The effectiveness of sinking lid policies in reducing problem gambling expenditure

NEW ZEALAND WORK RESEARCH INSTITUTE

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RESEARCH & INNOVATION

Research Aims

Aim 1: How do different local policies affect the availability of problem gambling (in terms of venues and electronic gaming machines)?

Aim 2: Are local public policies effective in curbing problem gambling expenditure?

Motivation

- Problem gambling is a significant health concern in NZ – affecting approximately 11 percent of NZers each year (DIA, 2008)

  - Strains professional and interpersonal relationships

  - Causes financial problems

  - Leads to feelings of shame/guilt

 - Leads to depression (National Center for Responsible Gaming, 2012)

Motivation

- Non-casino electronic gaming machines (EGMs) contribute the most harm compared to other types of gambling (NZ Ministry of Health, 2019)

  - Defined as "Class 4 gambling"

- Class 4 gambling:

  - Clubs and pubs
  - Enclosed, isolated spaces
  - Age-restricted
  - Removed from common areas patrons at a bar or club might occupy

Motivation

- In order to reduce Class 4 gambling, NZ passed Gambling Act 2003 ("the Act")

  - The Act mandated baseline restrictions regarding number of EGMs/venue

    - 18 EGMs/venue if licenses allocated before October 17, 2001
    - 9 EGMs/venue thereafter

  - Required territorial authorities (TAs) to define local Class 4 policies and review them every 3 years

  - Some TAs stuck with baseline policies from the Act, while others adopted more stringent policies

Motivation

- Some TAs stuck with baseline policies from the Act, while other adopted more stringent policies:

  - Absolute caps (AC) on the number of Class 4 venues, EGMs, or both

  - Per capita caps (PC) on the number of Class 4 venues, EGMs, or both

  - Sinking lids (SL) entail a cap on EGMs which is fluid, and only decreases when the transfer of a Class 4 gaming license is prohibited

    - The strictest Class 4 gambling policy at the TA-level
    - Unique to NZ
    - A graphical illustration (next slide)
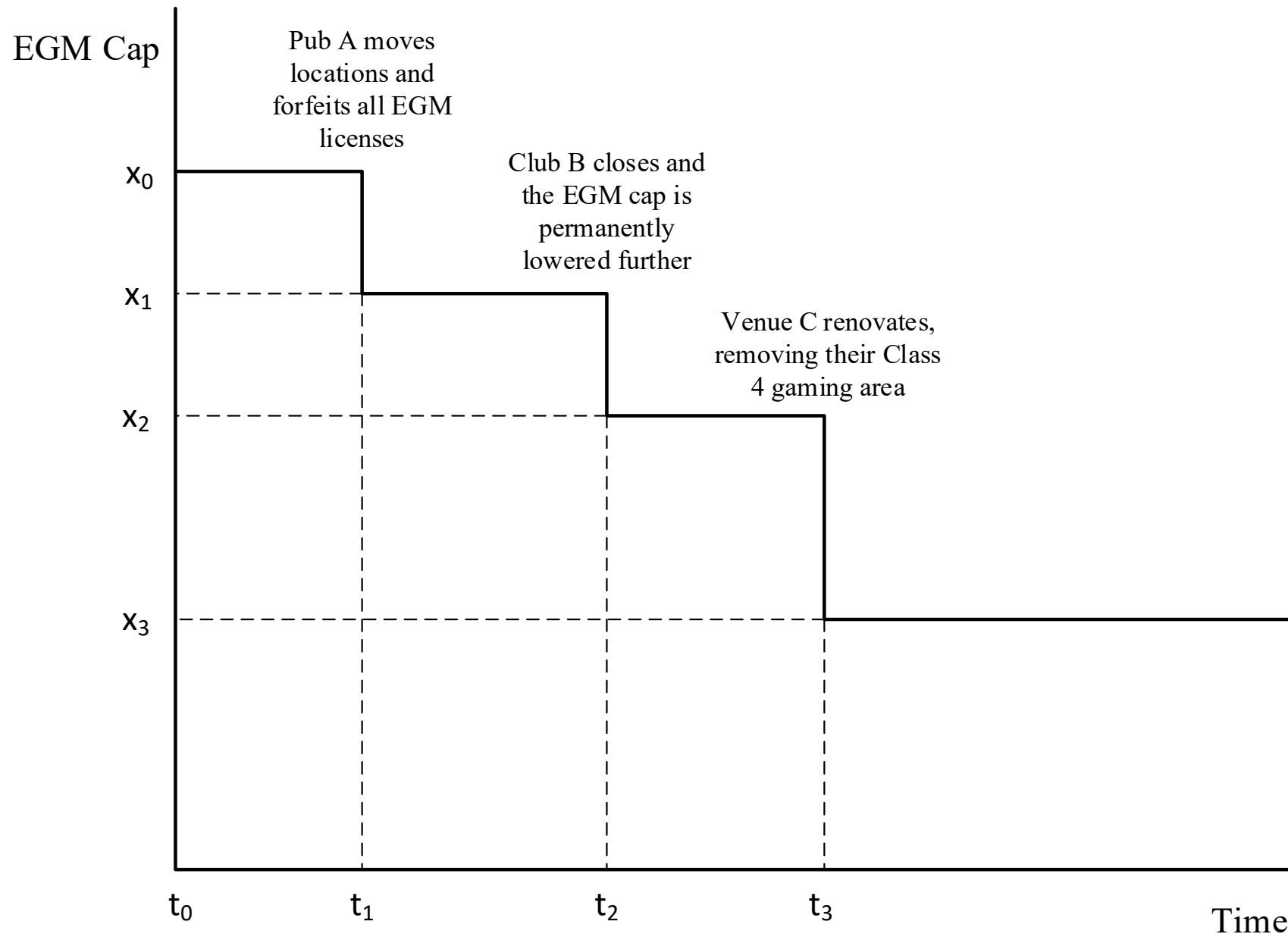
Motivation

