Economic outcomes of gender diverse people: New evidence from linked administrative data in New Zealand

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ARTICLE INFO	ABSTRACT
JEL classification: J1 *Keywords:* Transgender Gender diverse Employment Earnings Linked administrative data New Zealand	We provide new evidence on the economic outcomes of transgender and gender diverse people in New Zealand (NZ) using confidential linked administrative data from driver license records – which identify gender diverse people since 2021 – linked to NZ birth and tax records. We document that gender diverse people are younger than both transgender and cisgender people but are more highly educated than transgender people. Relative to otherwise similar cisgender men, we find large employment and earnings penalties for transgender and gender diverse people. Earnings gaps for gender diverse individuals are especially large.

1. Introduction

Little is known about the economic experiences of gender minorities, such as people who are transgender and/or nonbinary (Badgett et al., 2024).[1] Evidence from survey data suggests that nonbinary and other gender diverse people may have worse economic outcomes compared to transgender people (Carpenter et al., 2022). In this paper, we examine the economic outcomes of transgender and gender diverse people in New Zealand using confidential linked administrative records. We identify transgender and gender diverse individuals based on individuals' self-reported gender in driver license applications from NZ Transport Agency (NZTA) and congruency between driver license gender and sex listed in the individual's birth record. To our knowledge, no prior study has used administrative data to study nonbinary and other gender diverse people.

2. Data and empirical approach

We use data from the Integrated Data Infrastructure (IDI), a database hosted by Statistics New Zealand (Stats NZ). The IDI holds a large range of administrative and survey data (note the disclaimer in the Appendix). Crucially, Stats NZ links all the datasets on the individual level and assigns a unique encrypted identifier to each anonymized individual. We use NZ Department of Internal Affairs (DIA) birth records to identify birth record sex, which only allow two options: 'male' or 'female'. Next, we link DIA birth records with the NZTA Driver License Register and restrict our sample to individuals who had their driver license registration/renewal in 2021 or after when the NZTA driver license application allowed identification of men, women, and gender diverse people.[2] We compare driver license gender with birth record sex to identify cisgender people (those whose birth record sex matches their driver license recorded gender), transgender people (those whose birth

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[1] Transgender individuals are people whose gender identity and/or gender expression or behavior differ from their sex at birth or differ from gender-cultural norms attached to their sex at birth. Cisgender individuals identify with their sex at birth. Gender diverse and nonbinary individuals are people whose gender identity is neither exclusively male nor exclusively female; some nonbinary individuals identify as transgender, while others do not.

[2] We provide visual examples of each of the driver license forms in the Appendix. Under the current form, any write-in response that indicates nonbinary, gender diverse, or a related gender is coded as gender diverse.

record sex does not match their driver license register gender and whose driver license register gender is either male or female), and gender diverse people (those whose driver license register gender indicates gender diverse).

We measure two economic outcomes as of March 2023.[3] We define NEET (not in employment, education, or training) as an indicator that takes the value of 1 if the individual is not enrolled in any vocational training or tertiary education institution, is not undergoing any formal assessed training at the workplace, and does not receive income from wages, salaries, or self-employment from April 2022 until March 2023, and 0 else. We also define earnings from wages and salaries (in log units) using Inland Revenue's tax records measured from April 2022 until March 2023.

To estimate the association between gender minority status and economic outcomes, we estimate the following model that pools all individuals :[4]

descent, less likely to be married or in a civil union, less likely to have children, more likely to live in Auckland or Wellington, and more likely to have a mental health prescription than cisgender men. Turning to column 3 for gender diverse individuals whose birth record sex is male, we see that these individuals are younger, more likely to have tertiary education, and more likely to have a mental health prescription than both transgender women and cisgender men. Gender diverse individuals whose birth record sex is male are much more similar to transgender women than they are to cisgender men with respect to marital status, presence of children, and residence in Auckland or Wellington.

