The Macroeconomic Effects of M&A Activity

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This Paper

Since the 1980s, several trends have emerged in the US:

- Large documented increase in markups, e.g. de Loecker et al. (2020)
- Growing market concentration driven by superstar firms, e.g. Autor et al. (2020)
- Fall in business dynamism, e.g. Decker et al. (2016)
- Decline in the labor share of output, e.g. Karabarbounis and Neiman (2014)
- Increases in both income and wealth inequality, e.g. Saez and Zucman (2020)

At the same time, the 1980s-90s witnessed large merger waves.

Aim of this paper: Quantifying the effects of M&A activity on the economy, in particular markups, concentration, and business dynamism, using a structural model.

Main Results

Empirics:

- Acquirers are larger, more productive, charge higher markups
- Mergers create value as measured by acquirer-target value-weighted returns
- Targets capture the major part of merger gains
- Ambiguous competitor returns reflect tension between pro-competitive synergies and anti-competitive market power effects

Theory:

- Develop a structural model with firm dynamics, variable markups, M&A market
- Model matches key moments relating to markups, concentration, and the structure of the merger market
- In counterfactual exercises, show that M&A leads to higher aggregate markup, markup dispersion, and concentration
- Synergy gains from mergers offset by declines in entry and rising misallocation

Literature

Structural Models of M&A:

- Farrell and Shapiro (1990), Gowrisankaran (1999), Wang (2018), David (2020), Mermelstein et al. (2020), Cavenaile et al. (2021), Cao and Zhu (2024), Guadalupe et al. (2024)

Empirical Analyses of M&A:

- Andrade et al. (2001), Bhagat et al. (2005), Duso et al. (2007), Duso et al. (2013), Bena and Kai Li (2014), Blonigen and Pierce (2016), Chen (2019), Klein (2020), Arnold et al. (2022), Belluci and Rungi (2022), Stiebale and Szucs (2022), Levonyan and Mengano (2024), Demirer and Karaduman (2025)

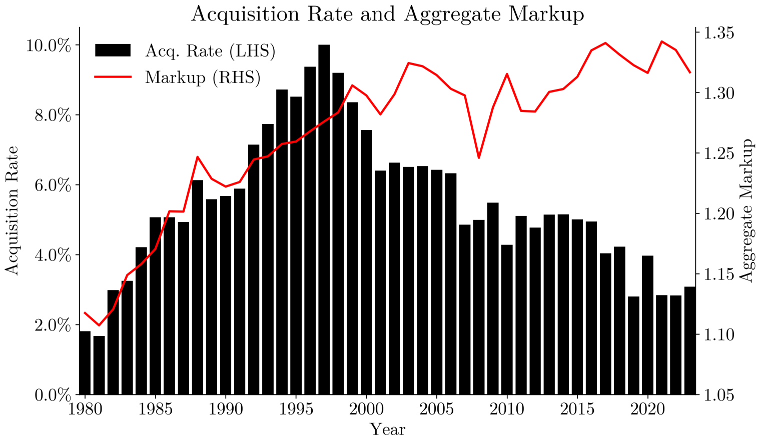
Variable Markups and Misallocation:

- Hsieh and Klenow (2009), Klenow and Willis (2016), Baqaee and Fahri (2020), Peters (2020), Edmond, Midrigan, and Xu (2023), Baqaee et al. (2024)

Rise of Markups and Concentration:

- Autor et al. (2020), De Loecker et al. (2020), Ganapati (2021), Karabarbounis (2024), Kwon et al. (2024), Attalay et al. (2025), De Ridder et al. (2025), Dopper et al. (2025)

M&A Activity and Aggregate Markup



Merger data from SDC Platinum. Aggregate markup (harmonic mean, Cobb-Douglas) computed using the 2-step approach of Ackerberg et al. (2015) and Compustat.

