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Economic Outcomes of Gender Diverse People: New Evidence from Linked Administrative Data in New Zealand

Christopher S. Carpenter, Linda Kirkpatrick, Maxine J. Lee, and Alexander Plum

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ABSTRACT

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.

Keywords: transgender, gender diverse, employment, earnings, linked administrative data, New Zealand

JEL Codes: J1

Highlights: –

- We provide new evidence on economic outcomes for gender minority people, including transgender and gender diverse/nonbinary people.
- Our study uses administrative driver license applications linked to birth records, tax records, and other population-level administrative data.
- Analysis shows transgender and gender diverse people have worse economic outcomes than comparable cisgender men, especially gender diverse people.

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Declaration of Interest: None

*Carpenter [corresponding author] is E. Bronson Ingram Professor of Economics at Vanderbilt University and Research Associate at the National Bureau of Economic Research; christopher.s.carpenter@vanderbilt.edu. Kirkpatrick is Senior Research Officer at the New Zealand Policy Research Institute at Auckland University of Technology; linda.kirkpatrick@aut.ac.nz. Lee is Associate Professor of Economics at San Francisco State University; mclee@sfsu.edu. Plum is Senior Research Fellow at the New Zealand Policy Research Institute at Auckland University of Technology; alexander.plum@aut.ac.nz. The data used in this paper are restricted access; individuals interested in accessing the data can contact the corresponding author for details. The views here are our own and do not reflect those of Statistics New Zealand. All errors are our own.

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, Lee, and Nettuno 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

[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.

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 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

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

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]

$$(1)\ Y_i = \beta_0 + \beta_1 X_i + \beta_2(\text{TRANSGENDER WOMAN})_i + \beta_3(\text{GENDER DIVERSE PERSON WITH BIRTH RECORD SEX = MALE})_i + \beta_4(\text{CISGENDER WOMAN:})_i + \beta_5(\text{TRANSGENDER MAN})_i + \beta_6(\text{GENDER DIVERSE PERSON WITH BIRTH RECORD SEX = FEMALE})_i + \varepsilon_i$$

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.

[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.

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 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 equation (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 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

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

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, Goodman, and Lee 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 percent – 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 individuals have earnings that are significantly lower than those of similarly situated cisgender men *and* cisgender women.

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.

References

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

Online Appendix

Appendix A: Disclaimer

Disclaimer for output produced from the IDI

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/
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Disclaimer for Inland Revenue tax data

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

Disclaimer for Census 2013/2018 data

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Data and Statistics Act 2022. The results presented in this study are the work of the author, not Stats NZ or individual data suppliers.

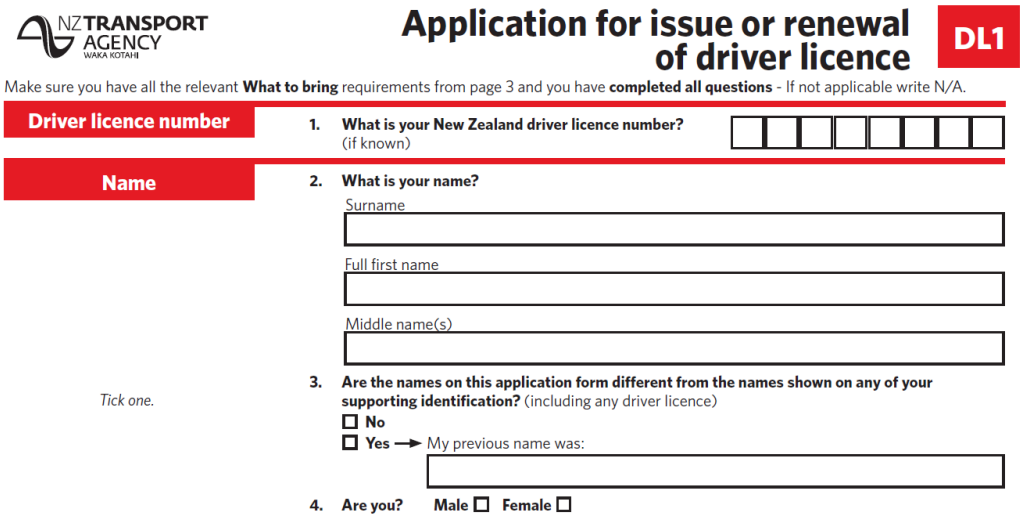
Appendix B: Datasets

We use the following datasets to create our sample:

