

2017 Purchase Price Allocation Study

DECEMBER 2018

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About Houlihan Lokey



Houlihan Lokey is the trusted advisor to more top decision-makers than any other independent global investment bank.

Corporate Finance

2017 M&A Advisory Rankings All U.S. Transactions

	Advisor	Deals
1	Houlihan Lokey	174
2	Goldman Sachs & Co	173
3	JP Morgan	164
4	Morgan Stanley	132
5	Barclays	106

Source: Thomson Reuters

No. 1 U.S. M&A Advisor

Top 10 Global M&A Advisor

Leading Capital Markets Advisor

Financial Restructuring

2017 Global Distressed Debt & Bankruptcy Restructuring Rankings

	Advisor	Deals
1	Houlihan Lokey	63
2	Rothschild & Co.	48
3	Lazard	36
4	PJT Partners LP	35
5	Moelis & Co.	22

Source: Thomson Reuters

No. 1 Global Restructuring Advisor

1,000+ Transactions Completed
Valued at More Than \$2.5 Trillion
Collectively

Financial Advisory

1997 to 2017 Global M&A Fairness Advisory Rankings

	Advisor	Deals
1	Houlihan Lokey	1,001
2	JP Morgan	959
3	Bank of America Merrill Lynch	699
4	Duff & Phelps	672
5	Morgan Stanley	660

Source: Thomson Reuters. Announced or completed transactions.

No. 1 Global M&A Fairness Opinion
Advisor Over the Past 20 Years

1,000+ Annual Valuation
Engagements

Our product knowledge, industry expertise, and global reach deliver superior results.

Product Expertise

Mergers & Acquisitions

Capital Markets

Financial Restructuring

Financial Advisory

Strategic Consulting

Dedicated Industry Groups

Business Services

Consumer, Food & Retail

Data & Analytics

Energy

Financial Institutions

Healthcare

Industrials

Real Estate, Lodging & Leisure

Technology•Media•Telecom

Financial Sponsors

Active Dialogue With a Diverse Group of More Than 550 Sponsors

Private Equity Firms

Hedge Funds

Capital Alliances

Our clients benefit from our local presence and global reach.

North America

Atlanta
Chicago
Dallas
Houston
Los Angeles
Miami
Minneapolis
New York
San Francisco
Washington, D.C.

Europe & Middle East

Amsterdam
Dubai
Frankfurt
London
Madrid
Milan (Leonardo & Co.)
Paris

Asia-Pacific

Beijing
Hong Kong
Singapore
Sydney
Tokyo

#1 Position Across Product Categories



HOULIHAN LOKEY

Corporate Finance

Mergers & Acquisitions

- Sellside & Buyside Transactions
- Leveraged Transactions
- Minority Equity Transactions
- Activist Shareholder Advisory
- Takeover Defense

Capital Markets

- Debt & Equity Private Placements
- High Yield
- Public Equity Offerings
- PIPEs Financings
- Liabilities Management
- Special Situations Advisory

Illiquid Financial Assets

Financial Advisory

- Tax & Financial Reporting Valuation
- Technology & Intellectual Property Advisory
- Real Estate Valuation & Advisory Services
- Derivatives Valuation & Advisory Services
- Due Diligence Services
- Valuation Opinions
- Portfolio Valuation & Advisory Services
- Fairness Opinions
- Solvency Opinions
- Dispute Resolution & Financial Expert Opinions

Financial Restructuring

- Out-of-Court Transactions
- Restructuring Debt & Equity
- Chapter 11 Planning
- Bulk Sales of Assets
- Sales of Performing & Nonperforming Loans
- Corporate Viability Assessment
- Debtor-in-Possession (DIP) Financing
- Exchange Offers
- Plans of Reorganization
- Distressed Mergers & Acquisitions

Strategic Consulting

Strategy & Execution

- Corporate & Business Unit Strategy
- M&A Support, Due Diligence & Post-Merger Integration
- New Market Entry

Sales & Marketing Management

- Sales & Marketing Effectiveness
- Product & Solutions Development
- Pricing Strategy

Operations & Performance Improvement

- Organization & Business Model Design
- Supply Chain Optimization
- Strategic Sourcing & Supply Management

No. 1 M&A Advisor for All U.S. Transactions in 2017

No. 1 Global M&A Fairness Opinion Advisor Over the Past 20 Years

No. 1 Global Investment Banking Restructuring Advisor

Recognized Leader in Management Consulting (*Kennedy Research*)

Financial Advisory Services Overview

Transaction Opinions

Fairness Opinions

- Public Company
- Special Committee
- Roll-Up/Aggregate
- Indenture
- Equity Allocation

Solvency Opinions

- Leveraged Transactions
- Corporate Spinoffs
- Dividend Recapitalizations
- Retrospective Solvency Analyses

Valuation Opinions

- Distressed Valuation Opinions
- Estate & Gift Tax Valuation Opinions
- ERISA & ESOP Opinions
- Corporate Planning

Transaction Advisory Services

Due Diligence Services

- Buyer Services
- Seller Services
- Lender Services

Tax & Financial Reporting Valuation

- Purchase Price Allocation
- Impairment of Goodwill & Other Assets
- Tangible Asset Valuation
- Tax Valuation
- Equity-Based Compensation
- Fresh-Start Accounting

Portfolio Valuation & Advisory Services

Fair Value Reporting

- Illiquid Securities
- Leveraged Loans
- PIPE Investments
- Real Estate Investments

Derivatives Valuation & Risk Management

- Structured Products
- Complex Derivative Instruments

Real Estate Valuation & Advisory Services

Valuations & Opinions

- Fairness Opinions
- Solvency Opinions
- Corporate Planning
- Expert Witness

Tax & Financial Reporting

- Portfolio Valuations
- Purchase Price Allocations
- Tax Valuations

Financial Consulting

Dispute Resolution & Financial Expert Opinions

- Case Assessment
- Financial Modeling
- Damage Theory Formulation
- Settlement Assistance
- Expert Witness Testimony

INSOURCE Corporate Development Services™

- Strategic Alternatives Analysis
- Liquidity Issues
- Unique Valuation Issues

Executive Summary

Introduction

Dear all:

Thank you very much for taking time to read Houlihan Lokey's 17th annual Purchase Price Allocation Study ("2017 Study"). Houlihan Lokey completed its 2017 Study by reviewing public filings for 1,266 completed transactions in 2017 and summarizing the results for certain transactions by transaction size and industry. The 2017 Study also provides statistics, other annual data, and a comparison to certain 2016 results ("2016 Study") and 2015 results ("2015 Study"). Key observations from the 2017 Study include the following:

- The number of transactions that meet our search criteria decreased 4% year over year to 1,266, although the number of large size deals (over \$5 billion) increased 23% year over year to 27.
- According to the 2017 Study, technology was the most active sector for M&A activities, although the infrastructure services & materials sector had the largest average transaction size.
- Identifiable intangible assets and goodwill as percentages of purchase consideration remained relatively stable year over year, and the technology sector had the highest percentage of goodwill.
- Contingent consideration (CC) remained an important part of many transactions. Approximately 21% of the transactions in the 2017 Study had CC in the purchase consideration, slightly up from 19% in the 2016 Study.
- With the exception of consumer, food & retail transactions, in which trademarks and trade names are considered a key asset, transactions across all industries showed technology and customer-related assets as the main identifiable intangible assets.

As part of the 2017 Study, you will also find a summary prepared by Houlihan Lokey on ASC 842 and ASU 2016-01. The Financial Accounting Standards Board (FASB) issued ASC 842, amending previous guidance in U.S. GAAP (ASC 840) related to the recognition of lease assets and lease liabilities, and issued ASU 2016-01, amending previous guidance in U.S. GAAP related to the classification and measurement of minority equity investments. Both amendments affect public and private companies.

I hope you will find the 2017 Study and updates on FASB rules helpful. Thank you again for reading this—we're excited to hear your comments and feedback.

Best,



Dimitri Drone

Managing Director, Head of Tax & Financial Reporting Valuation

Introduction (cont.)

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Financial Reporting Update: ASC 842 Lease Accounting

The FASB issued ASC 842,⁽¹⁾ amending previous guidance in U.S. GAAP (ASC 840) related to the recognition of lease assets and lease liabilities.

Background

- Under current U.S. GAAP, leases are accounted under two methods: capitalized leases and operating leases. Capitalized leases report leased assets and capitalized lease obligations on the balance sheet. Commitments arising from operating leases are reported in notes to the financial statements and are not recorded on the balance sheet.
- Under the amended guidance outlined in ASC 842, effectively all leases are now recorded on the balance sheet, with limited exceptions for operating leases with terms less than 12 months.
- Capitalized leases under ASC 840 are now referred to as finance leases and are accounted for similarly.
- Operating leases are now recorded on the balance sheet. The asset is referred to as a “right-of-use” asset. The corresponding liability is determined by discounting the lease obligation by the implicit rate in the lease. If not readily determined, the lessee should use its incremental borrowing rate.
- Operating lease liabilities are not considered debt but are other liabilities on the balance sheet.

Observations

- Operating ratios involving balance sheet items will change post-adoption.
- Operating rent expense will be reported as the straight-line average of the lease payments within operating income on the income statement. Earnings are not expected to be impacted as a result.

