals’ consumption behaviour. An NIT will provide those impoverished with enough capital to train themselves before entering the workforce. While people could potentially use the transfers for undesirable activities, such as consuming drugs, economics assumes people are rational. Essentially, people will make decisions to maximize their utility. Furthermore, individuals make a cost-benefit analysis to assess whether they should engage in an activity (Riddell & Riddell, 2021). Hence, the NIT will benefit society, especially because it does not impact employment levels.

## **5.0 Conclusion**

Some of these studies assert that the minimum wage can negatively impact our economy, particularly in Canada. For example, firms would be more reluctant to hire new workers, impacting their productivity levels. One study, however, proposes that the Negative Income Tax can be a plausible and feasible solution to a price floor like the minimum wage. There was even evidence that an NIT could increase work activity and productivity in Manitoba, contrary to the initial viewpoint that suggested an NIT would reduce worker productivity. The researchers could discern the relationship between an NIT and productivity for welfare participant groups, which amounted to a 35% increase in hours worked, so there was a positive labour response (Riddell & Riddell, 2021). Furthermore, an NIT can eliminate poverty, which will improve Canada's economy. Lastly, through various quantitative exercises, the data suggest that the annual individual consumption rate would increase by an average of 2.1% (Lopez-Daneri, 2016). Therefore, the argument remains consistent. Accordingly, the author believes that all nations worldwide should seriously evaluate the positive impacts of an NIT and use it as an alternative to the minimum wage. One of the limitations of this particular literature review is that there needs to be additional research regarding the NIT worldwide. However, COVID-19 prompted numerous governments to implement basic income policies, so this should incentivize economists to analyze the effects of basic income policies in both the short and long run.

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Appendices

Appendix 1

MINIMUM WAGE ELASTICITIES BASED ON PRESPECIFIED RESEARCH DESIGN AND SUBSEQUENT MODIFICATIONS

Minimum wage measure	Minimum wage index			Separate minimum and hourly wage		
	Teens 16-19 (1)	Young adults 20-24 (2)	Youths 16-24 combined (3)	Teens 16-19 (4)	Young adults 20-24 (5)	Youths 16-24 combined (6)
<b>Baseline, excluding prime-age skilled employment rate</b>						
Min. wage	-0.090 (0.138)	-0.058 (0.059)	-0.093 (0.075)	-0.013 (0.180)	-0.019 (0.079)	0.050 (0.089)
Min. wage lagged	-0.192 (0.133)	-0.097 (0.062)	-0.163** (0.079)	-0.273*** (0.061)	-0.198** (0.084)	-0.229*** (0.086)
Sum current and lagged	-0.282*** (0.107)	-0.155*** (0.055)	-0.256*** (0.061)	-0.285*** (0.098)	-0.217*** (0.049)	-0.180*** (0.046)
<b>Including prime-age skilled employment rate</b>						
Min. wage	-0.116 (0.138)	-0.037 (0.061)	-0.099 (0.076)	-0.039 (0.180)	-0.025 (0.090)	0.059 (0.099)
Min. wage lagged	-0.187 (0.134)	-0.104* (0.060)	-0.163** (0.080)	-0.260 (0.161)	-0.205** (0.087)	-0.229** (0.096)
Sum current and lagged	-0.303*** (0.103)	-0.141*** (0.055)	-0.263*** (0.064)	-0.299*** (0.108)	-0.230*** (0.063)	-0.170** (0.075)
<b>Nonenrolled with high school education or less, including prime-age skilled employment rate</b>						
Min. wage	0.214 (0.140)	-0.221*** (0.082)	-0.234*** (0.082)	0.142 (0.169)	-0.095 (0.095)	-0.164 (0.106)
Min. wage lagged	-0.034 (0.140)	0.025 (0.091)	-0.034 (0.095)	-0.463*** (0.180)	-0.221** (0.099)	-0.071 (0.102)
Sum current and lagged	-0.248* (0.138)	-0.196** (0.077)	-0.268*** (0.082)	-0.321*** (0.123)	-0.316*** (0.074)	-0.235** (0.094)

(Campolieti et al., 2006).

