



**NEW ZEALAND  
WORK RESEARCH INSTITUTE**

# Electronic gambling machines in New Zealand:

A local government policy analysis

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# Research Aim

What is the impact of public policy interventions on the number of electronic gambling machines/venues and players' losses?

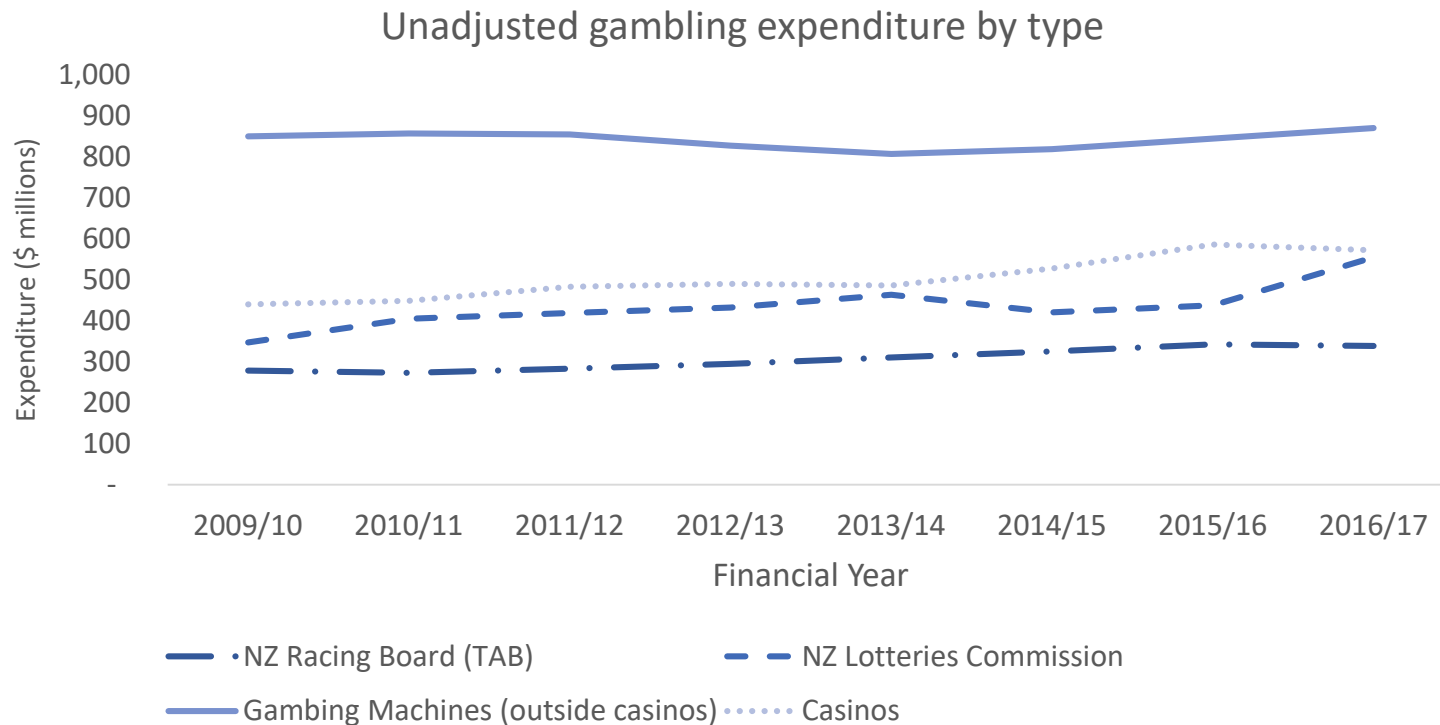
# Motivation

- Problem gambling is a significant health concern in NZ – affecting approximately 11 percent of NZers each year (DIA, 2008).
- Non-casino electronic gaming machines (EGMs), contribute the most harm compared to other types of gambling (Ministry of Health, 2019).