Important Dates

- For public business entities, the amendments to the accounting guidance in ASC 842 are effective for any fiscal years beginning after December 15, 2018, including any interim periods within those fiscal years. For private business entities, the amendments will become effective for fiscal years beginning after December 15, 2019, and all interim periods within fiscal years beginning after December 15, 2020. Early application of the amendments in ASC 842 is permitted for all entities.

(1) FASB Accounting Standards Update 2016-02, Topic 842, Leases

Financial Reporting Update: Minority Equity Investments

The FASB recently issued ASU 2016-01,⁽¹⁾ amending previous guidance in U.S. GAAP related to the classification and measurement of minority equity investments.

Background

- Under current U.S. GAAP, minority equity securities that are not accounted for under the equity method of accounting (i.e., those for which an investor has less than a 20% equity interest) are currently measured at cost (less any impairment), unless the investor elects to account for them using the fair value option.
- Under the amended guidance outlined in ASU 2016-01, companies will no longer be able to utilize the cost method of accounting when measuring minority equity investments. Minority equity investments must now be measured at fair value through net income (FVTNI).
- Pending a qualitative impairment test by the investor, securities without a readily determinable fair value (RDFV) may be recorded at cost less impairment plus or minus any changes resulting from observable price changes in comparable transactions.
- Securities with a RDFV must now be recorded at FVTNI and may no longer be classified as available for sale securities.

Observations

- As all minority equity investments are now required to be measured at fair value through net income, rather than OCI, earnings could become more volatile, especially for companies holding significant minority equity interests.
- This new guidance results in an increased need for advisory services related to the identification of potential impairment of investments without a RDFV as well as the valuation of these investments if an impairment were determined to exist.

Important Dates

- For public business entities, the amendments to the accounting guidance in ASU 2016-01 are effective for any fiscal years beginning after December 15, 2017, including any interim periods within those fiscal years. For all other entities, the amendments will become effective for fiscal years beginning after December 15, 2018, and all interim periods within fiscal years beginning after December 15, 2019.
- All non-public business entities may choose to adopt the amendments of ASU 2016-01 earlier as of the fiscal years beginning after December 15, 2017, including interim periods within those years.

(1) FASB Accounting Standards Update 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities

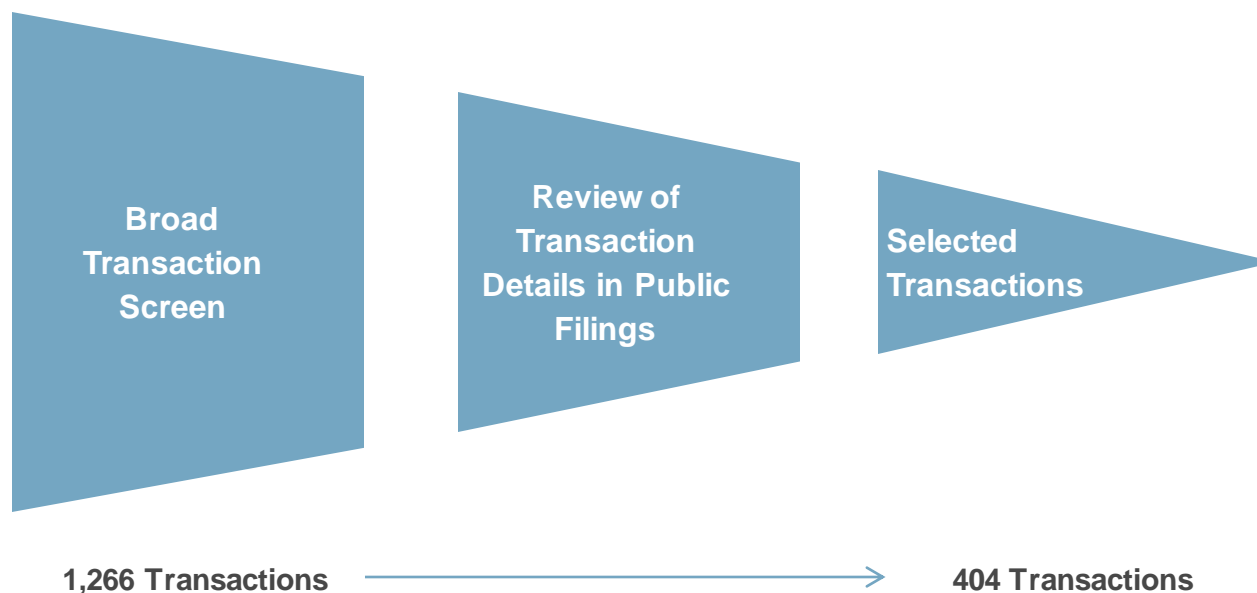
Screening Criteria and Methodology

The universe of transactions initially considered in the 2017 Study was obtained from S&P Capital IQ using the following search criteria:

- Transaction closed in 2017
- Acquirer was a U.S. publicly traded company
- Ownership percentage sought by acquirer was 50% or greater
- Base equity purchase price was disclosed

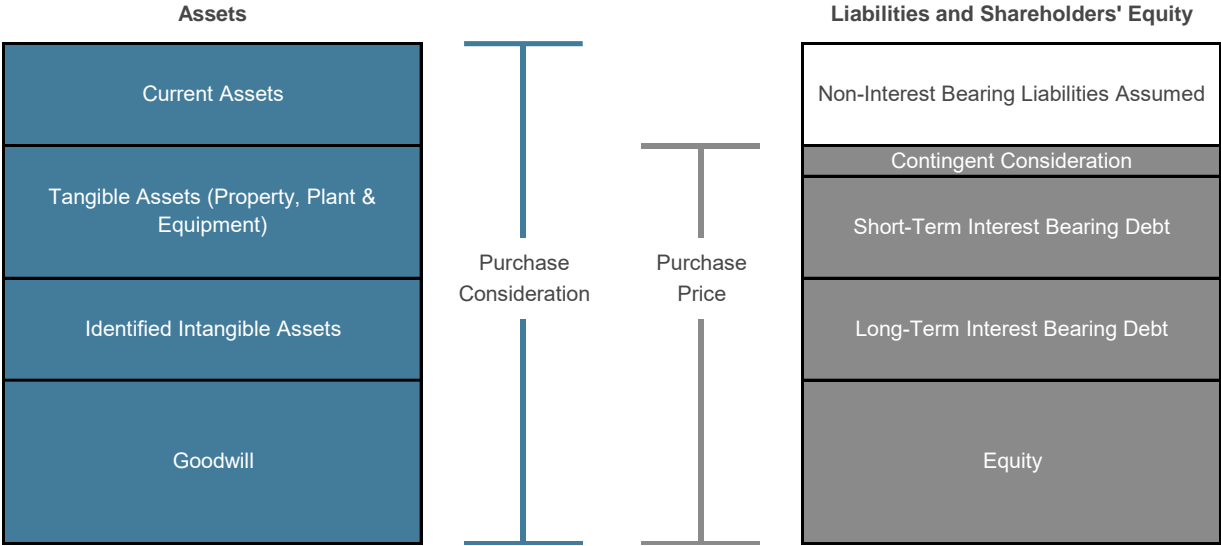
The initial sample consisted of 1,266 transactions. We reviewed public filings for each company in the initial sample with the objective of finding detailed disclosures regarding purchase consideration (PC), identifiable intangible asset fair values, and goodwill. Sufficient disclosures were provided for 404 transactions, which represented approximately 32% of the initial sample.

These 404 transactions formed the basis of the 2017 Study.



Screening Criteria and Methodology (cont.)

The primary objective of the 2017 Study was to review the amount of PC allocated to tangible assets, identifiable intangible assets, and goodwill. In addition, the 2017 Study marks the sixth year that CC recorded by acquirers, a component of PC per GAAP, has been analyzed. PC is defined as the sum of the purchase price paid and liabilities assumed in connection with a business combination. PC is equivalent to the fair value of the total assets of the target.



For the 2017 Study, identifiable intangible assets were classified into five categories:

- Developed technology (including patents)
- In-process research and development (IPR&D)
- Customer-related assets (including backlog, customer contracts, and customer relationships)
- Trademarks and trade names (including domain names)
- Other (including non-compete agreements, licenses, contracts, and core deposits, among others)

Screening Criteria and Methodology (cont.)

In addition to summarizing the allocation data according to intangible asset classes, we also conducted studies based on industry, deal size (as defined by PC), and lifing characteristics.