Impact of Merger Announcements - Event Study Estimation

Event study approach relying on event-by-event regressions (Campbell et al., 1997)

Counterfactual model: estimated using daily stock return data and Fama and French (2015) 5-factor model:

$$r_{i,t} - r_t^f = \alpha_{i,k} X_t + \epsilon_{i,t}, \quad t_{i,k} - 273 \leq t < t_{i,k} - 21$$

Abnormal returns upon case filing date:

$$\widehat{AR}_{i,k,t_{i,k}+h} = r_{i,t_{i,k}+h} - \hat{\alpha}_{i,k} X_{t_{i,k}+h}, \quad \widehat{CAR}_{i,k}[0, t_{i,k} + h] = \sum_{l=0}^{t_{i,k}+h} AR_{i,k,l}$$

Cross-sectional averages used to conduct inference on event study results:

$$\widehat{CAAR}[0, t_{i,k} + h] = \frac{1}{N} \sum_k \sum_i \widehat{CAR}_{i,k}[0, t_{i,k} + h]$$

Impact of Merger Announcements - Event Study Results

Competitors are defined for each merging firm using the Embeddings-Based TNIC Industry Classifications by Hoberg and Philips (2016, 2025)

	Acquirers Only		**Targets Only**		**Portfolio**		**Competitors**	
Event Window	CAAR	p-val.	CAAR	p-val.	CAAR	p-val.	CAAR	p-val.
$[-2, -1]$	0.08	0.00	0.83	0.00	0.51	0.00	-0.02	0.00
$[-2, 0]$	0.18	0.00	5.60	0.00	3.30	0.00	-0.00	0.00
$[-2, 1]$	0.35	0.00	6.91	0.00	4.17	0.00	-0.00	0.00
$[-2, 2]$	0.36	0.00	6.91	0.00	4.17	0.00	-0.01	0.00
$[-2, 3]$	0.33	0.00	6.85	0.00	4.13	0.00	-0.02	0.00
$[-2, 4]$	0.32	0.00	6.85	0.00	4.13	0.00	-0.01	0.00
$[-2, 5]$	0.28	0.00	6.83	0.00	4.11	0.00	-0.03	0.00
$[-2, 10]$	0.09	0.05	6.87	0.00	3.99	0.00	-0.05	0.00
$[-2, 21]$	-0.20	0.65	7.01	0.00	3.88	0.00	-0.09	0.00

Notes: p-values are for the GRANK-T test statistic by Kolari and Pynnönen (2011). Number of events for the $[-2, 0]$ window are: Acquirers (18,711), Targets (19,108), Portfolio (16,353), and Competitors (19,571).

Model Overview

Firm Dynamics Model:

- Firm heterogeneous in (time-varying) productivity
- Monopolistic competition with Kimball (1995) demand for variable markups
- Entry/exit

Endogenous M&A Market:

- Second-price sealed-bid auctions between acquirers for a target
- Target-specific arrival rates based on target attractiveness
- Stochastic synergies between acquirers and targets

Structural estimation matching key moments for markups, concentration, macroeconomic aggregates, and M&A market structure

Counterfactual and welfare analyses of synergy/allocative trade-offs involved with M&A

Household Problem

Household side is standard and follows Edmond, Midrigan, and Xu (2023).

Preferences:

$$\max_{\{\{c_{i,t}\}_{i\in\mathcal{C}_t}, N_t, K_{t+1}\}_{t=0}^{\infty}} \sum_{t=0}^{\infty} \beta^t \left(\log(C_t) - \psi \frac{N_t^{1+\frac{1}{\nu}}}{1+\frac{1}{\nu}} \right)$$

Budget Constraint:

$$\int_{i\in\mathcal{C}_t} p_{i,t} c_{i,t}\, di + K_{t+1} = W_t N_t + (R_t + 1 - \delta) K_t + \Pi_t$$

Kimball (1995) Demand System: The final good C_t is implicitly defined by

$$\int_{i\in\mathcal{C}_t} \Upsilon\left(\frac{c_{i,t}}{C_t}\right) di = 1, \quad \Upsilon(1) = 1, \quad \Upsilon'(\cdot) > 0, \quad \Upsilon''(\cdot) < 0$$

Demand System

Functional Form: Following Klenow & Willis (2016), I use

$$\Upsilon'(x) = \frac{\sigma - 1}{\sigma} \exp\left(1 - \frac{x^{\varepsilon}}{\sigma}\right)$$

Demand Elasticity & Superelasticity:

$$\sigma(x) = \bar{\sigma} x^{-\varepsilon/\bar{\sigma}}, \quad \varepsilon(x) = \varepsilon x^{-\varepsilon/\bar{\sigma}}$$

Variable markups since larger firms face less elastic demand:

$$\mu(x) = \frac{\sigma(x)}{\sigma(x) - 1}$$

As $\varepsilon \to 0$, markup becomes constant and we recover the CES case.

