Interaction and Telemarketers

EES 4760/5760
Agent-Based & Individual-Based Computational Modeling
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Class #14: Thurs. February 23 2017

Getting Started

- Download the following files:
  - https://ees4760.jonathangilligan.org/models/class_14/jg-tif.nls
  - https://ees4760.jonathangilligan.org/models/class_14/telemarketer_class_14.nl[...]
  - https://ees4760.jonathangilligan.org/models/class_14/telemarketer_mergers_cl[...]
  - https://ees4760.jonathangilligan.org/models/class_14/telemarketer_class_14%2[...]
  - https://ees4760.jonathangilligan.org/models/class_14/telemarketer_mergers_cl[...] table.csv
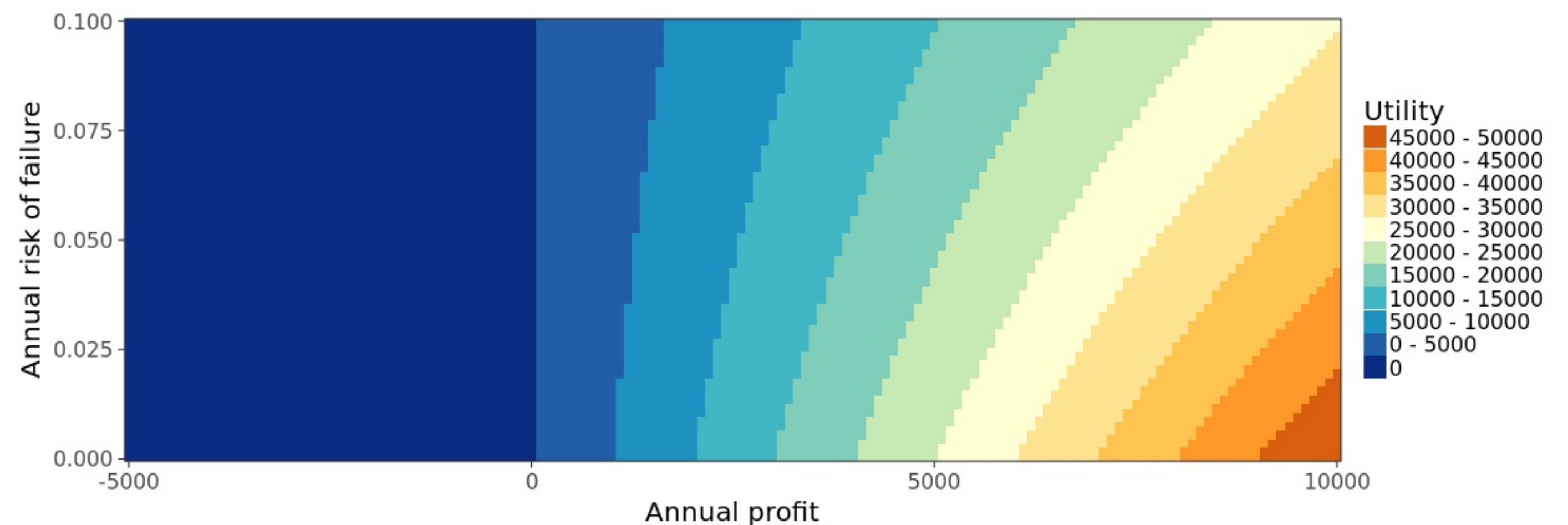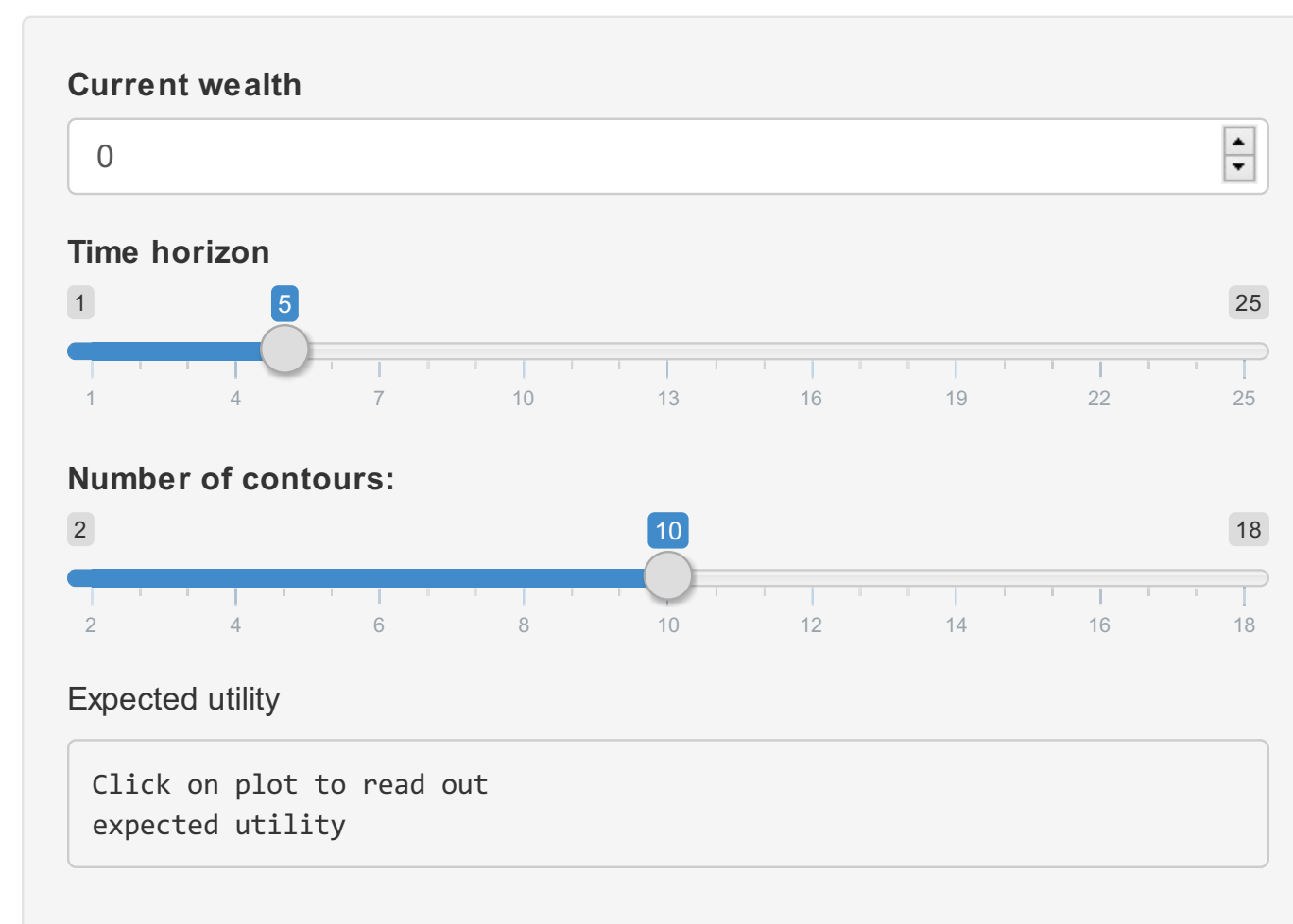
Business Investors

