Online Appendix of:

The Norwegian Tax Holiday:
Salience, Labor Supply Responses, and Frictions

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A The Norwegian Tax System

Until the reformed tax system was in place in 1957, the Norwegian fiscal year began on July 1st. This implied that, for example, the direct taxes for the fiscal year 1954/55 are assessed based on incomes earned during 1953 and on property held as of January 1, 1954. This changed in 1957 and taxes paid in 1957 were based on the income earned in that year and the value of the property held as of January 1 that year.

   Income taxes were levied both at the national (government) level and the local (municipality) level. The tax paid to the government was progressive while the municipal-level tax was flat but varied across municipalities. Table A.1 presents an overview of the tax schedule for incomes earned in 1952-1955. At the bottom of the tax schedule, for incomes of 12,000 NOK or lower, taxpayers were subject to a 10% tax to the government and 14-18.5% tax to their municipality, depending on where they live. In total a tax rate of about 25%.

Table A.1: Tax rates

	Government	Municipalities	Total
Of the first 12,000	10%	14-18.5%	24-28.5%
Of the next 8,000	15%	14-18.5%	29-33.5%
Of the next 10,000	25%	14-18.5%	39-43.5%
Of the next 10,000	35%	14-18.5%	49-53.5%
Of the next 30,000	45%	14-18.5%	59-63.5%
Of the next 100,000	55%	14-18.5%	69-73.5%
Any exceeding amount	65%	14-18.5%	79-83.5%

Notes: The table present the progressive schedule of rates of taxes paid to the government and to municipalities on earnings in 1952-1955. For municipalities it reports the range from the lowest to the highest rate. *Source:* Statistisk Sentralbyrå (1956, 1957).

   Not all income was taxed. At the governmental level, there were deductions from taxes payable where the amount of deduction was based on which 'tax class' individuals were in. For example, singles were in tax class 1 and those with one child in tax class 2. If individuals were sick or disabled they were moved up by a tax class. If individuals themselves or their spouses would turn 69 years old before January 1 in the year they were being assessed they would also move up a tax class (see, e.g., Statistisk Sentralbyrå, 1956). Table A.2 presents an overview of tax deductions and implied tax-exempt income by tax class. Individuals in the first tax class would for example get deducted 400 NOK from their tax payment, which implied that individuals in that class with incomes below 4,100 NOK would not pay tax. At the municipal level, there were similarly 8 tax classes, but the municipalities had 7 options for allowing for tax-exempt income within each class. For example, individuals in tax class 1 living in a municipality with the lowest amount of tax-exempt income could earn 600 NOK before paying a tax to their municipality. In comparison, those living in a municipality allowing for the highest amount could earn 1,300 NOK.

   Figure A.1 plots the distribution of income across taxpayers. As explained and documented

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Table A.2: Tax deductions and exempt income

	Government		Municipalities
Tax class	Deduction	Lowest taxable income	Tax exempt income
1	400	4,100	600-1,300
2	800	8,100	1,000-2,300
3	1,000	10,100	1,500-3,500
4	1,300	12,700	2,100-4,900
5	1,700	15,400	2,800-6,500
6	2,200	18,700	3,600-8,300
7	2,800	21,700	4,000-10,300
8	3.500	24,500	5,500-12,500

Notes: The table present an overview of tax deductions and resulting levels of tax exempt incomes at both the governmental and municipal level in 1952-1955. All numbers are in Norwegian Krone (NOK). Individuals are separated into 8 tax classes depending on factors such as family and health status. See main text for more details. *Source:* Statistisk Sentralbyrå (1956, 1957).

