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Nonbinary and Transgender Identities and Earnings: Evidence from a National Census†

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We provide the first evidence from a large population census on earnings disparities experienced by nonbinary people—individuals who do not exclusively identify as men or women—and transgender people—individuals whose gender differs from their sex assigned at birth—relative to cisgender people. Using restricted-access 2021 Canadian census data linked to tax records, we find that nonbinary individuals assigned male at birth, transgender men, transgender women, and cisgender women all earn significantly less than comparable cisgender men. Nonbinary individuals assigned female at birth experience an additional earnings penalty. Differences in job sorting explain some of these disparities. (*JEL* J16, J31, J71)

Societies that acknowledge a spectrum of genders that may not align with an individual's sex at birth have long existed (Herdt 2020; Wiesner-Hanks 2021). However, the formal recognition by some high-income nations of gender identities that do not conform to binary gender norms is relatively recent and represents a significant cultural and social development. In this article, we present the first nationally representative evidence on the demographic characteristics and labor market experiences of people with diverse genders in North America.

Economic research on gender identity has grown significantly in the past three decades (Badgett et al. 2024), especially studies of transgender people. Transgender people are those whose gender identity does not align with their sex assigned at birth. Transgender women are individuals assigned male at birth who

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identify as women. Transgender men are individuals assigned female at birth who identify as men. Cisgender people are individuals whose gender identity aligns with their sex assigned at birth. Existing studies of transgender people's labor market outcomes suggest earnings disparities relative to similarly situated cisgender men (Geijtenbeek and Plug 2018; Carpenter, Eppink, and Gonzales 2020; Carpenter, Lee, and Nettuno 2022; Carpenter, Goodman, and Lee 2024). These studies either use administrative records with information on legal gender marker changes or small samples of transgender people from population surveys such as the Behavioral Risk Factor Surveillance System or the US Census Bureau's Household Pulse Survey.

In contrast to the growing number of studies on transgender people, there is no large-scale research on another fast-growing gender minority group: nonbinary people.[1] Nonbinary people are those who identify neither exclusively as men nor exclusively as women.[2] We are aware of only one study in economics that has explicitly focused on nonbinary people. Coffman, Coffman, and Ericson (2024) study a nonrepresentative online sample of 1,917 adults from Prolific, of which 455 were nonbinary. They find that nonbinary people report having experienced more discrimination than cisgender men and women. They also find that there is more anti-nonbinary sentiment than anti-LGBT sentiment among cisgender people, especially cisgender men.

Other studies have examined economically relevant outcomes for gender-diverse populations. Carpenter, Lee, and Nettuno (2022) find that individuals who describe their gender as "none of these" (as opposed to male, female, or transgender) in the US Census Bureau's Household Pulse Survey had significantly lower employment rates and household incomes than cisgender people. Carpenter et al. (2025) examine individuals in New Zealand who indicated that they were "gender diverse" (as opposed to male or female) on their driver's license application, which may possibly include transgender people who conform to a binary gender identity and intersex people.[3] They find that gender-diverse individuals had significantly lower average earnings than similarly situated cisgender people. Neither of these studies identifies nonbinary people per se.[4]

Our work is based on restricted-access data from the 2021 Canadian long-form Census. These data have several strengths relative to prior work studying gender minority populations. First, because the census is mandatory, it has a response rate of 98 percent, which is very high compared to sample surveys. For comparison, the main nationally representative dataset in the United States with information on gender minorities, the Census Bureau's Household Pulse Survey, has a 6 to 10 percent response rate (Perez-Lopez 2021).[5] Because census long forms were administered to

[1] We use the term "gender minority" to refer to nonbinary and transgender people.

[2] Some—but not all—nonbinary people also identify as transgender in the sense that their gender deviates from their sex assigned at birth.

[3] Intersex refers to individuals born with physical sex characteristics—such as chromosomes, hormones, or anatomy—that do not fit typical definitions of male or female.

[4] Some surveys have explicitly offered "nonbinary" as a response option to a question about gender, though these surveys typically have very small samples. For example, Stacey, Reczek, and Spiker (2022) use data from the 2018–2019 Gallup National Health and Well-Being Index, which identifies 73 people whose gender is "nonbinary / genderqueer."

[5] Although the Household Pulse Survey is weighted to be nationally representative, the variables used for adjustment do not include nonbinary or transgender status (because they are not measured in administrative data systems).

25 percent of the entire population of Canada, we also obtain much larger samples of nonbinary and transgender people than any other studies, allowing us degrees of freedom to control for detailed demographics and to investigate differences throughout the earnings distribution. Additionally, the 2021 Canadian Census is a random sample of the population as opposed to, say, driver's license applicants (as in Carpenter et al. 2025) who may be selected on dimensions correlated with earnings.

Second, our Canadian census data include high-quality annual earnings information from 2019 and 2020 matched from tax records and contain a rich set of variables including age, education, immigration status, religion, health status, family structure, location, time worked, and job characteristics including occupation and industry. Research using other datasets that include nonbinary and transgender identities do not have access to such detailed demographic and labor market information. Our large samples combined with these additional variables allow us to investigate previously unstudied issues, including the age profile of nonbinary people, earnings disparities across the conditional distribution, and the roles of time worked and sorting across occupations in explaining earnings disparities (for which we find strong evidence).