- Expected utility function:

$$U = (W + PT) \times (1 - F)^T$$

  W = wealth, P = profit, F = risk of failure, T = time horizon

- How does this change as investors gain more wealth?

- Interactive app https://ees4760.jonathangilligan.org/contour

Telemarketer Model

- Telemarketing firms interact
  - Telemarketer calls patches
  - If patch has received a previous call that tick, it hangs up
  - If patch has not received a previous call that tick, it buys something
  - Interaction is indirect, mediated by patches
- Accounting:
  - Net profit = 2 × sales − 50 × size
  - If balance < 0, firm goes bankrupt
- Growth
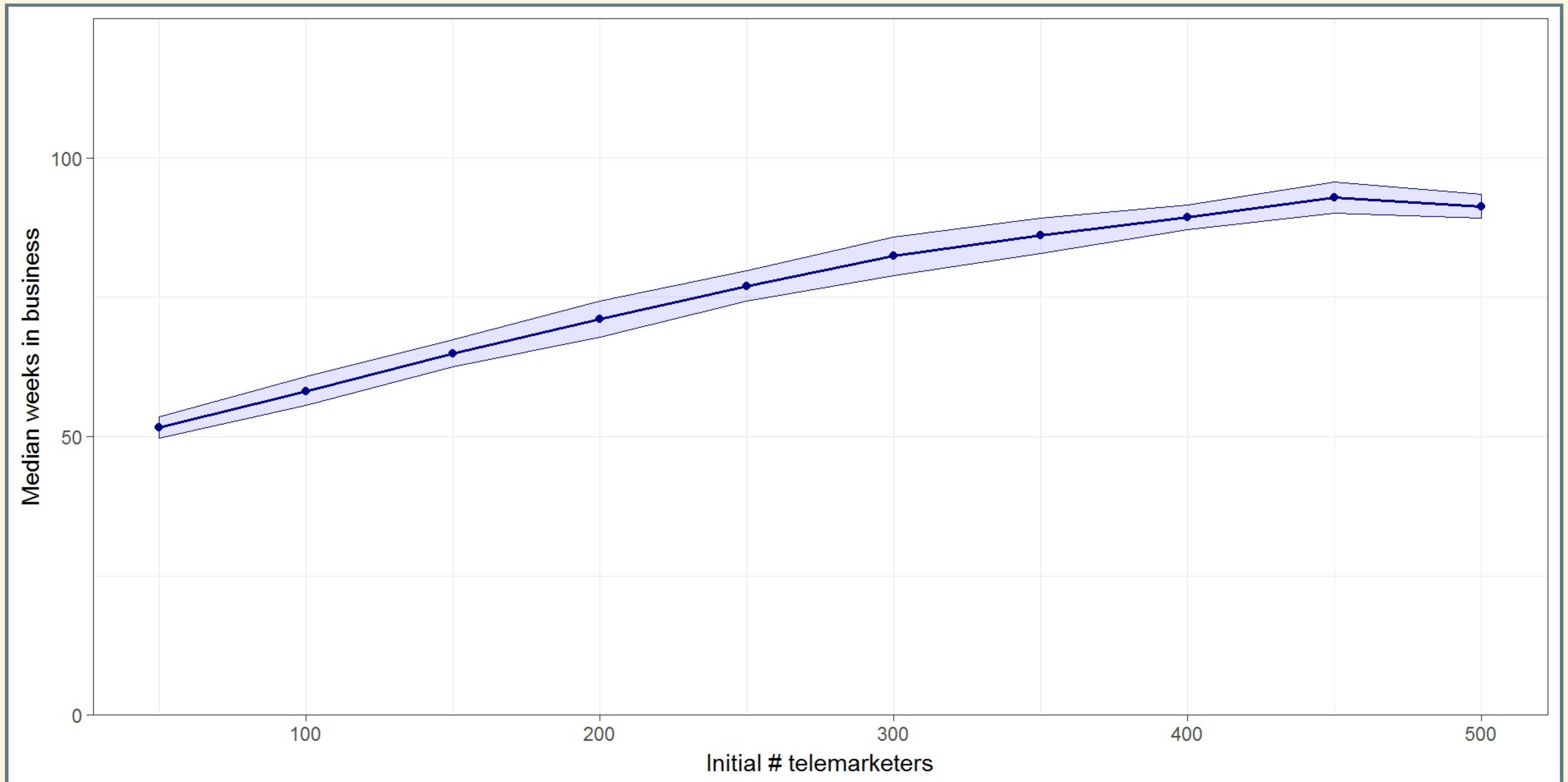 - If balance > growth threshold, firm increases size proportional to excess balance
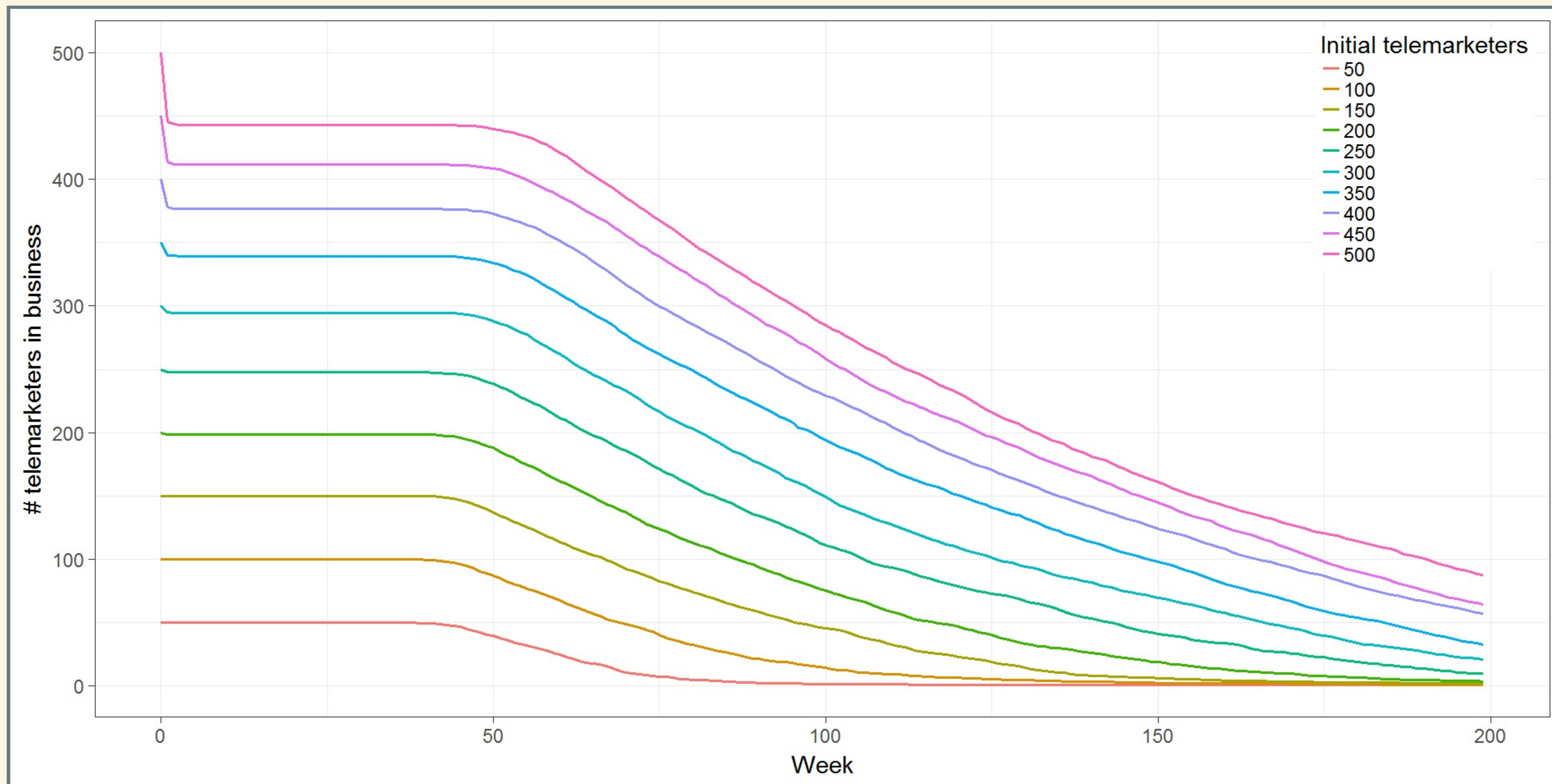
Results
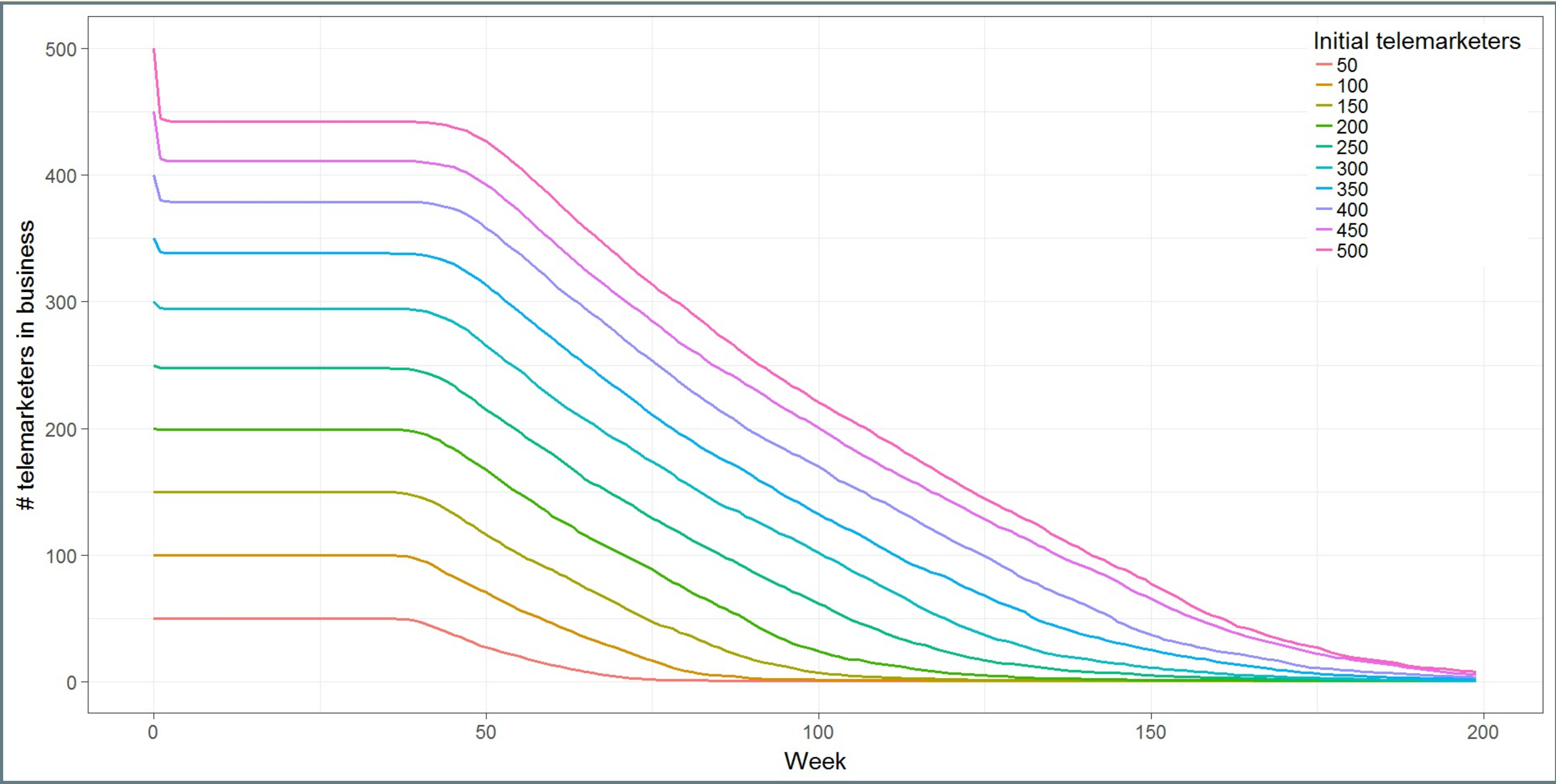
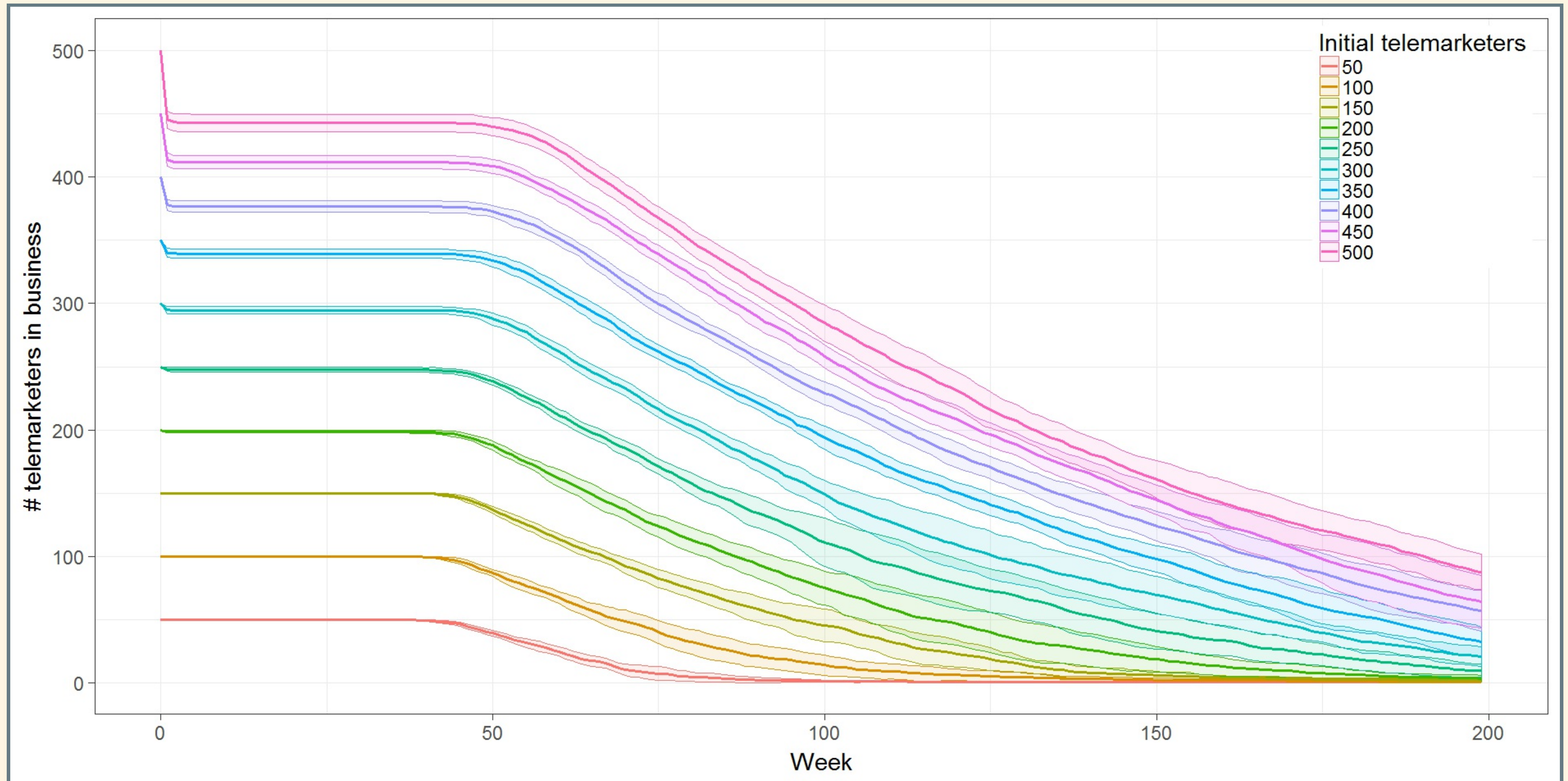# Variation
