Motivation	Methods+Data	Understanding Scope	Scope Expansion and Firm Value	Conclusions	Appendix
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Scope, Scale and Competition: The 21st Century Firm

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- Seminal theory (Panzar and Willig (1977, 1981), Teece (1980)) suggests scope expansion should be across related markets (low-cost entry synergies).
- Conglomerate literature mostly focuses on diversification. Our results suggest modern perspective needs revision.
- Our thesis: scope mainly about positive NPV expansion across related markets. It is operationalized by redeploying assets and innovating to increase productive flexibility.
- Implications: Re-think modern conglomerate foundation. Implications for IO-finance, investment, valuation, and declining competition.

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Literatı	ıre				

Firm Organization: Scope and Scale

- Classical theories: Panzar and Willig (1977, 1981), Teece (1980). Cost and recurrent use of knowledge.
- Lang and Stulz (1994), Berger and Ofek (1995): Agency view.
- Henderson and Cockburn (1996): Innovation can facilitate scope.
- Maksimovic and Phillips (2002): Efficiency view with scarce managerial talent.





Firm size is increasing: 149% inflation-adjusted increase during our sample.

• We will next show that scope increased 40-70%. Thus $\frac{1}{3}$ to $\frac{1}{2}$ size increase.





Scope increased 70% (TNIC-FIC scope) or 40% (NAICS scope).

- A new 21st century firm: Scope increase achieved w/o more operating segments.
- Evidence: likely fueled by asset redeployment, acquisitions, and innovation.
- Overall: scale and scope both increasing...





CS segments look different in time series! Why?

- Regulatory change in scope reporting (SFAS 131) requirements in 1997.
- Segment reporting tied to performance evaluation buckets, not industry coverage.
- Favors under-reporting, with bias larger for more related industries.
- If related industry operations are evaluated together, predict no increase in segments even as scope has increased substantially.
- Does not identify related segments except coarsely.







Compustat Segments

* We use actual vocabulary firms use to describe the products they sell (<u>Reg</u> S-K). * Compustat segments based on how firms track performance (not industries)



Firm₆

Firm₁₁



World with Scope But Why, When, Which Industries to Expand?



Data	Mathada	\cdot $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $	Business Deser	ntions	

Reg S-K requires 10-K Item 1s to be updated and through.

- If a firm operates in many industries, expect multiple industry vocabularies.
- 10-K Item 1s discuss products firms sell: natural for scope evaluation.
- Relies less on idiosyncracies of data providers, avoids forcing a firm into fixed bins like NAICS, and all firms are subjected to same disclosure platform and SEC review process.
- At a high level: we wish to establish local industry "dialects" based on firms that report single segments (FIC) OR use external industry vocabulary (NAICS) and see how many dialects a given firm has in its business description.
- We also use Latent Dirichlet Allocation (LDA) textual methods (in appendix) to form 300 "topic industries" in 1997 and then get topic loading for each firm in each year for these industries.



Establish Industry Vocabulary Vectors

Use 300 Industry Vocabularies from HP 2016 FIC-300 or 311 NAICS-4 from NAICS manual .



Restrict words to cleaned industry vocab by HP2016. Use HP2016 vector space. FIC scope: additionally purge words appearing in >2% of industries. Only consider single segment firms using 1997 base-year as in HP2016. NAICS scope: additional non-industry stop word list in Appendix.



Score Firms on Scope

Compare firms to 300+ Ind vocabs! Need constant scaling for each industry (avoid cosines)



*Use simplest and most transparent method (avoid black box): compute fraction of industry j's vocab that firm i has in its Item 1. So 300 or 311 overlaps for each firm year. *Industry vocabs fixed over time (NAICS, FIC-300). Robust to dynamic FIC-300. *Example: Firm 1 is cell+electronics, Firm 2 is furniture+office equip.

Motivation 00000000	Methods+Data ○○○●○	Understanding Scope	Scope Expansion and Firm Value	Conclusions	Appendix 000000000
Back Ex	xtension o	of TNIC to	1988		

- We back-extend TNIC data repository (was from 1996 to 2017) to cover (1988 to 2017) by gathering OCRed 10-Ks from the HBS and Dartmouth libraries.
- OCR software: Nuance Power PDF performed best from a # candidates. Then parse Item 1's following HP2016.
- Badly OCRed words are purged by only retaining words that (A) are in the EDGAR filings, or (B) that are in the Webster Dictionary or (C) that appear more than once in the early years and that pass a manual check.
- We gain important insights from back extension esp given regulatory changes for segment reporting around 1997 (Hyland).

