

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.

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).

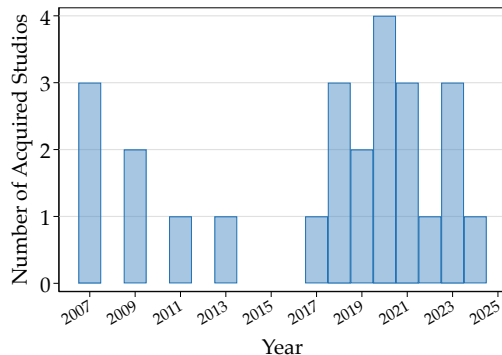
STEAM AND VALVE

- 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.

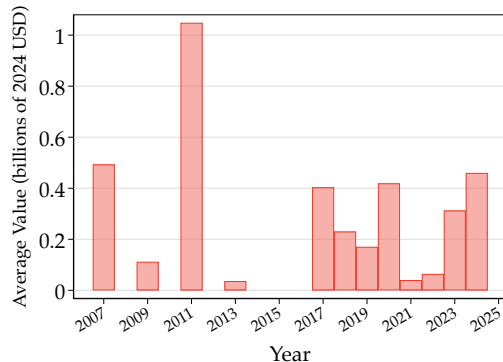
DATA: OVERVIEW

- Dataset features the universe of videogames in the Steam store.
 - A total of $\sim 106,000$ 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.

25 SIZABLE ACQUISITIONS

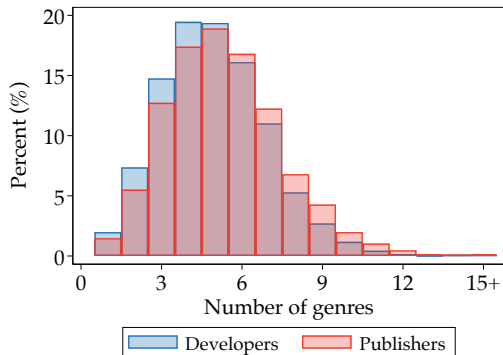


(a) Number of acquisitions

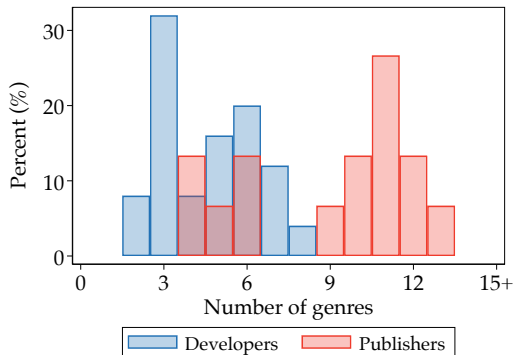


(b) Average studio value (billions of 2024 USD)

DEVELOPERS ARE MORE SPECIALIZED THAN PUBLISHERS



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



(b) Only acquired/acquirers.

Developers summary statistics

Publishers summary statistics

A MEASURE OF SPECIALIZATION/DIVERSIFICATION

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

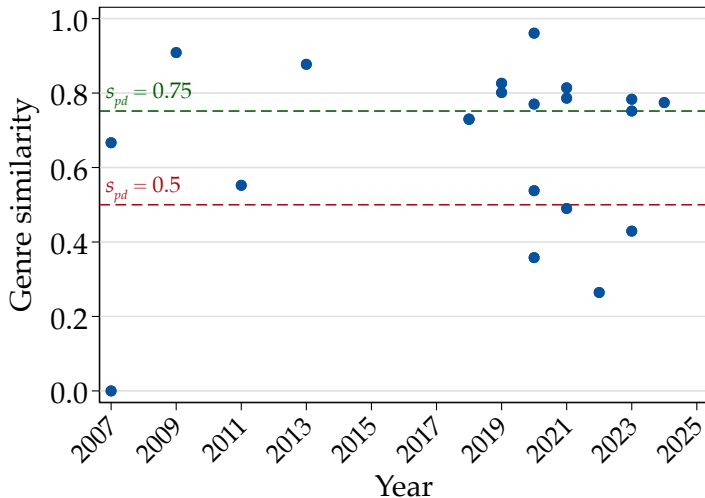
$$p_{ig} = \frac{\text{\# of games of } i \text{ in genre } g}{\text{\# of games of } i}$$

- 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).

OVERALL, MORE SPECIALIZATION THAN DIVERSIFICATION



DETERMINANTS OF SPECIALIZATION

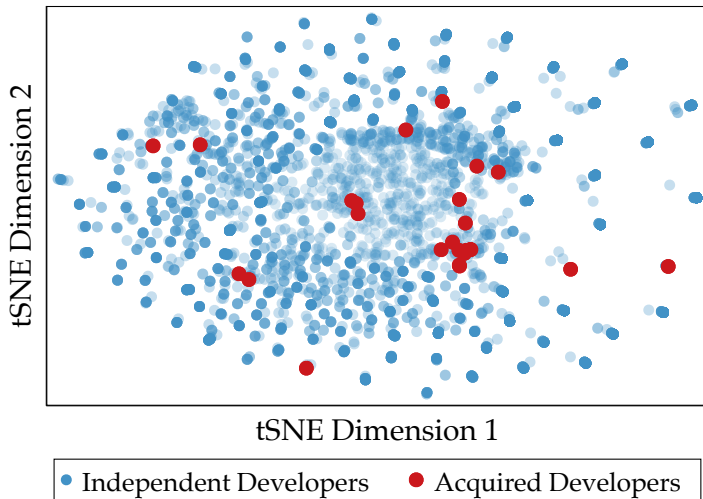
- Which features of the market predict specialization?
- In terms to the publisher's portfolio, I test two competing hypotheses:
 1. ("Learning-by-doing") More games in a genre \Rightarrow more specialization.
 2. (Cannibalization) More games in a genre \Rightarrow more diversification.
- For market 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.

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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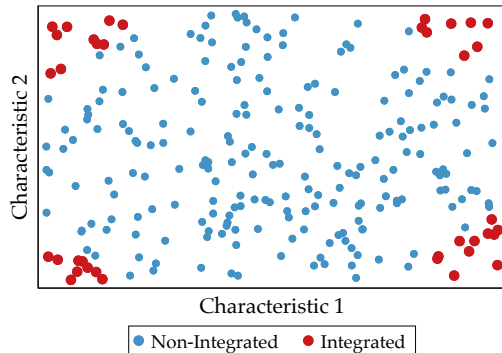
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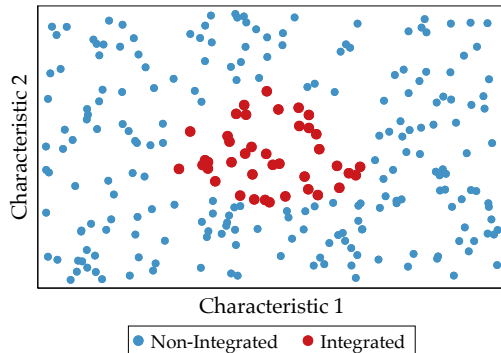
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FIRM DISTRIBUTION HAS DIFFERENT IMPLICATIONS

[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