

SPECIALIZATION OR DIVERSIFICATION? PATTERNS IN VERTICAL INTEGRATION AND PRODUCT VARIETY

CONTRACTS AND ORGANIZATIONS WORKSHOP

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CONSUMER WELFARE AND PRODUCT VARIETY

- Relevant questions focus around understanding the welfare effects of
 - Mergers and acquisitions.
 - Entry and exit.
 - Policy changes.
- This entails understanding the (equilibrium) responses of:
 1. Prices.
 2. Number of products.
 3. Product variety (e.g., quality).
- I will focus on the effects of vertical integration (VI) on product variety.

HOW CAN VI IMPACT PRODUCT VARIETY?

- Product variety can have two dimensions:
 1. Vertical (e.g., quality).
 2. Horizontal (e.g., product characteristics).
- VI may affect the vertical dimension through investment.
 - Integration can lead to more investment (e.g. alleviating the hold-up problem).
 - But can also reduce incentives to invest (see [Whinston, 2003](#)).
 - On top, VI can change investment decisions of competitors in equilibrium.
- VI can affect horizontal dimensions through acquired firm choices.
 - Integration can happen in different locations in characteristic space.
 - Diversification/specialization \Rightarrow different product offerings in equilibrium.

Graphical intuition

THIS PROJECT

1. **(Today)** Analyze whether firms diversify/specialize when integrating.
 - In the context of the videogame industry: where publishers acquire developers.
 - Specifically, the market for (digital) PC games on Steam.
 - For now, focus on 25 major acquisitions between 2007 and 2024.
2. Study how diversification/specialization impact equilibrium product variety.
 - Build a structural model of vertical integration with endogenous investment.
 - Product variety in equilibrium will be a result of which firms were acquired.
3. Conduct relevant counterfactuals.
 - Banning vertical integration.
 - Socially optimal integration strategies.

LITERATURE REVIEW

- Endogenous product choice.
 - Fan (2013); Mazzeo et al. (2018); Wollmann (2018); Fan & Yang (2020); Sullivan (2020); Berry & Waldfogel (2001).
- Vertically integrated markets/Exclusive agreements.
 - Chen & Waterman (2007); Conlon & Mortimer (2013); Lee (2013); Asker (2016); Crawford et al. (2018).
- Videogame industry.
 - Nair (2007); Lee (2013); Gil & Warzynski (2015); Rusakov & Kretschmer (2024); Argyres et al. (2025).

THE VIDEOGAME INDUSTRY

- The market for videogames is sizable.
 - Global revenues of ~183 billion USD in 2024, > 50% from mobile (Newzoo, 2024).
 - Digital games have become the norm (especially on PC).
- Three main agents:
 - **Developers:** Create videogames.
 - **Publishers:** Finance, provide game testing services, and distribute the game.
 - **Stores:** Sell games to consumers (e.g., Steam).
- Vertical integration happens when publishers acquire developers.
 - The industry has seen a large number of acquisitions.
 - Mostly due to increases in game development costs.

WHY THIS IS A GOOD SETTING

- Studios are highly specialized single-product firms.
 - Studios, in general, develop one game at a time and within a specific genre.
 - Development cycles last multiple years.
- Developers contract with only one publisher, even without integration.
 - Foreclosure incentives in this case might only work through talent retention.
- Contracts between developers and publishers are fairly homogeneous.
 - Publishers provide the same services in general.
 - Funding: milestone payments and revenue sharing ([Gil & Warzynski, 2015](#)).

STEAM AND VALVE

- Steam is the largest digital distribution platform for PC games.
 - Launched in 2003 by Valve Corporation.
 - Over 180 million (average) monthly active users in 2024 (Epyllion, 2025).
 - Estimates suggest its market share in 2025 is more than 70% (in revenue terms).
- Steam has a fixed royalty rate of 30% on game sales.
 - However, there is no fee for launching games on Steam.
- Valve is also a developer/publisher.
 - Owns popular game franchises such as Half-Life, Counter-Strike, and Dota.
 - However, revenues from Steam come mostly from third-parties.
 - Thus, scope for strategic behavior seems limited.

DATA: OVERVIEW

- Dataset features the universe of videogames in the Steam store.
 - A total of ~106,000 games.
 - Will only consider those launched between 2007 and 2025 (104,575 games).
- For each game: developer(s) and publisher(s), release date and genre.
 - Among others (e.g., prices, estimated sales, reviews).
- For today, use genre as horizontal characteristic.
 - Games are associated with one or more genres.
 - The dataset features 33 different genres.