Table 2 presents the regression results from Eq. (1) for the outcome of employment (column 1) and earnings (column 2). Specifically, we predict the indicator for NEET for adults age 18 and older in column 1, and we estimate log earnings regressions conditional on any positive earnings for adults age 18 and older in column 2.[6] This table essentially asks whether transgender and gender diverse individuals have different

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 (\text{TRANSGENDERWOMAN})_i + \beta_3 (\text{GENDERDIVERSEPERSONWITHBIRTHRECORDSEX} = \text{MALE})_i$$
$$+ \beta_4 (\text{CISGENDERWOMAN} :)_i + \beta_5 (\text{TRANSGENDERMAN})_i + \beta_6 (\text{GENDERDIVERSEPERSONWITHBIRTHRECORD} \quad\quad (1)$$
$$\text{SEX} = \text{FEMALE})_i + \varepsilon_i$$

where Y_i are the outcomes for individual *i* and X_i is a vector of individual characteristics. The excluded category is cisgender men.[5] Throughout, we estimate White standard errors robust to heteroskedasticity.

3. Results

We present descriptive statistics in Table 1. Columns 1–3 report results for people whose birth sex is female; columns 4–6 present results for people whose birth sex is male. Columns 1 and 2 of Table 1 shows that relative to cisgender women, transgender men are younger, less likely to be of European descent, less likely to be married or in a civil union, less likely to have children, more likely to live in Auckland or Wellington, less likely to have a tertiary qualification, and more likely to have a mental health prescription. Turning to column 3 for gender diverse individuals whose birth record sex is female, we see that these individuals are younger, less likely to be married, less likely to have had any children, more likely to have a mental health prescription, and more likely to be NEET than both transgender men and cisgender women. Regarding education, gender diverse individuals whose birth record sex is female are more likely than transgender men but less likely than cisgender women to have a tertiary qualification.

Turning to differences for individuals whose birth record sex is male in columns 4–6 of Table 1, we see similar patterns. Relative to cisgender men, transgender women are younger, less likely to be of European

employment and earnings than cisgender men and women (and from each other) even after accounting for the fact that they have significantly different observable characteristics, as shown in Table 1.

The results in Table 2 return strong evidence that gender minorities in New Zealand are much more likely to be NEET than otherwise similar cisgender people. We estimate that transgender women, gender diverse individuals whose birth record sex is male, and gender diverse individuals whose birth record sex is female are 10–12 percentage points more likely to be NEET than similarly situated cisgender men. We estimate a precise gap between cisgender women and cisgender men of about 4 percentage points, which is much smaller than the gaps for transgender women and gender diverse individuals of either birth record sex. Notably, the estimate for transgender men is more similar to the gap estimated for cisgender women. This could reflect the labor market advantages accumulating to male gender (Geijtenbeek and Plug, 2018; Carpenter et al., 2024).

Turning to earnings in column 2, we again find that gender minorities earn significantly less than cisgender men with similar observable characteristics. Here, however, the differences for cisgender women – which indicate precise earnings gaps of about 33 % – are similar in magnitude to those estimated for transgender women and transgender men. In contrast, gender diverse individuals whose birth record sex is male and gender diverse individuals whose birth record sex is female both experience significantly larger earnings gaps compared to both cisgender men and cisgender women.

4. Conclusion

We used newly available confidential administrative data from New Zealand to study the economic outcomes of gender minorities. Our results indicate that transgender women and gender diverse individuals are much less likely to be in employment or education/training than both cisgender men and cisgender women with similar observable characteristics. When we examine earnings, the picture changes somewhat: here, we estimate that transgender men and women earn less than similarly situated cisgender men but earn about the same as cisgender women. On the contrary, we consistently estimate that gender diverse

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[3] The Appendix describes each of the detailed administrative datasets used to create the variables in our study.

[4] For the dichotomous economic outcomes, we estimate linear probability models.

[5] The controls include: dummies for single year of age, categorical variable on ethnicity (European [reference], Māori, Pacifica, Asian, MELAA, other), highest educational qualification (no post-school qualification [reference], post-school qualification below tertiary qualification, tertiary qualification), marital status (binary: married or in a civil union vs. else), an indicator for living in Auckland or Wellington, indicators on urbanization of residence (categorical: highly urban area [reference], major urban area, medium urban area, small urban area, rural settlement, rural other), meshblock deprivation score (one [reference] to ten); and additional indicator for the annual earnings regression taking value of 1 if working in retail trade, accommodation/food services, education and training, health care & social assistance and 0 else.