- Although Class 4 expenditures have been declining, they remain substantially higher than any other gambling activity in NZ

Real per capita spending, by gambling activity, FY2010 to FY2017
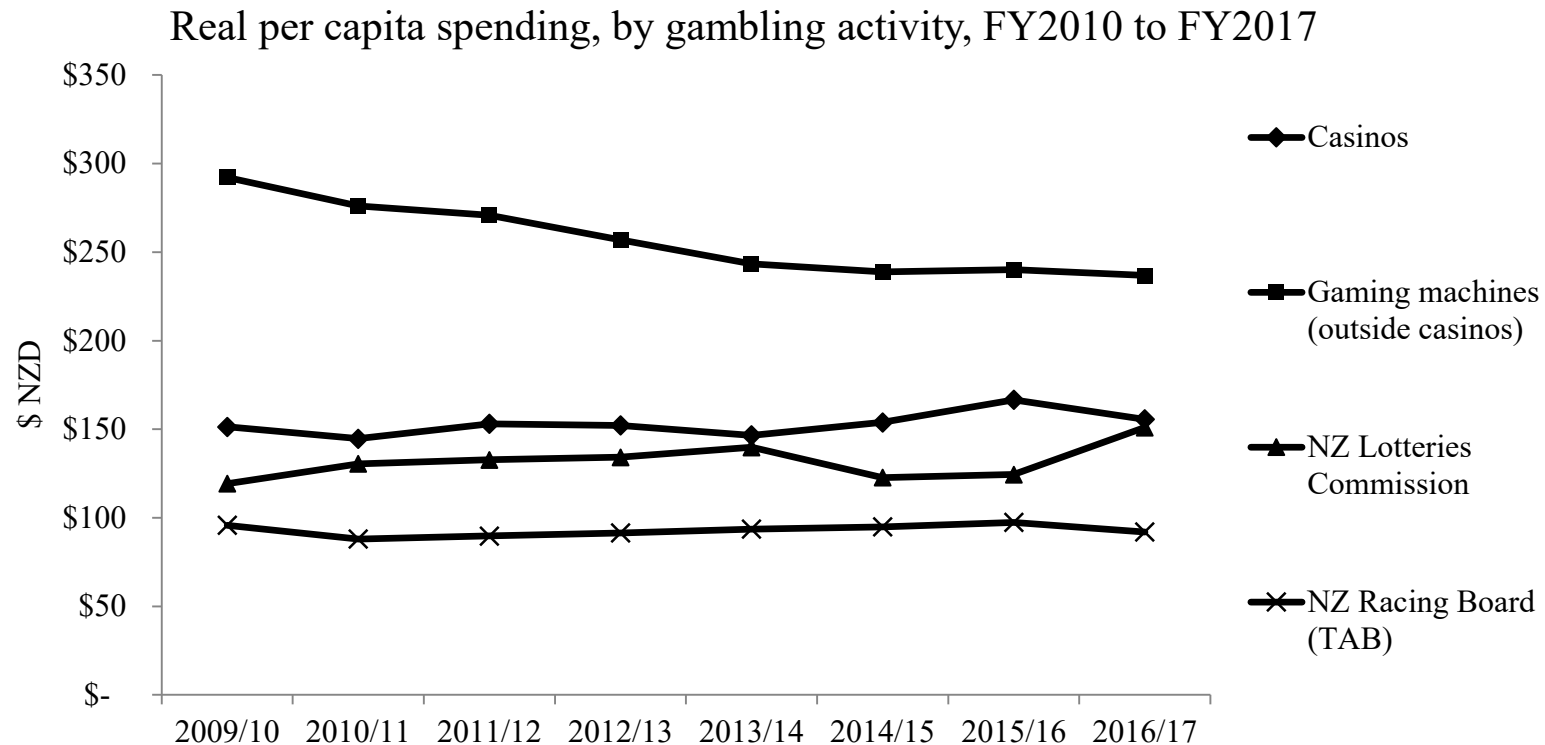
Literature