Third, in our data, we can identify transgender and nonbinary people who would be missed in existing administrative data based on changes in binary sex markers on government documents or specific medical diagnoses. While administrative data have strengths, they may miss a large proportion of individuals who have not pursued a medical diagnosis or taken steps to change government documents. This may be particularly relevant for nonbinary people. The 2021 Canadian Census also uses the gold standard two-step method to identify gender minorities that separates and clearly distinguishes sex at birth from gender (Bates, Chin, and Becker 2022).

Including nonbinary and transgender people in the economics literature is important for several reasons. First, the available evidence suggests that younger individuals are much more likely to be gender minorities than older individuals, and thus, this population group will likely grow in the coming years. Second, understanding the relative economic position of nonbinary and transgender populations is important for economic and legal policy debates. For example, one of the first executive orders signed by Donald J. Trump in 2025 requires that federal agency forms requiring information on a person's sex "shall list male or female, and shall not request gender identity" (United States White House 2025). Our work—by leveraging a data context where nonbinary and transgender people are directly identified—documents the potential consequences of such a policy of omitting these identities from government data. And although a US Supreme Court case in 2020 extended federal nondiscrimination protection in employment to transgender people (*Bostock v. Clayton County*), there have been numerous anti-transgender laws adopted by US states in recent years (Hassan 2023). A key question relevant for adjudicating the legality of these policies is whether nonbinary and transgender populations constitute a "suspect class," which turns, in part, on whether they have historically experienced discrimination and powerlessness (Biskupic 2024).[6] Our work helps inform this important debate. Finally, understanding patterns in the demographic and economic outcomes of nonbinary and transgender people can contribute to innovation in the economics of identity,

[6]Examples of agreed-upon suspect classes include race and religion (Cornell Law School, Legal Information Institute 2024).

gender, and discrimination (Akerlof and Kranton 2000; Blau and Kahn 2017; Blau and Lynch 2024; Kline, Rose, and Walters 2022).

Although ours is the first study to estimate differences in individual earnings between transgender people compared to similarly situated cisgender people using a mandatory national population census linked to administrative tax records, other studies have used administrative data alone to show that transgender people—particularly transgender women—have lower earnings than cisgender people (Carpenter, Goodman, and Lee 2024; Geijtenbeek and Plug 2018). Thus, among the hypotheses that we investigate is whether or not transgender men and women have lower earnings than cisgender men. In contrast, there is minimal prior evidence on the relative earnings of people who identify as nonbinary. Prior audit study evidence on hiring discrimination against fictional candidates who use "they/them" pronouns suggests that nonbinary people may face discrimination at the point of hiring (Eames 2025; Kline, Rose, and Walters 2022). If nonbinary status is observable by employers or coworkers or customers, and if violating gender norms is socially costly, then segregation into lower-paying types of work or lower pay conditional on work would result in nonbinary people earning less than cisgender people.

Existing economic theories do not provide a clear prediction of how labor market attainment would differ between transgender and nonbinary people. If individuals face a social penalty for observably deviating from cisgender norms in their gender expression, then those who are more likely to be perceived as not conforming may face a greater earnings penalty. Transgender people may be more likely than nonbinary people to undergo significant medical interventions to affirm their gender, increasing the likelihood that they are perceived as cisgender. If so, nonbinary individuals may face a larger penalty. However, medical interventions could also independently impact labor market outcomes, thus making relative earnings predictions even more complex. Sex at birth is well known to be correlated with earnings for cisgender people. It may also matter for nonbinary people. For this reason, we investigate earnings gaps separately for nonbinary people assigned male at birth versus those assigned female at birth. However, given the paucity of theoretical models on gender minority labor markets, the magnitudes of relative earnings disparities are ultimately empirical questions that may provoke, rather than resolve, predictions of economic models.

I. Data and Descriptive Statistics

The 2021 Census was the first in Canada to allow for the identification of nonbinary and transgender people. Previous censuses only asked about sex but not gender. In 2021, a question on gender was added that asks "what is this person's gender?" and includes a note that gender "refers to current gender which may be different from sex assigned at birth and may be different from what is indicated on legal documents." The three response options to the gender question are male, female, and a write-in option that reads "or please specify this person's gender."[7] This two-step

[7] We provide a visual representation of the 2016 and 2021 Canadian Census forms in Supplemental Appendix Figures A1 and A2, respectively.

approach to asking about sex at birth separately from gender is considered best practice (Badgett et al. 2014; Bates, Chin, and Becker 2022).

We identify nonbinary people based on their text responses to this question about their current gender.[8] Together with information on sex at birth, we separate nonbinary people into nonbinary people assigned male at birth and nonbinary people assigned female at birth. The estimated sample counts are approximately 6,400 for nonbinary people and 7,600 for transgender people aged 25 to 59. This corresponds to over 25,000 nonbinary individuals and 30,000 transgender individuals in the Canadian population in this age range.

The 2021 Canadian long-form Census also includes detailed demographic information, including age, visible minority status, Indigenous status, household structure, marital status, immigration status, educational attainment, geographic location, mobility, health, industry, and occupation.[9] Our primary results use earnings data from 2019 to avoid challenges with the COVID-19 pandemic in our main specifications (Jones et al. 2023).

We start by presenting the estimated population shares of nonbinary people assigned female at birth, nonbinary people assigned male at birth, transgender men, and transgender women in Supplemental Appendix Figure A4. This figure shows that about 0.34 percent of the full sample of Canadians aged 25–59 is nonbinary or transgender.[10] Transgender women are the largest group, comprising 0.11 percent of the population of 25-to-59-year-olds, followed by nonbinary individuals assigned female at birth (0.1 percent), transgender men (0.08 percent), and nonbinary individuals assigned male at birth (0.05 percent). A striking pattern shown in Supplemental Appendix Figure A4 is the strong age gradient: Gender minorities are much more prevalent among younger people; their representation falls off sharply by age 40.

