

Innovation: The Bright Side of Common Ownership?

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Research question: between two macro trends re competitiveness debate

- ① Increasing product market concentration - hand in hand with less business dynamism, and decline in corporate innovation
- ② Increasing common ownership (CO): the extent to which the most influential shareholders of one firm have financial interests in other firms

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How does corporate innovation depends on common ownership?

Can CO have pro-competitive and welfare enhancing effects?

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How does corporate innovation depends on common ownership?

Can CO have pro-competitive and welfare enhancing effects?

- Theory says: Potentially!
 - Common ownership of competitors can reduce incentives to innovate.
 - But technological spillovers can also incentivize more innovation (López and Vives, 2019).
- Open empirical question: Are 4b2P effects present in the data? Which one prevails?

The Rise of Common Ownership

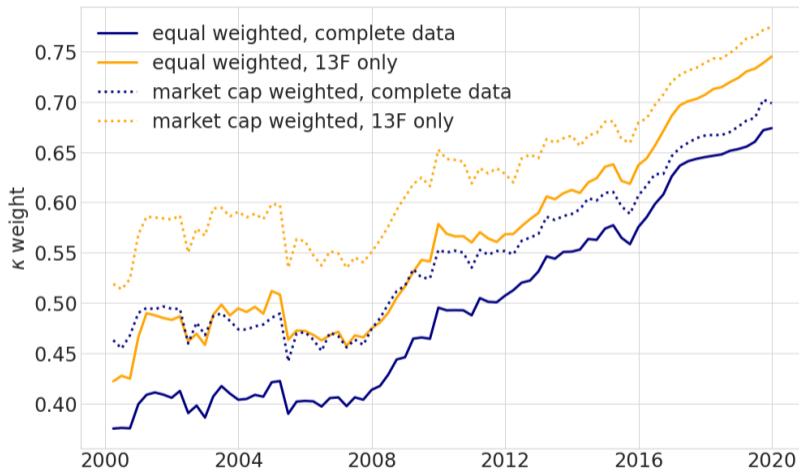


Figure: Common ownership profit weights over time (Amel-Zadeh et al., 2022)

Common ownership across industries



Common ownership across industries



R&D Exp
\$2.4bn
(2% of sales)

Patents
452



R&D Exp
\$5.7bn
(6% of sales)

Patents
5,052



R&D Exp
\$2.5bn
(13% of sales)

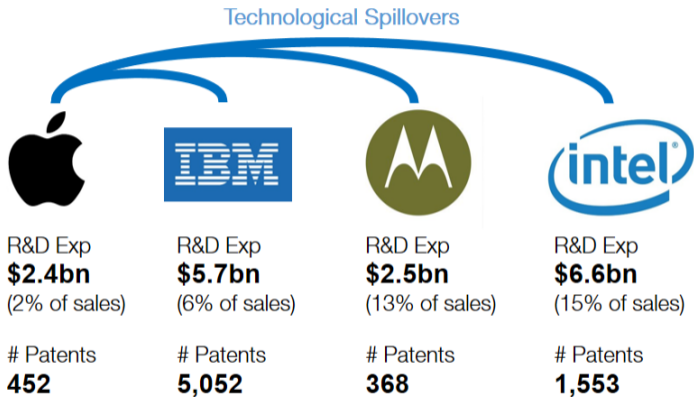
Patents
368



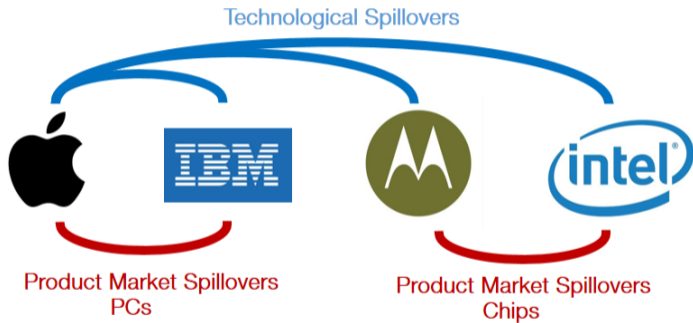
R&D Exp
\$6.6bn
(15% of sales)