Back-extended baseline TNIC data already available (1989-2019): http://hobergphillips.tuck.dartmouth.edu/

Motivation	Methods+Data 0000●	Understanding Scope	Scope Expansion and Firm Value	Conclusions	Appendix 000000000
Data					

- 100,525 firm-year observations w/ available Compustat, and TNIC data.
- metaHeuristica data to construct validation queries.
- Asset redeployability data from Kim and Kung (2017) and BEA.
- Standard screens: drop if either assets or sales less than \$1M, drop financials and utilities (but results robust to keeping them).

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Disne	ey E	xamp	le			
Year	Topic	Amount	Word List			
			Panel A: Disney	Scope Allocations in 1990		
1000	206	275.0	series production warner live fe	ature studio distribution company relea	se produced	
1000	180	155.2	event team garden super cham	nion league collectible sporting arena of	oncert	
1000	100	128.4	programming broadcast network	cable satellite program time channel	broadcasting bousehold	
1000	222	127.3	motion picture screen movie pr	oduction cinema company theater creat	tive sound	
1990	290	43.2	nublishing adult company publis	sher toy character gift imperial english	nreview	
1990	122	41.9	music, audio, disc, theater, studio	 content, videocassette, licensors, digital, 	consumer	
			Panel B: Disney	Scope Allocations in 2003		
2003	100	745.3	programming, broadcast, network	. cable, satellite, program, time, channel,	broadcasting, household	
2003	296	641.1	series, production, warner, live, fe	ature, studio, distribution, company, relea	se, produced	
2003	180	448.8	event, team, garden, super, cham	pion, league, collectible, sporting, arena, c	oncert	
2003	245	316.9	radio, market, broadcasting, broad	dcast, ownership, company, rule, interest,	communication, local	
2003	222	294.5	motion, picture, screen, movie, pr	oduction, cinema, company, theater, creat	zive, sound	
2003	198	92.6	cable, system, service, regulation,	local, rate, programming, television, auth	ority, ownership	
2003	127	88.3	resort, vacation, grand, valley, lift	, ownership, white, company, located, own	ier	
2003	167	86.3	company, food, guest, menu, qua	lity, concept, location, service, beverage, i	tem	
2003	285	75.2	florida, development, resident, con	unty, residential, company, alaska, residen	e, miami, area	
2003	217	72.6	group, room, reservation, eagle, b	orand, leisure, travel, occupancy, company,	service	
			Panel C: Disney	Scope Allocations in 2017		
2017	100	736.4	programming, broadcast, network	, cable, satellite, program, time, channel,	broadcasting, household	
2017	296	620.8	series, production, warner, live, fe	ature, studio, distribution, company, relea	se, produced	
2017	180	416.7	event, team, garden, super, cham	pion, league, collectible, sporting, arena, c	oncert	
2017	245	237.4	radio, market, broadcasting, broad	dcast, ownership, company, rule, interest,	communication, local	
2017	222	193.4	motion, picture, screen, movie, pr	oduction, cinema, company, theater, creat	ive, sound	
2017	127	138.6	resort, vacation, grand, valley, lift	, ownership, white, company, located, own	ier	
2017	148	117.5	service, launch, satellite, program	ming, primestar, channel, system, echosta	r, company, directv	
2017	190	115.3	cost, ferc, order, service, pipeline,	settlement, restructuring, interstate, tran	sportation, regulatory	
2017	217	101.8	group, room, reservation, eagle, b	orand, leisure, travel, occupancy, company,	service	
2017	167	84.2	company, food, guest, menu, qua	lity, concept, location, service, beverage, i	tem	
2017	290	62.2	publishing, adult, company, publis	sher, toy, character, gift, imperial, english,	preview	

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Motivation	Methods+Data	Understanding Scope ○●○○○○○○○	Scope Expansion and Firm Value	Conclusions	Appendix 000000000
Scope 3	Statistics	vs Compust	tat Segment Coi	unts	

# Compustat Segments	FIC-Scope	NAICS-Scope	Assets	# Obs.	
1 segment	6.41	5.56	1365	71,575	
2 segments	7.53	7.02	3255	17,939	
3 segments	8.63	8.57	6192	7,447	
4 segments	9.90	10.21	10084	2,353	
5+ segments	12.21	15.17	30776	1,211	

- * Scope measures positively related to CS segments (validation).
- * Segment measures have little variation beyond 1-2 segments.