Our estimated share of the Canadian population that is nonbinary or transgender is somewhat lower than previous estimates in other countries. For example, a 2022 Pew Research Center survey with a little over 10,000 respondents in the United States indicated that 1 percent of adults aged 18 and older identified as nonbinary with an additional 0.6 percent identifying as transgender (Brown 2022). Studies that identify transgender people using the gold standard two-step approach generally return lower estimated population shares, however. The United Kingdom Office for National Statistics in 2024 also reported that 0.5 percent of the population of England and Wales aged 16 and older reported a gender incongruent with their sex at birth in the 2021 UK Census, with 0.20 percent identifying as transgender, 0.06 percent identifying as nonbinary, and 0.24 percent with no write-in response (UK Office for National Statistics 2023). Thus, our estimated population shares among 25-to-59-year-olds in the 2021 Canadian Census are within the lower range of existing credible estimates.[11]

[8] We provide further details in the Supplemental Appendix regarding how Statistics Canada identified nonbinary people through write-in text responses, including a word cloud published by Statistics Canada on the most frequently used terms in Supplemental Appendix Figure A3.

[9] For a detailed description of these variables, see the Supplemental Appendix.

[10] Statistics Canada (2022) also reported that nonbinary and transgender individuals constituted 0.33 percent of all individuals aged 15 and older.

[11] These numbers should be taken with the understanding that there is a potential for underreporting of diverse gender identities in survey data.

Table 1—Summary Statistics on Demographic and Economic Outcomes by Gender Identity and Sex at Birth

	Nonbinary people assigned female at birth	Nonbinary people assigned male at birth	Transgender women	Transgender men	Cisgender women	Cisgender men
Panel A. Demographic characteristics						
Age	33.4	35.7	39.9	37.8	42.4	42.3
Indigenous	10.7	9.4	5.4	7.3	4.9	4.5
Visible minority	14.0	14.0	25.4	23.0	28.3	26.2
First generation	13.4	13.5	26.7	22.9	31.0	28.7
HH Abrahamic religion	13.1	14.9	32.9	30.7	49.3	48.0
BA or more	46.0	37.6	29.3	25.7	37.7	29.7
Any children 0 to 5 for census family	6.8	4.8	9.8	8.7	17.8	16.8
Married	17.5	18.1	38.1	28.9	49.9	47.1
Living common law	23.2	19.1	13.6	16.9	17.6	18.1
Same-gender spouse	3.1	1.3	2.5	3.6	0.4	0.3
Large city	78.5	78.7	70.1	67.1	63.5	62.9
Moved within past 5 years	33.4	29.8	22.1	25.3	20.7	20.8
Mental health difficulty	58.0	41.5	21.6	26.3	9.0	5.7
Physical difficulty	20.8	15.9	11.0	13.2	7.1	6.2
Learning difficulty	24.0	18.1	8.5	10.7	2.6	2.6
Other health problems	33.9	21.4	13.8	17.8	10.6	8.8
Panel B. Labor market outcomes						
Earnings in 2020, > 0	42,400	58,100	53,400	57,000	58,500	82,600
Earnings in 2020, full-time	53,200	69,200	62,900	64,200	68,200	89,200
Earnings in 2020, reg. sample	42,600	58,900	55,200	58,000	59,800	84,000
Earnings in 2019, > 0	41,100	56,600	53,700	56,400	58,000	82,600
Earnings in 2019, reg. sample	42,100	57,800	56,100	57,400	59,900	84,600
Hours, > 0	34.2	38.0	36.6	38.5	36.3	41.1
Employed	69.1	68.7	64.3	69.1	73.6	80.8
Full-time employed 2020	53.9	63.1	55.4	62.9	64.3	79.1
Self-employed	14.6	13.1	11.6	11.6	9.8	15.0
Weighted total observations	17,145	8,280	17,670	12,890	8,358,860	8,065,705

Notes: 2021 Census of Canada. "> 0" means that the outcome is reported for the subsample where the outcome is strictly greater than zero. "Reg. sample" is the regression sample that restricts to people who had an occupation or industry of work in the last five years. "HH Abrahamic religion" is an indicator for whether the person who filled out the survey for the household was Christian, Jewish, or Muslim. "Large city" is a large Canadian urban population center of 100,000 or more. "Moved" refers to moved within Canada to a different census subdivision. Health difficulty indicators equal one when the health difficulty is experienced "often" or "always" and zero otherwise. Physical difficulties include difficulties seeing, walking, or hearing. Learning difficulties include difficulties learning, concentrating, or remembering. Earnings are rounded as per Statistics Canada requirements.