Patents
1,553

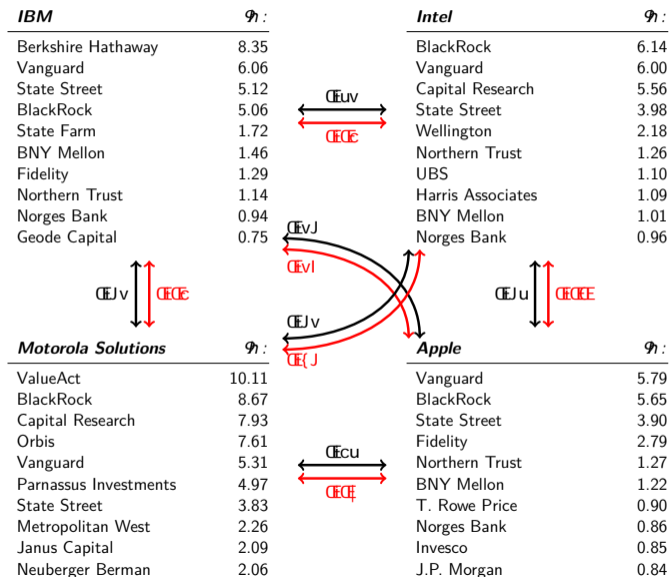
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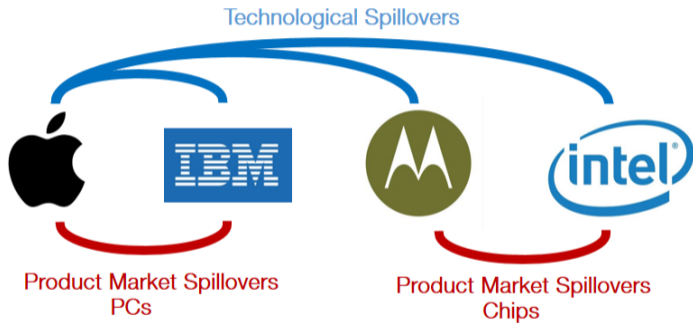
Motivation



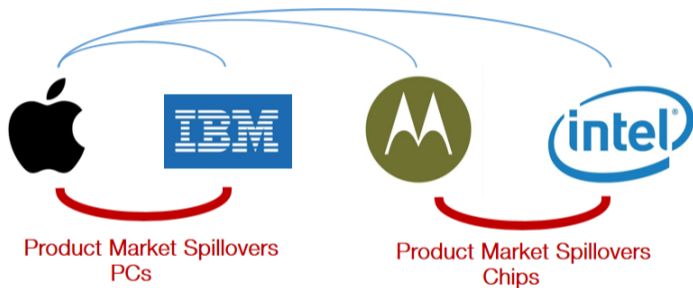
Technology & product market spillovers as per Bloom et al. (2013)



How does Common ownership interact with Spillovers?



Motivation: Internalizing the externalities



- Common ownership helps overcome free-rider problem; spurs innovation amid high technology spillovers.

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- Common ownership helps overcome free-rider problem; spurs innovation amid high technology spillovers.
- Common ownership reduces incentives to steal market share from competitors; can discourage innovation.

This Paper

- We know anti-competitive effects

Firms internalize competitive externalities on other firms choose lower q , higher p
deadweight loss

In this framework:

Competitive concerns also gives reduced incentives to compete: why pay for innovation to steal market share from commonly-owned rival?

Technological spillovers, by contrast, give increased incentives to innovate: multiple portfolio firms benefit from costly innovation.

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- Which effect prevails? Theory...

y PCB⁰/₀₀

Overview of the Model

- ① Oligopolistic competition with heterogeneously differentiated products between firms
No industry definitions because innovation spillovers across the entire economy

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Product homogeneity N_i increases opportunity for firm i to steal business away from competitor

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- 4 Owners are diversified - each owner has a stake in firm as well as shares in other firms denoted by α_i
Firm maximizes $\sum \alpha_i \pi_i$
Greater weight attached to profits of firm when α_i is higher

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Model Setup

- firms set quantity (or price) and choose innovation
Inverse demand: $p = a - bQ$ where $a > 0$ $b > 0$ "
Marginal cost: c /

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- firms set quantity (or price) and choose innovation
 Inverse demand: $P = a - bQ$ where $0 < a < \infty$
 Marginal cost: c

- Potentially diversified shareholders

Firm i 's profit: $\pi_i = (P - c)q_i$

Firm i 's objective function: $V_i = \alpha_i \pi_i + \beta_i$ (Rotemberg, 1984)

Common ownership measured by α_i the weight that firm i places on i 's net profits

$$\alpha_i = \sum_{j \neq i} \theta_{ij}$$

where θ_{ij} is the ownership share of firm i accruing to shareholder j and β_i is the control share of firm i exercised by shareholder i .