in Table A.2, earnings of 600 NOK are the lowest earnings to be taxed at the municipal level and 4,100 NOK at the governmental level.
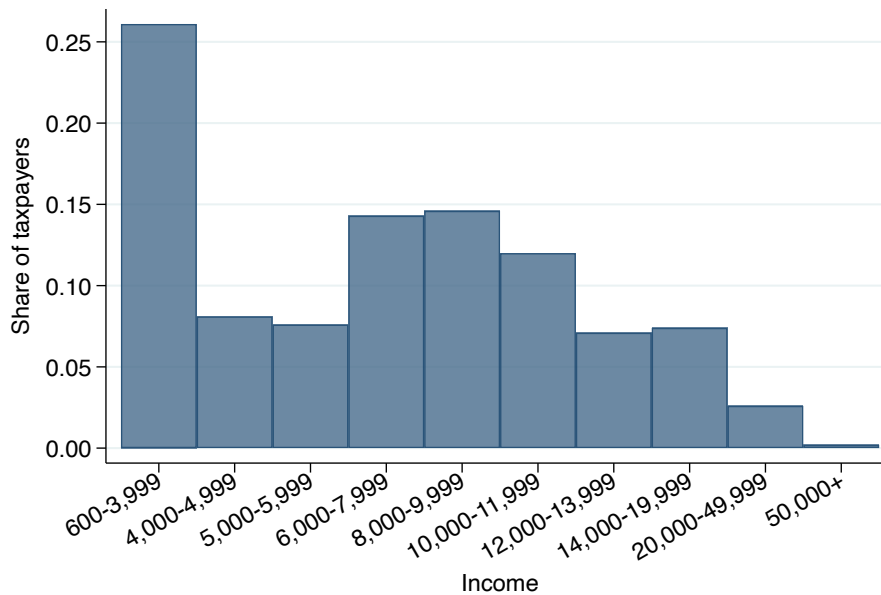

Figure A.1: Distribution of taxable income

Notes: The figure plots the distribution of income of taxpayers for taxes paid in the fiscal year 1954/55. All numbers are in Norwegian Krone (NOK). No individuals with earnings below 600 NOK pay a tax to the government or a municipality. 731,234 individuals paid taxes to central government and 1,581,650 taxpayers were assessed for taxes by the municipalities, or 43% of the total population. *Source:* Statistisk Sentralbyrå (1956).

B Survey Questions

The main text reports evidence based on answers to three main questions in the Gallup survey. Figure 2 in the main text reports evidence on salience based on the fraction of people that know about the tax holiday and the earning opportunity it provided. It reports the share of people that answered yes to the following question asked in Norwegian:

"På grunn av overgangen til skatt av årets inntekt er det i år adgang for alle til å tjene penger skattefritt. Har De lagt merke til disse bestemmelsene?"

An English translation of this question is:

"Because of a transition to a pay-as-you-earn tax system, there is an opportunity for everyone this year to earn tax-free money. Did you notice this provision?"

Figure 3 in the main text reports evidence of labor supply responses to the tax holiday. Among those who answered yes to the former question, it reports the share of people that answered yes to the following question asked in Norwegian:

"Har De personlig satt Dem i sving for å dra fordel av disse bestemmelsene, f.eks. ved å ta Dem en ekstrajobb, ta overtid eller liknende?"

An English translation of this question is:

"Have you personally acted to take advantage of these provisions for tax-freedom, e.g. by taking an additional job, work overtime or similar?"

Figure 4 in the main text reports reasons for non-response, which was asked to those who answered no to the former question. In Norwegian the question was stated:

"Hvorfor har De ikke sett deg i sving for å tjene penger skattefritt?"

An English translation of this question is:

"Why have you not acted to earn tax-free money?"

Gallup organizes the answers into the following categories (English translations in parenthesis):

- *"Ikke tid, anledning, har barn, hus, ..."* (*"Does not have time, opportunity, has child, house, ..."*)

- *"Kan ikke tjene mer enn jag gjør, lang nok arbeidstid"* (*"Can not earn more than I do, long working hours, ..."*)

- *"Ikke arbeid å få"* (*"No work available"*)

- *"For gammel, de vil ikke ha eldre folk"* (*"Too old, they do not want older people"*)

- *"Er arbeidsufør, syk"* (*"Is incapacitated for work, sick"*)

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- *"Tror at vi får skatt allikevel, bare noe de sier"* (*"Think we will be taxed anyway, just something they say"*)

- *"Har ikke tenkt over det"* (*"Have not thought about it"*)