# Motivation

- This form of gambling is classified as “Class 4” gaming – the most high-risk high-turnover form of gambling.
- Expenditure on this form of gambling is significantly higher than any other gambling activity.



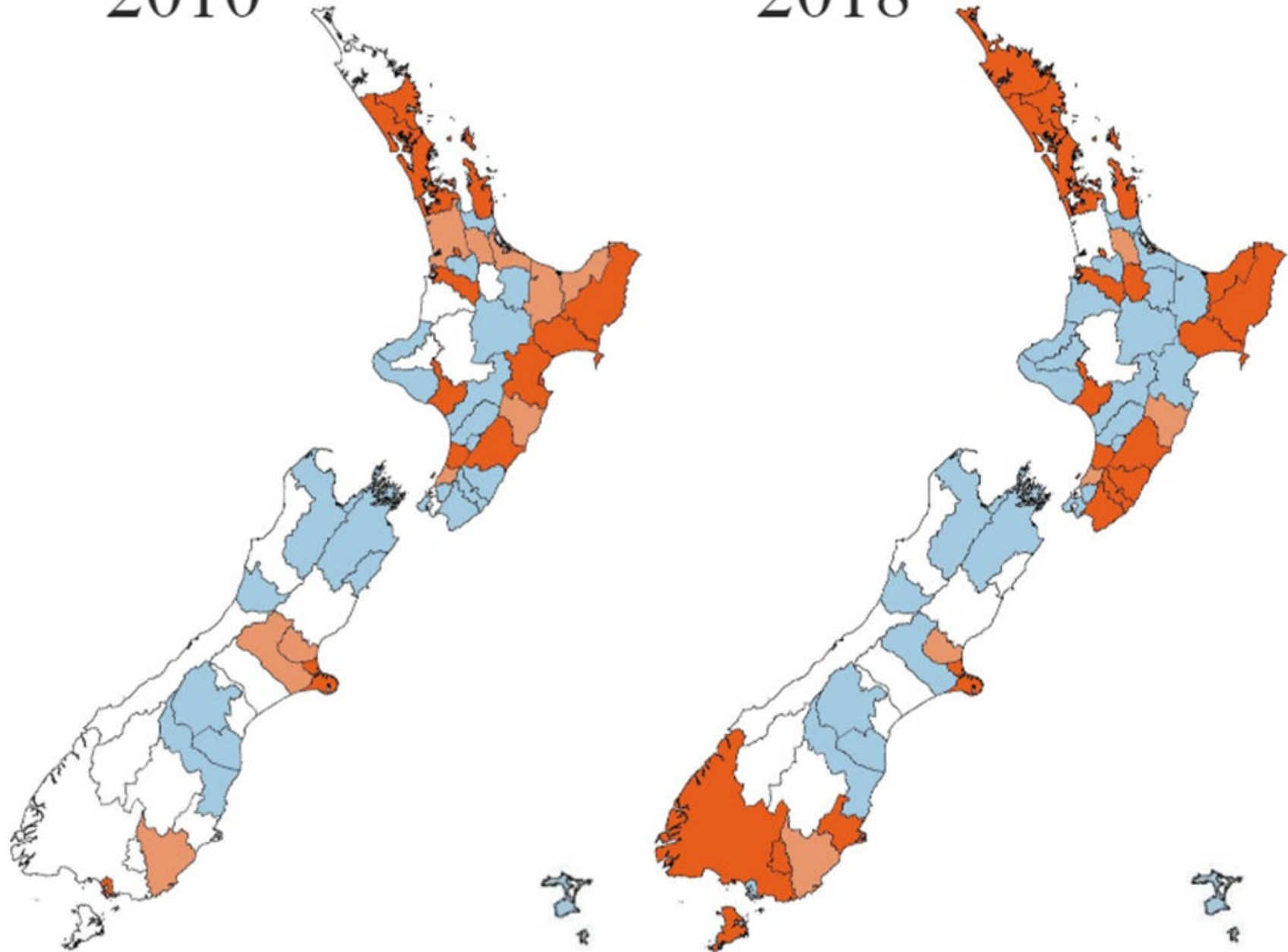
# Class 4 gambling policies

- At a minimum, provisions under the 2003 Gambling Act (reference group);
  - Absolute cap on the number of EGMs and / or venues;
  - Per capita cap on the number of EGMs and / or venues;
  - Sinking lid.
- Policies vary by territorial authority (TA) and are reviewed every 3 years.