Captures overlapping ownership between firms ... ~~SPS~~ and - opss industries

First order conditions: Two distinct effects

$$/ \frac{\#}{\$}$$

CO product market spillovers

$$/ \frac{\#}{-} \text{ €}$$

CO technology spillovers

Intuition

- Product market spillovers ()

Innovation reduces own marginal cost, increases own profit, but reduces other firms' profits because of business stealing

? $S < b - q$ LC innovation when common ownership increases

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- Technology spillovers ()

Innovation reduces other firms' cost and increases their profit

$B^A < b - q$ LC innovation when common ownership increases

When does CO increase or decrease innovation?

Proposition (Common Ownership and Innovation)

$\frac{\partial \Delta \pi}{\partial \alpha} > 0$ if $\alpha < \alpha^*$ and $\frac{\partial \Delta \pi}{\partial \alpha} < 0$ if $\alpha > \alpha^*$

where $\alpha^* = \frac{1}{2} \left(\frac{1 + \beta}{1 + \beta + \beta^2} \right)$

B\ eSSs

Data and specifications

- $R^{\wedge}bf-zS^{\wedge} @-z- =$

R^e-z=p. ? CteC[^]@s-qS -[^]@p. ? wr-YCs Htp\ ; b\ e~sz-z

a -ze-z= ^-\ 4CqbHe-zC[^]zs><S-zS[^]Q.CS PzC@f-Y-C bHe-zC[^]zs y; „ >-[^]@\ -qVz f-Y-C bHe-zC[^]zs

yr[i Gp\ VbL-[^]>d-e-[^]SWY ~>r Cq->-[^]@rzb' \ -[^]fk TB | CEugj ? -z- c_Dl Q CEI i

Data and specifications

- $R^{bf-z} S^@-z =$

$R^{e-z} = p. ? CteC^@z-qS -^@p. ? wr-YCs Htp \ ; b \ e \sim sz-z$

$a \sim ze \sim z = ^ \sim \ 4Cq bHe-zC^zs > < S \sim S^Q.CS PzC@f-Y-C bHe-zC^zs y ; ,, > \sim ^@ \ -q \ / z f-Y-C bHe-zC^zs$

$yr [i Gp \ VbL \ ^>d-e \ ^S \ / Y \ \sim >r Cq \ > \sim ^@r zb' \ \ -^ fk TB | C E u j ? \ -z \ c \ _Dl Q C E l i$

- $r e S \ / f C q \ \ C \ -s \ -q C s =$ Bloom, Schankerman & Van Reenen (2013), Lucking et al. (2018)

$dcp@ \sim z \ \ -q \ / z se S \ / f C q s f \ g = \ / \ >$

Data and specifications

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$dcp@ \ \sim \ -q \ se S^{fCq} s f g =$ / >

$..PCq \ \ < bcpY z S^ 4Cz .CC^ " q \ S \ \ ^@UsP-qC bHs-YCs S' G \ \ <P bHzPC | _I S^@ \ \ szq \ %o$

$sCL \ C^zs > \ \ ^@ \ \ S zPC szb \ <WbHp. ? i$

Data and specifications

- $R^{bf-z} S^@ z =$

$R^{e-z} = p. ? CteC^@z-qS -^@p. ? wr-YCs Htp \ ; b \ e \sim sz-z$

$a \sim ze \sim z = \sim \backslash 4Cq bHe-zC^zs > < S-z S^Q.CS PzC@f-Y-C bHe-zC^zs y ; , > -^@ \ -q \ z f-Y-C bHe-zC^zs$

$yr [i Gp \ VbL-^>d-e-^S \ Y \ \rightarrow r Cq \rightarrow -^@r zb' \ \backslash -^ fk TB | C E u j ? -z- c_{DI} Q C E i$