Static Firm Problem

Production: Gross output y_{it} combines value added v_{it} and intermediates m_{it}

$$y_{i,t} = v_{i,t}^{\phi} m_{i,t}^{1-\phi}, \quad v_{i,t} = z_{i,t} k_{i,t}^{\alpha} l_{i,t}^{1-\alpha}$$

Profit Maximization: Firm i statically chooses its markup $\mu_{i,t} \geq 1$ to maximize profits

$$\pi(z_{i,t}) = (\mu_{i,t} - 1) MC_{i,t}^{*} y_{i,t}$$

subject to its inverse demand curve and cost-minimizing marginal cost MC_{it}^{*}:

$$\underbrace{\mu_{i,t} MC_{i,t}^{*}}_{=p_{i,t}} = \Upsilon' \left(\frac{y_{i,t}}{Y_t} \right), \quad MC_{i,t}^{*} = \frac{1}{z_{i,t}} \underbrace{\left[\left(\frac{W_t}{1-\alpha} \right)^{1-\alpha} \left(\frac{R_t}{\alpha} \right)^{\alpha} \right]^{\phi}}_{\text{Aggregate Input Price Index}}$$

Firm Dynamics

Productivity Dynamics: Idiosyncratic productivity evolves according to an AR(1) in logs

$$\log(z_{i,t+1}) = \rho \log(z_{i,t}) + \varepsilon_{i,t+1}, \quad \varepsilon_{i,t+1} \sim \mathcal{N}(0, \sigma_z^2)$$

M&A Market: Every period, shares p^{acq} and p^{tgt} of firms are randomly selected to participate in M&A market as acquirers or targets respectively

Entry satisfies the following free-entry condition:

$$\kappa W_t = \int V(z_t)\, d\mu(z_t)$$

Exit: A fraction φ of firms exogenously exits each period.

M&A Market: Matching

Matching: Acquirers are randomly paired with viable targets by a benevolent matchmaker. Each target initiates a second-price sealed-bid auction whose outcome determines the successful acquirer.

Synergy Function: If acquirer i^* wins the auction initiated by target j, the new entity has productivity

$$z_{m,t} = A z_{i^*,t}^{\gamma_a} z_{j,t}^{\gamma_t} \omega_{i^*,j,t}$$

where $\omega \sim$ i.i.d. Lognormal$(\mu_\omega, \sigma_\omega^2)$ is a random synergy shock with CDF $F(\cdot)$.

Viability: The pair (i, j) is viable with probability $\chi_{i,j,t} = 1 - F(\omega^*_{i,j,t})$ where $\omega^*_{i,j,t}$ solves

$$V(z_{m,t}(z_{i,t}, z_{j,t}, \omega^*_{i,j,t})) = V(z_{i,t}) + V(z_{j,t})$$

M&A Market: Auction Setup

Second-price sealed-bid auctions initiated by each target.

Arrival of Acquirers: A random number of acquirers $N_{j,t} \sim \text{Poisson}(\lambda_{j,t})$ with CDF $G_j(\cdot)$ arrive at target j's auction, with the arrival rate $\lambda_{j,t}$ given by:

$$\lambda_{j,t} = \frac{p^{acq}}{p^{tgt}} \cdot \frac{\mu_{j,t}^{\text{viable}}}{\bar{\mu}_t^{\text{viable}}}$$

$$\mu_{j,t}^{\text{viable}} = \underbrace{\int_{z_i} \chi(z_i, z_j)\, d\mu_t(z_i)}_{\text{Viable mass for target } j} \quad \text{and} \quad \bar{\mu}_t^{\text{viable}} = \underbrace{\int_{z_j} \mu_{j,t}^{\text{viable}}\, d\mu_t(z_j)}_{\substack{\text{Average viable mass} \\ \text{across all targets}}}$$