2010

2018

- Control
- Absolute cap
- Per capita cap
- Sinking lid



# Past research

- Many international jurisdictions implement policies that limit access to EGMs. These restrictions vary in both intensity and reach but analysis results are mixed.
  - For example, rise in problem gambling following EGMs being permitted in hotels in Queensland.
  - On the other hand, no change in EGM expenditure following an absolute cap policy in Victoria.
- No studies analysing the impact of these policies in New Zealand.

# Outcomes of interest

- Direct effects:
  - Number of EGMs
  - Number of Class 4 venues
  - Class 4 gambling expenditure



# Data

- Policy interventions – collected via OIA requests to all 67 territorial authorities.
- Gambling statistics – Department of Internal Affairs.
- Demographic and socio-economic information – Statistics NZ.

# Data

- The number of EGMs have decreased over the course of our sample period (2010 to 2018).

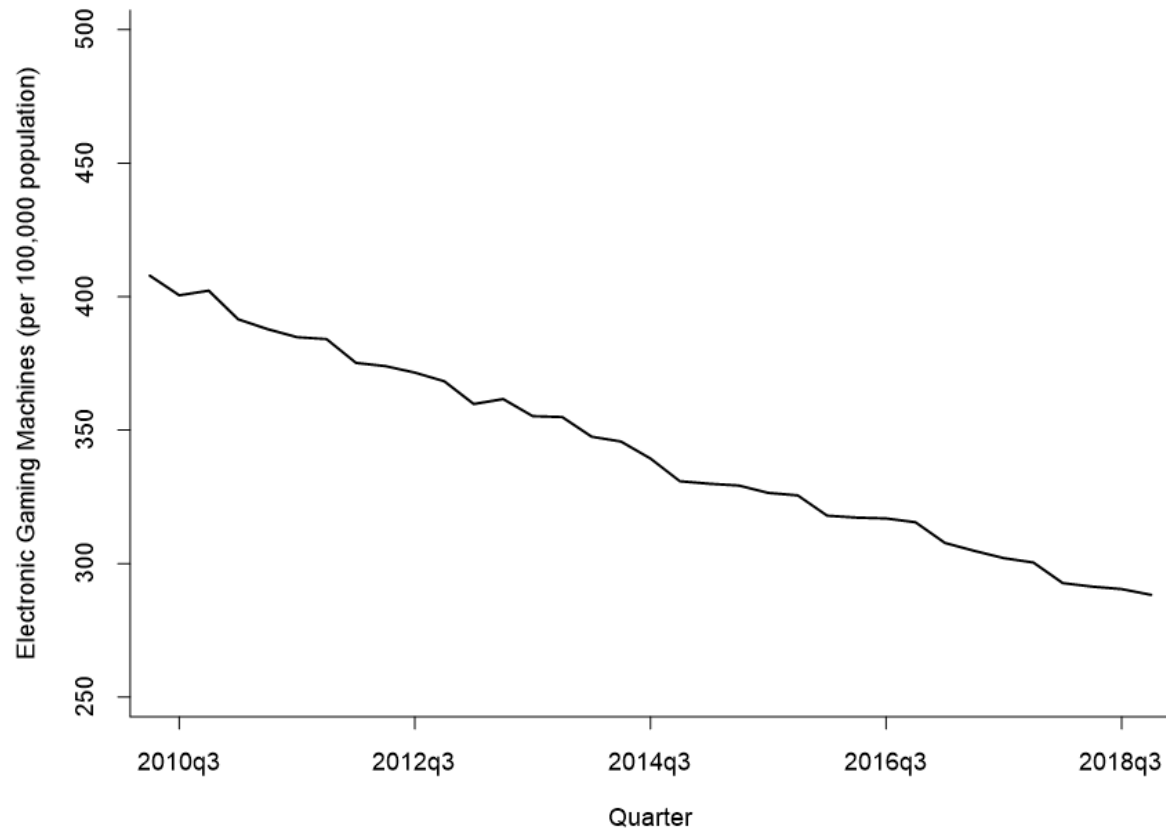


Figure 4. Electronic gaming machines per 100,000 TA population, 2010 to 2018

# Data

- Although Class 4 expenditure has also been declining, it remains substantially higher than any other gambling activity in NZ.

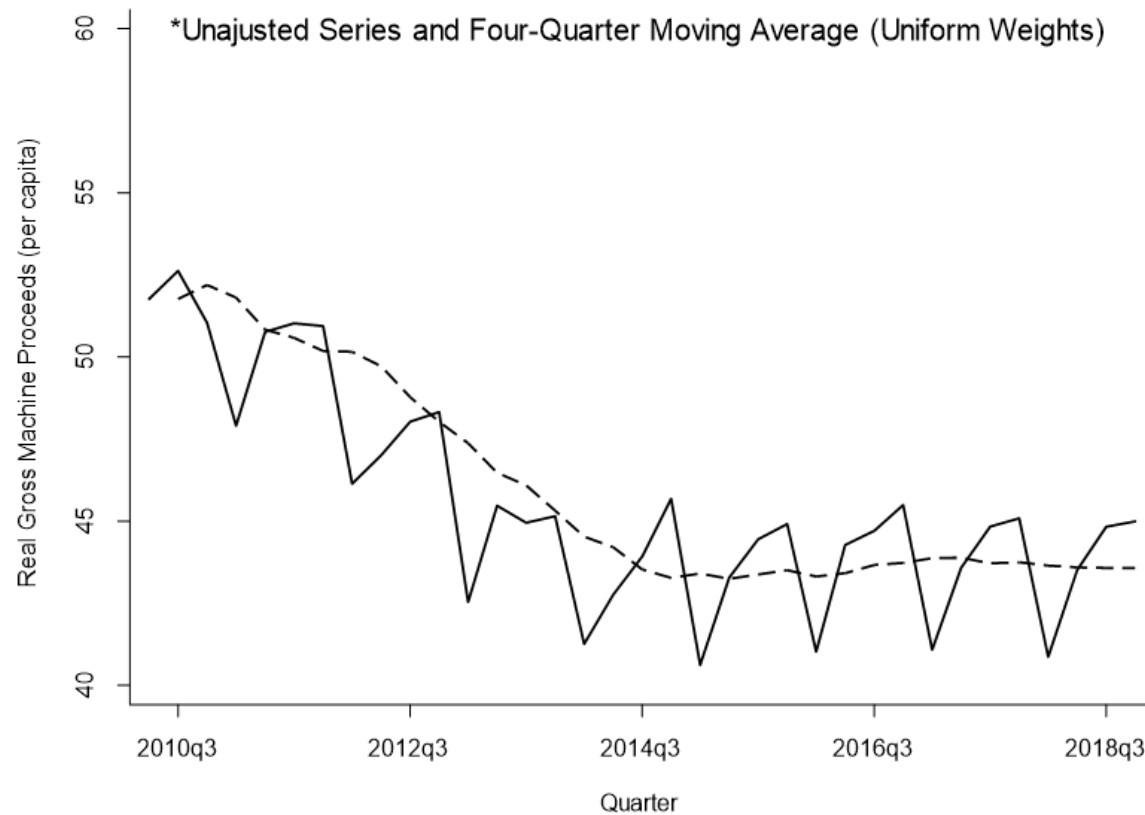


Figure 3. Real gross machine spending per capita, 2010 to 2018

# Method

- Difference-in-differences with contemporaneous and lagged treatments

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

- Reference group: no Class 4 gambling policy beyond Gambling Act 2003
- $y_{it}$  = outcome for TA  $i$  in year  $t$