- $r e S^{fCq} \backslash C-s-qCs =$ Bloom, Schankerman & Van Reenen (2013), Lucking et al. (2018)

$dcp@-z \ \backslash -q \ z se S^{fCq} f g =$ / >

$..PCqC \ \backslash bcpY z S^ 4Cz .CC^ " q \ S-^@UsP-qC bHs-YCs S' G- <P bHzPC I _I S^@-szq\%$

$sCL \ C^zs > -^@ \ S zPC szb < WbHp. ? i$

$yC < P^b \ VbL \% se S^{fCq} f g =$ / >

Data and specifications

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$R^{e-z} = p. ? CteC^@z-qS - ^@p. ? wr - YCs Htp \ ; b \ e \sim sz-z$

$a \sim ze \sim z = ^ \sim \backslash 4Cq bHe - zC^zs > < S \sim zS^Q.CS PzC@f - Y-C bHe - zC^zs y ; , > - ^@ \backslash - q \backslash z f - Y-C bHe - zC^zs$

$yr [i Gp \ VbL - ^ > d - e - ^ S \backslash Y \sim > r Cq > - ^ @ r zb' \ - ^ fk TB | C E u j ? - z - c _ D I Q C E i$

- $r e^{SfCq \ C - s \sim qCs} =$ Bloom, Schankerman & Van Reenen (2013), Lucking et al. (2018)

$dcp @ - z \backslash - q \backslash z se^{SfCq} f g =$ / >

$.. PCq < bcpY zS^ 4Cz . CC^ " q \ S - ^ @ UsP - qC bHS - YCs S^ G - < P bHzPC I _ I S^ @ - szq \% o$

$sC \backslash C^zs > - ^ @ S zPC szb < WbHp . ? i$

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$.. PCq < bcpY zS^ 4Cz . CC^ " q \ S - ^ @ UsP - qC bHe - zC^zs S^ G - < P bHzPC J | v zC < P$

$< Y ssCs i$

Data and specifications

- TR13F augmented by scraping SEC 13F following Ben-David et al.(2020): correct stale, omitted institutions, missing holdings since 2000. (In progress: add blockholders.)
- Execucomp for individual owners that are employed as officers or board.
- ; b\ \ b^ a ...^CopsPSe \ C- s~qC= from Backus et al. (2020) "kappa"

4Cz..CC^ - ^%‰ q\ e- S\ - ^@ - < qss zPC C^zS\ C<b^b\ %oBl -- YQbqf- Y-QQ. C\ PzC@ - fCq LC bH
zPC .. C\ Pz zP- z zPC b..^Cops bH" q\ eY < C S^ %G q b^ zPC eq" zs bHzPC bzPCq " q\ s S^ zPC
C<b^b\ %os - i

- / _____ or - / _____

fcg

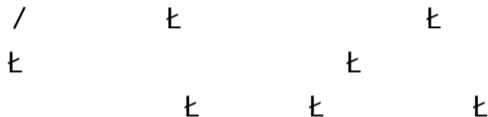
Methodology

- We extend a classic innovation model to also capture common ownership and its interactions with **product market** & **technology** spillovers



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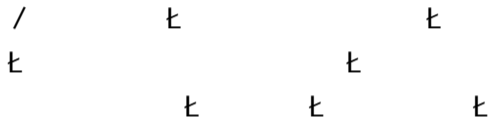
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- Controls include the logs of market value, K/L, firm age, HHI, industry sales, and institutional ownership.
- All specifications include year, industry, and firm fixed effects.