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Scope S	Statistics	vs Firm Siz	е		

	_		All Firms		_		Single S	egment Firi	ms Only	
Firm Size	#Comp	ustFIC	NAICS		#	#Compus	tFIC	NAICS		#
Quintile	Segmen	ts Scope	Scope	Assets	Obs.	Segments	Scope	Scope	Assets	Obs.
Small Firms	1.22	5.65	4.02	23	20,094	1	5.50	3.88	19	14,304
Quintile 1	1.26	6.16	5.04	102	20,110	1	6.07	4.72	74	14,321
Quintile 2	1.35	6.69	5.93	305	20,113	1	6.28	5.39	203	14,320
Quintile 3	1.50	7.50	7.18	936	20,111	1	6.76	6.18	604	14,321
Big Firms	1.94	8.62	9.17	11728	20,097	1	7.41	7.64	5926	14,309

- * Firm size sorts scope measures. Serving more markets requires more assets!
- * True overall and even for single segment firms.





Consider a spatial representation of Industries

I9 and I12 are distant industries



Motivation	Methods+Data 00000	Understanding Scope ○○○○○●○○○	Scope Expansion and Firm	Value C	Conclusions	Appendix 000000000
Scope v	's Related	lness (Div	versification a	thing (of the	past!)

Industry-Pair Similarity Decile	Fraction Scope Pairs (All Firms)	Fraction Scope Pairs (Single-Seg)	Fraction Scope Pairs (Multi-seg)	Average TNIC-pair Similarity	# Obs
Similarity Beene	(/ /	(511616 566)	(111111-306)	onnuncy	# 005.
Least Similar	0.036	0.038	0.030	0.001	828,872
Decile 2	0.043	0.046	0.035	0.002	829,542
Decile 3	0.041	0.043	0.036	0.003	829,012
Decile 4	0.052	0.056	0.043	0.004	829,145
Decile 5	0.053	0.053	0.054	0.006	829,064
Decile 6	0.067	0.067	0.068	0.008	829,462
Decile 7	0.086	0.086	0.086	0.010	828,756
Decile 8	0.096	0.091	0.107	0.014	829,414
Decile 9	0.132	0.125	0.147	0.020	828,926
Most Similar	0.393	0.393	0.395	0.047	829,422

* Take all permutations of NAICS industry pairs in each year (about 8.3M observations).
* Compute average TNIC similarity of firms in the pair and sort into deciles of industry-pair distance.

* Results show scope expansion heavily focused in the most similar industry pairs. Little evidence of unrelated diversification.



Goal: use metaHeuristica to identify direct statements indicating high scope.

- List A: product lines, product categories
- List B: product lines, product categories, service lines, service categories
- List C: breadth, broad, broader, wide, multiple, numerous, diverse, categories, divisions

Create four variables

- **Product Breadth:** (# List A Paragraphs)/(Total Paragraphs).
- **Product/Svc Breadth:** (# List B Paragraphs)/(Total Paragraphs).
- Product Breadth Detail: (# Both List A and C Paragraphs)/(Total Para).
- **Product/Svc Breadth Detail:** (# Both List B <u>and</u> C Para)/(Total Para).

Anchor Phrase Method: Use of proximity in "and" queries ensures high precision

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High Product Breadth Validation Tests (Part I)

