

# Mergers and Acquisitions, Market Power, and Efficiency



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## Research Questions and Findings

### 1. What drives horizontal mergers? Efficiency or market power?

I build a theory of *who merges with whom*, which allows me to identify how motivations for mergers and acquisitions (M&A), such as market power or production synergies drive merger sorting patterns. Mergers exhibit high assortativity: large firms tend to buy other large firms. This is true when measured by employment, sales, profit, and market value. The calibrated model suggest that merger synergies are small and the model with no synergies fits aggregate moments well. From this, I conclude that mergers are *principally driven by market power considerations*.

### 2. What are the aggregate implications of M&A?

Despite being driven by market power, counterfactual analysis shows that mergers tend to *increase aggregate productivity* as it reduces misallocation by lowering the overall dispersion of markups. However, M&A *decreases output and welfare* through a higher aggregate markup. I estimate that mergers increase aggregate productivity by 1.6%, yet decreases output by 3.9%.

## What drives mergers?

### Model sketch

- Nested CES demand with *oligopolistic competition*.
- Firms are heterogenous in the productivity  $z$  and number of products  $m$ .
- Prices and quantities are determined à la Bertrand competition.

When two firms merge, the merged firm can:

1. Gain market power (by eliminating competition)
2. Gain new product lines  $m_a + m_t$
3. Raise their productivity  $z_m = Az_a^\gamma z_t^\nu$

When merger opportunities arise, (which occurs at rate  $a$ ) firms within industries form bilateral matches or remain unmatched. This is a challenging environment for matching since it is a one-sided (roommate) matching problem with externalities.

To determine the matches, I use a *robust stable matching* solution concept where a stable matching will exist.

### Who merges with whom?

The correlation between the size of acquirors and targets is the key moment that informs the productivity gains in mergers. Figure 6 shows the proportion of times the most productive firm (6) merges with each other rank in the industry, for different realizations of industry productivities. The model predicts mergers are assortative:

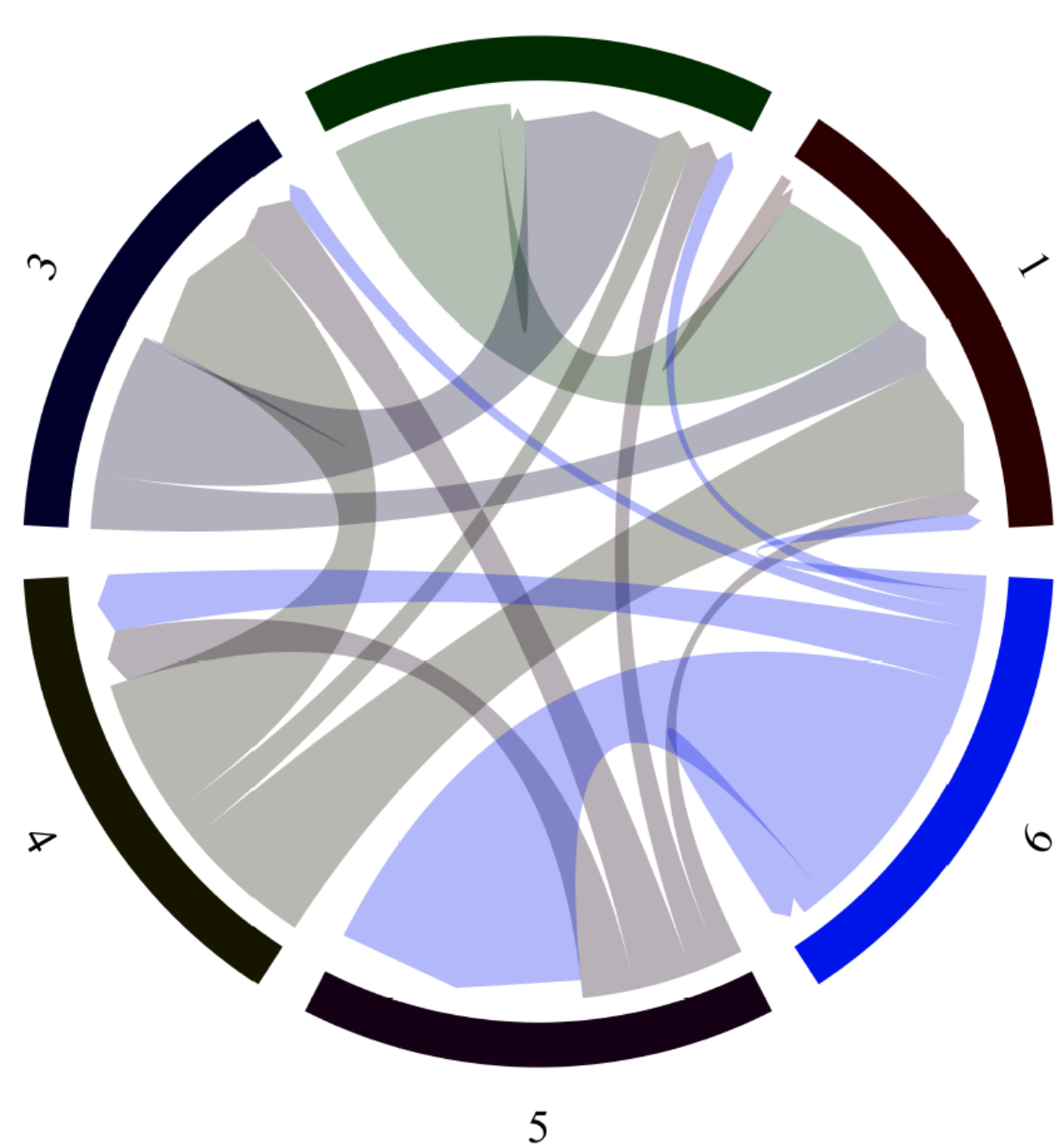


Figure 2. Who does the industry leader merge with?

When synergies are stronger, the model predicts a less assortative pattern of matching.

Calibrating the model gives a merger efficiency of  $A=1.03$ . Contrasting the calibrated value to a 'no synergy' case with  $A=1$  implies a slightly more assortative pattern, as shown in Figure 3. The merger rate only falls from 2.2 to 1.9 mergers per industry per year.

Figure 4 shows the distribution of simulated productivity gains of mergers. The median merger only increases the productivity of the acquirer by 0.8% and 60% of mergers reduce the productivity of the acquirer.