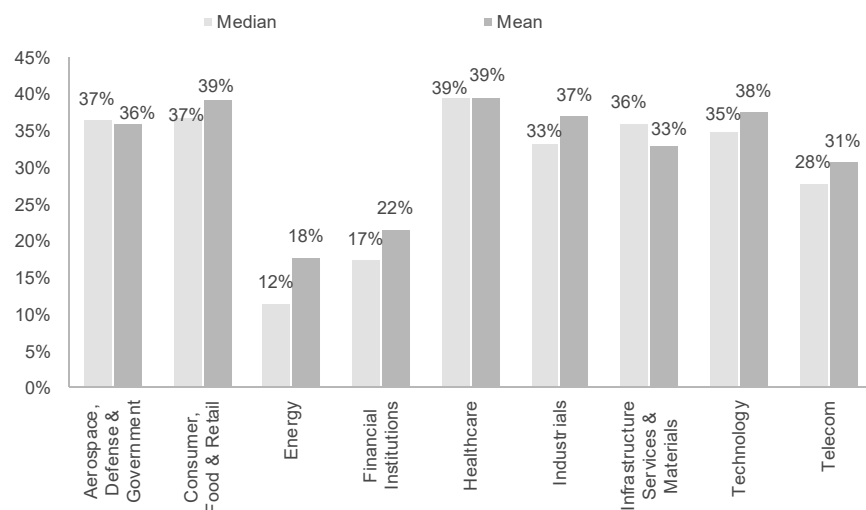
- With respect to industry, we classified the 2017 transactions into nine sectors:
 - Aerospace, Defense & Government (ADG)
 - Consumer, Food & Retail (CFR)
 - Energy
 - Financial Institutions
 - Healthcare
 - Industrials
 - Infrastructure Services & Materials (ISM)
 - Technology
 - Telecom
- With respect to deal size, we stratified the allocation results across seven categories (PC, \$ in millions):
 - > \$5,000
 - \$1,000–\$5,000
 - \$500–\$1,000
 - \$250–\$500
 - \$100–\$250
 - \$50–\$100
 - < \$50
- With respect to lifing characteristics, we classified the summarized data for intangibles as either definite- or indefinite-lived assets.
- It should be noted that the indefinite-lived assets exclude IPR&D, which must be recorded as such per ASC 805. IPR&D was considered as definite-lived assets in the 2017 Study.
 - Per ASC 805, IPR&D is not amortized, as it is not yet ready for use. It is tested annually for impairment (or when there are indicators of impairment) until the asset is either abandoned or put to use in the operations as a product, at which time the acquirer estimates the useful life of the asset.

Allocation of Intangible Assets vs. Goodwill

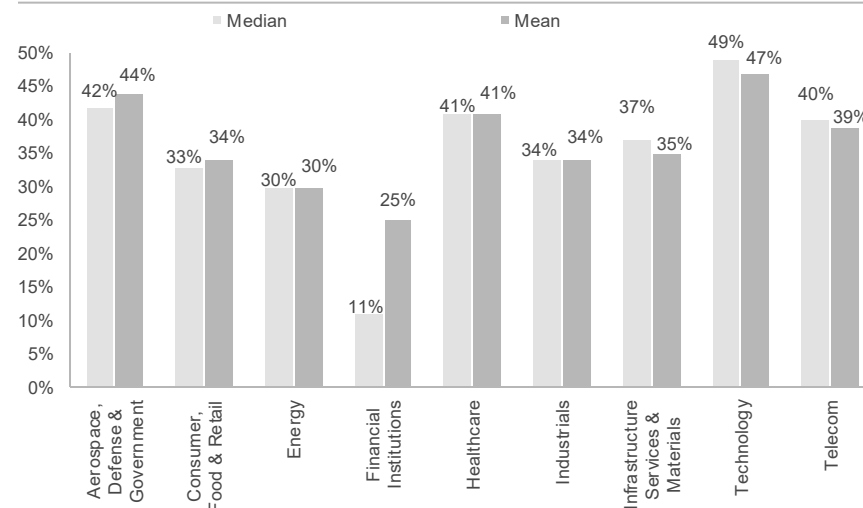
Summary Allocation Percentages 2017 Study

- The median allocation of PC to intangible assets in 2017 and 2016 was 35% and 33%, respectively.
- The median allocation of PC to goodwill in 2017 and 2016 was 40% and 36%, respectively.
- Industries with intangible assets and goodwill percentage below the mean and median include:
 - Energy and telecom, due to significance of fixed assets
 - Financial institutions, due to significance of financial assets
- Conversely, technology is the primary sector driving up the overall mean and median percentages for intangible assets and goodwill.

Intangible Assets as % of Purchase Consideration



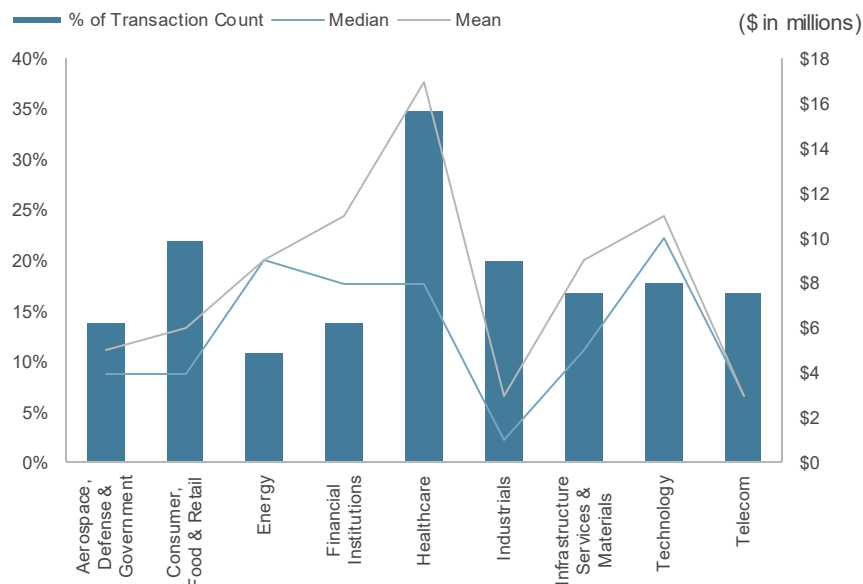
Goodwill as % of Purchase Consideration



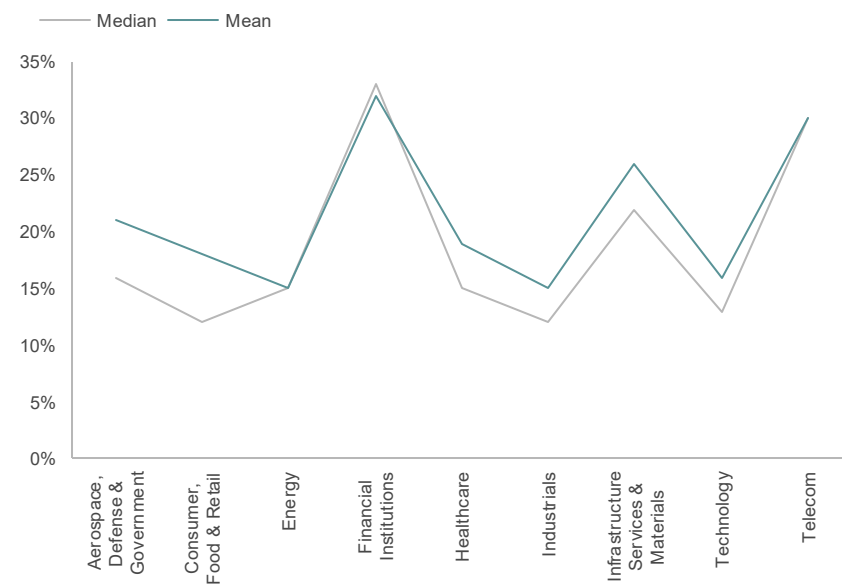
Contingent Consideration

- Per ASC 805, CC is classified as an asset, liability, or equity and measured at fair value on the acquisition date.⁽¹⁾ CC is included in PC.
- Approximately 21% of the transactions in the 2017 Study had CC in the purchase price, up from 19% of transactions in the 2016 Study.
- CC represented 14% and 18% of PC when measured on the median and mean, respectively. CC represented 14% and 19% of PC when measured on the median and mean, respectively, in the 2016 Study.

CC Amount and as % of Transaction Count



CC as % of Purchase Consideration



- Transaction-related contingent compensation and retention bonuses are not included in PC. These employee compensation expense items are generally accounted for under ASC 718.
- Over the past few years, we have observed increased scrutiny from auditors when reviewing the valuation of CC. Specifically, as CC terms have become more complex, auditors have generally shifted from accepting scenario-based valuation methodologies to preferring simulation-based valuation methodologies (i.e., Monte Carlo simulations).

(1) Thereafter, CC classified as an asset or liability is remeasured to fair value each reporting period, with changes recorded in earnings. CC classified as equity is not remeasured.

2017 Observations and Results

Transaction Volume

- Final results indicate that the U.S. economy expanded during the fourth quarter of 2017, as GDP, the value of all goods and services in the U.S., increased at an annualized rate of 2.9%. This follows an annualized increase in GDP of 3.2% recorded in the third quarter of 2017. The increase in real GDP growth in the fourth quarter reflected increases in personal consumption expenditures and gross private domestic investment.⁽¹⁾
- The number of transactions with sufficient disclosures for analysis decreased 11% year over year, from 455 in 2016 to 404 in 2017.
- Our initial screening generated a population of 1,266 transactions. Of these deals, 862 transactions were not considered for the following two reasons:
 - Financial statements did not present intangible asset values and/or PC information in a clear, reconcilable format for our purposes.
 - The general asset and liability segmentation was insufficient for us to determine the nature of the intangible assets acquired.
- The number of initial transactions decreased 4% year over year, from 1,313 in 2016 to 1,266 in 2017.
- The number of transactions with sufficient disclosures decreased to 32% in 2017 from 35% in 2016.