Bidding Strategy: Each potential acquirer i bids their true valuation:

$$b_{i,j,t} = \max\{0, V(z_{m,t}) - V(z_{i,t})\}$$

M&A Market: Auction Outcome

Auction Winner: Let $\mathcal{N}_{j,t}$ be the set of acquirers bidding for target j. The winner i^* is the bidder with the highest valuation:

$$i^* = \arg\max_{i \in \mathcal{N}_{j,t}} \; b_{i,j,t}$$

Auction Price: The winner pays the second-highest bid, subject to the target's reservation price

$$P_{i^*,j,t} = \max\left\{ \max_{i \in \mathcal{N}_{j,t} \setminus \{i^*\}} \{b_{i,j,t}, V(z_{j,t})\} \right\}$$

and to a participation constraint that the winner's bid covers the auction price (ensures non-negative gains for the successful acquirer):

$$b_{i^*,j,t} \geq P_{i^*,j,t}$$

M&A Market: Division of Gains

Successful mergers: Gains are divided between the winning bidder i^* and target j. Gains and surplus shares are heterogeneous across pairs (i^*, j).

Total Surplus:

$$\mathcal{S}_{i^*,j,t} = V(z_{m,t}) - (V(z_{i^*,t}) + V(z_{j,t}))$$

Acquirer's Gain:

$$\mathcal{S}^{acq}_{i^*,j,t} = V(z_{m,t}) - V(z_{i^*,t}) - P_{i^*,j,t}$$

Target's Gain:

$$\mathcal{S}^{tgt}_{i^*,j,t} = P_{i^*,j,t} - V(z_{j,t})$$

Firm's Bellman Equation

$$V(z_{i,t}) = \pi(z_{i,t}) + \underbrace{p^{acq} \int_{z_{j,t}} \left[\sum_{N_{j,t}=0}^{\infty} \frac{e^{-\lambda_{j,t}} \lambda_{j,t}^{N_{j,t}}}{N_{j,t}!} \int_{\omega_{i,t},\Omega_{N_{j,t}-1,t}} \mathcal{S}_{i,j,t}^{acq} \cdot \mathbf{1}_{\{i \text{ wins auction}\}} \, d\Psi_{j,t}(\Omega_{N_{j,t}-1,t}) dF(\omega_{i,t}) \right] d\mu(z_{j,t})}_{\text{Expected gain as an acquirer}}$$

$$+ \underbrace{p^{tgt} \left[\sum_{N_{i,t}=0}^{\infty} \frac{e^{-\lambda_{i,t}} \lambda_{i,t}^{N_{i,t}}}{N_{i,t}!} \int_{\Omega_{N_{i,t},t}} \mathcal{S}_{i,j,t}^{tgt} \cdot \mathbf{1}_{\{\text{auction success}\}} \, d\Psi_{i,t}(\Omega_{N_{i,t},t}) \right]}_{\text{Expected gain as a target}}$$

$$+ \underbrace{\beta \frac{C_t}{C_{t+1}} (1-\varphi) \int_{z_{i,t+1}} V(z_{i,t+1}) P(dz_{i,t+1} | z_{i,t})}_{\text{Continuation value}}$$

Joint Distribution of Acquirer Types & Synergies: $\Psi_{j,t}(\Omega_{N_{j,t}}) = \prod_{k=1}^{N_{j,t}} g_{j,t}(z_{k,t}) dF(\omega_{k,t})$

Acquirer Win Condition: $\mathbf{1}_{\{i \text{ wins auction}\}} = \mathbf{1}\left\{ b_{i,j,t} \geq \max\{ \max_{k \in \Omega_{N-1,t}} \{b_{k,j,t} \; V(z_{j,t})\}\} \right\}$

Target Auction Success Condition: $\mathbf{1}_{\{\text{auction success}\}} = \mathbf{1}\left\{ (\max_{k \in \Omega_{N,t}} \{b_{k,i,t}\}) \geq P_{k,i,t} \right\}$

Quantitative Estimation

Externally Calibrated Parameters: $\beta = 0.9615$, $\nu = 1.0$, $\delta = 0.06$, $\varphi = 0.04, \phi = 0.55$. The parameters ψ and κ are set internally to normalize aggregate output and the mass of firms, $Y_t = N_t = 1$.