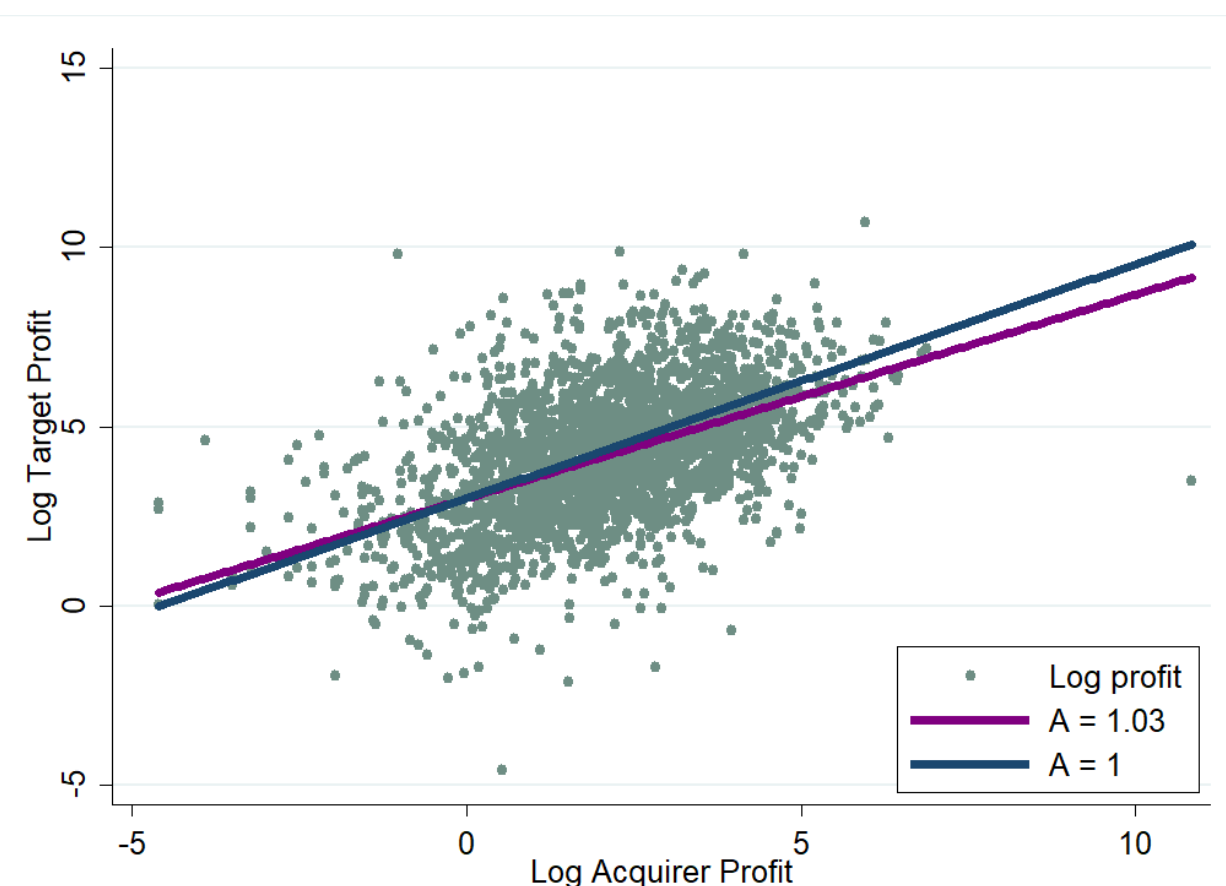


Figure 3. Assortivity with and without synergies

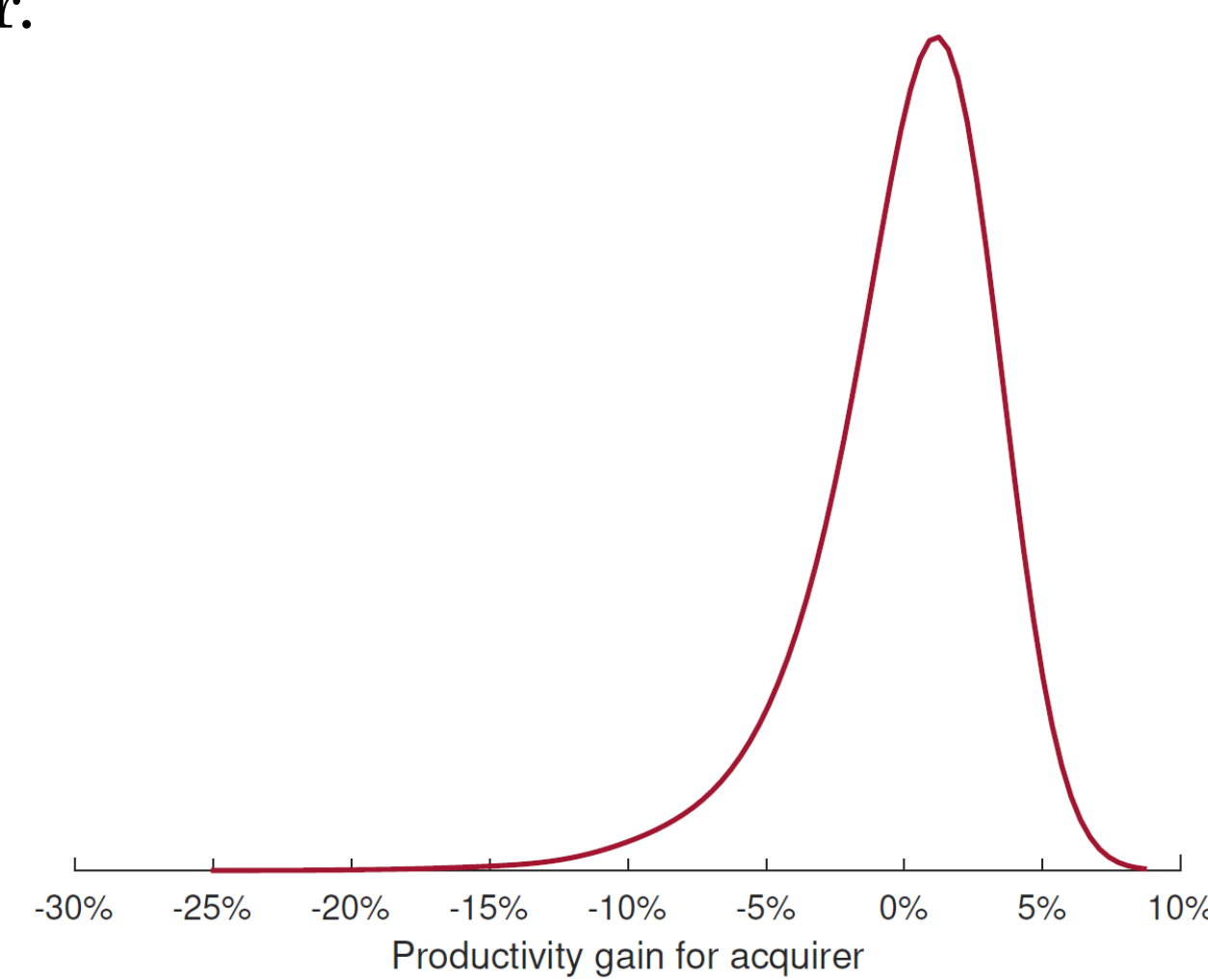


Figure 4. Simulated productivity gains

## How do mergers affect outcomes?

### Mergers tend to raise avg. markup but lower dispersion

Figure 1 shows three key ways markups evolve with mergers. (1) Industries with more mergers have higher average markups. When firms gain productivity