Table 1 provides descriptive statistics from the Canadian Census for those aged 25 to 59. To our knowledge, these descriptive statistics are the first such evidence from a mandatory population national census on individuals who are nonbinary and transgender. We present means of key demographic and economic variables for nonbinary people assigned female at birth in column 1, nonbinary people assigned male at birth in column 2, transgender women in column 3, transgender men in column 4, cisgender women in column 5, and cisgender men in column 6. We observe several patterns in Table 1. First, nonbinary people are significantly younger than transgender or cisgender people. Second, nonbinary people are much more likely than transgender or cisgender people to be Indigenous and less likely to be a visible minority (a policy category in Canadian law that roughly means "not Indigenous and not

White").[12] Third, there is a complicated education gradient: Transgender people have lower levels of formal education than cisgender people, while nonbinary people have higher levels than cisgender people. Fourth, nonbinary and transgender people are less likely to be married (although more likely to be married to someone with the same gender) and less likely to have children between the ages of zero and five present in the household than cisgender people, and these differences are larger for nonbinary people than for transgender people. Fifth, nonbinary and transgender people are more likely to be in households in central cities and are more likely to have moved in the past five years than cisgender people, and again these differences are larger for nonbinary people than for transgender people.

There are also enormous health differences: Nonbinary people are six to eight times more likely than cisgender people, and two times more likely than transgender people, to report at least one mental health condition (such as depression or anxiety); 58 percent of nonbinary people who were assigned female at birth reported such a condition. While these rates are extremely high, they align with the recent findings in the United States of gender nonconforming individuals having higher rates of chronic depression or anxiety than both transgender and cisgender individuals (Feir and Mann 2024).[13] One in five nonbinary people assigned male at birth and one-quarter of nonbinary people assigned female at birth also report difficulty concentrating, learning, or remembering compared to about one in ten transgender people and one in 50 cisgender people. The same general patterns exist for physical conditions, though the prevalence rates are lower.[14]

The bottom section of Table 1 examines labor market outcomes. We note that the full-time work indicator[15] applies most closely to 2020 earnings, so we only consider full-time workers for that income year. The "reg. sample" is a subsample restricted to the set of individuals with a valid occupation and industry, which we focus on in our regression analysis. Regardless of the year and measure of earnings, nonbinary people assigned female at birth have lower earnings than either transgender men or cisgender women, while nonbinary people assigned male at birth have lower earnings than cisgender men but higher earnings than transgender women in both years. Nonbinary people assigned female at birth are less likely to be full-time workers in 2020 than either transgender men or cisgender women, while nonbinary people assigned male at birth are more likely to be full-time workers in 2020 than transgender women but less likely to be full-time workers than cisgender men.

Nonbinary people assigned female at birth have lower average hours of work than cisgender women or transgender men, while nonbinary people assigned male at birth have fewer work hours than cisgender men but more hours than transgender women. The pattern of earnings and employment is particularly striking given the notably higher level of formal education of nonbinary people on average, particularly among

[12] Ten percent of nonbinary people are Indigenous, while only 5 percent of the Canadian population is overall. This relative overrepresentation may be related to the fact that some Indigenous communities have historically had more open and flexible conceptions of gender than nonindigenous communities (Robinson 2020).

[13] Since in Canada gender dysphoria is a diagnosed mental health condition, some of the differences we observe between gender minority people and cisgender people in mental health may be mechanical.

[14] The question requests that individuals only report "difficulties or long-term conditions that have lasted or are expected to last for six months or more."

[15] Full-time employment is defined as working mainly full-time weeks in 2020 (30 or more hours per week).

those assigned female at birth. The earnings difference between cisgender women and cisgender men is comparable to the difference reported in Fortin (2019).

II. Empirical Approach

Our objective is to explore the correlation of gender minority status with earnings, conditional on demographic and other characteristics. To do this, we estimate linear regression models of the following form for log earnings, y, and covariate matrix, X:

$$\begin{aligned}(1)\quad y_i = {} & \alpha + \gamma_1 \textit{nonbinary person assigned female at birth}_i \\ & + \gamma_2 \textit{nonbinary person assigned male at birth}_i + \gamma_3 \textit{transgender man}_i \\ & + \gamma_4 \textit{transgender woman}_i + \gamma_5 \textit{cisgender woman}_i + X_i\beta + u_i,\end{aligned}$$

for each observation $i = 1, \ldots N$. We also estimate quantile regressions for quantiles $k = 0.1, 0.2, \ldots 0.9$ of the form

$$\begin{aligned}(2)\ P[y_i > {} & \alpha_k + \gamma_{1k} \textit{nonbinary person assigned female at birth}_i \\ & + \gamma_{2k} \textit{nonbinary person assigned male at birth}_i + \gamma_{3k} \textit{transgender man}_i \\ & + \gamma_{4k} \textit{transgender woman}_i + \gamma_{5k} \textit{cisgender woman}_i + X_i\beta_k + u_i] = q_k\end{aligned}$$

Each equation contains indicator variables for nonbinary people assigned female at birth, nonbinary people assigned male at birth, transgender men, transgender women, and cisgender women, with the excluded category being cisgender men. The covariate list varies across columns and includes some or all of the controls regarding age, Indigenous and visible minority status, education, immigrant status (interacted with Indigenous and visible minority status), religion, household structure, fine-grained location of residence, health, and occupation and industry of work. Supplemental Appendix Table A1 presents a detailed set of coefficient estimates.

For all coefficients, we present weighted least squares estimates using Canadian census survey weights to make the results representative of the Canadian population, and we report heteroskedasticity-robust standard errors. Many estimated coefficients are large, so although we present coefficient estimates in the main tables, we discuss percent differences in the main text. These are computed as $exp(\gamma) - 1$ for any coefficient γ in a log-earnings regression. The analog to Table 2 with percent differences and associated standard errors of percent differences is in the Supplemental Appendix, Table A2.