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- Reference group: no Class 4 gambling policy beyond Gambling Act 2003
- $y_{it}$  = 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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- $\mathbf{X}$  = ethnicity, age and gender composition indicators; and economic activity
- $\boldsymbol{\delta}_t$  and  $\boldsymbol{\delta}_i$  capture time trends and time-invariant TA-level characteristics, respectively



# Results

| Treatments     | EGMs                  | Venues               | Machine spending |
|----------------|-----------------------|----------------------|------------------|
| Absolute Cap   | -67.18***<br>(-15.0%) | -6.88**<br>(-16.9%)  | -10%***          |
| Lagged AC      | 6.14<br>(0.9%)        | -0.07<br>(-0.2%)     | -3%              |
| Per Capita Cap | -84.64***<br>(-18.8%) | -8.01***<br>(-19.6%) | -14%***          |
| Lagged PC      | 8.28<br>(1.8%)        | -1.08<br>(-2.6%)     | -3%              |
| Sinking Lid    | -36.21*<br>(8.1%)     | -4.47*<br>(-11.0%)   | -8%***           |
| Lagged SL      | -11.53<br>(-2.6%)     | -0.36<br>(0.9%)      | -5%**            |

Notes: N = 536, R squared = 0.69; 0.68; 0.58. All other demographic and socio-economic controls included. Spending is the natural log of real gross machine proceeds per capita, reported in 2019 dollars.

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## **Robustness:**

- Weights based on the TA-level population statistics
- Removed the lags
- Homogeneous policy intervention

## **Caveats:**

- Are effects driven by casual gamblers or problem gamblers?
- Substitution between Class 4 gambling and other types of gambling?



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**Thank you  
Questions?**



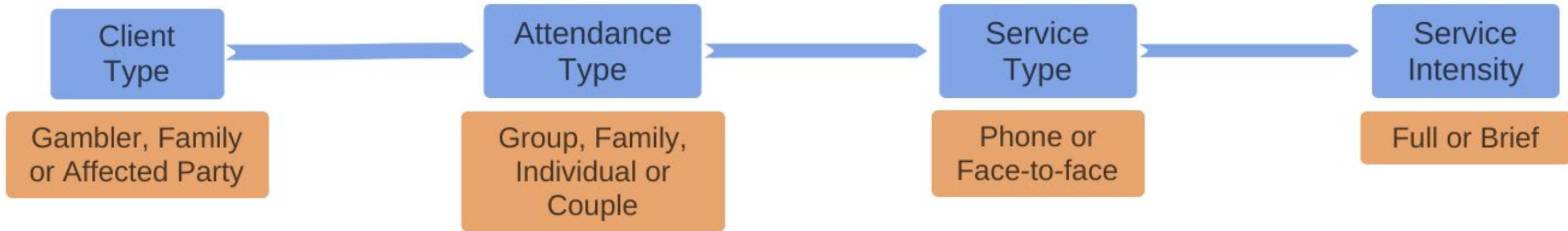
# Impact on MoH intervention service use

Several studies find a positive association between EGM availability and demand for help.

However, theoretical expectations are ambiguous

- Policy intervention >> ↓ access to machines and venues >> ↑ cost to access gambling >> ↓ problem gamblers that need access to intervention services
- Or >> ↑ in those quitting leads to a ↑ in those needing services
- Dynamic element – potential for short run ↑ and long run ↓

# Information available: CLIC database



# Results

- Only sinking lid policies resulted in decreased service use in year of implementation.
- Per capita caps resulted in an increase in new clients in the year following implementation.



