Financial Markets, Common Ownership and Product Market Outcomes

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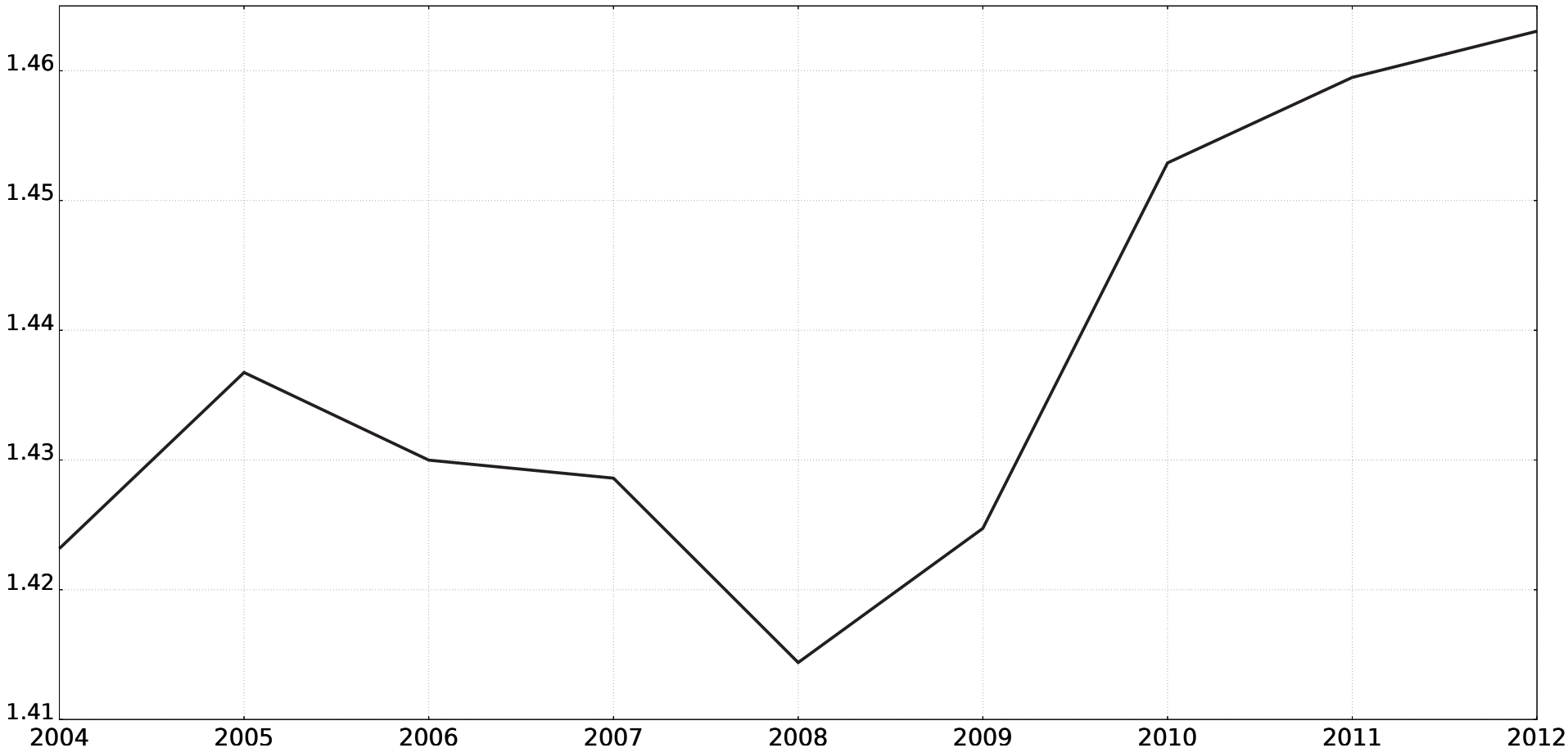
Summary of results