Simulated Method of Moments Estimation

Economy-Wide Moments				**M&A Moments**			
Moment	Model	Data	Param.	Moment	Model	Data	Param.
Top 5% Sales Share	0.567	0.572	ε, σ_z	M&A Rate	0.032	0.031	p^{tgt}
Aggregate Markup	1.350	1.317	σ, ρ	Avg. Merger Surplus	0.110	0.100	A
Markup Tail (p90)	1.701	1.824	ε, σ_z	Avg. Merger Premium	0.503	0.470	p^{acq}
Labor Share of GDP	0.579	0.604	σ, ρ	Avg. Acq/Tgt TFP Ratio	1.159	1.144	γ_a, γ_t
				Corr. Acq/Tgt TFP	0.364	0.387	γ_a, γ_t

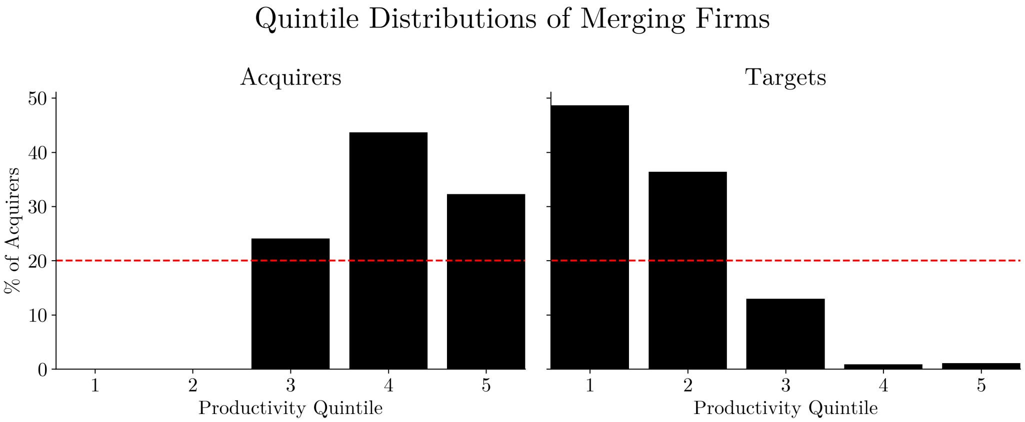
Economy-Wide Parameter Estimates

$$\sigma = 10.66, \quad \varepsilon = 4.34$$
$$\rho = 0.76, \quad \sigma_z = 0.15$$

M&A Parameter Estimates

$$p^{acq} = 0.215, \quad p^{tgt} = 0.067, \quad A = 1.22$$
$$\gamma_a = 0.87, \quad \gamma_t = 0.49$$

M&A Market



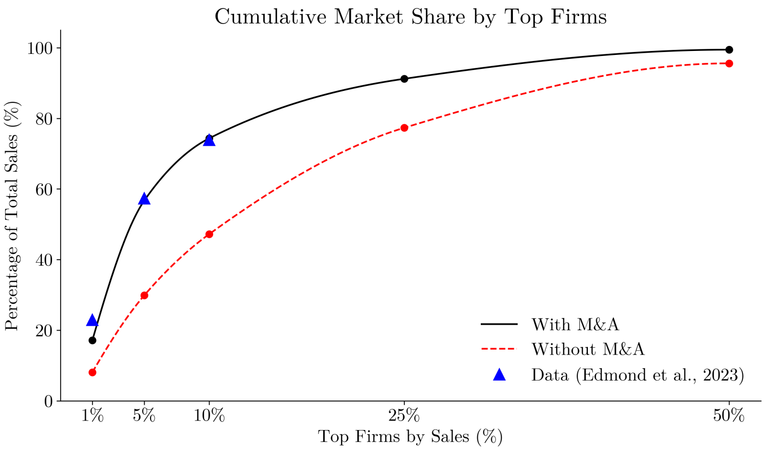
Selection into M&A and heterogeneity between and within acquirers & targets