# Intervention services results

Impact of gambling policies on intervention service use

| Variables             | (1)<br>All services | (2)<br>New clients  | (3)<br>Existing clients | (4)<br>Gamblers    | (5)<br>Family/other | (6)<br>Face-to-face  | (7)<br>Phone calls | (8)<br>Brief      | (9)<br>Full         |
|-----------------------|---------------------|---------------------|-------------------------|--------------------|---------------------|----------------------|--------------------|-------------------|---------------------|
| Absolute cap          | 121.95<br>(103.54)  | 34.19<br>(58.89)    | 60.23<br>(50.04)        | 83.64<br>(62.70)   | 10.79<br>(34.83)    | 69.13<br>(71.34)     | 25.29<br>(27.47)   | 11.01<br>(17.36)  | 60.70<br>(58.24)    |
| Lagged absolute cap   | 9.24<br>(69.54)     | 17.44<br>(46.66)    | 10.98<br>(36.72)        | 28.88<br>(47.37)   | -0.46<br>(30.13)    | 45.00<br>(43.91)     | -16.58<br>(32.46)  | -10.47<br>(12.43) | 41.16<br>(43.02)    |
| Per capita cap        | 18.07<br>(164.56)   | -26.66<br>(113.54)  | 3.88<br>(73.42)         | -53.45<br>(100.88) | 30.67<br>(74.61)    | -20.56<br>(110.52)   | -2.22<br>(44.58)   | 25.42<br>(33.46)  | -40.07<br>(94.59)   |
| Lagged per capita cap | 177.56<br>(134.76)  | 186.30*<br>(105.29) | 0.77<br>(46.75)         | 170.34*<br>(94.61) | 16.73<br>(39.11)    | 190.33**<br>(94.32)  | -3.25<br>(35.00)   | 17.51<br>(32.32)  | 160.83*<br>(90.79)  |
| Sinking lid           | -159.37*<br>(84.14) | -50.33<br>(43.06)   | -87.23*<br>(49.03)      | -96.59*<br>(53.88) | -40.97<br>(27.23)   | -104.77**<br>(52.57) | -32.79<br>(34.04)  | -15.11<br>(13.66) | -90.19**<br>(45.36) |
| Lagged sinking lid    | 21.08<br>(77.61)    | 9.47<br>(57.61)     | 19.78<br>(25.48)        | 8.72<br>(51.54)    | 20.53<br>(30.78)    | 30.49<br>(53.08)     | -1.23<br>(29.10)   | -3.30<br>(14.06)  | 30.55<br>(48.57)    |
| Observations          | 536                 | 536                 | 536                     | 536                | 536                 | 536                  | 536                | 536               | 536                 |
| R <sup>2</sup>        | 0.09                | 0.07                | 0.12                    | 0.09               | 0.05                | 0.09                 | 0.10               | 0.08              | 0.07                |

Notes: Control variables described in Table 3 are included in these regressions, but not included here for the sake of brevity. TA and year fixed effects are included. Bootstrapped clustered standard errors are shown in parentheses. \*\*\*, \*\*, and \* denotes statistical significance at the one, five, and ten percent-levels, respectively.

# Robustness checks

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

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

# Robustness checks

## Goodman-Bacon decomposition

|                  | (1)<br>EGMs       | (2)<br>Venues   | (3)<br>Machine spending | Weight |
|------------------|-------------------|-----------------|-------------------------|--------|
| Timing Groups    | -41.18            | -5.93           | -.048                   | 3.48%  |
| Always Treated   | -25.55            | -4.58           | -.122                   | 82.04% |
| Never Treated    | -34.13            | -1.04           | -.106                   | 14.78% |
| Weighted Average | -27.34<br>(25.16) | -4.11<br>(3.05) | -.117***<br>(.028)      |        |
| Observations     | 603               | 603             | 603                     |        |