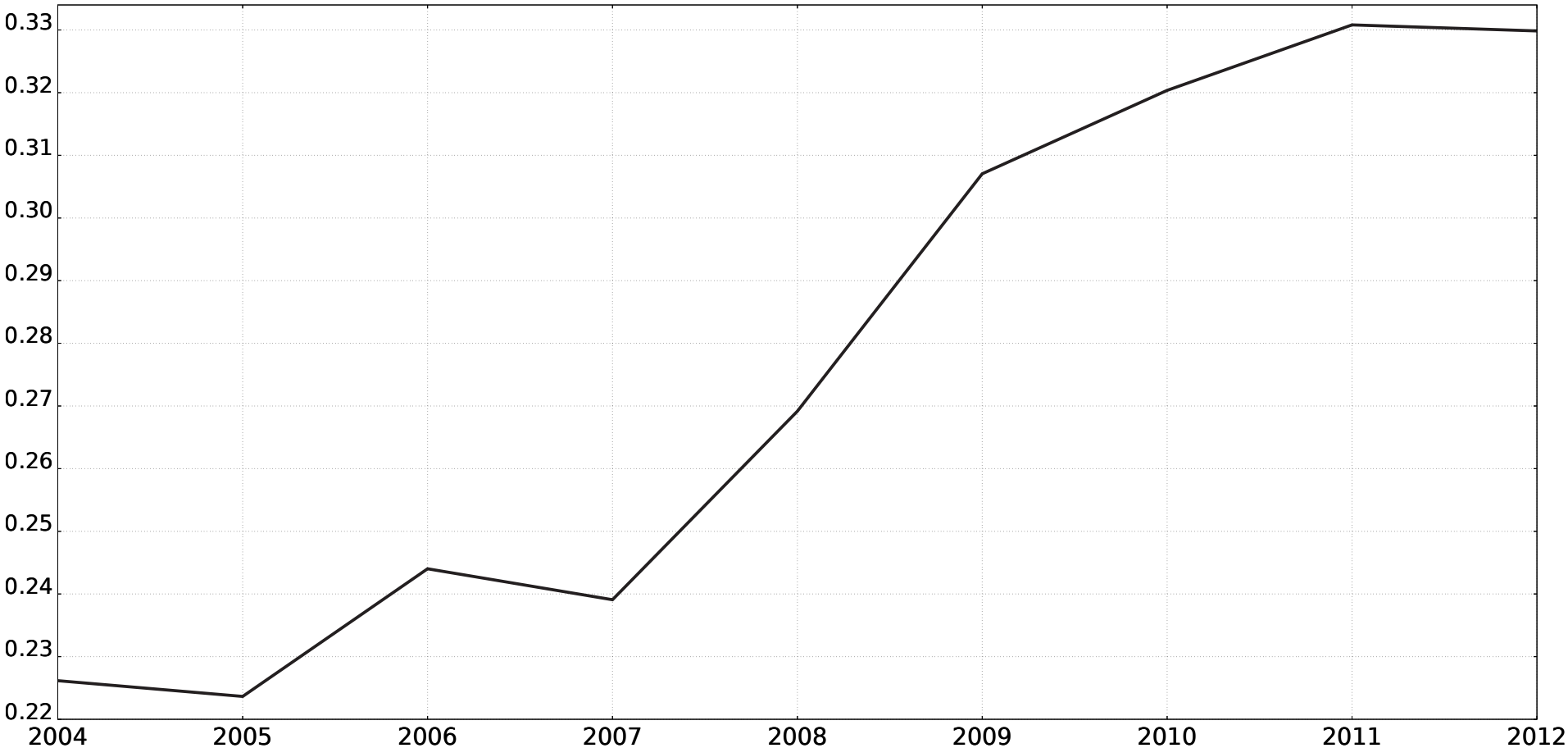
- 1.- If passive investors, as is empirically the case,
  - have relatively more holdings than active investors
  - while being more diversified
- ...then common ownership incentives –profit loads on rival firms by the manager of a firm ("lambdas")– increase
- 2.- Increase in holdings of passive investors is positively related to markups through profit loads

Markups across US industries are up



Mean markups US industries 2004 - 2012.