through synergies they converge to the monopoly markup quicker. (2) Since mergers raise markups, they increase the markup difference between relatively consolidated and unconsolidated industries. (3) Mergers tend to reduce the dispersion of markups within industries with  $k$  mergers (90-10 markup percentiles shown in bars).

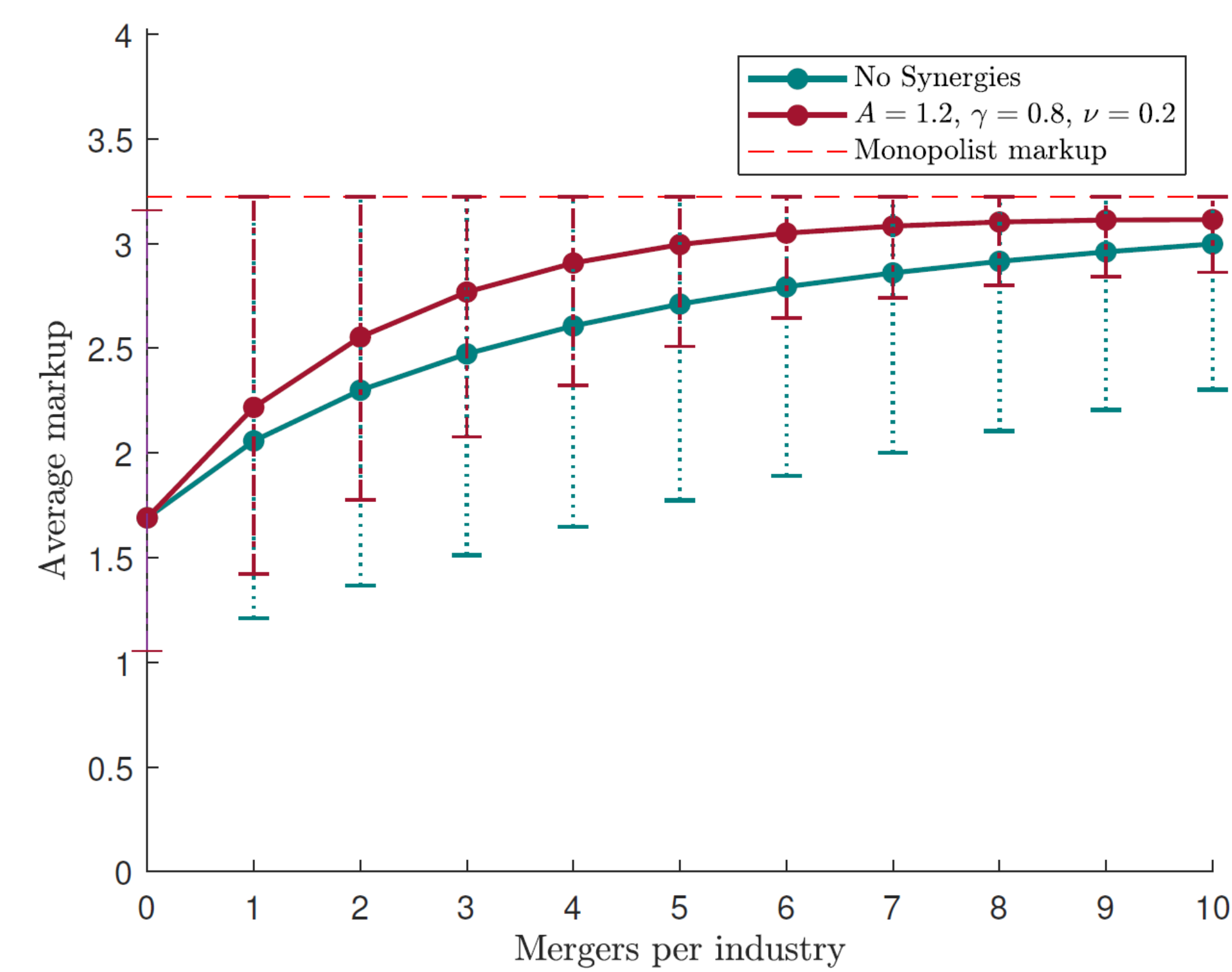


Figure 1. How do mergers affect markups?