Comparative Statics: Macro Aggregates With/Without M&A

Variable	With M&A	Without M&A	% Change
Measure of Firms	1.00	1.03	+3.22
GDP	0.55	0.64	+16.59
Consumption	0.49	0.55	+10.67
Labor Supply	0.30	0.31	+3.58
TFP	0.31	0.32	+0.36
TFP (No Markup Wedge)	0.36	0.32	-9.55
Aggregate Markup	1.35	1.17	-13.69

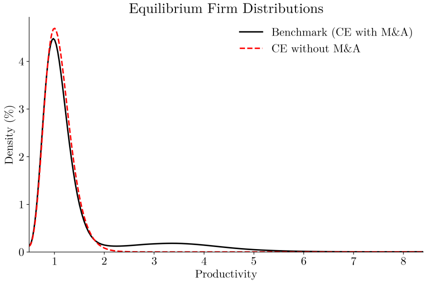
- Static consumption-equivalent welfare gain: 8.09%
- Shutting down M&A lowers TFP but also significantly reduces markups and increases firm entry. The efficiency gains from lower markups and the love-of-variety dominate, leading to higher output.

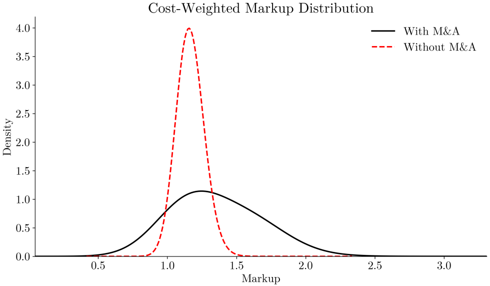
M&A Activity and Market Concentration



Data from 2012 US Census, see Edmond et al. (2023). Counterfactual without M&A exhibits substantially lower concentration

M&A Activity, Synergies, and Misallocation

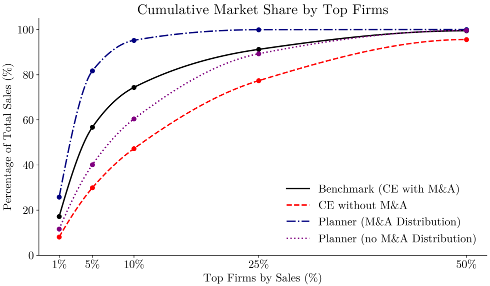


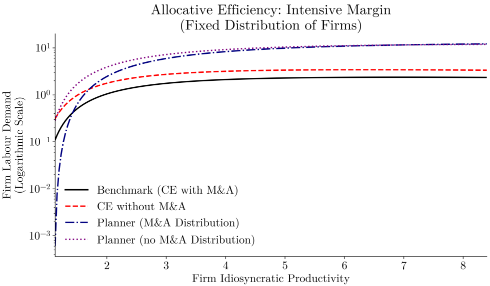


Merger synergies improve productivity distribution by creating superstar firms, but this is more than offset by rising misallocation, which is much higher with M&A

Comparison with Planner Solutions

Planner equilibria assuming the planner inherits the distribution of firms from the corresponding competitive equilibrium





Economy with M&A is the most distorted: large gap between the market and the planner allocations as productive firms vastly under-hire

Conclusion

- Data indicates mergers create shareholder value, but targets capture the vast majority of the gains
- Competitor returns are muted, suggesting a tension between the threat of synergies and the benefit of market power spillovers
- The structural model, disciplined by micro-data, identifies M&A as a primary driver of higher aggregate markups, corporate concentration, and superstar firms
- The model's key trade-off: the welfare costs of M&A-driven misallocation and reduced entry outweigh the synergy gains, resulting in net welfare losses