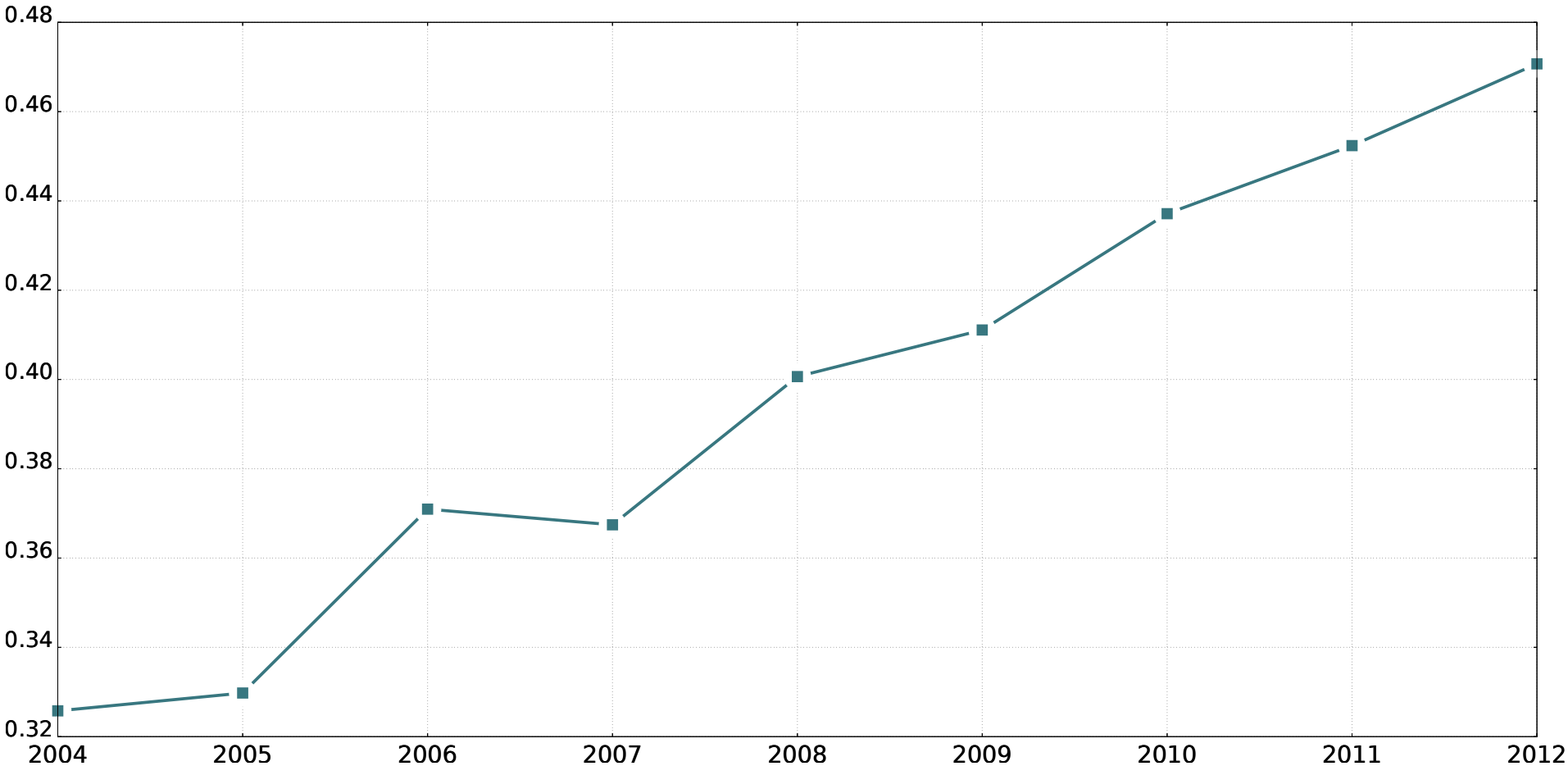
Lambdas in US industries are up



Median lambdas US companies 2004 - 2012.