III. Results

We report the results of estimating equation (1) in Table 2. Column 1 presents results from the specification controlling only for purely exogenous characteristics (age fixed effects, visible minority status, and Indigenous status); column 2 adds controls for educational attainment; column 3 adds controls for immigrant status,

Table 2—Nonbinary and Transgender log 2019 Earnings Relative to Cisgender Men

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Nonbinary person assigned female at birth	−0.586	−0.673	−0.670	−0.682	−0.596	−0.534	−0.319
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)
Nonbinary person assigned male at birth	−0.359	−0.401	−0.402	−0.409	−0.354	−0.313	−0.207
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.027)
Transgender man	−0.309	−0.288	−0.291	−0.288	−0.260	−0.239	−0.135
	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.021)
Transgender woman	−0.396	−0.404	−0.410	−0.409	−0.392	−0.376	−0.248
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Cisgender woman	−0.342	−0.394	−0.394	−0.394	−0.390	−0.385	−0.255
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Visible minority	X	X	X	X	X	X	X
Indigenous	X	X	X	X	X	X	X
Age FE	X	X	X	X	X	X	X
Education FE		X	X	X	X	X	X
Religion			X	X	X	X	X
Immigration			X	X	X	X	X
Census subdivision FE			X	X	X	X	X
Household composition				X	X	X	X
Physical/learning difficulty					X	X	X
Mental health difficulty						X	X
Occupation and industry FE							X
Weighted observations	3,119,070	3,119,070	3,119,070	3,119,070	3,119,070	3,119,070	3,119,070
R^2	0.077	0.119	0.142	0.149	0.152	0.154	0.262
	p-value testing two coefficients being equal						
$\beta_{cw} = \beta_{tm}$	0.135	0.000	0.000	0.000	0.000	0.000	0.000
$\beta_{cw} = \beta_{nbafab}$	0.000	0.000	0.000	0.000	0.000	0.000	0.002
$\beta_{cw} = \beta_{tw}$	0.008	0.607	0.415	0.464	0.931	0.677	0.710
$\beta_{cw} = \beta_{nbamab}$	0.573	0.796	0.764	0.609	0.210	0.013	0.074
$\beta_{tm} = \beta_{tw}$	0.004	0.000	0.000	0.000	0.000	0.000	0.000
$\beta_{tm} = \beta_{nbafab}$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$\beta_{tm} = \beta_{nbamab}$	0.172	0.002	0.002	0.001	0.010	0.040	0.034
$\beta_{tw} = \beta_{nbafab}$	0.000	0.000	0.000	0.000	0.000	0.000	0.010
$\beta_{tw} = \beta_{nbamab}$	0.287	0.937	0.829	0.996	0.279	0.070	0.210
$\beta_{nbafab} = \beta_{nbamab}$	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Notes: 2021 Census of Canada. In the bottom section of the table, *cw* denotes cisgender woman, *tm* transgender man, *tw* transgender woman, *nbafab* nonbinary person assigned female at birth, and *nbamab* nonbinary person assigned male at birth. See the Supplemental Appendix for a detailed description of the control sets. The sample only includes those with a valid occupation and industry of work within the past five years. Robust standard errors in parentheses.

household religion, and census subdivision (equivalent to a municipality or local political unit) fixed effects; column 4 adds fixed effects for family structure (household composition and marital/partnership status); column 5 adds all the health controls except mental health; column 6 adds the mental health variable; and column 7 adds industry and occupation fixed effects. The bottom of the table reports *p*-values for tests of equality of coefficients across groups.

The results in Table 2 provide clear evidence that nonbinary people assigned female at birth earn less than all other groups, while nonbinary people assigned male at birth, transgender women, and transgender men all have broadly similar earnings as similarly situated cisgender women. All groups earn significantly less than cisgender men.

In column 1, the estimated coefficient for nonbinary people assigned female at birth is −0.586, indicating earnings about 44 percent less ($exp(-0.586)-1 = -0.443$) than those of similar cisgender men. This is an enormous earnings gap: It is larger than the earnings gaps faced by Black men in the United States and larger than earnings differences faced by Indigenous men relative to White men in the 1990s (Pendakur and Pendakur 2011a, b; Feir 2013, 2024). The estimated coefficient for nonbinary people assigned male at birth is −0.359, indicating earnings about 30 percent less than those of similar cisgender men. In column 1, we have an estimated coefficient for transgender men of −0.309, indicating that transgender men earn about 27 percent less than cisgender men with the same age, Indigenous status, and ethnic minority status. For transgender women, the estimated coefficient is −0.396, indicating that transgender women earn about 33 percent less than similar cisgender men. These numbers are consistent with prior findings on transgender income disparities (see, e.g., Carpenter, Eppink, and Gonzales 2020; Carpenter, Lee, and Nettuno 2022).

In column 2, we add education controls. Given that we observe in the summary statistics that nonbinary people are more educated than other people, it is not surprising that the estimated coefficients are larger in column 2. The estimated coefficient for nonbinary people assigned male at birth is −0.401, implying an earnings gap of 33 percent compared to cisgender men. The estimated coefficient for nonbinary people assigned female at birth is −0.673, implying an earnings gap of 49 percent compared to cisgender men.