- Class 4 gambling is common internationally, yet policy evaluations are rare

  - Perhaps due to the private nature of Class 4 gambling, the availability of data, or the lack of an opportunity for quasi-experimental evaluation

  - Only one quasi-experimental study identified:

    - 2008 study by the Australian Centre for Economic Studies
    - Propensity score matching
    - Absolute caps placed on EGMs in five vulnerable communities in Victoria
    - No effect on overall EGM expenditure

Literature

- Other <u>descriptive</u> studies of EGM caps on Class 4 gambling expenditure produce mixed findings (details omitted here)

- Other outcomes in the literature include:

  - The demand for problem gambling intervention services
  - The spatial distribution of EGMs
  - Prevalence of problem gamblers with alcohol dependency
  - Participation in other forms of gambling (e.g., casino gaming)
  - Gambling expenditure in high deprivation neighbourhoods

Data

- Sample period: 2010Q2 to 2018Q4

- Panel of Class 4 policy interventions constructed from Official Information Act (OIA) requests to all 67 TAs (novel to NZ)

- Class 4 venue locations, EGM locations, and gross machine proceeds (GMP) from Department of Internal Affairs (DIA)

  - GMP measures net gaming machine spending by patrons (i.e., total revenue minus wins payed out), or player losses
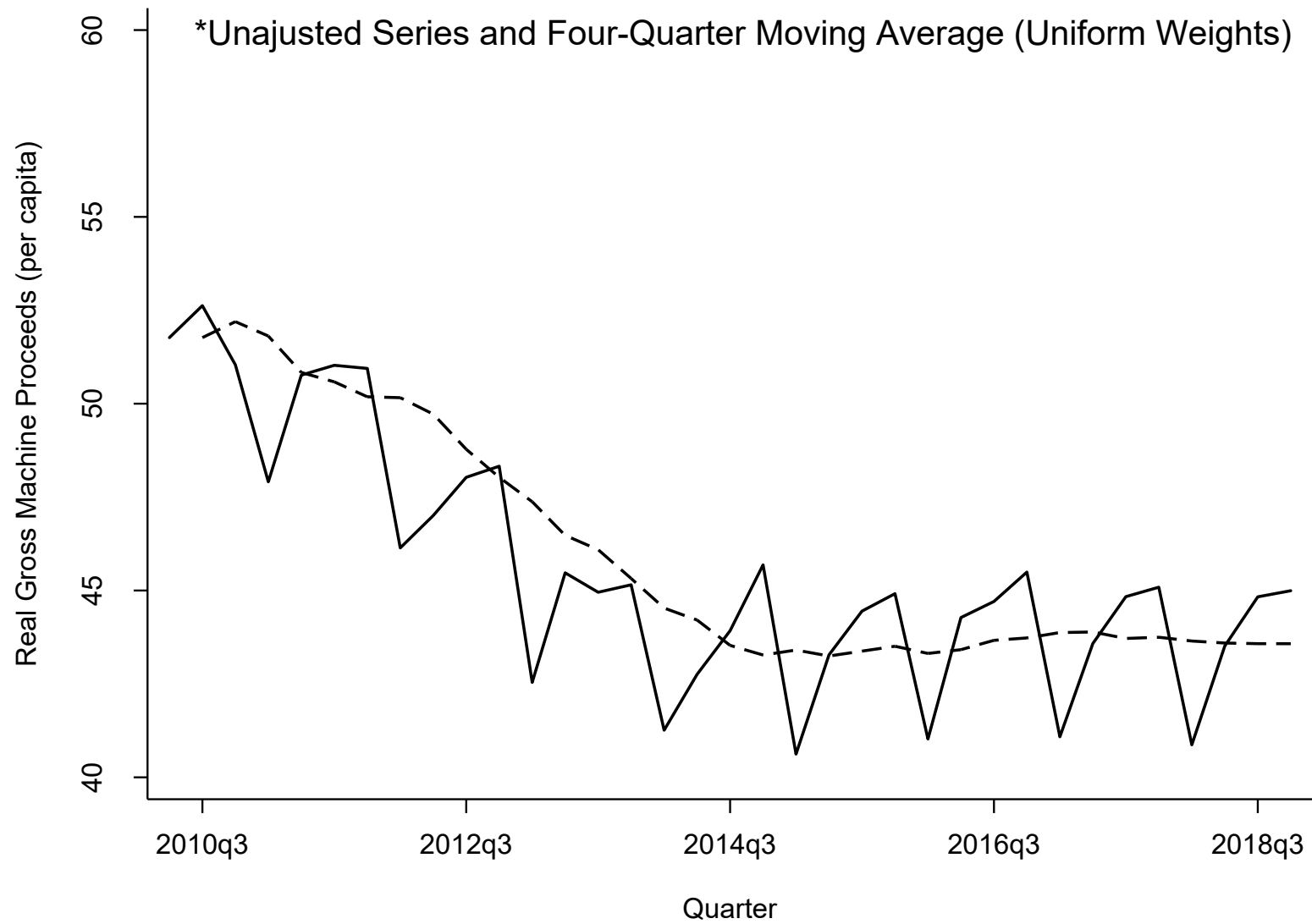
  - Time trends in next two slides…