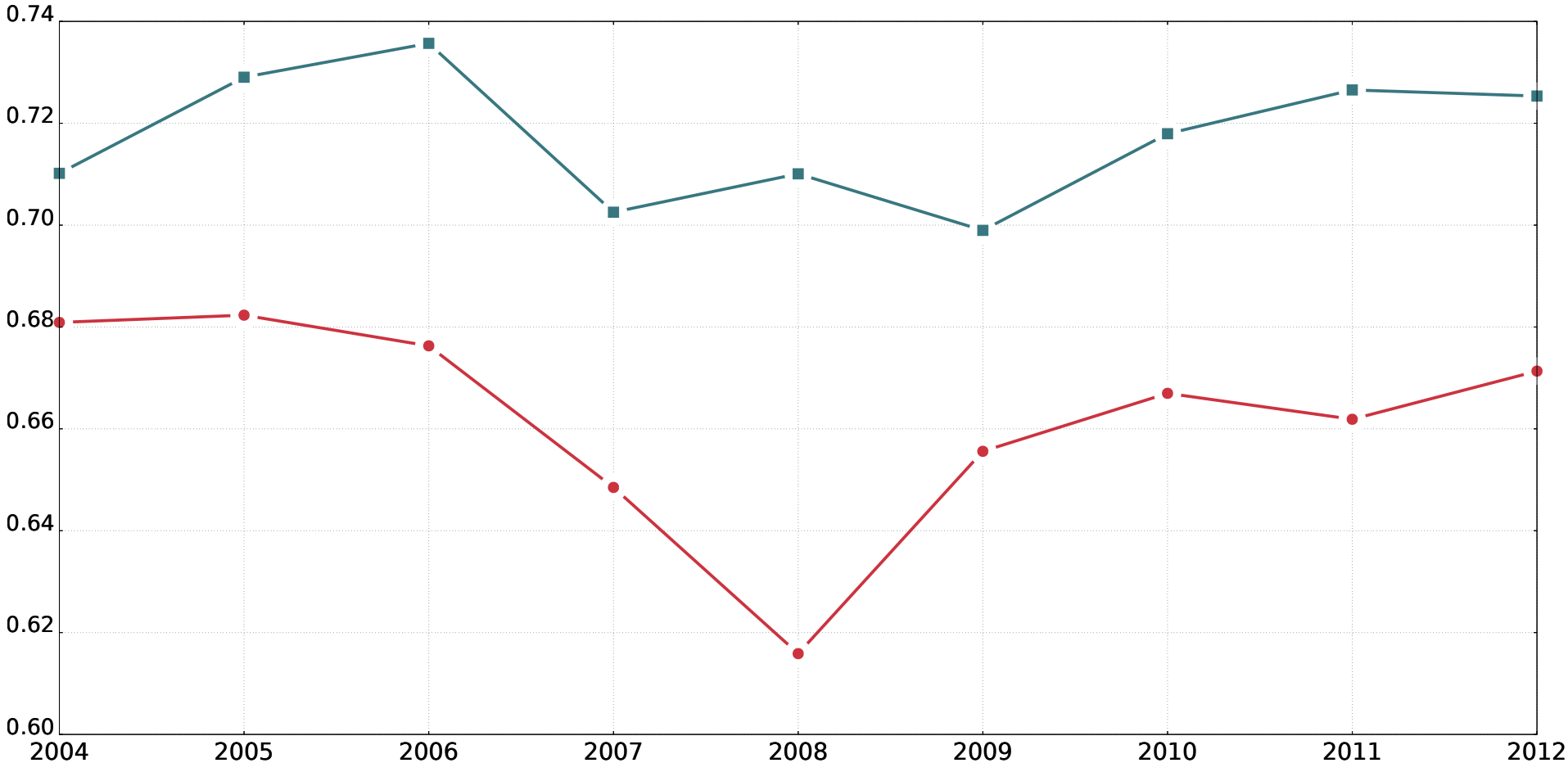
- λ: Load the manager of a firm should place on the profits of the other firms of the industry because of the common investors

Why are lambdas up? (i) Passive got relatively bigger



Median relative holdings for passive vs. active investors 2004 - 2012 ($\text{RLH}^{P/A}$).

Why are lambdas up? (ii) Passive are more diversified



Median investor diversification 2004 - 2012 (DIV^{τ}).

(Passive investors in blue squares & Active investors in red dots).

- Measure of dispersion of holdings across firms in the industry

A decomposition of lambda

- We can decompose λ as

$$\lambda_{jk} = \nu_j^A \lambda_{jk}^A + \nu_j^P \lambda_{jk}^P = (1 - \nu_j^P)\lambda_{jk}^A + \nu_j^P \lambda_{jk}^P,$$

where λ_{jk}^τ captures the links between firms j and k in the same industry through type τ investors only,