Moving across columns 3 through 7, adding covariates, we do not see any change in the overall pattern that nonbinary and transgender people face significant earnings disparities compared to cisgender men and that nonbinary people assigned female at birth face especially large earnings gaps even relative to cisgender women. Controlling for several measures of health status in column 5 and mental health specifically in column 6 decreases estimated earnings differences given that gender minority people report much worse health status on average. Controlling for industry and occupation of work in column 7 further reduces estimated differences. These controls reduce the earnings penalty for nonbinary people assigned female at birth by 21.5 log points. That is, sorting across occupation and industry accounts for about two-fifths of the gap between cisgender men and nonbinary people assigned female at birth.[16] As another example, the estimated earnings gap for transgender women compared to cisgender men falls by 12.8 log points between columns 6 and 7 in Table 2, suggesting that occupation and industry sorting accounts for one-third of the earnings gap between these two groups. Notably, however, even in our most saturated specification, the estimated gaps remain economically significant: Nonbinary people assigned female at birth earn 27 percent less than similarly situated cisgender men, while those assigned male at birth earn 19 percent less. Additionally, transgender men earn 13 percent less, and transgender women earn 22 percent less than otherwise similar cisgender men.

The evidence in Table 2 also indicates that the coefficients for each gender minority group are statistically different from cisgender individuals with the same

[16] Supplemental Appendix Table A3 shows that the patterns in columns 1–6 of Table 2 are quantitatively very similar if we do not impose the requirement of having information on occupation and industry.

sex assigned at birth, though notably transgender men earn significantly *more* than cisgender women. Table 2 also shows that nonbinary people assigned female at birth earn significantly less than comparable cisgender women. We estimate that the earnings gap between cisgender women and nonbinary people assigned female at birth falls from 14.9 log points in column 6 to 6.4 log points in column 7, or by 8.5 log points once we include occupation and industry controls. This means that occupational and industrial sorting accounts for over half of the earnings gap between cisgender women and nonbinary people assigned female at birth, which is larger than its role in explaining the earnings gap between cisgender men and nonbinary people assigned female at birth.

In the Supplemental Appendix, we demonstrate the robustness of these patterns and magnitudes in a few ways. First, in Supplemental Appendix Table A4, we consider a sample restricted to only individuals listed as the first person in their household on their census form (and thus are more likely to be the people responding about their own sex and gender). We find that the patterns and magnitudes are economically and statistically similar to those in Table 2, and the estimated coefficient for nonbinary people assigned female at birth is actually larger in the column 7 specification for the "first person" sample (-0.372) than in the full sample (-0.319).[17] Second, in Supplemental Appendix Table A5, we restrict the sample to adults aged 30–59 as opposed to aged 25–59 to further ensure completion of schooling years, and we demonstrate that those patterns are also very similar to our baseline estimates in Table 2. For example, the estimated coefficient for nonbinary people assigned female at birth in the column 7 specification is -0.335 in the age 30–59 sample versus -0.319 in the age 25–59 sample.

Next, we explore whether there is meaningful heterogeneity across the annual earnings distribution by estimating conditional quantile regressions at each decile. We display the results graphically in Figure 1 for the specification with the controls broadly corresponding to column 2 in Table 2.[18] The results in this figure show a clear gradient: Earnings disparities are more prominent at lower quantiles than at upper quantiles, and this pattern is much steeper for gender minorities than for cisgender women. Specifically, we find that, at the bottom decile, nonbinary people assigned male at birth face an earnings gap of 53 percent, adjusting for observable differences, but at the top decile, the earnings gap falls to 19 percent. For nonbinary people assigned female at birth, the pattern is also evident: They face an earnings gap of 62 percent at the bottom decile and 39 percent at the top decile. We see the same pattern of earnings gaps—larger at the bottom of the conditional earnings distribution than at the top—for transgender men and women compared to cisgender men in Figure 1, which has not previously been documented in the literature.

To explore how time worked may explain earnings differentials by gender identity and sex, we exploit census information on employment in Table 3. Each set of estimates in Table 3 is conditional on the controls from column 7 of Table 2, which includes occupation and industry. In column 1 of Table 3, we reproduce column 7

[17] One exception is that this sample restriction results in transgender men having statistically the same earnings penalty as cisgender women.

[18] The one exception to the control variables is that the quantile models use five-year bins for age fixed effects to avoid convergence issues. The results in Table 2 are practically identical if we use these alternative coarser fixed effects (see Supplemental Appendix Table A6).