### Mergers tend to increase productivity but lower output

I write aggregate productivity in this economy as a function of the measure of industries with  $k$  mergers  $v(k)$ :

$$Z = \left( \int_1^\infty \int_0^\eta v(k) \sum_{k=0}^{N-1} \underbrace{\left( \frac{\mu(u)}{M_k} \right)^{-\sigma}}_{\text{Markup dispersion within industries}} \underbrace{\left( \frac{M_k}{M} \right)^{-\sigma}}_{\text{Markup dispersion across industries}} y^{\sigma-1} f_{uy}(k) du dy \right)^{\frac{1}{\sigma-1}}$$

Mergers affect aggregate productivity  $Z$  through

- the *dispersion of markups* within industries with  $k$  mergers
- the *dispersion across industries* with  $k$  mergers over the economy-wide aggregate markup
- the productivity  $y$  directly.

Figure 5 shows that as the rate of mergers increases, aggregate output falls due to the higher aggregate markup. The effects on productivity are a horse race between whether they reduce markups more within than across industries with  $k$  mergers.

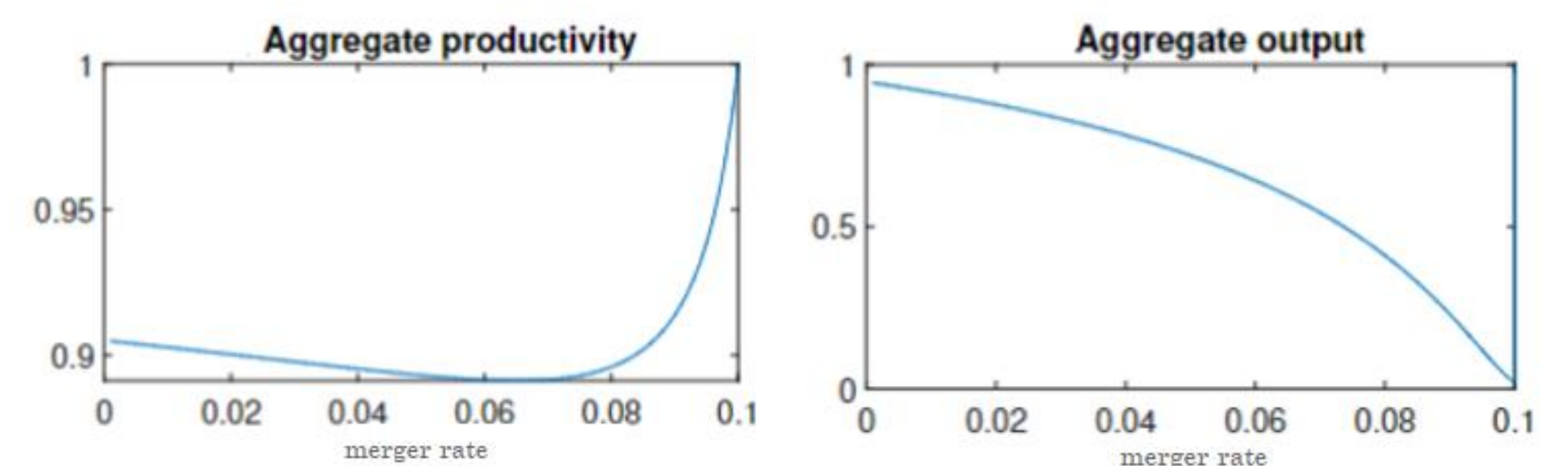


Figure 5. How do aggregate outcomes change with an increased rate of mergers?

In the full quantitative model, I consider removing mergers and antitrust to understand the role mergers and policy have, respectively. Deviations from steady state outcomes are shown below:

Table 1. Counterfactual scenarios: no M&A / no antitrust

Outcome	Deviation from steady state (%)	
	Prohibit mergers	No antitrust
Consumption	3.9%	-0.3%
Aggregate Productivity	-1.6%	0.7%
Welfare	3.8%	-0.5%

## Contact

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See the full paper