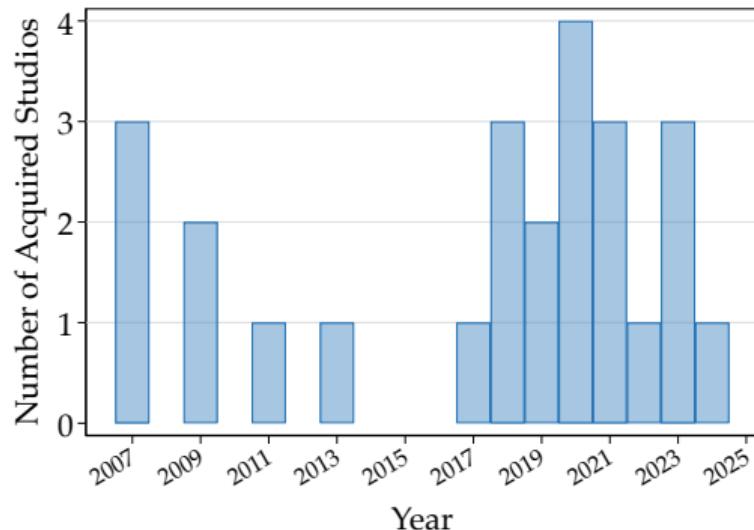
Motivation
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Industry Details
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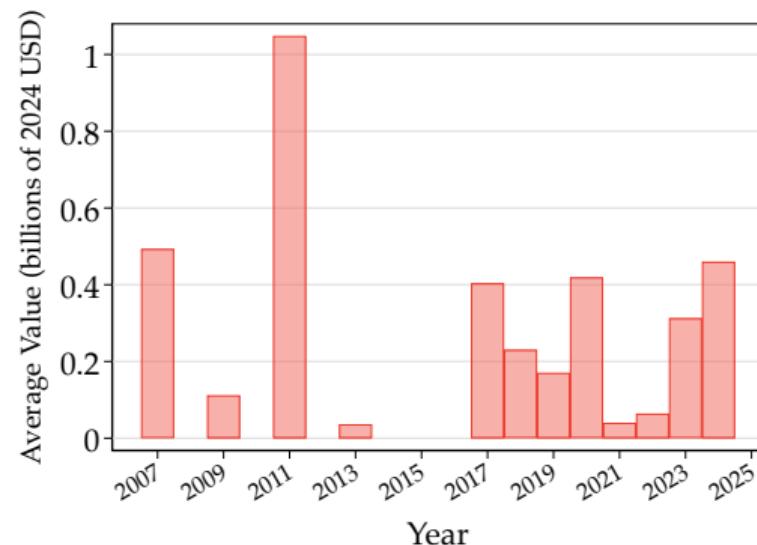
Data
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Results
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25 SIZABLE ACQUISITIONS



(a) Number of acquisitions



(b) Average studio value (billions of 2024 USD)