- *"Ikke nødvendig, pensjon, er ikke skattyter"* (*"Not necessary, pension, is not taxpayer"*)

- *"Diverse andre svar"* (*"Various other answers"*)

- *"Kan ikke begrunne"* (*"Can not justify"*)

C   Frisch Elasticity Based on Back-Of-The-Envelope Calculation

In the main text, I estimate a Frisch elasticity for Norway using the neighboring country Sweden as a counterfactual for Norway around the tax holiday in a country difference-in-differences estimation. As an alternative approach to quantify a Frisch elasticity for Norway, I use earlier labor supply estimates from other large-scale tax reforms in Norway, as well as parameter estimates from the literature. A dynamic labor supply model with time-separable utility in consumption and leisure gives the following relationship between the Frisch elasticity, steady-state (Marshallian) elasticity, and other parameters of the model (Ziliak and Kniesner, 1999; Browning, 2005):

$$\varepsilon_{\text{Frisch}} = \varepsilon_{\text{Marshallian}} - \frac{A}{wh} \cdot mpe \cdot (1 - \rho \cdot mpe)$$

where ρ is the intertemporal substitution in consumption (EIS), mpe is the marginal propensity to earn (MPE) out of unearned income, and $\frac{A}{wh}$ is the ratio of wealth to labor income.