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- Controls include the logs of market value, K/L, firm age, HHI, industry sales, and institutional ownership.
- All specifications include year, industry, and firm fixed effects.
- Proposition 1 tests: $\beta_1 > 0$ and $\beta_2 > 0$

Input Innovation: R&D Expenditures

R&D expenditure	(1)	(2)	(3)	(4)	(5)	(6)
$\ln R\&D_{i,t}$	Jaf.	Jaf.	Jaf.	Jaf.	Mah.	Mah.
$\ln a$		-0.00151** (0.000736)	-0.0347** (0.0162)	-0.0347** (0.0164)	-0.00124* (0.000726)	-0.0697*** (0.0215)
$\ln a \ln R\&D_{i,t}$			0.00247** (0.00108)	0.00246** (0.00109)		0.00486*** (0.00143)
$\ln a \ln R\&D_{i,t}^2$			-0.00111** (0.000507)	-0.00103** (0.000513)		-0.00224** (0.000878)
$\ln R\&D_{i,t}^2$	-0.0204*** (0.00642)	-0.0216*** (0.00651)	-0.0223*** (0.00654)	-0.0215*** (0.00668)	-0.0164* (0.00838)	-0.0176** (0.00841)
$\ln R\&D_{i,t}^3$	0.00468*** (0.00134)	0.00442*** (0.00135)	0.00470*** (0.00135)	0.00489*** (0.00137)	0.00215 (0.00219)	0.00266 (0.00220)
$\ln R\&D_{i,t}^4$				0.00426 (0.00349)	0.00486 (0.00350)	0.00471 (0.00349)
Observations	25,985	25,276	25,276	25,009	25,009	25,009
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

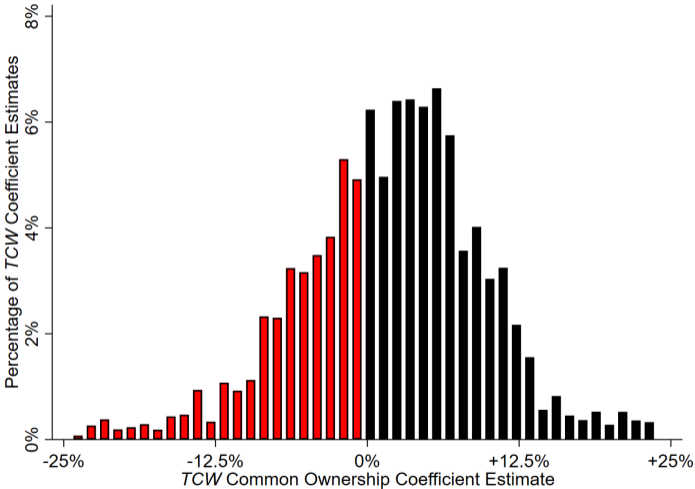
Output Innovation: Citation-weighted Patents

Citation-weighted patents y_i	(1) Jaf.	(2) Jaf.	(3) Jaf.	(4) Jaf.	(5) Mah.	(6) Mah.
$\ln a$		0.0476 (0.138)	-6.085*** (2.162)	-6.045*** (2.189)	0.125 (0.147)	-6.520** (2.675)
$\ln a \cdot \text{YrdRXXyB; Ofi}$			0.465*** (0.154)	0.466*** (0.156)		0.519*** (0.185)
$\ln a \cdot \text{YrdRXXrR fi}$			-0.237*** (0.0919)	-0.233** (0.0928)		-0.346*** (0.134)
YrdRXXyB; Ofi	0.133*** (0.0475)	0.133*** (0.0475)	0.0400 (0.0566)	0.0397 (0.0567)	0.174*** (0.0614)	0.0676 (0.0707)
YrdRXXrR fi	-0.0130 (0.0257)	-0.0127 (0.0256)	0.0367 (0.0317)	0.0372 (0.0319)	-0.0237 (0.0371)	0.0521 (0.0459)
$R^2 \sim \text{Z}^{\wedge} - \text{Ya} \dots \text{CpPs}$				0.137 (0.0952)	0.128 (0.0936)	0.137 (0.0953)
Observations	24,683	24,683	24,683	24,487	24,487	24,487
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Patent Stock Market Value