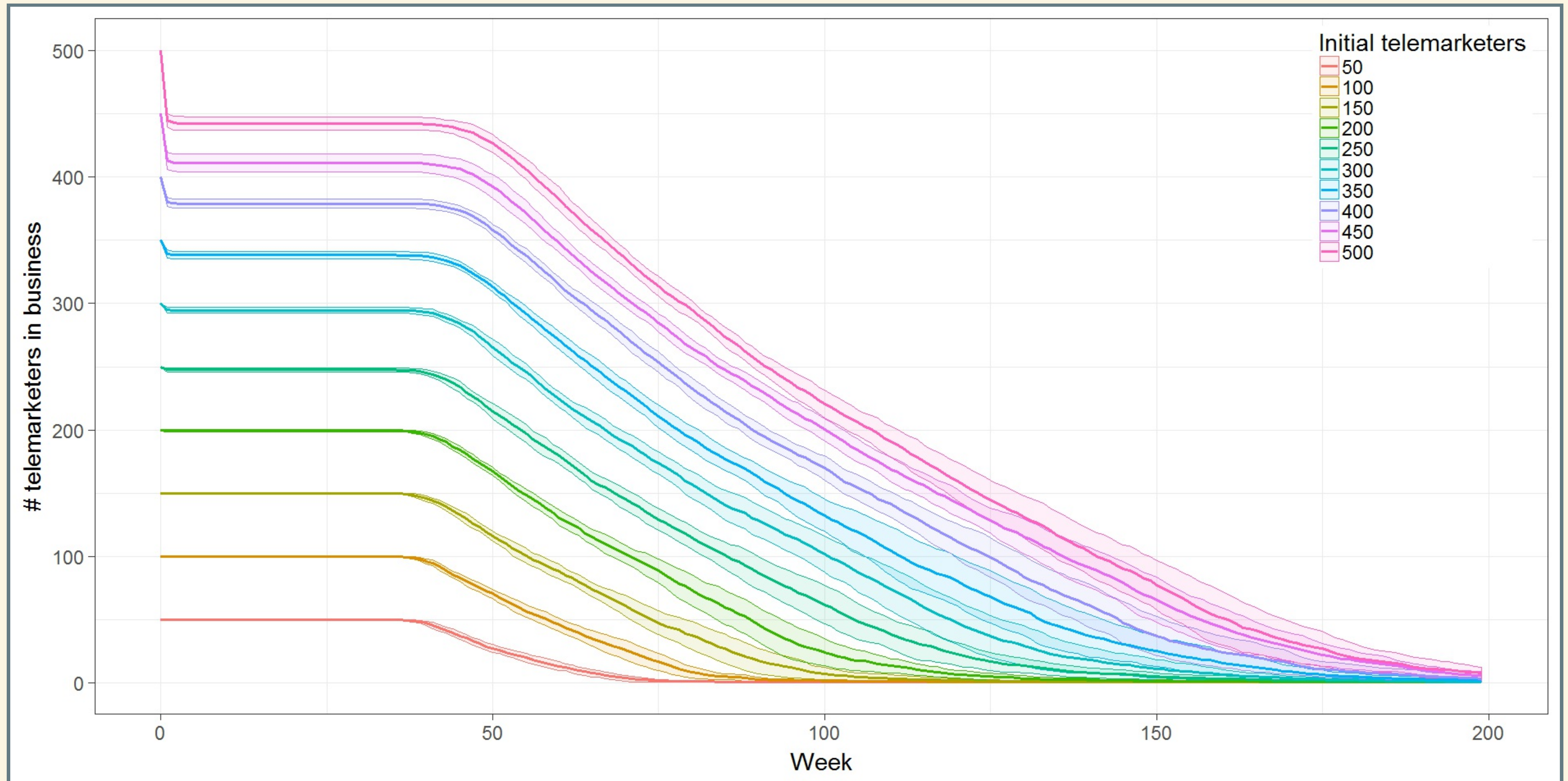
Median Weeks in Business

Mergers

- Instead of going bankrupt when the bank balance drops below 0, firms look for acquisition partner
  - Find a company that's bigger and has enough money to pay off deficit.
  - If it finds a parent, parent pays off deficit (child firm ends up with 0 balance)
  - In future turns, child pays parent 50% of its net profits.
  - In future, if child's balance becomes negative:
    - If parent has enough money, it pays child's deficit
    - If parent does not have enough money, child dies.

Results

Variation

Median Weeks in Business