Aarbu and Thoresen (2001) exploit a Norwegian tax reform in 1992 that substantially increased the net-of-tax rate for high-income earners to estimate a permanent (steady-state) labor supply elasticity of 0.21 (see Table 2, column 5, which attempts to address mean reversion). As this estimate does not attempt to separate the substitution and income effects, I interpret this as an estimate of the Marshallian—or uncompensated—elasticity. Cesarini et al. (2017) report an estimate of the MPE of 0.1 for the sample of Swedish lottery winners. This estimate is similar to estimates from other prominent estimates in the literature, such as Imbens et al. (2001) who estimate an MPE of 0.11 for people playing the lottery in Massachusetts. I use an MPE of 0.1 in the calculation. Havránek (2015) conducts a meta-analysis of the estimates of the EIS and reports an average estimate of 0.5, which I use in the calculation. Lastly, I use a $\frac{A}{wh}$ ratio of 1.21 which is calculated as the ratio of average wealth to average labor earnings in 1955. Together these parameters imply a Frisch elasticity of 0.34, or about twice as large as estimated using cross-country difference-in-differences.
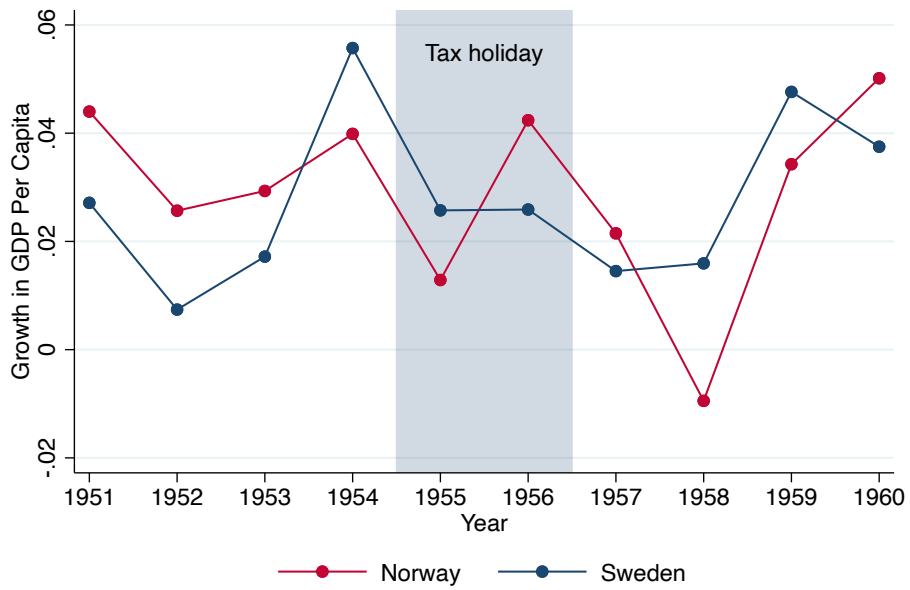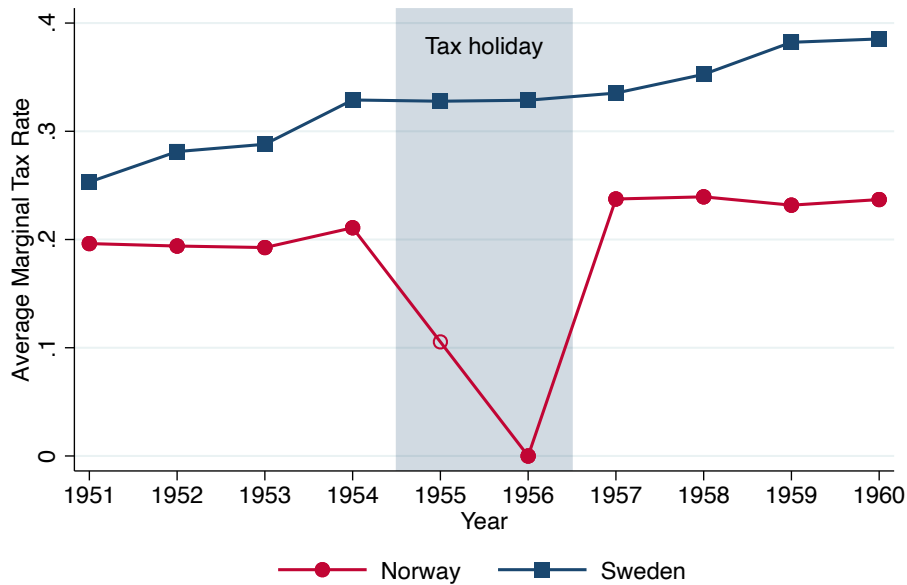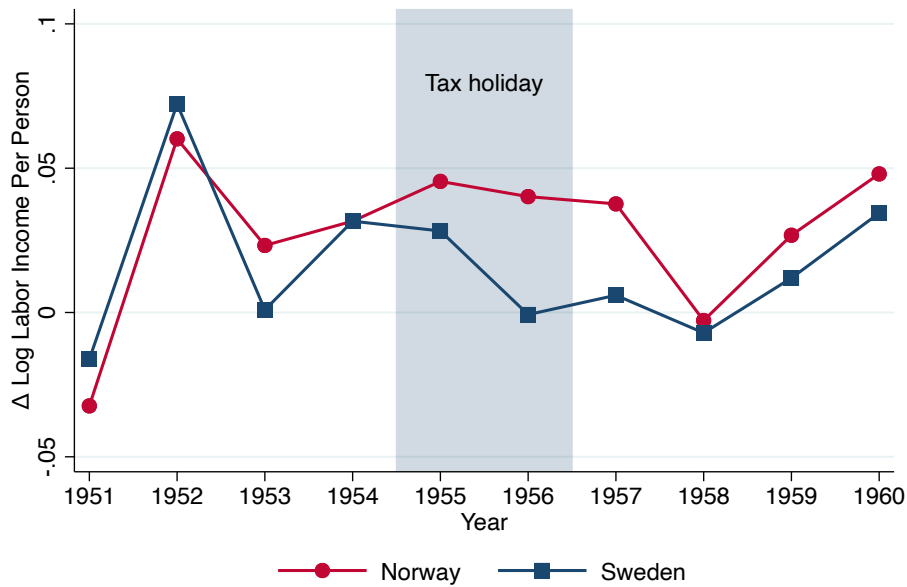
D   Supplementary Figures