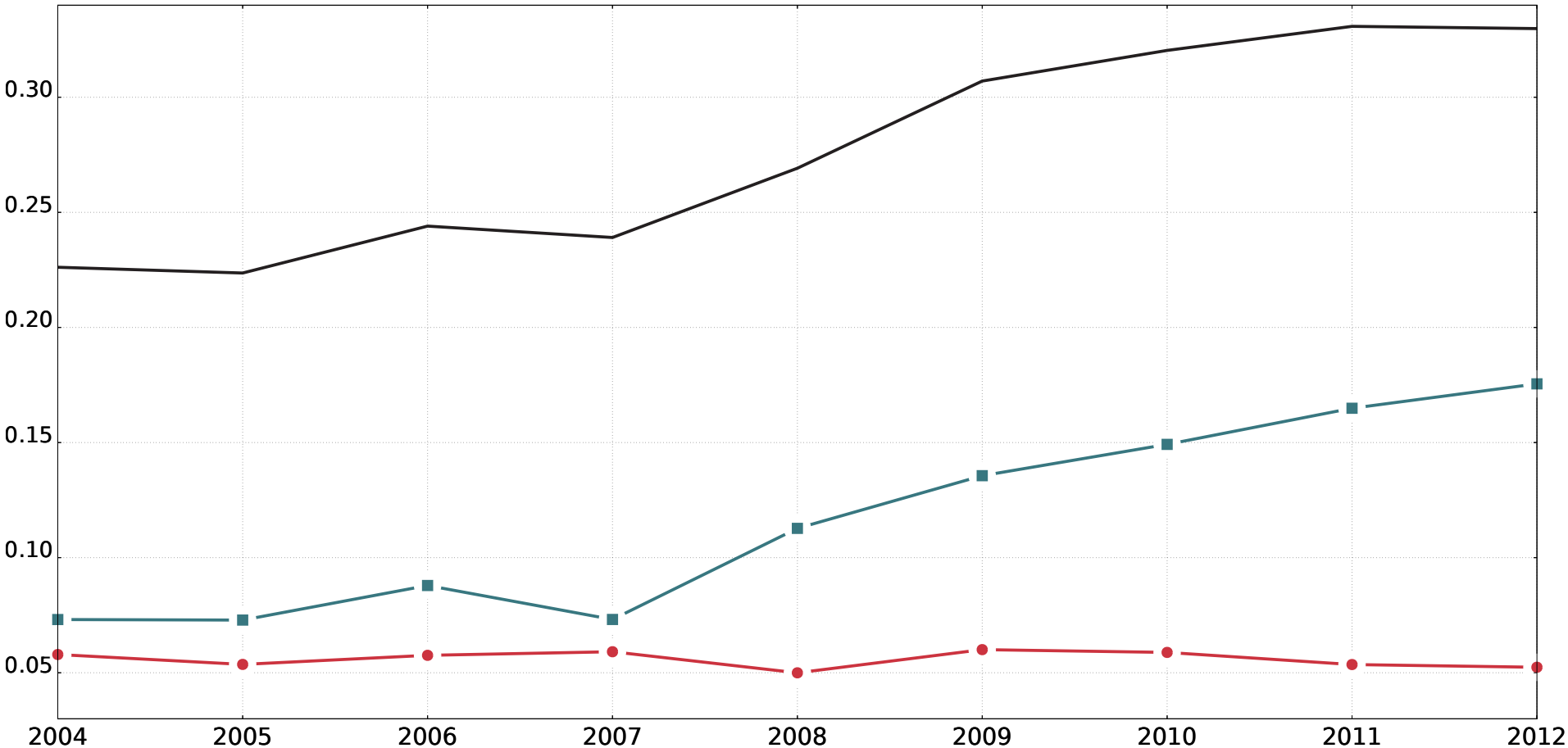
$$\lambda_{jk}^\tau \equiv \frac{\sum_{i \in \tau} \gamma_{ij} \beta_{ik}}{\sum_{i \in \tau} \gamma_{ij} \beta_{ij}},$$

and ν_j^τ are the weights of the links through each of the two types of investors in the overall common ownership incentives measure,

$$\nu_j^\tau \equiv \frac{\sum_{i \in \tau} \gamma_{ij} \beta_{ij}}{\sum_{i \in A \cup P} \gamma_{ij} \beta_{ij}} \text{ for } \tau = A, P.$$

- The case of proportional control: $\gamma_{ij} = \beta_{ij}$.

Why are lambdas up? Weight of passive investors is up



Median weights (ν) x lambdas (λ) for both types of investors 2004 - 2012.

(Passive investors in blue squares & active investors in red dots).