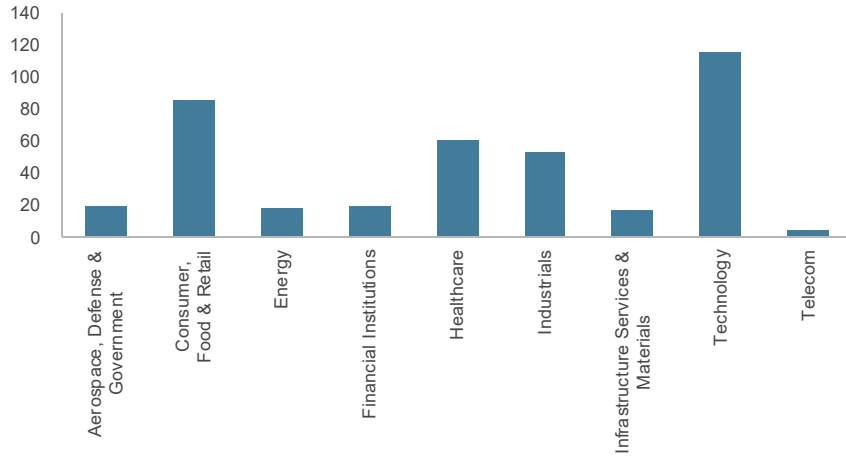
(1) Bureau of Economic Analysis, March 28, 2018, pp. 6, 8.

Industry Results

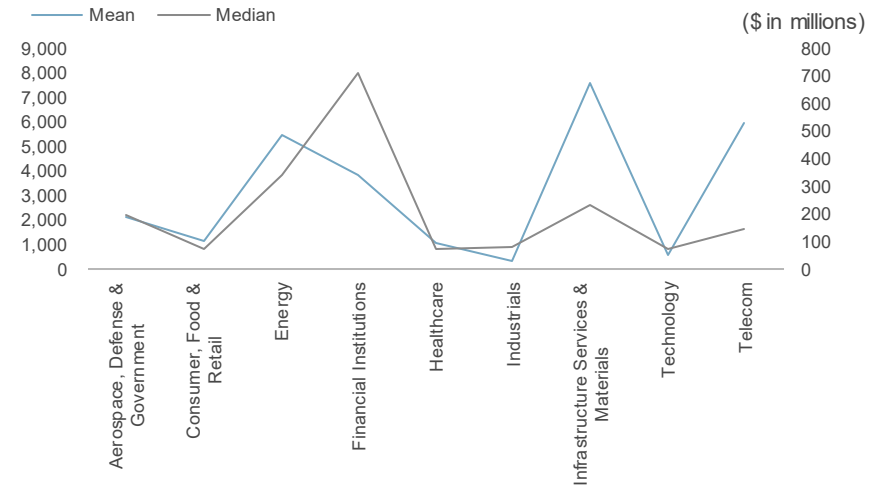
- Five of the nine industries experienced year-over-year declines in the number of transactions available for the 2017 Study relative to the 2016 Study.
 - Energy had the largest percentage increase, up 138% or 11 transactions, while financial institutions had the largest percentage decrease, down 68% or 44 transactions, from the previous year.
- When measured across all industries, the median percentage of PC allocated to identifiable intangible assets increased slightly, from 33% in 2016 to 35% in 2017. Three out of the nine industries showed only a small change (i.e., 5% or less) in the median amount of PC allocated to identifiable intangible assets compared with 2016.
 - Financial institutions recorded the largest percentage increase of 17% for PC allocated to identifiable intangible assets.
 - Energy recorded the largest percentage decrease out of all industries at 18% for PC allocated to identifiable intangible assets.
- The median percentage of PC allocated to goodwill increased slightly to 40% in 2017 from 36% in 2016.
 - Telecom represented the highest percentage increase in goodwill allocation at 18% year over year.

Industry Results (cont.)

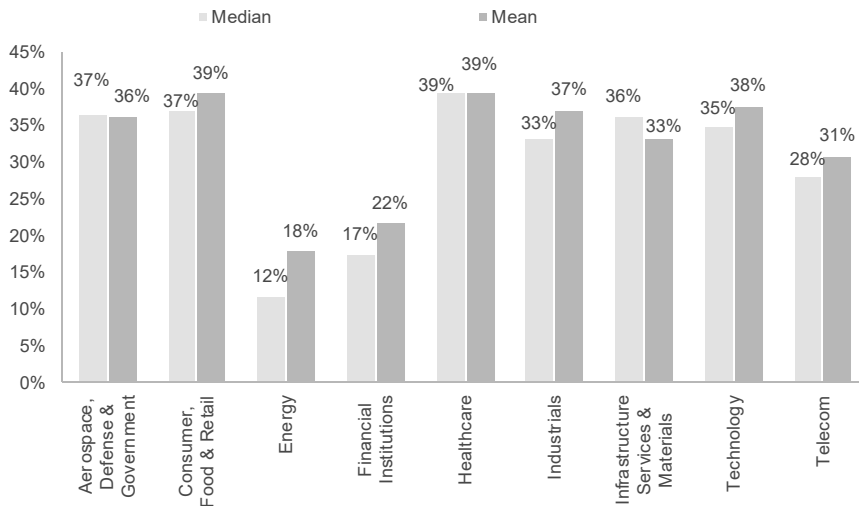
Transaction Count



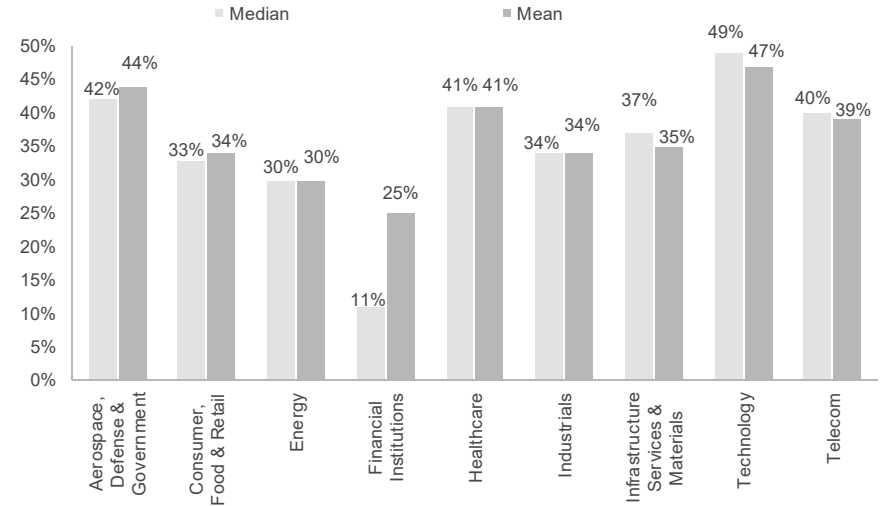
Purchase Consideration



Intangible Assets as % of Purchase Consideration



Goodwill as % of Purchase Consideration



Industry Results (cont.)

Summary Allocation Percentages by Industry 2017 vs. 2016

\$ in millions

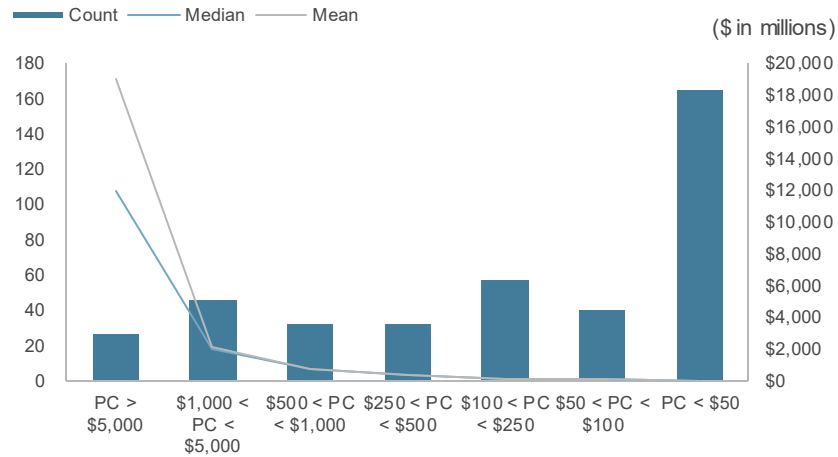
	Count			Median Results								
				Purchase Consideration			Intangible Assets, % of PC			Goodwill, % of PC		
	2017	2016	% Chg.	2017	2016	% Chg.	2017	2016	BPS Chg.	2017	2016	BPS Chg.
All Industries	404	455	-11%	\$95	\$131	-27%	35%	33%	2%	40%	36%	3%
Aerospace, Defense & Government	21	26	-19%	199	244	-18%	37%	29%	7%	42%	37%	5%
Consumer, Food & Retail	86	74	16%	78	98	-20%	37%	36%	1%	33%	35%	-2%
Energy	19	8	138%	345	269	28%	12%	30%	-18%	30%	34%	-4%
Financial Institutions	21	65	-68%	716	561	28%	17%	1%	17%	11%	5%	6%
Healthcare	62	91	-32%	77	57	35%	39%	50%	-11%	41%	37%	4%
Industrials	54	48	13%	82	110	-26%	33%	33%	1%	34%	45%	-11%
Infrastructure Services & Materials	18	20	-10%	234	146	60%	36%	28%	8%	37%	28%	9%
Technology	117	116	1%	75	60	26%	35%	35%	0%	49%	50%	0%
Telecom	6	7	-14%	147	495	-70%	28%	48%	-20%	40%	22%	18%