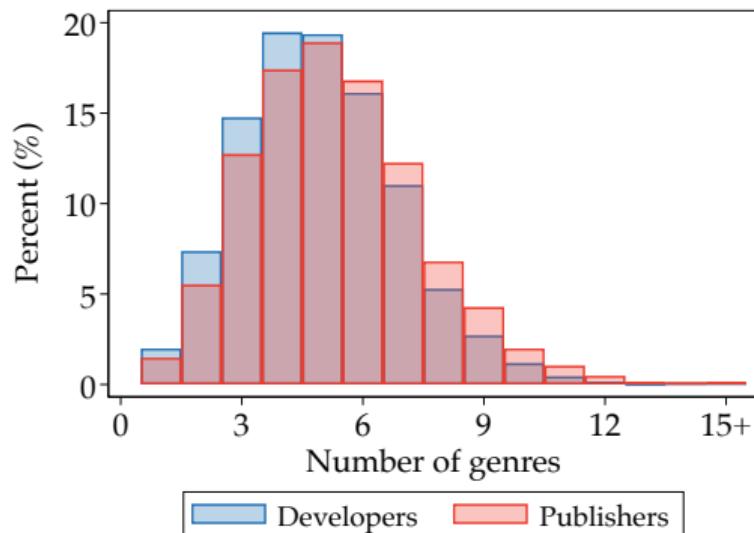
Motivation
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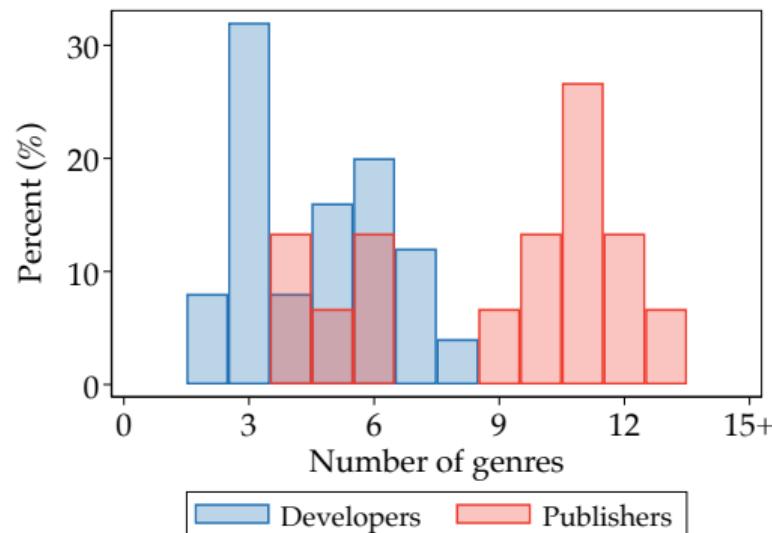
DEVELOPERS ARE MORE SPECIALIZED THAN PUBLISHERS



(a) Full sample (with at least 4 games).

Developers summary statistics

Publishers summary statistics



(b) Only acquired/acquirers.

A MEASURE OF SPECIALIZATION/DIVERSIFICATION

- Let i be a firm and define its “genre portfolio” as the vector p_i with

$$p_{ig} = \frac{\text{\# of games of } i \text{ in genre } g}{\text{\# of games of } i}$$

- For publisher p and developer d define their similarity as

$$s_{pd} = \frac{p_p \cdot p_d}{\|p_p\| \cdot \|p_d\|}$$

- Publishers specialize if s_{pd} is high, and diversify if s_{pd} is low.
 - Consider an acquisition as specialization if s_{pd} is above 0.5 or the median (0.75).

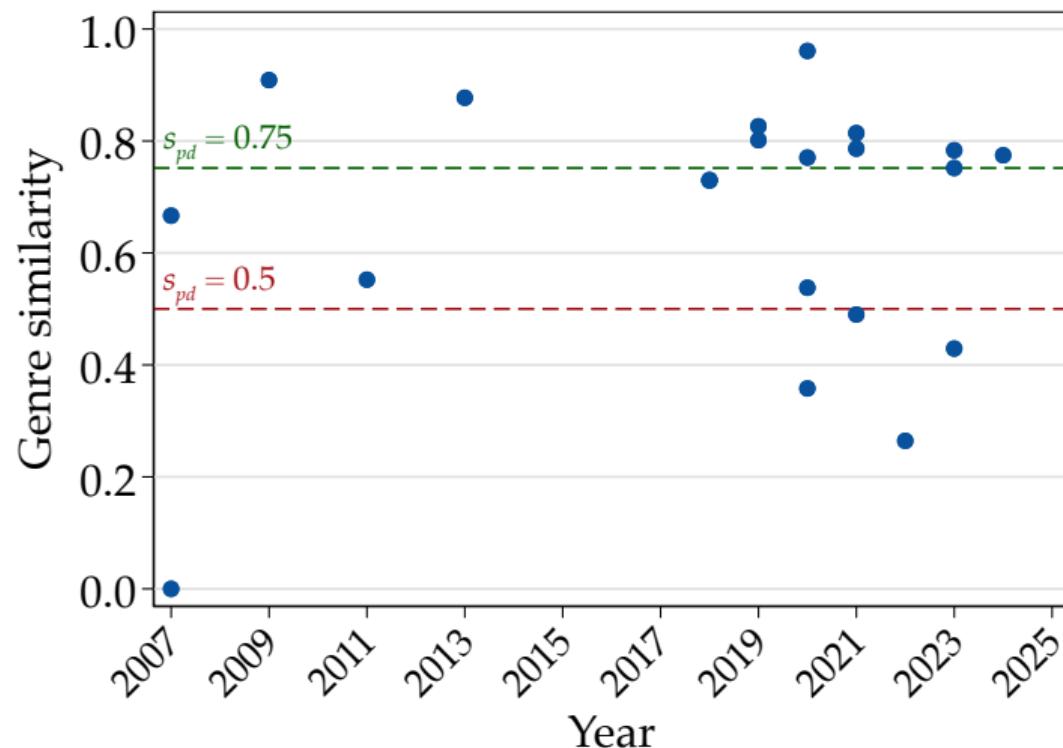
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OVERALL, MORE SPECIALIZATION THAN DIVERSIFICATION