Theoretical framework

- Steps of analysis:
  - Definition of financial market variables (also used in empirics)
  - Derive predictions of their effects on λ's within symmetric model
  - Derive predictions of effect of λ's on markups within symmetric price competition model

- Denote:
  - Set of firms in a given industry by S
  - Set of active and passive investors in those firms by A and P, resp.
  - Monetary ownership holdings of investor $i \in A \cup P$ in firm $j \in S$ by h_{ij}

Characteristics of each type of investor $\tau = A, P$

- Relative level of **overall holdings** in each firm $j \in S$

$$RLH_j^\tau \equiv \frac{\sum_{i \in \tau} h_{ij}}{\sum_{i \in A \cup P} h_{ij}}$$

- Average degree of **portfolio diversification** across firms in S:

$$DIV_S^\tau \equiv \sum_{i \in \tau} DIV_{i,S} / |\tau| \quad \text{where} \quad DIV_{i,S} \equiv 1 - \sum_{j \in S} \left(\frac{h_{ij}}{\sum_{k \in S} h_{ik}}\right)^2$$

- Degree of **ownership concentration** within each firm $j \in S$

$$CONC_j^\tau \equiv \sum_{i \in \tau} \left(\frac{h_{ij}}{\sum_{i \in \tau} h_{ij}}\right)^2$$

Comparative statics in a symmetric model

Proposition

For any given degree of diversification of passive and active investors (DIV_S^P, DIV_S^A), an increase in the relative level of overall holdings of passive investors ($RLH_j^{P/A}$) increases λ_{jk} if and only if $DIV_S^P > DIV_S^A$.

- Common ownership incentives increase if more diversified investors become relatively more powerful than less diversified investors.

Proposition

Assuming symmetry in lambdas (λ), firm markups (μ_j) increase in the level of common ownership incentives.

- Competition softens when firms become more interconnected.

Data: Investors - Thomson Reuters Global One

- Holdings by each investor in each firm at year end (2004-2012)
  - "Money-manager view" to link the holdings to the actual firm that manages the investments (as opposed to "as-filed view" from WRDS)
  - 13F, 13D, 13G filings and forms 3, 4, and 5
- Investors classified as active or passive types
  - Active fund managers choose individual investments in order to try to beat the market (alpha strategy)
  - Passive fund managers replicate existing stock indices by buying shares of all the member firms of the particular index (beta strategy)

Data: Investors - Data cleaning

- Ultimate owner (investor) identified on the basis of public sources
  - Supplement with data from the National Information Center (NIC) from Federal Reserve System.
- Investor acquisitions during this period coded on the base of public sources
- Exclude ADRs, all special share classes, plus those investors that have at most 2 firms in their portfolios
- We focus on the top investors
  - Being one of the 20 largest investors of either type (value held) in at least one of the years of our sample
  - We retain all-years-sample holdings of 106 investors
- Ownership is computed with respect to the holdings of these investors

Data: Firms and product markets - Compustat US

- All publicly listed firms in the US (excluding finance)
- Matching done on the base of (i) CUSIP and (ii) name
  - On average 4211 firms/year and 106 investors/year
  - 75 NAICS-3 industries
  - Investors' holdings are allocated across firms and industries

Empirics I: Financial Markets to Common Ownership

- We estimate:

$$\begin{aligned}\lambda_{j,t} =& \alpha_0 + \alpha_1 RLH_{j,t}^{P/A} + \alpha_2 CONC_{j,t}^{A} + \alpha_3 CONC_{j,t}^{P} + \alpha_4 DIV_{S,t}^{A} + \alpha_5 DIV_{S,t}^{P} \\ &+ \beta_X X_{j,t} + \gamma_j + \gamma_t + u_{j,t},\end{aligned}$$

  where j is firm in industry S, t the year, $X_{j,t}$ firm level controls, γ_j and γ_t firm and time fixed effects, and $u_{j,t}$ the error term.

- We assume proportional control and define yearly firm-level lambdas as

$$\lambda_{j,t} \equiv \frac{1}{|k|} \sum_{k \in S} \lambda_{jk,t}$$

Empirics II: Common Ownership Incentives to Market Outcomes

- We express markups as a function of λ

$$\mu_{j,t} = \delta_\lambda \lambda_{j,t} + \delta_X X_{j,t} + \gamma_j + \gamma_t + \varepsilon_{j,t},$$

  where we use the same firm level controls, and firm and time fixed effects.
- We estimate the parameters of interest by 2SLS.
- Markup $\mu_{j,t}$ is elasticity of output with respect to variable input over revenue share of variable input. Elasticity is obtained by estimating CD production function by industry.
  - Variable input is "Cost of Goods Sold" (COGS). Measure for capital is "Net Capital" (PPENT).
  - Allowing common ownership structures to influence (future) productivity: also estimate markups with λ in law of motion.