Row	Dependent Variable	FIC- Scope	NAICS- Scope	# Compustat Segments	Log Assets	Log Age	TNIC HHI	# Obs
			p-	8	8	88-		11
(1)	Product Breadth				1.650	0.400	-2.119	72,280
(2)	Prod/Svc Breadth				(3.640) 1.774	(0.260) 0.642	(-1.760) -2.063	72,280
. /	,				(3.840)	(0.410)	(-1.680)	
(3)	Prod Breadth Detail				0.763	-1.124	-1.558	72,280
. ,					(3.820)	(-1.700)	(-3.260)	
(4)	Prod/Svc Breadth Detail				0.791	-0.917	-1.497	72,280
					(3.920)	(-1.370)	(-3.070)	
(5)	Product Breadth			1.381	1.513	0.140	-2.124	72,280
				(2.800)	(3.320)	(0.090)	(-1.760)	
(6)	Prod/Svc Breadth			1.299	1.646	0.397	-2.068	72,280
				(2.570)	(3.550)	(0.260)	(-1.680)	
(7)	Prod Breadth Detail			0.430	0.720	-1.205	-1.559	72,280
				(1.920)	(3.590)	(-1.820)	(-3.260)	
(8)	Prod/Svc Breadth Detail			0.415	0.750	-0.996	-1.498	72,280
				(1.820)	(3.700)	(-1.480)	(-3.070)	

* Firm and year FE in all models in this paper.

- * First four rows so baseline model. Size predicts product breadth.
- * Adding CS segments has weak positive incremental power.
- * Segments especially weak for more refined queries.

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High Pr	oduct Br	readth Valida	ation Tests (Par	t II)	

Row	Dependent Variable	FIC- Scope	NAICS- Scope	# Compustat Segments	Log Assets	Log Age	TNIC HHI	# Obs
(9)	Product Breadth	0.640		0.959	1.075	0.569	-0.410	72,280
(10)	Prod/Svc Breadth	0.663 (8.520)		0.861 (1.720)	1.192 (2.600)	0.841 (0.550)	-0.293	72,280
(11)	Prod Breadth Detail	0.216 (6.360)		0.288 (1.300)	0.572 (2.910)	-1.060 (-1.610)	-0.981 (-2.010)	72,280
(12)	Prod/Svc Breadth Detail	0.228 (6.610)		0.265 (1.170)	0.594 (2.990)	-0.843 (-1.260)	-0.888 (-1.780)	72,280
(13)	Product Breadth	. ,	0.309 (6.020)	1.063 (2.150)	1.253 (2.770)	0.391 (0.260)	-0.700 (-0.580)	72,280
(14)	Prod/Svc Breadth		0.327 (6.240)	0.962 (1.900)	1.371 (2.970)	0.662 (0.430)	-0.562 (-0.450)	72,280
(15)	Prod Breadth Detail		0.132 (5.290)	0.294 (1.310)	0.609 (3.090)	-1.098 (-1.660)	-0.952 (-1.960)	72,280
(16)	Prod/Svc Breadth Detail		0.137 (5.360)	0.275 (1.200)	0.635 (3.190)	-0.884 (-1.320)	-0.867 (-1.750)	72,280

* Scope measures very positively predict direct product scope statements.

- * Highly robust even for more refined queries.
- * FIC-scope more strongly validated than NAICS scope.
- * Including scope variables subsumes much of # segments coefficient.

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Examin	e cross se	ction as a p	oriority		

Typical "prior" of financial economists: conglomerates are diversified (all or nothing view) and associated consequences.

That view likely quite apt in 1980s. Still true today? Past slides: "mostly no".

Most important: Baseline view of multiproduct firms needs revision.

- We test Panzar and Willig foundation (strategic, not diversified, conglomerates).
- How do firms expand scope: acquisitions, CAPX, innovation.
- Performance: is scope expansion value-creating or agency-driven?
- How are scope expansions financed?

Challenge: scope expansion is endogenous. We propose new "specific-channel-inspired" instruments new to the literature.





Network econometric theory [Bramoulle, Djebbari, and Fortin 2009] suggests that distant peers likely have exogenous variation relative to focal firm: excellent for identification. See Cohen-Cole, Kirilenko, and Patacchini (2014JFE) for example in finance (trading networks).



- * A_j is the 180-element vector for industry j indicating the asset distribution used by industry j.
- * $F_{i,t,j,near}$ is the fraction of focal firm *i*'s close peers in industry *j* in year t.
- * $F_{i,t,k,distant}$ is analogously defined for industry k for distant peers.

$$LocalAssetRedep_{i,t} = \sum_{j,k \ s.t.} \sum_{j \neq k \in NAICS-4} F_{i,t,j,near} F_{i,t,k,distant} < \frac{A_j}{A_j \cdot 1} \cdot \frac{A_k}{A_k \cdot 1} >$$
(1)

* The dot product is bounded in [0, 1] and is high when industries j and k use very similar productive assets.