Figure 3. Real gross machine spending per capita, 2010 to 2018
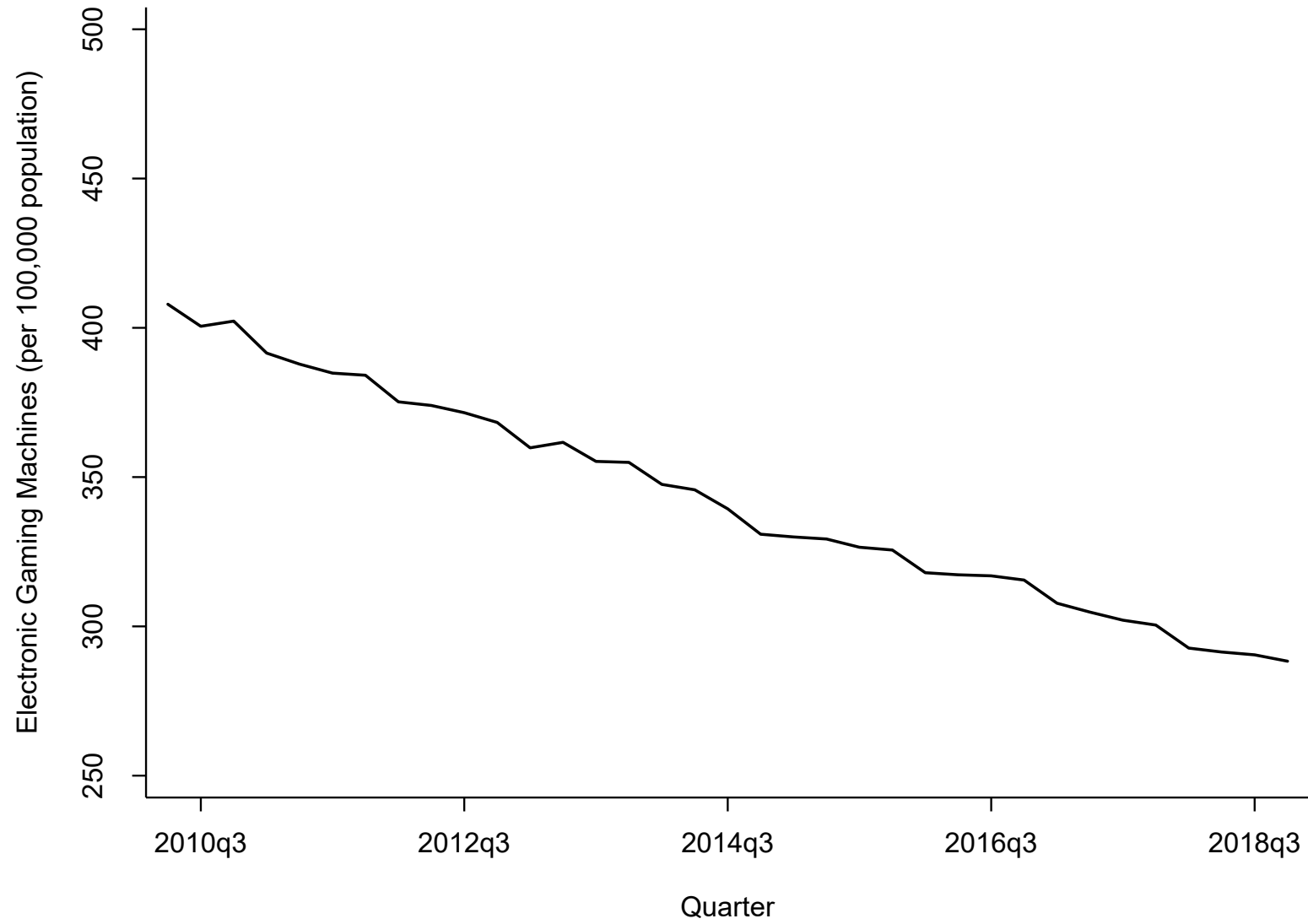
Figure 4. Electronic gaming machines per 100,000 TA population, 2010 to 2018

Data

- Demographic and socio-economic information from Statistics NZ

- Problem gambling intervention service use from Ministry of Health (MOH)

- Main outcomes:

  - Number of Class 4 venues per 100,000 resident population at the TA-level
  - Number of EGMs per 100,000 resident population at the TA-level
  - Real GMP per capita the TA-level (in 2019 NZD)

Table 3. Descriptive statistics for gambling policy evaluation

Variables	Mean (SD)
Reference group	0.18
Absolute cap	0.35
Per capita cap	0.13
Sinking lid	0.34
Machine spending	185.91 (56.82)
EGMs	449.27 (167.48)
Venues	40.77 (21.49)
Female (%)	50.80
Aged 15 - 39 (%)	27.85
Aged 40 - 64 (%)	39.09
Aged 65+ (%)	18.60
NZ European (%)	74.56
Māori (%)	17.67
Pasifika (%)	3.04
Asian (%)	4.19
MELAA (%)	0.54
Deprivation	5.88 (1.44)
GDP growth rate	4.31 (6.67)
Observations	536

Notes: Data cover all 67 TAs in NZ from 2010 to 2018. The machine spending variable used in the regression is the natural log of the variable defined in this table. All descriptives are unweighted TA-year means. Annual GDP growth rates at the TA-level are estimates from MBIE. Standard deviations are shown in parentheses.