Figure A.2: GDP growth per capita in Norway and Sweden

Notes: The figure plots the growth rates in GDP divided by population at working age in Norway and Sweden. Data are from National Accounts in the two countries, adjusted for inflation using CPI.
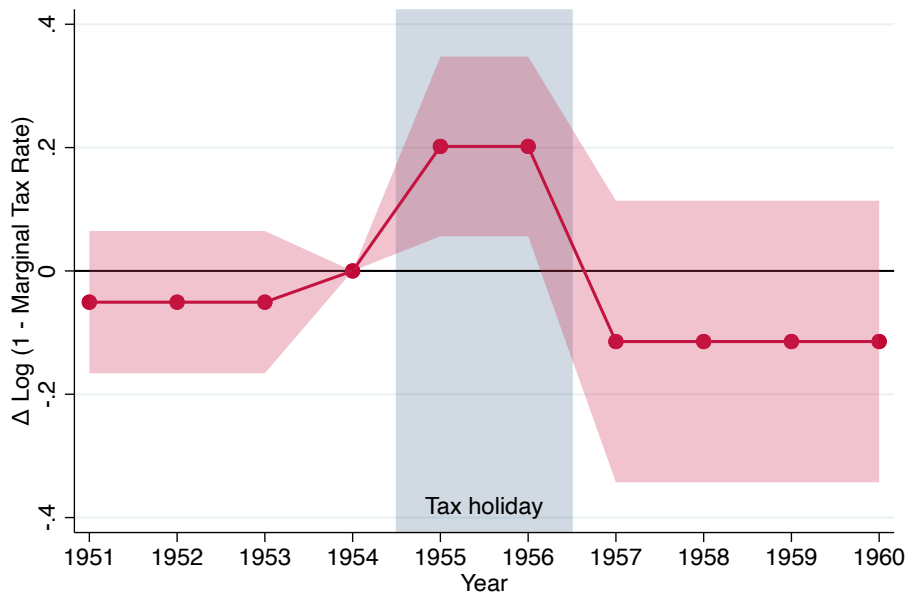
(a) Average marginal tax rate

(b) Labor income per person

Figure A.3: Marginal tax rate and labor income

Notes: The figure plots average marginal tax rate (panel a) and the growth rates in total labor income (wages and salaries) divided by population at working age (panel b). Marginal tax rates for Norway are computed using data from annual publications of Statistics Norway's *"Skattestatistikk"*, e.g. Statistisk Sentralbyrå (1956). I calculate the average marginal tax as the weighted average of taxpayers in each bracket of the progressive tax schedule, plus the weighted average of local municipal tax rates. The tax rate in 1955 is set to 50% of the statutory rate, reflecting that half of the year was a tax holiday. Marginal tax rates for Sweden are from Stenkula et al. (2014). Labor earnings are from National Accounts in the two countries, adjusted for inflation using CPI. The growth rate for Sweden is normalized to equal that in Norway in 1954, the year before the tax holiday.

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(a) Average marginal tax rate
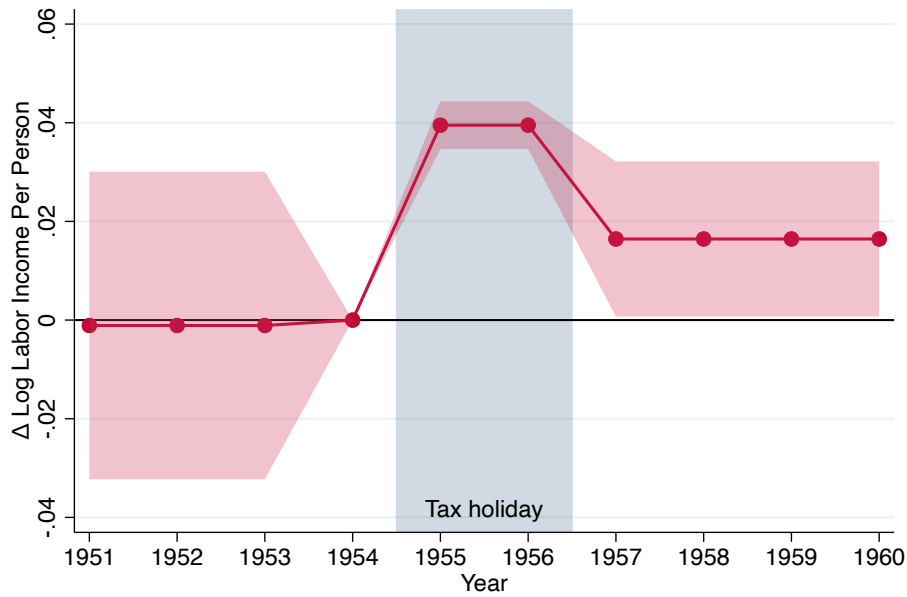
(b) Labor income per person