	(1) $\log \mu$	(2) $\log \lambda$	(3) $\log \mu$	(4) $\log \lambda$	(5) $\log \mu$	(6) $\log \lambda$
$\log \lambda$	0.0531**		0.0487*		0.412***	
	(0.0259)		(0.0253)		(0.145)	
$\log \text{RLH}^{P/A}$		0.0883***		0.0883***		0.240***
		(0.00359)		(0.00359)		(0.0286)
$\log \text{CONC}^{A}$		-0.124***		-0.124***		-0.0702**
		(0.00348)		(0.00348)		(0.0295)
$\log \text{CONC}^{P}$		-0.110***		-0.110***		-0.126***
		(0.00425)		(0.00425)		(0.0337)
$\log \text{DIV}^{A}$		0.0207*		0.0207*		0.0483**
		(0.0110)		(0.0110)		(0.0215)
$\log \text{DIV}^{P}$		0.0377***		0.0377***		0.0841***
		(0.0120)		(0.0120)		(0.0247)
N	33470	33470	33470	33470	1590	1590
Fixed Effects	Firm	Firm	Firm	Firm	Industry	Industry
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Std. Errors	Robust	Robust	Robust	Robust	Robust	Robust
# of Groups	5310	5310	5310	5310	177	177
R^2	0.524	0.272	0.531	0.272	0.107	0.410
F-stat	285.0	526.2	321.1	526.2	12.0	61.2
p-value F-stat	0.00	0.00	0.00	0.00	0.00	0.00
End. Stat	1.39	-	1.05	-	5.79	-
p-value End.Stat	0.24	-	0.31	-	0.02	-

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficients for first and second stages of log regressions of firm-level markups on lambdas (columns (1) and (2)), firm-level markups –with lambda in law of motion– on lambdas (column (3) and (4)), industry-level markups on industry-level lambdas (columns (5) and (6)). COGS and PPENT as controls.

Holdings and diversification do not directly affect markups

	(1) log μ	(2) μ
$RLH^{P/A}$	-0.00258	0.00145
	(0.00473)	(0.00663)
$CONC^{A}$	-0.0156***	-0.0201***
	(0.00466)	(0.00628)
$CONC^{P}$	0.00386	0.00330
	(0.00640)	(0.00838)
DIV^{A}	0.00262	-0.00613
	(0.0153)	(0.0207)
DIV^{P}	-0.00895	-0.0150
	(0.0157)	(0.0224)
N	33470	33470
Fixed Effects	Firm	Firm
Time FE	Yes	Yes
Std. Errors	Robust	Robust
# of Groups	5310	5310
R^2	0.524	0.439
F-stat	210.0	165.3
p-value F-stat	0.00	0.00

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficients for the IV validity test. COGS and PPENT as controls.

Conclusion

- Showed, both theoretically and empirically, that:
  - 1.- If passive investors
    - have relatively more holdings than active investors
    - while being more diversified
  - ...then common ownership incentives increase
  - 2.- Increase in passive investors' holdings relate to increase in markups through common ownership incentives

- Next steps in empirics
  - Varying levels of control of active versus passive investors
  - Applying different definitions of lambda (e.g., industry-wide)
  - Heterogenous effects across firms/industries

Appendix

Markup estimation

- Cobb-Douglas production functions by industry, with variable input and fixed capital as production factors (Ackerberg et al., 2015)
  - For industry s, production function

$$y_{it} = \theta_s^V v_{it} + \theta_s^K k_{it} + \omega_{it} + \epsilon_{it}$$

  - y_{it} is firm-level output at time t, and v_{it}, k_{it} firm-level variable input and capital (all in logs), ω_{it} is firm-level (unobserved) productivity and ϵ_{it} unobserved shock to output
- Control function

$$\omega_{it} = h_{st}(v_{it}, k_{it}, z_{it})$$

  - z_{it} set of instruments: current investment –because determined one period ahead– and lagged labor
- Apply industry-level deflators for three main variables: y_{it} (sales), v_{it} (COGS) and k_{it} (PPENT)

Markup estimation - law of motion

- Law of motion of productivity first-order Markov process
  1. Base line specification

$$\omega_{it} = g(\omega_{it-1}) + \xi_{it}$$

  2. Allow for common ownership incentives to affect future productivity

$$\omega_{it} = g(\omega_{it-1}, \lambda_{it-1}) + \xi_{it}$$