Transaction Size

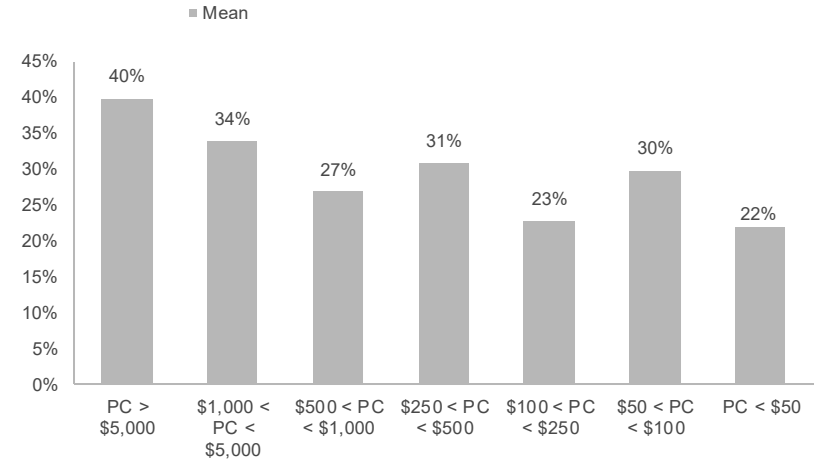
- Approximately 66% of the transactions in the 2017 Study had PC below \$250 million, which is an increase when compared with the 62% of 2016.
- Larger transactions generally recorded lower allocations to intangible assets and higher allocations to goodwill in 2017.
 - For transactions with PC below \$250 million, intangible assets and goodwill averaged 38% and 37% of PC, respectively. In 2016, the corresponding percentages of allocation to intangible assets and goodwill were each at 37%.
 - For transactions with PC above \$250 million, intangible assets and goodwill averaged 29% and 38% of PC, respectively. In 2016, the corresponding percentages of allocation to intangible assets and goodwill were 27% and 32%, respectively.
- From 2016 to 2017, the average transaction size increased from \$1,423 million to \$1,648 million, and the median transaction size decreased from \$131 million to \$95 million.

Transaction Size (cont.)

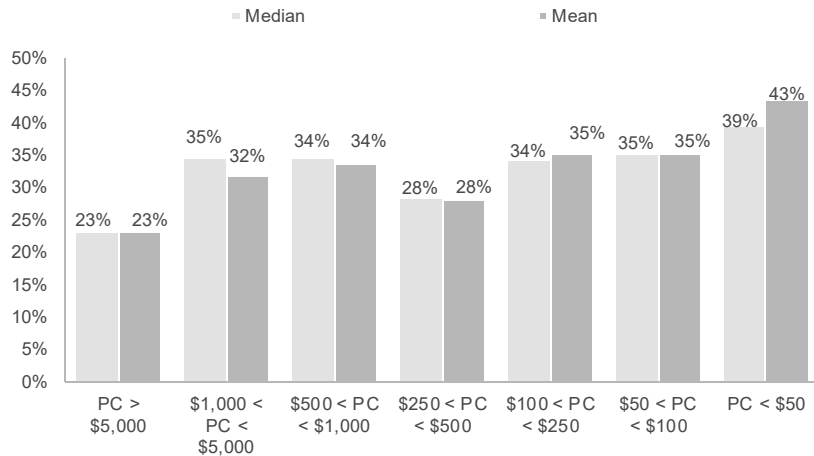
Transaction Count and Purchase Consideration



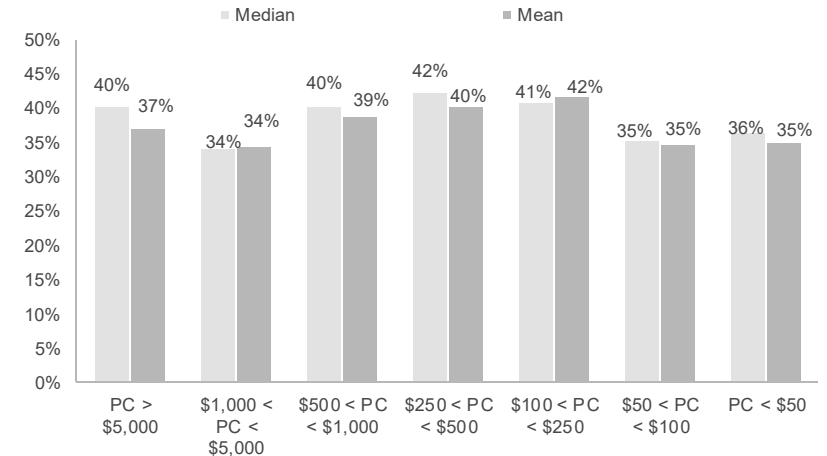
Tangible Assets as % of Purchase Consideration



Intangible Assets as % of Purchase Consideration



Goodwill as % of Purchase Consideration



Transaction Size (cont.)

Summary Allocation Percentages by Size 2017 vs. 2016

\$ in millions

	Count			Median Goodwill, % of PC		
	2017	2016	% Chg.	2017	2016	% Chg.
All Transactions	404	455	-11%	40%	36%	9%
PC > \$5,000	27	22	23%	40%	39%	4%
\$1,000 < PC < \$5,000	46	54	-15%	34%	34%	0%
\$500 < PC < \$1,000	33	40	-18%	40%	13%	203%
\$250 < PC < \$500	33	58	-43%	42%	35%	21%
\$100 < PC < \$250	58	74	-22%	41%	37%	10%
\$50 < PC < \$100	41	42	-2%	35%	40%	-12%
PC < \$50	166	165	1%	36%	37%	-2%

Indefinite-Lived Intangible Assets

- Indefinite-lived intangible assets accounted for approximately 12% of the total intangible asset value in 2017, as compared with 13% in 2016.
- Trademarks and trade names were the most common intangible assets to be considered indefinite lived.
 - In 2017, the number of transactions in the sample that ascribed PC to trademarks and trade names increased from 49% to 65%.
 - Acquirers considered 22% of the purchased trademarks and trade names to be indefinite-lived assets in 2017, as compared with 23% in the previous two years.
- Other intangible assets classified as indefinite lived included (but are not limited to) license agreements, franchise licenses, artistic-related assets, and content/databases.

Trademark and Trade Name Lifting Classification 2015–2017

Trademarks and Trade Names	2017		2016		2015	
	Count	% of Total	Count	% of Total	Count	% of Total
All Indefinite-Lived	57	22%	52	23%	65	23%
All Definite-Lived	206	78%	178	77%	216	77%
Mix of Definite- and Indefinite-Lived	0	0%	0	0%	0	0%
Total	263	100%	230	100%	281	100%

Indefinite-Lived Intangible Assets (cont.)

- The following are noteworthy transactions with the largest portions of indefinite-lived intangible assets:

Top 10 Transactions by Dollar Allocation to Indefinite-Lived Assets 2017

\$ in millions

Date	Acquirer	Target	Purchase Consideration	Total \$ Amount of Indefinite Lived Assets	Total % Allocated to Indefinite Lived Assets	Total % Allocated to Intangible Assets	Primary Indefinite Lived Asset
8/31/2017	DowDuPont Inc. (NYSE:DWDP)	E. I. du Pont de Nemours and Company	\$115,901	\$4,862	4%	23%	Trademark & Trade Name
4/12/2017	Danone SA (ENXTPA:BN)	The WhiteWave Foods Company	\$14,762	\$3,186	22%	23%	Trademark & Trade Name
8/17/2017	McCormick & Company, Incorporated (NYSE:MKC)	French's Food companies and Tigers Milk LLC	\$5,285	\$2,475	47%	49%	Trademark & Trade Name
10/6/2017	Caesars Entertainment Corporation (NasdaqGS:CZR)	Caesars Acquisition Company	\$12,164	\$1,124	9%	10%	Trademark & Trade Name
2/28/2017	Cboe Global Markets, Inc. (NasdaqGS:CBOE)	BATS Global Markets, Inc.	\$5,018	\$840	17%	40%	Trademark & Trade Name
6/1/2017	The Sherwin-Williams Company (NYSE:SHW)	The Valspar Corporation	\$14,218	\$776	5%	41%	Trademark & Trade Name
12/29/2017	Qurate Retail Group, Inc. (NasdaqGS:QRTE.A)	HSN, Inc.	\$3,216	\$676	21%	40%	Trademark & Trade Name
8/7/2017	Church & Dwight Co., Inc. (NYSE:CHD)	PIK Holdings, Inc.	\$1,339	\$645	48%	59%	Trademark & Trade Name
9/8/2017	Knight-Swift Transportation Holdings Inc. (NYSE:KNX)	Swift Transportation Company	\$6,423	\$635	10%	23%	Trademark & Trade Name
2/9/2017	Symantec Corporation (NasdaqGS:SYMC)	LifeLock, Inc.	\$2,853	\$583	20%	44%	Trademark & Trade Name

Frequently Identified Intangible Assets

- Developed technology, trademarks and trade names, IPR&D, and customer-related assets were the most commonly identified intangible assets. Other intangible assets typically included, among others, non-compete agreements, licenses, permits, and other contracts or agreements.
- Developed technology, customer-related assets as well as trademarks and trade names recorded increases in the frequency of identification from 2016 to 2017.
- With respect to the amount of PC allocated to each of these categories from 2016 to 2017, developed technology remained constant, while customer-related assets increased and IPR&D as well as trademarks and trade names decreased.