[6] Results examining individuals aged 25 and older returned very similar patterns.

Table 1

Descriptive Statistics – people aged 18+.

Birth record sex is:	Female	Female	Female	Male	Male	Male
Driver license gender is:	Female	Male	Gender Diverse	Male	Female	Gender Diverse
Sample we think this is most likely to be:	Cisgender women	Transgender men	Gender diverse people	Cisgender men	Transgender women	Gender diverse people
Age	39.95	30.12	25.34	40.22	34.60	29.89
Ethnicity						
Asian	0.027	0.051	0.034	0.027	0.042	0.018
European	0.656	0.556	0.666	0.657	0.522	0.586
Māori	0.247	0.266	0.225	0.235	0.302	0.313
Pacifica	0.049	0.102	0.023	0.049	0.104	0.045
Marital status						
Married/Civil union	0.285	0.098	0.053	0.285	0.082	0.062
One person at address	0.219	0.192	0.203	0.210	0.206	0.171
Any children (by DIA records)	0.609	0.175	0.066	0.549	0.132	0.119
Spatial information						
Deprivation index (1–10)	5.50	6.02	5.59	5.46	6.21	6.09
AKL/WLG (major urban area)	0.268	0.379	0.403	0.266	0.394	0.403
Education (highest achieved)						
No post-school qualification	0.138	0.172	0.127	0.181	0.194	0.161
Secondary qualification	0.545	0.653	0.612	0.627	0.611	0.621
Tertiary qualification	0.317	0.175	0.261	0.193	0.195	0.218
Wellbeing indicators (past year)						
Mental health prescription[a]	0.205	0.272	0.475	0.106	0.253	0.313
Police victimization record	0.043	0.032	0.052	0.042	0.054	0.058
Annual Earnings (NZ$)	55 454	40 501	31 757	75 691	46 949	38 201
NEET	0.145	0.149	0.162	0.119	0.224	0.210
Individuals	**800 304**	**804**	**834**	**834 444**	**741**	**513**

Notes: Author calculations, various datasets from New Zealand Integrated Data Infrastructure.

[a] Following the definition of Bowden et al. (2020), we use the 'Chemical IDs' assigned to each dispensing to identify drugs most likely to treat anxiety and/or depression.

Table 2

Gender minority gaps in employment and annual earnings.

	(1)	(2)
Outcome is:	NEET	Annual Earnings 2023
Sample is age:	18+	18+
Excluded category is cisgender men		
Birth record = M, Driver license = F	0.108***	−0.487***
	(0.015)	(0.054)
Birth record = M, Driver license = GD	0.119***	−0.579***
	(0.017)	(0.060)
Birth record = F, Driver license = F	0.040***	−0.371***
	(0.001)	(0.002)
Birth record = F, Driver license = M	0.060***	−0.420***
	(0.012)	(0.044)
Birth record = F, Driver license = GD	0.111***	−0.645***
	(0.012)	(0.047)
N	**1 637 640**	**1 260 522**

Notes: See text for list of demographic control variables. Robust standards errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

individuals have earnings that are significantly lower than those of similarly situated cisgender men *and* cisgender women.

Although the administrative data used for our study is a key strength, we also note an important limitation. Because our ability to identify transgender and gender diverse individuals arises in the context of driver license applications, our sample likely excludes transgender and gender diverse individuals who do not have or need a driver license, as well as individuals who do not update their government documents. These individuals are plausibly more economically vulnerable than transgender and gender diverse people who we observe in the driver license application data. If so, we may be underestimating the economic disparities facing the broader transgender and gender diverse population.

Despite this limitation, our paper makes an important contribution to the emerging literature on gender diverse status and economic outcomes. As the first estimates for gender diverse individuals that rely on administrative data, our results confirm that individuals who eschew

binary gender norms experience substantially more economic precarity than previously understood.

Disclaimer

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.econlet.2024.112155.

Data availability

The authors do not have permission to share data.

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