Empirical Model

- TA-level Class 4 gambling policies vary geographically and over time

    - Some TAs did not adopt any more stringent policies compared to those laid out in the Act (the reference group)

    - Policies within the TA change over time due to the requirement to revisit Class 4 gambling policies every 3 years

- We appeal to a difference-in-difference model with TA and time fixed effects

- Illustration of variation on the next slide…

2010
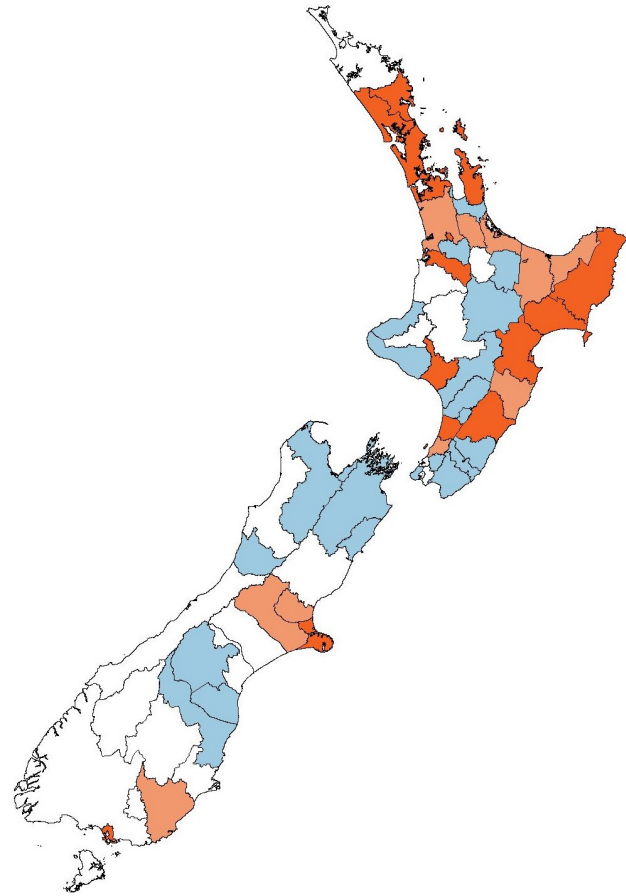
2018
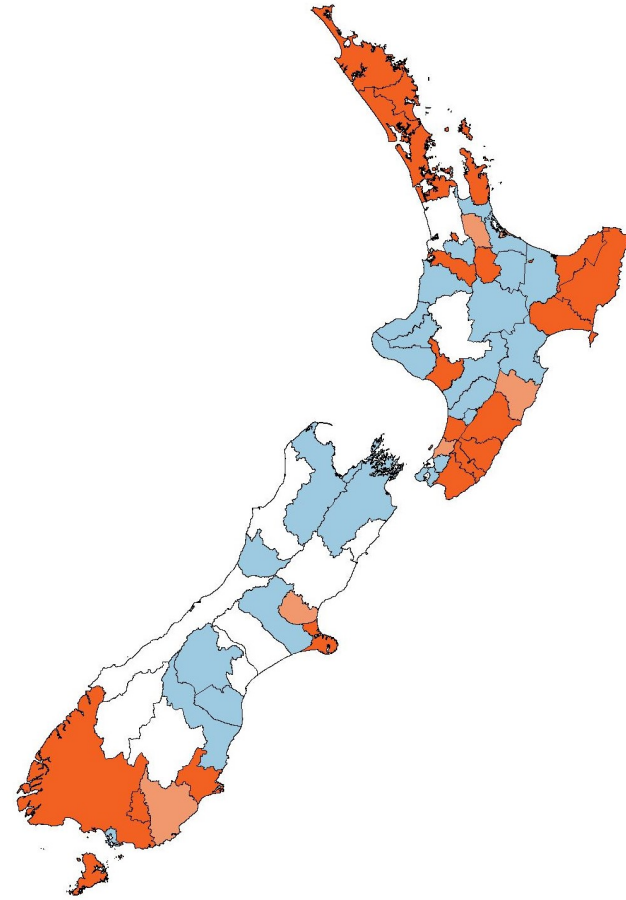
Treatment ☐ 1 ☐ 2 ☐ 3 ☐ 4