Frequently Identified Intangible Assets 2015–2017

	Count, % of Sample			Median % of PC		
	2017	2016	2015	2017	2016	2015
Developed Technology	51%	49%	44%	11%	11%	12%
<i>Change</i>	3%	5%	4%	0%	-1%	3%
IPR&D	7%	12%	10%	4%	6%	15%
<i>Change</i>	-4%	2%	3%	-2%	-9%	9%
Customer-Related Assets	79%	69%	69%	19%	18%	18%
<i>Change</i>	10%	0%	10%	1%	0%	4%
Trademarks and Trade Names	65%	49%	50%	3%	4%	4%
<i>Change</i>	16%	-1%	5%	0%	0%	0%

Aerospace, Defense & Government

- In the 2017 Study, 21 transactions were observed that allocated PC to intangible assets or goodwill within the ADG industry, down from 26 transactions in the 2016 Study.
- Within the ADG industry, customer-related assets were allocated the highest percentage of PC to any identifiable intangible asset, with 22% and 25% of PC being allocated to this asset on a median and mean basis, respectively.
- The second highest percentage of PC allocated to any identifiable intangible asset in the ADG industry was developed technology, with 10% and 12% of PC allocated to these assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (ADG) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	15	71%	\$267	\$2,618	1%	36%	10%	12%
IPR&D	2	10%	180	180	0%	4%	2%	2%
Trademarks and Trade Names	9	43%	176	1,057	1%	29%	2%	7%
Customer-Related Assets	18	86%	187	2,441	4%	95%	22%	25%
Other Identifiable Intangible Assets	8	38%	410	3,846	0%	37%	1%	7%
Goodwill	20	95%	233	2,264	15%	80%	42%	44%

- Notable transaction activity in this industry included the following:

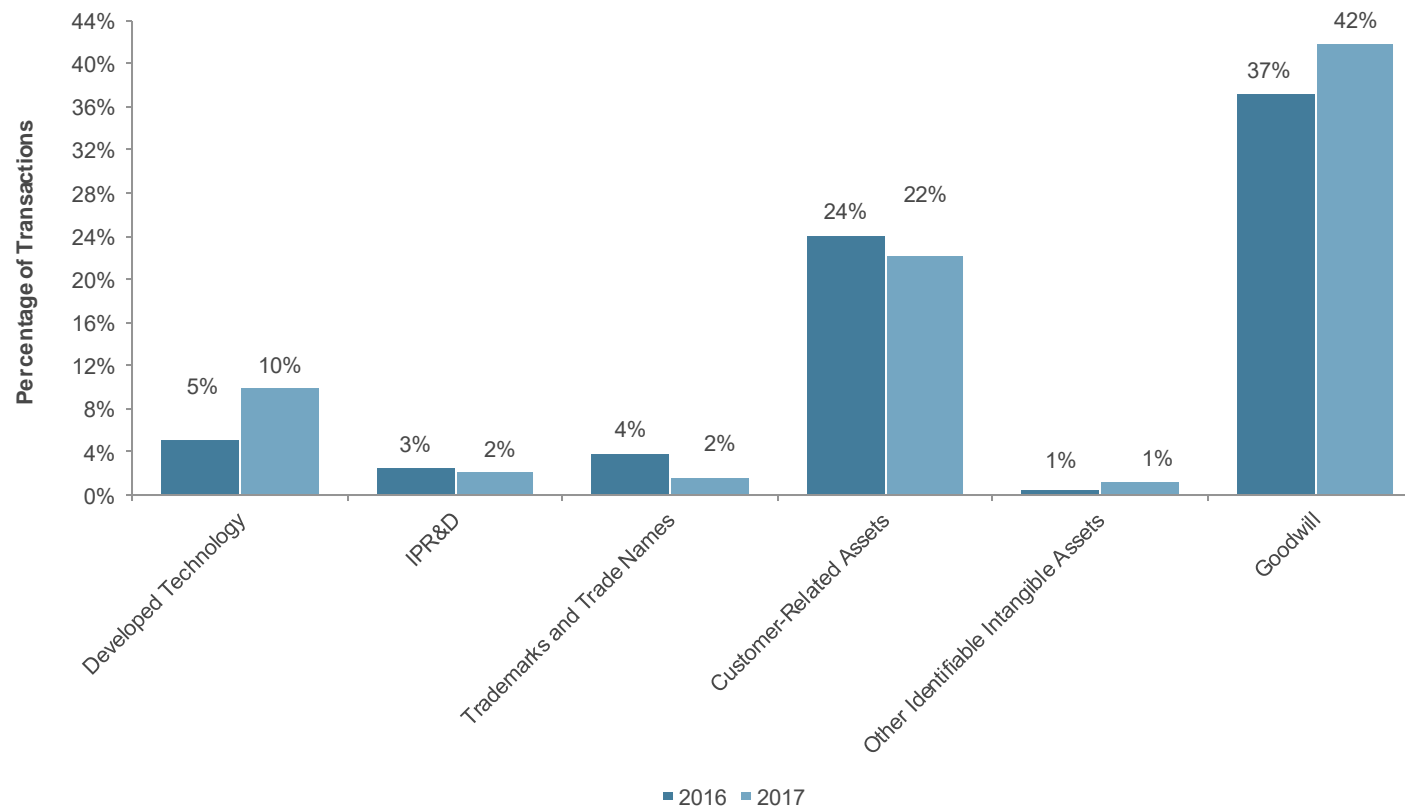
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
3/31/2017	DXC Technology Company (NYSE:DXC)	Everett Spinco, Inc.	\$23,498	27%
4/13/2017	Rockwell Collins, Inc. (NYSE:COL)	B/E Aerospace, Inc.	\$10,293	15%
10/20/2017	H.B. Fuller Company (NYSE:FUL)	Royal Adhesives & Sealants, LLC	\$1,969	39%
12/11/2017	CIRCOR International, Inc. (NYSE:CIR)	Fluid Handling Business	\$1,079	36%
12/15/2017	Jacobs Engineering Group Inc. (NYSE:JEC)	CH2M HILL Companies, Ltd.	\$5,395	11%

Aerospace, Defense & Government (cont.)

- As illustrated below, PC allocations to both developed technology and goodwill changed by 5% or more from the 2016 Study to the 2017 Study.
- In the 2017 Study, goodwill continued to receive the highest allocation among any intangible asset, with 42% of PC within the ADG industry being allocated to goodwill on a median basis, up from 37% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Consumer, Food & Retail

- In the 2017 Study, 86 transactions were observed that allocated PC to intangible assets or goodwill within the CFR industry, up from 74 transactions in the 2016 Study.
- 12% and 20% of PC were allocated to trademarks and trade names on a median and mean basis, respectively.
- 16% and 17% of PC were allocated to customer-related assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (CFR) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	21	24%	\$52	\$569	0%	100%	6%	15%
Trademarks and Trade Names	73	85%	83	1,073	0%	99%	12%	20%
Customer-Related Assets	59	69%	115	1,022	1%	55%	16%	17%
Other Identifiable Intangible Assets	48	56%	45	1,034	0%	79%	3%	12%
Goodwill	79	92%	88	1,242	3%	88%	33%	34%