* The higher is "Local Asset Redep" the more likely it is that the focal firm can expand scope at low relative cost.



Novel Instruments: Local Scope Expansion Opportunity Set



In above example, opportunity set measure is $1 - [(3/6)^2 + (1/6)^2 + (1/6)^2 = .67$

We only consider distant peers for this calculation to maximize exogenous content to focal firm.

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* Intuition: if the focal firm has a large number of industries represented in its distant peers, it likely faces a lot of opportunities to expand scope itself.

* Most easily computed as one minus the concentration of the distant peers by industry:

* $F_{i,t,j,distant}$ is is the fraction of focal firm *i*'s distant peers in industry *j* in year t.

$$LocalScopeExpansionOpp.Set_{i,t} = 1 - \sum_{j \in NAICS-4} F_{i,t,j,distant}^2$$
(2)

* The result is bounded in [0,1] and is high when the focal firm has a strong scope-expansion opportunity set.

* Unlike first instrument, which shifts the costs of expansion, this is about scope growth opportunities.

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Predicting Scope: First-Stage Regressions

Row	Dependent Variable	Sectoral Redeployment Potential	Sectoral Opportunity Set Potential	Log Assets	Log Age	# Obs
(1)	FIC-Scope	1.251	6.941	0.882	-0.830	99.506
()		(4.330)	(11.910)	(19.290)	(-6.030)	
(2)	NAICS-Scope	1.074 (2.380)	12.772 (14.680)	1.279 (17.730)	-0.976 (-5.060)	99,506
(3)	# Compustat Segments	0.019 (0.300)	0.293 (2.900)	0.107 (12.340)	0.161 (6.260)	99,506

- * Strong results for both instruments using new scope measures.
- * Overall weak results for segments as a scope measure.
- * We will not examine segments as a scope measure any further.

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Investment Regressions: With Predicted Scope

-	Dependent							
Row	Variable	Scope Variable	Log Assets	Log Age	# Obs			
	Panel A: FIC-Scope is Scope Variable							
(1)	Acquirer Dummy	0.026	-0.006	-0.029	98,196			
		(4.660)	(-0.920)	(-2.710)				
(2)	Target Dummy	-0.009	0.038	0.039	98,196			
		(-2.270)	(8.570)	(5.390)				
(3)	R&D/Assets	0.003	-0.016	0.009	98,196			
		(3.900)	(-12.690)	(4.370)				
(4)	CAPX/Assets	0.000	-0.002	-0.014	98,196			
		(0.450)	(-2.630)	(-9.820)				
		Pa	nel B: NAICS-Scope is Sc	ope Variable				
(5)	Acquirer Dummy	0.016	-0.003	-0.035	98,196			
. /		(4.860)	(-0.580)	(-3.540)				
(6)	Target Dummy	-0.005	0.036	0.042	98,196			
. ,		(-2.060)	(9.060)	(6.240)				
(7)	R&D/Assets	0.001	-0.015	0.008	98,196			
. ,		(3.570)	(-12.860)	(3.980)				
(8)	CAPX/Assets	0.000 [′]	-0.002	-0.014	98,196			
. ,	,	(0.570)	(-2.870)	(-10.190)				

- * RHS variables are lagged i,t-1.
- * High scope incentives lead firms to acquire more, divest less, and do more R&D.
- * No results for CAPX.
- * Results robust using FIC-Scope or NAICS-Scope.
- * Robust for FF-5 ind. w/ R&D more focal for tech and M&A for manufacturing.

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Outcomes Regressions

	Dependent					
Row	Variable	Scope Variable	Log Assets	Log Age	# Obs	
		F	Panel A: FIC-Scope is Sco	pe Variable		
(1)	Valuation (M/B)	0.080	-0.532	-0.344	97,625	
		(4.310)	(-17.410)	(-7.360)		
(2)	Sales Growth	0.031	-0.098	-0.182	97,825	
		(5.790)	(-14.990)	(-17.860)		
(3)	Asset Growth	0.047	-0.206	-0.038	98,193	
		(8.830)	(-30.220)	(-3.550)		
(4)	OI/Assets	-0.001	0.012	0.000	97,995	
		(-0.540)	(3.510)	(0.010)		
		Pa	nel B: NAICS-Scope is Sc	ope Variable		
(5)	Valuation (M/B)	0.040	-0.512	-0.373	97,625	
. ,		(3.730)	(-17.880)	(-8.230)		
(6)	Sales Growth	0.018 Ó	-0.094	-0.191	97,825	
. ,		(5.960)	(-15.990)	(-20.450)		
(7)	Asset Growth	0.028	-0.200	-0.050	98,193	
. ,		(9.500)	(-33.210)	(-5.180)		
(8)	OI/Assets	-0.001	0.011	ò.000	97,995	
. /		(-0.490)	(3.650)	(0.100)		