Patent stock market value	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln P_{it}$	Jaf.	Jaf.	Jaf.	Jaf.	Mah.	Mah.
$\Delta \ln P_{it}$		0.581*** (0.0680)	-2.779*** (0.964)	-2.883*** (1.002)	0.692*** (0.0797)	-3.868*** (1.318)
$\Delta \ln P_{it} \text{ (with } \Delta \ln R_{it} \text{)}$			0.206*** (0.0701)	0.219*** (0.0729)		0.263*** (0.0921)
$\Delta \ln P_{it} \text{ (with } \Delta \ln R_{it} \text{ and } \Delta \ln R_{it}^2 \text{)}$			0.0418 (0.0523)	0.0446 (0.0532)		0.0463 (0.0809)
$\Delta \ln P_{it} \text{ (with } \Delta \ln R_{it} \text{ and } \Delta \ln R_{it}^2 \text{ and } \Delta \ln R_{it}^3 \text{)}$	0.0785 (0.0907)	0.0625 (0.0902)	-0.0122 (0.0929)	0.0327 (0.0936)	-0.0530 (0.117)	-0.136 (0.120)
$\Delta \ln P_{it} \text{ (with } \Delta \ln R_{it} \text{ and } \Delta \ln R_{it}^2 \text{ and } \Delta \ln R_{it}^3 \text{ and } \Delta \ln R_{it}^4 \text{)}$	0.0508* (0.0268)	0.0541** (0.0268)	0.0443 (0.0272)	0.0413 (0.0274)	0.0775* (0.0421)	0.0652 (0.0419)
$\Delta \ln P_{it} \text{ (with } \Delta \ln R_{it} \text{ and } \Delta \ln R_{it}^2 \text{ and } \Delta \ln R_{it}^3 \text{ and } \Delta \ln R_{it}^4 \text{ and } \Delta \ln R_{it}^5 \text{)}$				0.367** (0.147)	0.350** (0.143)	0.357** (0.146)
Observations	24,694	24,694	24,694	24,495	24,495	24,495
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Heterogeneity of the relationship CO and Citation-weighted Patents



Passive mechanism for negative product market effect

$y_{PCsC} \alpha_{Cs} - \gamma_{Cs} \wedge CS_{PCq} - ss \sim \lambda C \wedge bq \ S \ e \ \gamma_{\sigma\sigma} < z_{fC} S \wedge z_{Cq} f C \wedge z_{Sb} \wedge s \ 4\% \alpha_{b \setminus} \setminus b \wedge b \dots \wedge C_{psi}$

- Suppose innovation requires managerial effort.

Absent incentives (and shareholder pressure) to innovate, firms will innovate less.

Common owners of product market competitors optimally provide less such pressure S^A
 $\sigma \sim SS_{1q} \setminus$, because cost reductions would hurt product market competitors in the same portfolio. (Antón et al. JPE 2023)

- Hence, there can be negative effects of common ownership of product market competitors on innovation, without active intervention by common owners.

Passive mechanism for positive tech spillovers

- Protecting innovation from spilling over to peers may take effort as well.
 - E.g., the inventor of the automobile assembly line – Eli Olds – patented the technology in 1901, allowing Henry Ford to only use & expand on it in 1913.
 - Non-common owner Olds took the effort to patent the technology, having strong incentives to do so.
 - A less incentivized owner/manager may not have patented the technology, allowing for a decade faster spillover to rival Ford.

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 - A less incentivized owner/manager may not have patented the technology, allowing for a decade faster spillover to rival Ford.
- Hence, particularly low effort – and less pressure from common owners – to protect inventions allows more free spillover over process innovation to other firms.

Conclusions

- Common ownership encourages innovation in *SB\ C* firms
 - Specifically, in high-spillover industries
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 - The two opposing effects cancel each other out on average.
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 - The two opposing effects cancel each other out on average.
 - More doubtful whether theoretically thinkable welfare-increasing effects of horizontal common ownership (as per Lopez & Vives 2019) exist
- Potential message to policy makers
 - To be sure, focus on more likely socially wasteful forms of common ownership?
 - E.g. tech likely high tech spillovers – focus enforcement on airlines, banking, ...?

Future work

- Address endogeneity of parameters modeled as exogenous?

Of common ownership (omitted industry trends)

B#bLC^b~s sPb<Wzb b..^CpPse f\ ~z--YH^@s<- ^@Y| CEE >S^@C: S^<Y-sb^ bH<b\ eCzSibp>bq
3XVCKR\ CqCqj

Of the level of spillovers , (type of innovation; strategic positioning of the firm)

- Ownership data: blockholders?

Active mechanism are thinkable, too

- See Shekita (2020) for 30 examples.
- E.g. common owners could just tell portfolio firms to (i) not enforce patents / let technology spill over, and (ii) put qualms about competition aside.

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References I

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