Appendix 2

*Separation Rate, Low Skilled*

	All tenure	<1 year	<6 months	6-11 months
<i>Males and females</i>				
<b>No lags</b>				
log(real min. wage)	-0.0009 (0.0053)	-0.0351 (0.0114)***	-0.0434 (0.0134)***	-0.0075 (0.0107)
<b>With 1 year lag</b>				
log(real min. wage)	-0.0028 (0.0081)	-0.0318 (0.0173)*	-0.0419 (0.0202)**	0.0010 (0.0180)
Lagged log(real min. wage)	0.0024 (0.0081)	-0.0031 (0.0172)	0.0002 (0.0202)	-0.0107 (0.0180)
<i>Males</i>				
<b>No lags</b>				
log(real min. wage)	-0.0011 (0.0057)	-0.0380 (0.0133)***	-0.0436 (0.0156)***	-0.0107 (0.0138)
<b>With 1 year lag</b>				
log(real min. wage)	-0.0066 (0.0089)	-0.0396 (0.0209)*	-0.0444 (0.0245)*	-0.0151 (0.0235)
Lagged log(real min. wage)	0.0063 (0.0089)	0.0013 (0.0208)	0.0022 (0.0244)	0.0028 (0.0234)
<i>Females</i>				
<b>No lags</b>				
log(real min. wage)	-0.0009 (0.0060)	-0.0318 (0.0127)**	-0.0420 (0.0153)***	-0.0061 (0.0119)
<b>With 1 year lag</b>				
log(real min. wage)	0.0009 (0.0093)	-0.0282 (0.0198)	-0.0471 (0.0240)**	0.0117 (0.0201)
Lagged log(real min. wage)	-0.0018 (0.0093)	-0.0018 (0.0198)	0.0081 (0.0241)	-0.0200 (0.0202)

Notes. Dependent variable: proportion of workers on a job in month  $t$  who separate from that job in month  $t + 1$ . All regressions are estimated using FGLS (AR(3) model) and are weighted by the inverse of the number in the at-risk group. The number of observations is 3,472 in specifications without a lag and 3,392 in specifications with a lag. All regressions include a full set of time and province dummies and a dummy equal to one if there was a minimum wage change in the month. Standard errors in parentheses. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

(Brochu & Green, 2013)

Appendix 3

**Treatment Effects in Mincome**

	Periodic Surveys (MINC4)		Payments Administrative File (MINC2)
	Employed	Hours	Employed
Treatment Group	.139** (.068)	72.43* (39.53)	.137* (.072)
8 Survey (time) fixed effects	Yes	Yes	No
34 Month fixed effects	No	No	Yes
Sample size	1018	1018	3484
Number of individuals	126	126	127

NOTES: Standard errors are in parentheses and are clustered on the individual. All regressions include dummies for the normal income category and household demographics. For the periodic surveys, employed=1 if positive hours, =0 if no hours worked. For the payments file, employed=1 if wages are positive, =0 for no wages in a given month.

(Riddell & Riddell, 2021)

Appendix 4

Comparison of different NIT's.

Variables	Baseline	NIT 0%	NIT 2.5%	NIT 5%	Optimal NIT
<b>GDP</b>	100.0	124.7	118.1	110.9	90.6
<b>Capital stock</b>	100.0	163.3	144.6	125.5	78.5
<b>Labor supply</b>	100.0	107.8	105.9	103.8	97.8
<b>Hours</b>	100.0	110.8	107.0	103.2	93.2
<b>Savings rate</b>	100.0	131.0	122.5	113.1	86.7
<b>Social security benefits</b>	100.0	107.8	105.9	103.8	97.8
<b>K/Y</b>	100.0	131.0	122.5	113.1	86.7
<b>K/L</b>	100.0	151.5	136.6	120.9	80.3
<b>Marginal tax rate</b>	-	8%	10%	13%	22%
<b>Welfare transfers</b>	100.0	0.0	113.1	226.3	497.8
<b>CEV</b>	0.0%	-4.1%	-2.0%	-0.2%	2.1%

Note: A comparison of the macroeconomic performance of different NIT's is shown in a setting where the actual federal welfare system is abolished. Aggregate variables are normalized with respect to the benchmark economy (Baseline=100.0). The welfare gain/loss for different taxes – Consumption Equivalent Variation (CEV) – takes into account the transitional dynamics.

(Lopez-Daneri, 2016)