Figure A.4: Cross-country difference-in-differences

Notes: The figure plots estimates from cross-country difference-in-differences regressions for the net-of-tax rate, panel (a), and labor income, panel (b). More precisely, the figures plots estimates of the coefficients β_t from the following regression:

$$y_{t,c} = \gamma_c + \delta_t + \beta_t \cdot Period \cdot Norway + \mu_{t,c}$$

where $y_{t,c}$ is the log change in the net-of-tax rate or total labor earners per person, γ_c and δ_t are country and year fixed effect, respectively, *Period* are indicators for the pre-reform period (1951-1954), the tax holiday (1955-1956), and the post-period (1957-1960), and *Norway* is an indicator for Norway, i.e. the treated country.
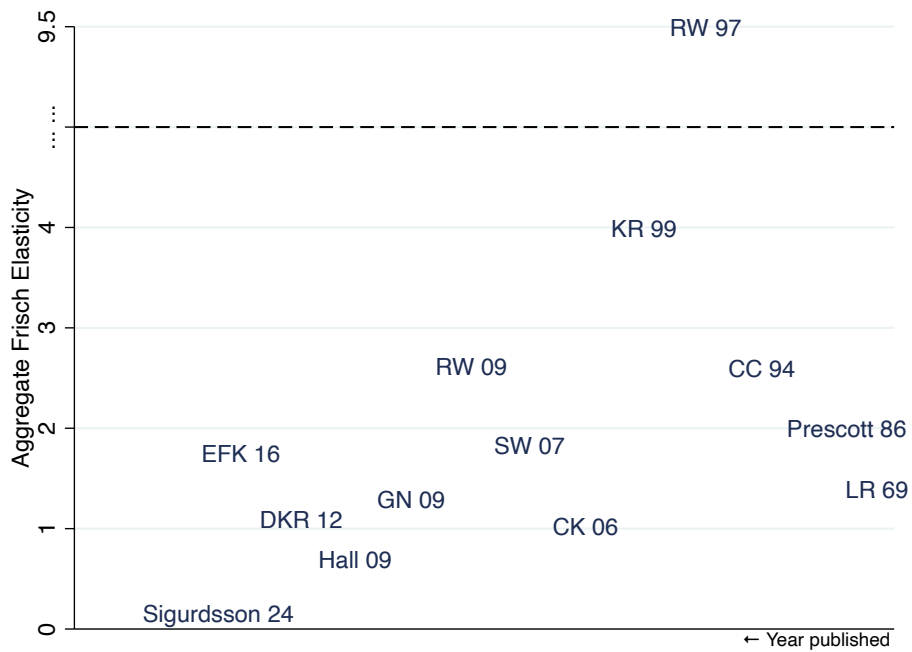
Figure A.5: Summary of aggregate Frisch elasticity estimates

Notes: The figure plots parameter estimates of aggregate (macro) Frisch elasticity in the macroeconomic literature. Estimates are ordered on the x-axis by the year published. Labels are as follows (from right to left). "LS 69": Lucas and Rapping (1969). "Prescott 86": Prescott (1986). "CC 94": Cho and Cooley (1994). "RW 97": Rotemberg and Woodford (1997). "KR 99": King and Rebelo (1999). "CK 06": Chang and Kim (2006). "SW 07": Smets and Wouters (2007). "RW 09": Rogerson and Wallenius (2009). "GN 09": Gourio and Noual (2009). "Hall 09": Hall (2009). "DKR 12": Dyrda et al. (2012). "EFK 16": Erosa et al. (2016). "Sigurdsson 24" refers to the estimate in Table 1, column (3) in the current paper.

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