- * High scope expansion strategies are value-creating.
- * Intuitively, we see high sales growth and asset growth.
- * No results for ROA consistent with best-markets-first strategy.

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Financi	ng Regre	ssions			

	Dependent						
Row	Variable	Scope Variable	Log Assets	Log Age	# Obs		
	Panel A: FIC-Scope is Scope Variable						
(1)	Equity Issuance	0.009 (7.220)	-0.050 (-25.060)	-0.009 (-2.950)	98,196		
(2)	Debt Issuance	0.002 (0.760)	-0.011 (-3.960)	0.010 (1.990)	98,196		
(3)	Dividends/Assets	-0.001 (-2.870)	0.001 (1.900)	0.002 (2.440)	98,097		
(4)	Repurchses/Assets	-0.001 (-1.460)	0.005 (7.430)	0.005 (5.070)	90,680		
		Pa	nel B: NAICS-Scope is Sc	ope Variable			
(5)	Equity Issuance	0.005 (7.530)	-0.049 (-26.340)	-0.012 (-4.010)	98,196		
(6)	Debt Issuance	0.001 (0.970)	-0.011 (-4.390)	0.010 (2.050)	98,196		
(7)	Dividends/Assets	-0.001 (-2.710)	0.001 (1.520)	0.002 (3.300)	98,097		
(8)	Repurchses/Assets	0.000 (-1.290)	0.004 (7.860)	0.006 (5.590)	90,680		

* Strong evidence favoring equity financing for scope expansion.

* Achieved both via new share issuance and lower payouts.

* No link to debt likely b/c asset redeployment and R&D do not create much collateral.



Observation 2: Adjustment for Scope (no time: see paper)



* SIC-3 HHI and SIC-2 HHI computed as in existing literature.

* Mixed HHI is [α SIC-2 HHI + (1 - α) SIC-3 HHI] where alpha (% FIC overlap) increases from zero to 50% linearly from 1997 to 2017.

- * Scope-adjusted Mixed HHI is not increasing.
- * Underscores that scope shifts relevant granularity over time.

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Conclu	sions				

The New 21st Century Firm

Novel text-based approach to measuring firm scope

- Scope increases dramatically in our sample.
- Concept of "diversified conglomerate" is fast becoming rare. 21st century multi-product firms span strategically related markets.
- Firms achieve scope via asset redeployment and R&D, not CAPX. High scope firms are more valuable and have high sales growth.
- Findings are in strong contrast to early literature on diversification discount.
- New narrative on rising concentration. Product bundling, kill zones, and supply chain worries (relating to scope increases) might be more pressing regulatory matters than classic horizontal concerns.



* We first replicate their finding using the approach outlined in their paper.

* They (GLM2017) use 3-digit NAICS. We find very similar results using SIC, and we focus on SIC due to its improved intuition.

* We also adjust HHIs for Compustat segments, but this has little impact (and recall issues with segment data noted earlier).

Motivation	Methods+Data	Understanding Scope	Scope Expansion and Firm Value	Conclusions	Appendix ○●○○○○○○○
Issues v	with Trad	itional Appr	roach		

* Using SIC or NAICS from Compustat forces each firm into one and only one industry. Cannot account for scope increases.

* Segment tapes often used to adjust. But SFAS 131 indicates segment reporting has disconnected from reporting actual industries since 1997.

* Also, per earlier results, segments not strongly validated as a scope measure. They are unlikely to pick up localized scope increases (which seems to be the bulk of scope increase).

* Need more flexible data. Text has a full summary of firm's actual products.