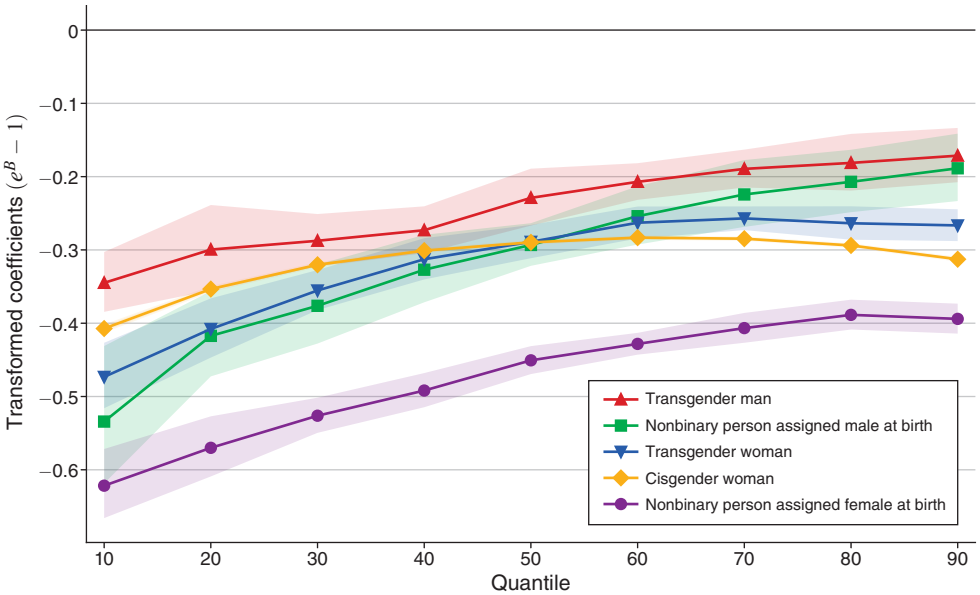

FIGURE 1. CONDITIONAL QUANTILE PERCENT DIFFERENCES FOR 2019 EARNINGS

Notes: All specifications adjust for the independent variables in the specification included in column 2 of Table 2, with the exception that the single-year age dummies are replaced with five-year age group dummies. In Supplemental Appendix Table A6, there are equivalent mean regressions with five-year age dummies showing that the main findings are unchanged using this alternative control for age. Shading represents 95 percent confidence intervals around each point estimate.

from Table 2 for reference. In column 2, we present results on log annual earnings using earnings data from 2020 instead of 2019 as in Table 2. We use 2019 data for our main results out of concern that the 2020 data may be affected by the COVID-19 pandemic, which could have affected nonbinary and transgender people differently than cisgender people. Column 2 of Table 3 shows that our results are unaffected if we use 2020 data, the year for which we have data on weeks worked and full-time status. In column 3, we present results on log *weekly* 2020 earnings instead of log annual 2020 earnings as in column 2. While all coefficient estimates indicate smaller gaps in earnings compared with cisgender men, the relative patterns across groups remain unchanged. Column 4 presents results for weekly earnings but restricts attention to the subsample of full-time workers, defined as those working at least 30 hours per week for most of the year in paid employment.[19] The estimates in column 4 indicate that full-time work explains a meaningful share of the gap between nonbinary people and cisgender women. For example, while the coefficient on cisgender women in column 4 falls only by 2.1 log points compared to the estimate in column 3, the associated coefficient on nonbinary people assigned female (male) at birth falls by 6.5 (7.4) log points. This suggests that sorting into full-time versus part-time work and over number of weeks worked account for a portion of the

[19] We report estimates from regression models predicting the probability of being employed in the census reference week in Supplemental Appendix Table A7.

Table 3—Nonbinary and Transgender log Earnings Relative to Cisgender Men, the Role of Time Worked

	2019 annual earnings (1)	2020 annual earnings (2)	2020 weekly earnings (3)	2020 full-time weekly earnings (4)
Nonbinary person assigned female at birth	−0.319	−0.338	−0.261	−0.196
	(0.020)	(0.022)	(0.019)	(0.017)
Nonbinary person assigned male at birth	−0.207	−0.249	−0.162	−0.088
	(0.027)	(0.030)	(0.026)	(0.024)
Transgender man	−0.135	−0.116	−0.060	−0.080
	(0.021)	(0.023)	(0.023)	(0.024)
Transgender woman	−0.248	−0.282	−0.173	−0.160
	(0.019)	(0.021)	(0.020)	(0.019)
Cisgender woman	−0.255	−0.266	−0.190	−0.169
	(0.001)	(0.001)	(0.001)	(0.001)
Visible minority	X	X	X	X
Indigenous	X	X	X	X
Age FE	X	X	X	X
Education FE	X	X	X	X
Religion	X	X	X	X
Immigration	X	X	X	X
Census subdivision FE	X	X	X	X
Household composition	X	X	X	X
Physical/learning difficulty	X	X	X	X
Mental health difficulty	X	X	X	X
Occupation and industry FE	X	X	X	X
Weighted observations	3,119,070	3,135,995	3,021,625	2,497,745
R^2	0.262	0.288	0.213	0.240
	p-value testing two coefficients being equal			
$\beta_{cw} = \beta_{tm}$	0.000	0.000	0.000	0.000
$\beta_{cw} = \beta_{nbafab}$	0.002	0.001	0.000	0.114
$\beta_{cw} = \beta_{tw}$	0.710	0.444	0.430	0.642
$\beta_{cw} = \beta_{nbamab}$	0.074	0.569	0.290	0.001
$\beta_{tm} = \beta_{tw}$	0.000	0.000	0.000	0.010
$\beta_{tm} = \beta_{nbafab}$	0.000	0.000	0.000	0.000
$\beta_{tm} = \beta_{nbamab}$	0.034	0.000	0.004	0.822
$\beta_{tw} = \beta_{nbafab}$	0.010	0.067	0.002	0.164
$\beta_{tw} = \beta_{nbamab}$	0.210	0.366	0.722	0.017
$\beta_{nbafab} = \beta_{nbamab}$	0.001	0.017	0.002	0.000

Notes: 2021 Census of Canada. In the bottom section of the table, *cw* denotes cisgender woman, *tm* transgender man, *tw* transgender woman, *nbafab* nonbinary person assigned female at birth, and *nbamab* nonbinary person assigned male at birth. See the Supplemental Appendix for a detailed description of the control sets. The sample only includes those with a valid occupation and industry of work within the past five years. The 2020 full-time weekly earnings sample is restricted to people who worked mainly full-time weeks in 2020 (30 or more hours per week), for pay either in the reference week (May 2021) or throughout 2020 if not employed in the reference week. Robust standard errors in parentheses.

earnings gap. Conditional on these measures of weeks and hours worked, nonbinary people assigned female at birth earn less than cisgender men and cisgender women; the *p*-value of the earnings difference between nonbinary people assigned female at birth and cisgender women is 11.4 percent.