- *Person oversea spell* dataset which provides the departure and arrival dates for every individual entering or exiting New Zealand. We restrict our sample to individuals who were not overseas in March 2023.
- *Department of Internal Affairs (DIA) Life Event* datasets provided information pertains to births, marriages, and civil unions that have been registered in New Zealand.
- *Inland Revenue's Employer Monthly Schedule (IR EMS)* dataset provides on the monthly level information on wages & salaries for all employees.
- *Inland Revenue's IR3 tax returns* dataset. IR3 tax returns are required to be filed every financial year for those who are self- employed or have income derived from other sources (apart from salary and wages).
- *Ministry of Education's (MoE) tertiary education* dataset. Each year information on enrolments and completions in tertiary education institutions is collected by MoE and the Tertiary Education Commission via an electronic administrative collection called the Single Data Return (SDR). All tertiary education institutions (public or private) that receive government funding are required to complete the SDR three times a year. This covers over 95% of institution-based formal tertiary education in NZ.

- *MoE's Industry Training* dataset. The tertiary education sector also encompasses all formally assessed training in the workplace. This is known as industry training. This covers a large amount of trades-based and vocationally-oriented training, often leading to nationally recognized qualifications. Employees involved in such education are usually referred to as learners rather than students and are one of two types: apprentices or industry trainees.
- *Ministry of Health Pharmaceutical* dataset contains individual-level information from pharmacists for subsidized dispensing.
- *New Zealand Police data: Recorded Crime Victims* is a collection of information on victims of crime.

Appendix C: Examples of New Zealand Driver License Applications



NZ TRANSPORT AGENCY
WAKA KOTAHI

Application for issue or renewal of driver licence **DL1**

Make sure you have all the relevant **What to bring** requirements from page 3 and you have **completed all questions** - If not applicable write N/A.

Driver licence number

1. **What is your New Zealand driver licence number?** (if known)

Name

2. **What is your name?**

Surname

Full first name

Middle name(s)

Tick one.

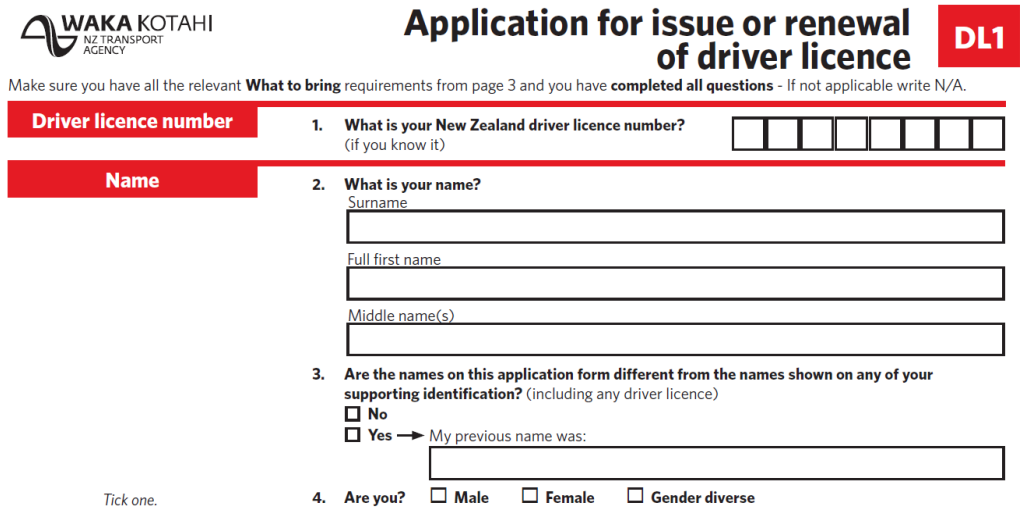
3. **Are the names on this application form different from the names shown on any of your supporting identification?** (including any driver licence)

☐ **No**

☐ **Yes** → My previous name was:

4. **Are you?** **Male** ☐ **Female** ☐

Before the 2021 change.