Motivation	Methods+Data	Understanding Scope	Scope Expansion and Firm Value	Conclusions	Appendix
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Competitive Intensity via Complaints vs Granularity

* Dependent variable: Fraction of 10-K paragraphs with competition complaints.

	One minus	One minus	SIC2 to SIC3		
Year	SIC2 HHI	SIC3 HHI	Ratio	Adj R ²	Obs.
1997	-0.001 (-0.46)	0.011 (8.15)	0.000	0.015	5521
1998	-0.003 (-1.34)	0.011 (7.63)	0.000	0.012	5297
1999	-0.003 (-1.24)	0.012 (8.66)	0.000	0.017	5076
2000	0.006 (2.46)	0.010 (7.90)	0.369	0.023	4827
2001	0.007 (2.37)	0.010 (6.74)	0.401	0.020	4359
2002	0.009 (3.17)	0.005 (3.30)	0.642	0.010	3954
2003	0.009 (2.34)	0.006 (2.90)	0.600	0.007	3631
2004	0.011 (4.44)	0.008 (6.02)	0.577	0.028	3540
2005	0.011 (4.25)	0.007 (5.11)	0.604	0.024	3465
2006	0.007 (3.34)	0.006 (4.91)	0.565	0.020	3378
2007	0.008 (3.85)	0.004 (3.80)	0.661	0.017	3305
2008	0.009 (4.54)	0.004 (4.29)	0.674	0.023	3120
2009	0.008 (4.21)	0.005 (4.78)	0.636	0.025	3006
2010	0.010 (5.20)	0.004 (3.72)	0.744	0.024	2899
2011	0.013 (6.47)	0.003 (2.91)	0.825	0.029	2755
2012	0.005 (2.51)	0.003 (2.92)	0.655	0.010	2665
2013	0.004 (2.10)	0.004 (4.23)	0.516	0.015	2654
2014	0.004 (1.98)	0.003 (3.43)	0.538	0.012	2695
2015	0.003 (1.82)	0.004 (4.57)	0.445	0.017	2643
2016	0.003 (1.93)	0.004 (4.21)	0.484	0.016	2546
2017	0.005 (2.96)	0.003 (3.67)	0.619	0.018	2453
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- * Competition used to live at SIC-3 granularity. It has moved half-way to a SIC-2 world.
- * True HHI now best modeled as an equal weighed average of SIC-2 and SIC-3 HHIs.
- * Note: This test does not use business descriptions (external validity)...





* Market overlap defined as fraction of FIC-300 industries firms with same SIC2/3 have in common.

- * Industry boundaries in SIC-2 now as strong as in SIC-3 were 25 years ago.
- * Scope Increase implies weakening of industry boundaries.
- * Since 1997, SIC-2 market overlap caught up with SIC-3 by 50%.





* SIC-3 HHI and SIC-2 HHI computed as in existing literature.

* Mixed HHI is [α SIC-2 HHI + (1 - α) SIC-3 HHI] where alpha (% FIC overlap) increases from zero to 50% linearly from 1997 to 2017.

- * Scope-adjusted Mixed HHI is not increasing.
- * Underscores that scope shifts relevant granularity over time.

Understanding Scope Scope Expansion and Firm Value Motivation Methods+Data Conclusions Appendix 000000000

Observation 3: Scope-implied HHIs



* To construct our scope variables, we first assign firms to multiple industries. * We compute above HHI by allocating each firm's sales to its assigned industries using similarity weights "Q", and then computing HHIs at industry level, and averaging HHIs back to the firm level using similarity weights Q again. * Then average over firm to plot the time series. We see no upward trend.





 \ast Same conclusion if we equal weight instead of sales weight to get economy-wide HHIs.



- Much of reported rise due to upward bias of not adjusting HHIs for scope.
- Compustat segments not a remedy b/c governed by performance categories, and actual scope increase is across related industries (similar perf categ).
- Narrative: Scope is rising but within-market horizontal competition is stable.
- Antitrust Implications: Increasing scope does not eliminate anti-trust concerns. Concerns are there but different from traditional horizontal ones. Watch for issues like product bundling, excessive control within supply chains, or kill zones in innovation.
- Policy Remedies: Best intervention (if any) depends on the channel.

Results suggestive. Yet we hope more researchers will enter debate. We cannot fully close debate on this topic in one paper. Issues important enough to seek multiple "looks".