In Supplemental Appendix Figure A5, we also estimate the same quantile regressions as those displayed in Figure 1 but using the same sample as in column 4 of

Table 3 to determine the role of weeks worked and full-time status in explaining the earnings penalty gradient. Controlling for time worked results in the upward slope in earnings differentials we saw in Figure 1 being more muted for all groups relative to cisgender men. Transgender men and women still earn significantly less than cisgender women at the bottom decile, and nonbinary people assigned female at birth earn significantly less than cisgender women across the distribution. The more muted disparities and reduced gradient suggest that a significant amount of the disparity seen in the bottom quantiles may be accounted for by disadvantageous sorting across time worked.[20]

IV. Discussion and Conclusion

We provide the first evidence regarding nonbinary and transgender earnings gaps from a large population-representative mandatory census, which was linked to administrative tax records. We identify over 6,400 nonbinary people and 7,600 transgender people aged 25 to 59. In addition to describing key differences in demographic characteristics across groups, we also estimate conditional and unconditional earnings differences. We find that cisgender women and all gender minority groups earn less than similar cisgender men. We also find that nonbinary people assigned female at birth—despite being more highly educated than other groups—earn significantly less than cisgender men, cisgender women, and all other gender minority groups. These gaps are larger at the bottom of the annual earnings distribution than at the top, and differences in time worked account for some of these disparities.

What do the pattern of results indicate about the labor market mechanisms at play? There are several takeaways. First, the fact that all of these groups earn less than cisgender men is consistent with a model where all gender minorities and cisgender women face barriers to labor market success. Such barriers could be based on discriminatory practices on the demand side of the labor market or asymmetries in worker preferences about hours of work or other job characteristics. That nonbinary people assigned female at birth are in a class of their own in terms of lower earnings suggests that something even stronger applies to this group, which could be due to the combination of being female at birth (already penalized in the labor market) and the violation of female gender norms.

Second, the fact that the earnings disparities faced by gender minorities are more pronounced at the bottom of the annual earnings distribution than at the top suggests that lower-income transgender and nonbinary people may face something like a "sticky floor" (see Christofides, Polycarpou, and Vrachimis 2013). Sticky floors represent a magnification of disadvantage for the most marginalized members of already disadvantaged groups. They may also be due to heterogeneity in the degree to which gender minority people are actually seen as cisgender people by the society surrounding them. If some members of gender minority groups are

[20] The only measure of hours worked available in the Census corresponds to hours in 2021 rather than 2020. For completeness, we report results on hourly earnings for full-time workers in Supplemental Appendix Table A8 and Supplemental Appendix Figure A6. However, we strongly recommend caution when interpreting these results given the mismatched timing of earnings and hours measures.

not perceived by others as gender minorities, we may expect those people to face smaller disparities.

Third, we see that in both mean earnings and the quantiles of earnings, measured disparities shrink when we control for detailed job characteristics like occupation and industry and control for weeks of work and full-time work. This suggests that sorting across job characteristics is important in generating earnings disparities for gender minorities. In this type of environment, affirmative action policies or nondiscrimination protection policies that restrict the ability of firms to discriminate at the point of hiring may help reduce earnings disparities.

Fourth, the demographic profile of nonbinary people as being relatively highly educated, young, and in poor mental health, even compared to transgender people, suggests that they may face distinct stressors. The literature on transgender stress (see, e.g., DuBois et al. 2017) has established that such health effects are important for transgender people; our results suggest that they may also be important for nonbinary people.

As in all research that relies on measures of nonbinary and transgender identities reported by the respondent or another individual, our research must acknowledge the possibility that self-identification of these statuses may be correlated with the variables of interest (here, earnings). The fact that we find nonbinary and transgender people to be overrepresented among younger cohorts and in cities, for example, is consistent with the idea that more progressive attitudes may be contributing to greater willingness to report these identities. We do not observe an objective measure of an individual's "true" nonbinary or transgender status. This limitation is true of all surveys and for all potentially stigmatized characteristics (e.g., minority sexual orientation, immigrant status, Indigenous and visible minority status, and others), so it is not unique to our population of interest. However, it is important to keep this limitation in mind when interpreting the findings since it is not clear how these patterns of selection affect our estimates. For example, it could be that those identified as nonbinary and transgender in our data are most sure of their identity and have the most social support in claiming such an identity; these factors are likely to be positively correlated with other unobserved determinants of earnings. Alternatively, it could be that higher-earning nonbinary and transgender people are more likely to conceal those identities in the census and possibly in other aspects of their lives as well, meaning that our sample of nonbinary and transgender people will likely be systematically worse off than in the true population. Regardless, those identified as nonbinary or transgender in census data are systematically more economically marginalized than the average cisgender person.

The concept of gender, an individual's experience of gender, and society's reactions to when gender deviates from sex assigned at birth shape the human experience globally. Here we have offered the first nationally representative evidence of nonbinary and transgender people's experiences in the labor market from a large population census in North America. We have also presented notable differences in demographic characteristics among gender identities and how they interact with sex at birth. There is still much to understand regarding what individual and societal forces shape labor market outcomes regarding gender identity. Our findings represent an important step toward this greater understanding.

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