# Simulation Summary: Panel Dataset of Firms

## Dataset Description

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| --- | --- |
| Feature | Description |
| Unit | Firm-year (panel) |
| N firms | 500 |
| Years observed | 2000–2010 (some missing due to random drop) |
| Entry/Exit | Firms randomly drop out with prob = 0.2 |
| Treatment share | 50% of firms |
| Treatment years | Staggered, randomly assigned from 2002–2007 |
| Treatment type | Absorbing (once treated, always treated) |
| Panel structure | Unbalanced (due to random firm-year dropping) |

## Treatment Variables

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| --- | --- |
| Variable | Description |
| treated | Firm-level dummy (1 = treated, 0 = control) |
| first\_treat | First year of treatment for treated firms |
| post\_treatment | Equals 1 if year ≥ first\_treat and treated = 1 |

## Outcome y1

|  |  |  |
| --- | --- | --- |
| Term | Description | Coefficient |
| firm\_fe | Firm fixed effect (random intercept) | Yes (1×) |
| year\_fe | Year fixed effect (random intercept) | Yes (1×) |
| firm\_age | Firm age in years since entry | 0.3 |
| post\_treatment | Treatment dummy (after adoption) | 2.0 |
| noise | Idiosyncratic shock ~ N(0, 1) | Yes |

Model equation:

y1\_it = α\_i + λ\_t + 0.3 \* firm\_age\_it + 2.0 \* post\_treatment\_it + ε\_it

## Outcome y2

|  |  |  |
| --- | --- | --- |
| Term | Description | Coefficient |
| firm\_fe | Firm fixed effect (random intercept) | Yes (1×) |
| year\_fe | Year fixed effect (scaled) | 0.2× |
| firm\_age | Firm age in years since entry | 0.1 |
| post\_treatment | Treatment dummy (after adoption) | 3.0 |
| noise | Idiosyncratic shock ~ N(0, 1) | Yes |

Model equation:

y2\_it = α\_i + 0.2 \* λ\_t + 0.1 \* firm\_age\_it + 3.0 \* post\_treatment\_it + ε\_