DETERMINANTS OF SPECIALIZATION

- Which features of the market predict specialization?
- In terms to the publisher's portfolio, I test two competing hypotheses:
 1. ("Learning-by-doing") More games in a genre \Rightarrow more specialization.
 2. (Cannibalization) More games in a genre \Rightarrow more diversification.
- For market conditions, I test if more crowded genres predict diversification.
 - More competitive genre \Rightarrow should avoid acquiring a developer specialized in it.

PUBLISHERS LEARN BUT AVOID CROWDED MARKETS

	Specialization					
	Hard coded (0.5)	Above median (0.75)	(1)	(2)	(3)	(4)
# of games by publisher in top genre of developer	0.010*** (0.002)	0.012*** (0.003)	0.013*** (0.002)	0.015*** (0.002)		
# of games in market in top genre of developer	-0.086** (0.023)	-0.120*** (0.027)	-0.053* (0.026)	-0.138*** (0.032)		
Acquisition year FE		✓			✓	
Observations	21	16	21	16		

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

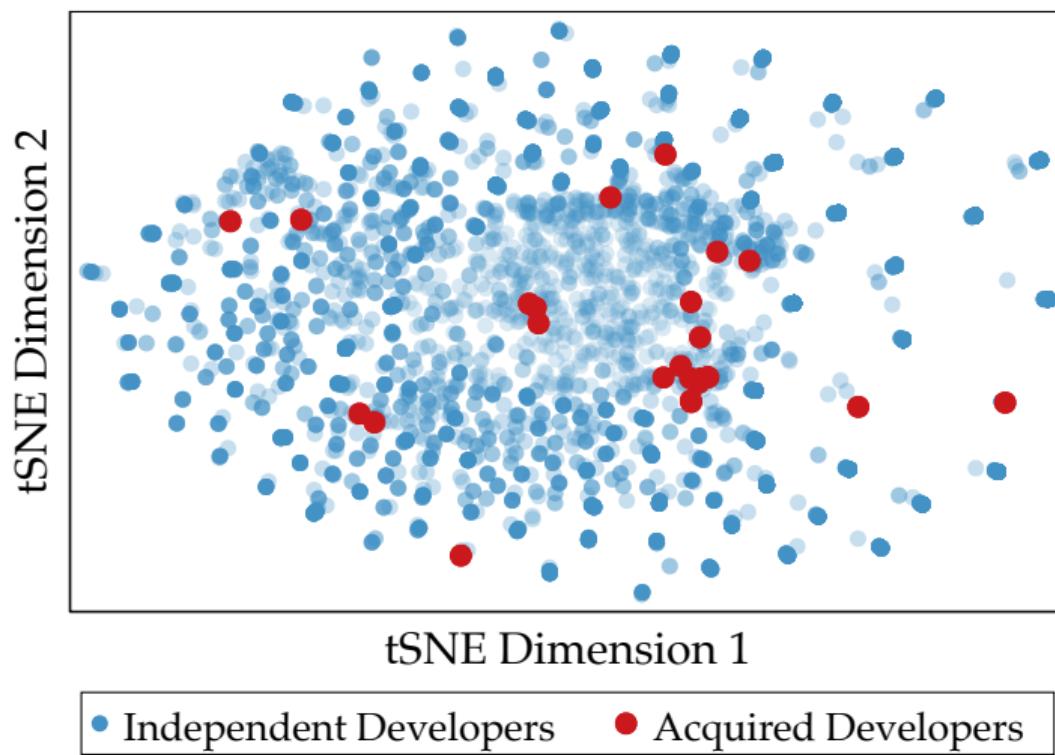
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THE OVERALL MARKET LOOKS MORE SPECIALIZED



CONCLUSION

- Vertical integration can impact product variety.
 - Specialization/diversification might lead to different equilibrium outcomes.
 - Understanding this phenomenon is relevant for competition/consumer welfare.
- In the videogame industry, publishers tend to specialize with acquisitions.
- Specialization is more likely when:
 1. Publishers have more experience in the developer's genre ("learning-by-doing").
 2. The developer's genre is less crowded (less competition).