WAKA KOTAHI
NZ TRANSPORT AGENCY

Application for issue or renewal of driver licence **DL1**

Make sure you have all the relevant **What to bring** requirements from page 3 and you have **completed all questions** - If not applicable write N/A.

Driver licence number

1. **What is your New Zealand driver licence number?** (if you know it)

Name

2. **What is your name?**

Surname

Full first name

Middle name(s)

3. **Are the names on this application form different from the names shown on any of your supporting identification?** (including any driver licence)

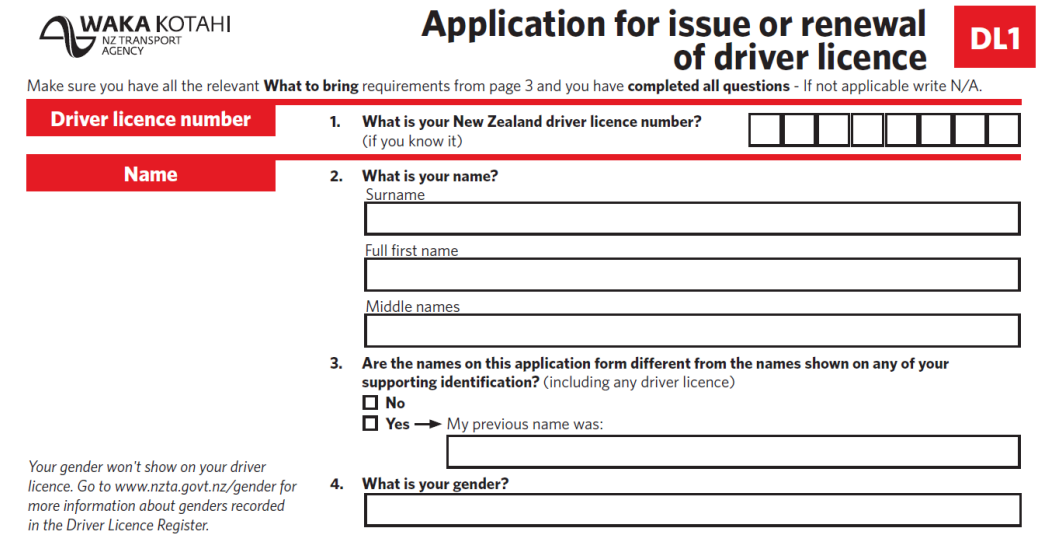
☐ **No**

☐ **Yes** → My previous name was:

Tick one.

4. **Are you?** ☐ **Male** ☐ **Female** ☐ **Gender diverse**

After the 2021 change.



WAKA KOTAHI
NZ TRANSPORT AGENCY

Application for issue or renewal of driver licence **DL1**

Make sure you have all the relevant **What to bring** requirements from page 3 and you have **completed all questions** - If not applicable write N/A.

Driver licence number

1. **What is your New Zealand driver licence number?** (if you know it)

Name

2. **What is your name?**
   Surname
   Full first name
   Middle names

3. **Are the names on this application form different from the names shown on any of your supporting identification?** (including any driver licence)
   ☐ **No**
   ☐ **Yes** → My previous name was:

Your gender won't show on your driver licence. Go to www.nzta.govt.nz/gender for more information about genders recorded in the Driver Licence Register.

4. **What is your gender?**

Current version (as of October 2024).