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Empirical Model

- Regression equation includes contemporaneous and lagged policy effects

$$y_{it} = \beta_0 + \beta_1 AC_{i,t} + \beta_2 AC_{i,t-1} + \beta_3 PC_{i,t} + \beta_4 PC_{i,t-1} + \beta_5 SL_{i,t} + \beta_6 SL_{i,t-1} + \boldsymbol{X\theta} + \delta_t + \delta_i + \varepsilon_{it}$$

- Where:

  - y_{it} = outcome for TA i in year t

    - EGMs per 100,000 population within the TA

    - Class 4 venues per 100,000 population within the TA

    - Natural log of real gross machine proceeds per capita within the TA

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- Where:

  - AC = absolute cap

  - PC = per capita cap

  - SL = sinking lid

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- Where:

  - $\boldsymbol{X}$ is a vector of controls containing the percent female, age shares, ethnicity shares, neighbourhood deprivation, and GDP growth

  - δ_t and δ_i are time and TA fixed effects, respectively

  - ε_{it} is an idiosyncratic error term

Empirical Model

- We test the parallel trends assumption by including policy leads in an event history setup

  - Not shown, but all pre-treatment dummies were not statistically different from zero

- We also test the sensitivity of results to homogenous treatments

  - Shown

Results

Variables	(1) EGMs	(2) Venues	(3) Machine spending
Absolute cap	-67.18**	-6.88**	-0.10**
	(26.84)	(3.43)	(0.04)
Lagged absolute cap	6.14	-0.07	-0.03
	(21.93)	(2.08)	(0.02)
Per capita cap	-84.64**	-8.01**	-0.14***
	(33.29)	(3.94)	(0.05)
Lagged per capita cap	8.28	-1.08	-0.03
	(24.74)	(2.53)	(0.03)
Sinking lid	-36.21*	-4.47*	-0.08***
	(19.65)	(2.61)	(0.03)
Lagged sinking lid	-11.53	-0.36	-0.05***
	(19.78)	(1.83)	(0.02)
Observations	536	536	536
R^2	0.69	0.68	0.58

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TABLE 6

Impact of any gambling policy beyond Gambling Act 2003 on EGMs, venues, and machine spending

	(1) EGMs	(2) Venues	(3) Machine spending
Outcome variables			
Any policy	-54.81**	-5.93**	-0.09***
	(24.43)	(3.03)	(0.03)
Lag of any policy	0.44	0.08	-0.04**
	(17.72)	(1.74)	(0.02)
Observations	536	536	536

Results

- Summary of findings from DIA outcomes:

  - Any policy going beyond the Act is effective at decreasing the stock of Class 4 venues and EGMs, as well as EGM expenditure.

  - Absolute and per capita caps reduce the supply of EGMs and Class 4 venues by 14-20%; sinking lids reduce these by 7-8%.

  - Policies going beyond the Act decreased Class 4 gambling expenditure by 10-14% in the first two years of implementation.

    - Sinking lids were the only policy type to show significant negative effects on spending in both the contemporaneous and lagged periods.

Limitations

- Policy changes are likely endogenous to some degree

  - Certain TAs may be more disapproving of Class 4 gaming in general

    - This could at once impact both policy adoption and the level of Class 4 gambling expenditure

    - TA fixed effects should control for *most* of these concerns at the TA-level

Limitations

- Policy changes are likely endogenous to some degree

  - Certain TAs may adopt stricter policies in response to a sudden increase in the number of Class 4 venues

    - Then the trajectory of Class 4 venue growth is at once impacting both policy adoption and the level of Class 4 gambling expenditure

    - Time fixed effects should control for *most* of these concerns

Conclusions

- Results suggest that relatively strict policies regarding Class 4 machine and venue permitting are effective in reducing gambling expenditure (player losses)

- Sinking lids are the only intervention in NZ shown to decrease player losses in both contemporaneous and lagged periods

- Future work should work to better understand how local governments actually use these tools (e.g., switching from one to another over time)

Thank you

Questions?