THANK YOU!

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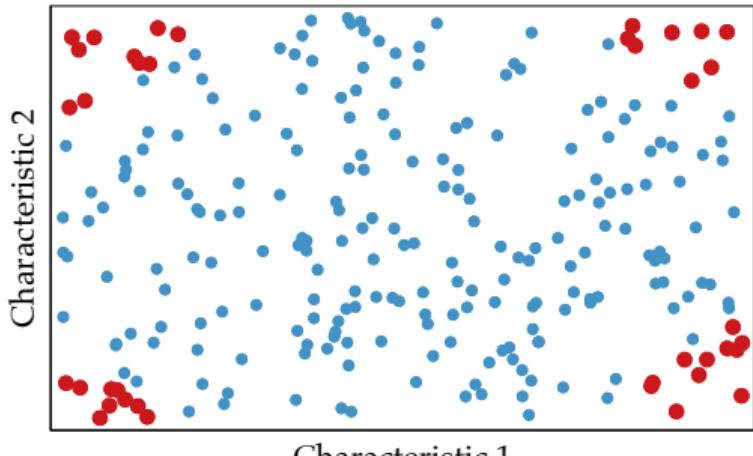
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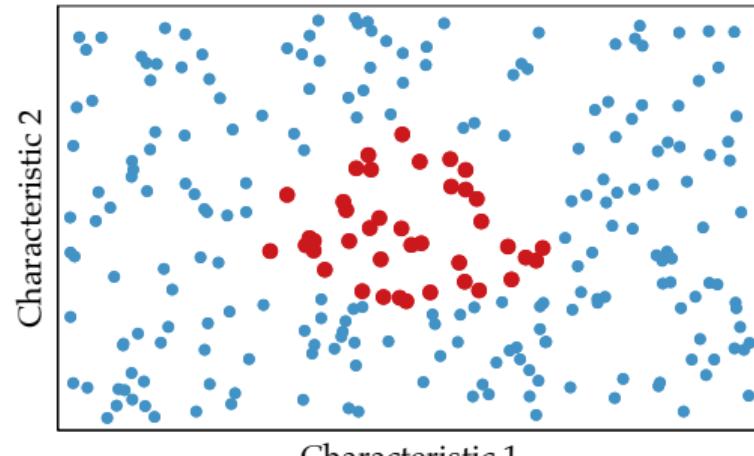
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FIRM DISTRIBUTION HAS DIFFERENT IMPLICATIONS

[BACK](#)

(a) Equilibrium with diversification



(b) Equilibrium with specialization

DEVELOPERS: SUMMARY STATISTICS

[BACK TO DATA](#)

	Mean	SD	Min	Max
Panel (a): Full sample (N = 63,811)				
Number of Games	1.66	3.17	1.00	203.00
Estimated Sales (millions)	0.18	2.87	0.01	510.00
Metacritic Score (%)	72.69	10.20	6.00	97.00
Positive Reviews (thousands)	2.50	64.89	0.00	12633.50
Negative Reviews (thousands)	0.50	11.91	0.00	1824.82
Panel (b): Acquired (N = 25)				
Number of Games	9.00	6.80	1.00	25.00
Estimated Sales (millions)	13.38	32.09	0.02	162.65
Metacritic Score (%)	78.09	5.64	65.00	88.00
Positive Reviews (thousands)	131.74	216.50	0.01	1100.76
Negative Reviews (thousands)	29.28	75.27	0.00	378.54

PUBLISHERS: SUMMARY STATISTICS

[BACK TO DATA](#)

	Mean	SD	Min	Max
Panel (a): Full sample (N=56,688)				
Number of Games	1.86	5.57	1.00	538.00
Estimated Sales (millions)	0.20	3.79	0.01	510.35
Metacritic Score (%)	72.61	10.13	6.00	97.00
Positive Reviews (thousands)	2.84	76.55	0.00	12634.79
Negative Reviews (thousands)	0.58	15.10	0.00	1825.02
Panel (b): Acquirers (N=15)				
Number of Games	69.87	55.67	1.00	142.00
Estimated Sales (millions)	66.53	90.33	0.01	349.27
Metacritic Score (%)	73.22	7.62	51.00	80.00
Positive Reviews (thousands)	782.77	1006.13	0.02	3670.00
Negative Reviews (thousands)	162.49	282.17	0.01	1111.46