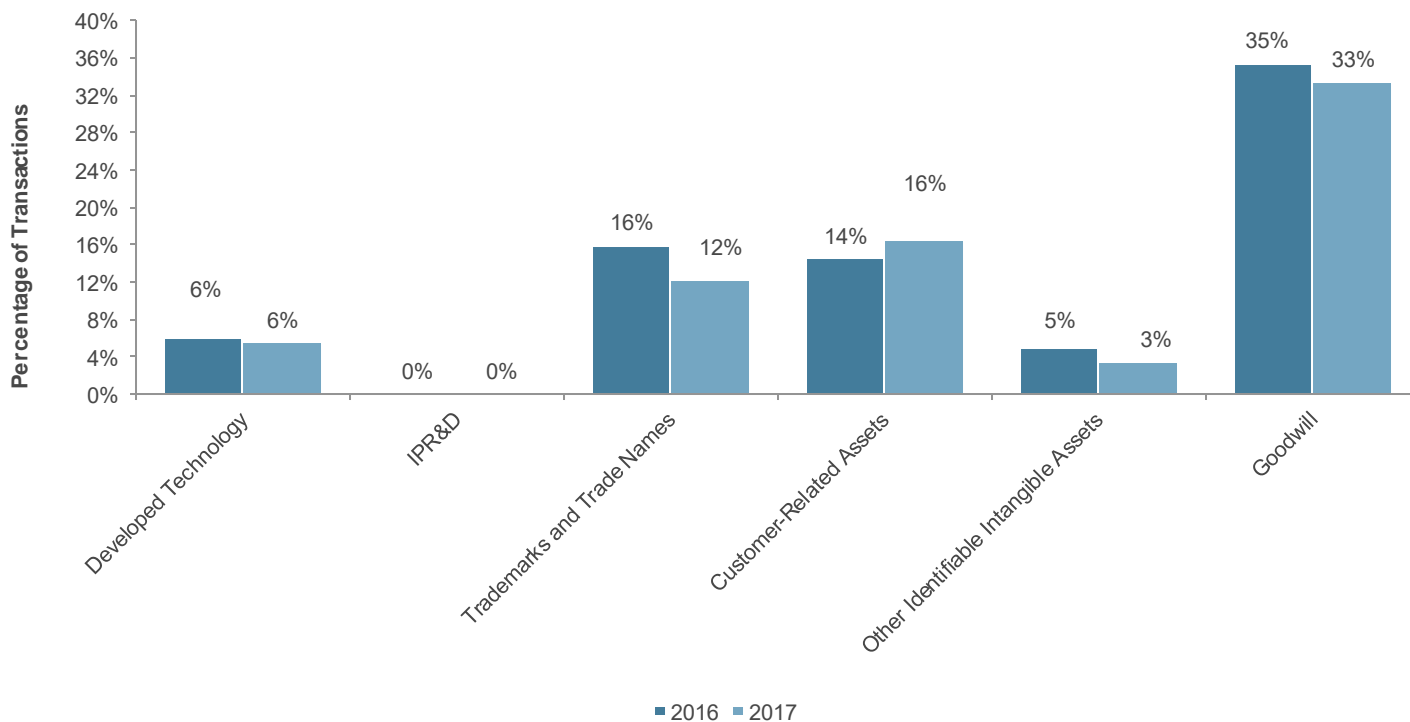
- Notable transaction activity in this industry included the following:

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
4/12/2017	Danone SA (ENXTPA:BN)	The WhiteWave Foods Company	\$14,762	23%
8/7/2017	Church & Dwight Co., Inc. (NYSE:CHD)	PIK Holdings, Inc.	\$1,339	59%
8/17/2017	McCormick & Company, Incorporated (NYSE:MKC)	French's Food companies and Tigers Milk LLC	\$5,285	49%
10/6/2017	Caesars Entertainment Corporation (NasdaqGS:CZR)	Caesars Acquisition Company	\$12,164	10%
12/29/2017	Qurate Retail Group, Inc. (NasdaqGS:QRTE.A)	HSN, Inc.	\$3,216	40%

Consumer, Food & Retail (cont.)

- As illustrated below, there have not been material changes (+/- 5% or more) in the allocation percentage to any particular intangible asset from the 2016 Study to the 2017 Study.
- In the 2017 Study, goodwill continued to receive the highest allocation among any intangible asset, with 33% of PC within the CFR industry being allocated to goodwill on a median basis, down from 35% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Energy

- In the 2017 Study, 19 transactions were observed that allocated PC to intangible assets or goodwill within the energy industry, up from eight transactions in the 2016 Study.
- Within the energy industry, customer-related assets were allocated the highest percentage of PC to any identifiable intangible asset, with 11% and 16% of PC being allocated to this asset on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (Energy) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	4	21%	\$6,229	\$18,729	0%	16%	5%	7%
Trademarks and Trade Names	8	42%	619	3,111	0%	6%	4%	3%
Customer-Related Assets	16	84%	337	5,783	1%	76%	11%	16%
Other Identifiable Intangible Assets	9	47%	1,968	9,828	0%	13%	2%	3%
Goodwill	18	95%	440	5,773	5%	59%	30%	30%

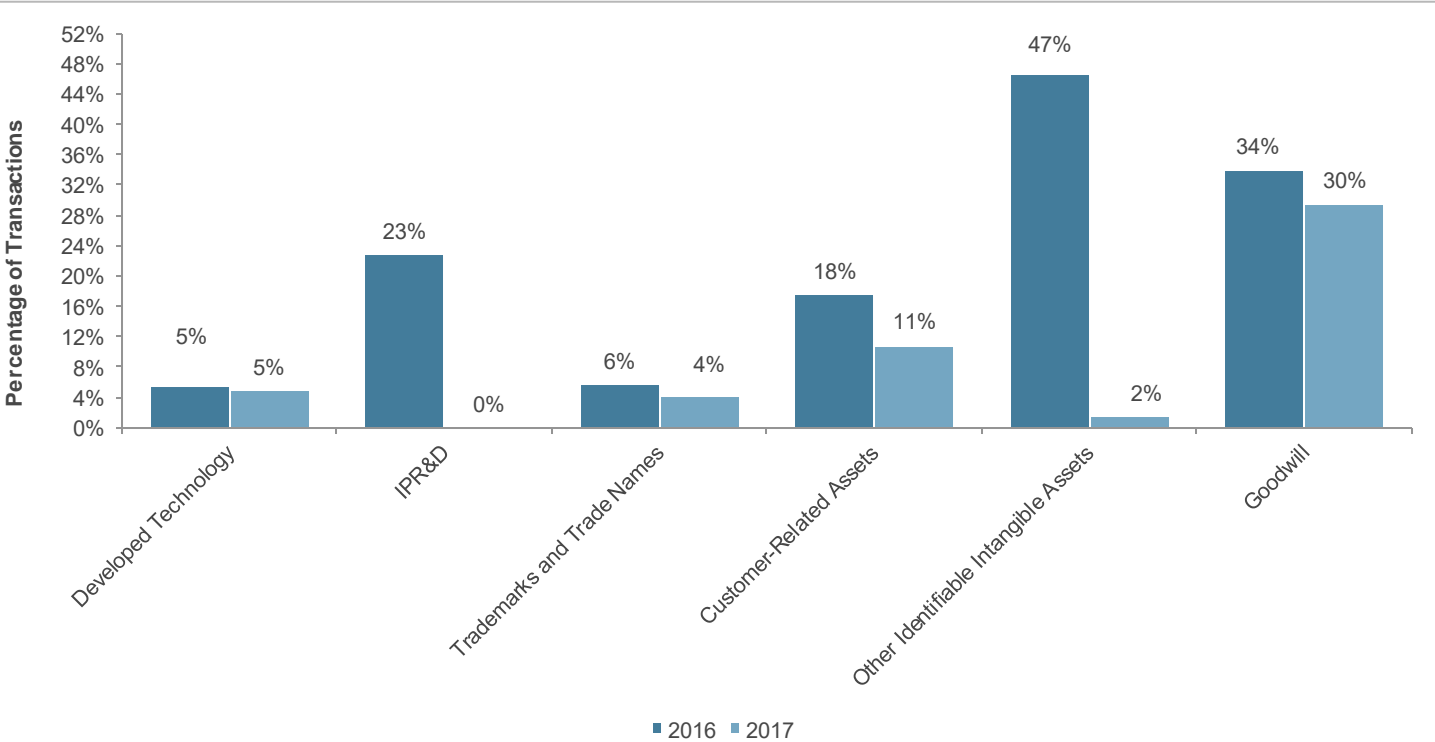
- Notable transaction activity in this industry included the following:

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
1/16/2017	TechnipFMC plc (NYSE:FTI)	FMC Technologies, Inc.	\$11,925	12%
2/27/2017	Enbridge Inc. (TSX:ENB)	Spectra Energy Corp	\$62,158	2%
6/1/2017	Andeavor (NYSE:ANDV)	Western Refining, Inc.	\$8,578	4%
6/30/2017	Delek US Holdings, Inc. (NYSE:DK)	Alon USA Energy, Inc.	\$2,804	3%
11/13/2017	EQT Corporation (NYSE:EQT)	Rice Energy Inc.	\$11,675	6%

Energy (cont.)

- As illustrated below, PC allocations to IPR&D, customer-related assets, and other identifiable intangible assets all changed by 5% or more from the 2016 Study to the 2017 Study.
- Goodwill had the largest allocation of PC, with 30% of PC allocated to goodwill in the 2017 Study, down from 34% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Financial Institutions

- In the 2017 Study, 21 transactions were observed that allocated PC to intangible assets or goodwill within the financial institutions industry, down from 65 transactions in the 2016 Study.
- Within the financial institutions industry, customer-related assets were allocated the highest percentage of PC to any identifiable intangible asset included in the 2017 Study, with 19% and 17% of PC being allocated to this asset on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (Financial Institutions) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	7	33%	\$4,368	\$4,338	0%	27%	1%	6%
Trademarks and Trade Names	15	71%	786	5,036	0%	4%	1%	1%
Customer-Related Assets	19	90%	716	2,699	0%	38%	19%	17%
Other Identifiable Intangible Assets	13	62%	1,135	5,059	0%	40%	1%	5%
Goodwill	21	100%	716	3,870	2%	57%	11%	25%

- Notable transaction activity in this industry included the following:

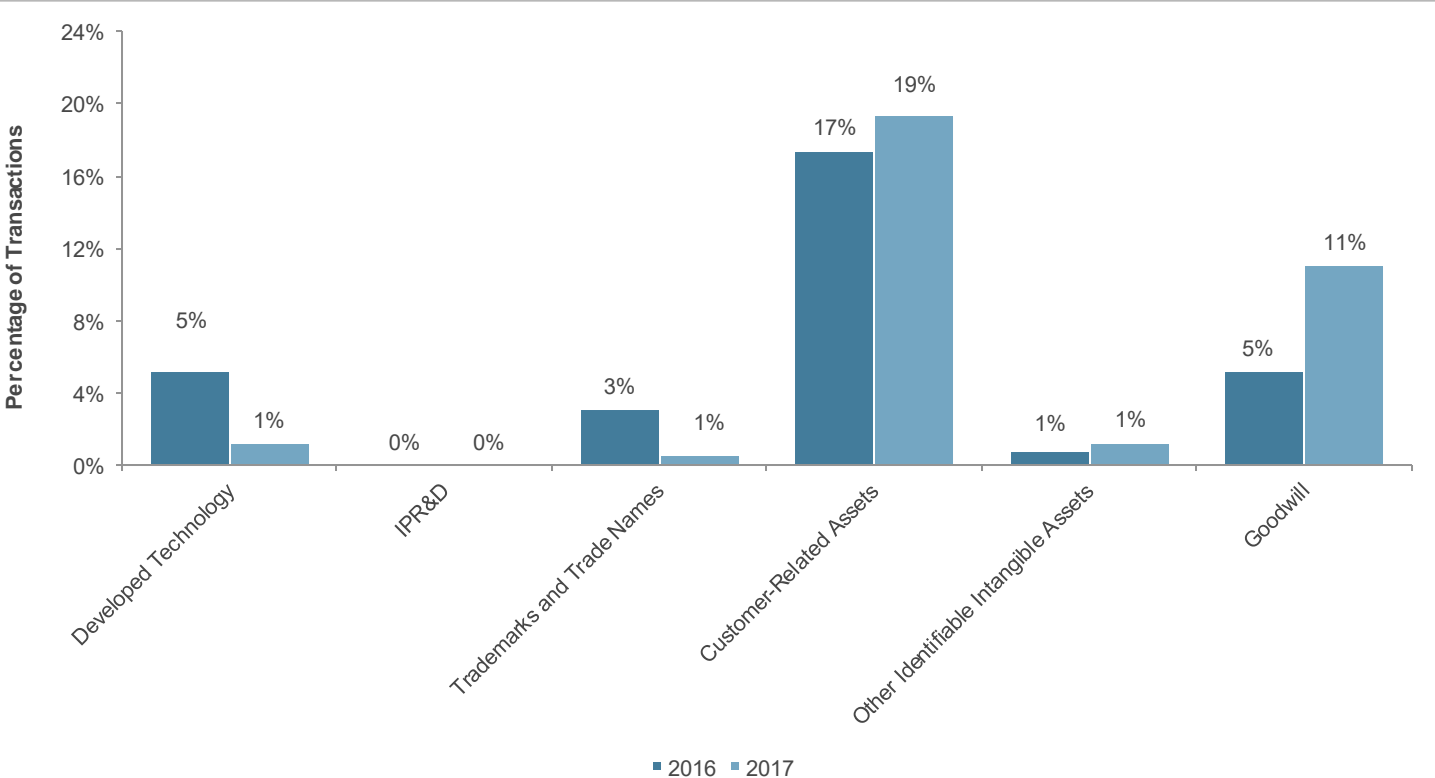
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
2/28/2017	Cboe Global Markets, Inc. (NasdaqGS:CBOE)	BATS Global Markets, Inc.	\$5,018	40%
5/1/2017	Cable One, Inc. (NYSE:CABO)	Rural Broadband Investments, LLC	\$786	61%
7/20/2017	Virtu Financial, Inc. (NasdaqGS:VIRT)	Virtu Americas	\$5,432	3%
11/17/2017	Markel Corporation (NYSE:MKL)	State National Companies, Inc.	\$4,368	9%
11/30/2017	FGL Holdings (NYSE:FG)	Fidelity & Guaranty Life	\$29,497	3%

Financial Institutions (cont.)

- As illustrated below, goodwill experienced a material change (+/- 5% or more) in the allocation of PC from the 2016 Study to the 2017 Study, with PC allocation increasing from 5% in the 2016 Study to 11% in the 2017 Study.
- In the 2017 Study, developed technology was allocated 1% of PC on a median basis, down from 5% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Healthcare

- In the 2017 Study, 62 transactions were observed that allocated PC to intangible assets or goodwill within the healthcare industry, down from 91 transactions in the 2016 Study.
- Within the healthcare industry, IPR&D was allocated the highest percentage of PC to any identifiable intangible asset, with 27% and 33% of PC being allocated to this asset on a median and mean basis, respectively.
- The second highest percentage of PC allocated to any identifiable intangible asset in the healthcare industry was developed technology, with 20% and 29% of PC allocated to these assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (Healthcare) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	37	60%	\$53	\$1,426	0%	100%	20%	29%
IPR&D	13	21%	134	629	0%	90%	27%	33%
Trademarks and Trade Names	35	56%	91	929	0%	51%	4%	5%
Customer-Related Assets	44	71%	99	1,532	1%	55%	19%	19%
Other Identifiable Intangible Assets	28	45%	63	286	0%	40%	2%	2%
Goodwill	57	92%	91	1,218	0%	86%	41%	41%

- Notable transaction activity in this industry included the following:

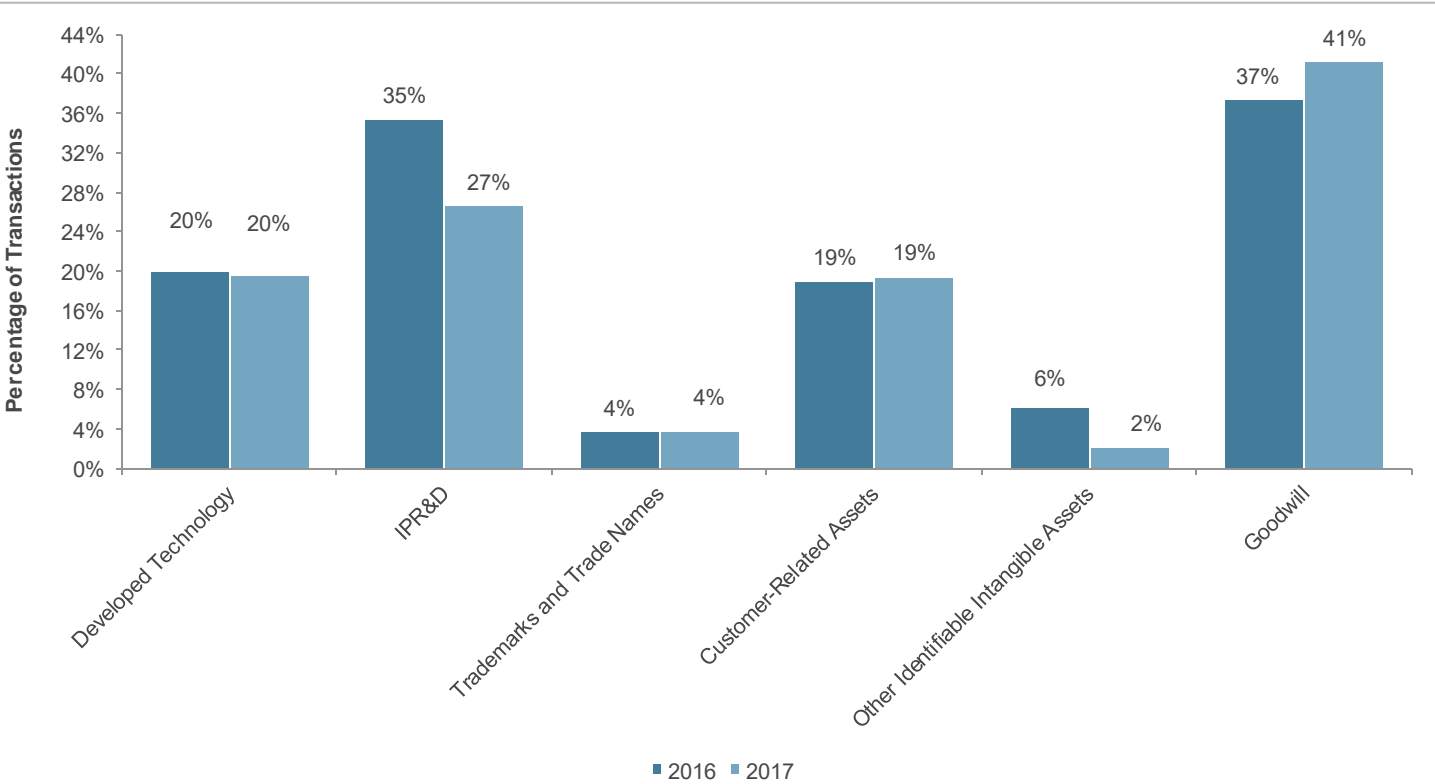
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
10/2/2017	Integra LifeSciences Holdings Corporation (NasdaqGS:IART)	DePuy Synthes, Inc., Codman Neurosurgery Business	\$1,036	52%
11/7/2017	Ultragenyx Pharmaceutical Inc. (NasdaqGS:RARE)	Dimension Therapeutics, Inc.	\$227	63%
9/25/2017	Mallinckrodt Public Limited Company (NYSE:MNK)	Infacare Pharmaceutical Corporation	\$126	90%
5/2/2017	LivaNova PLC (NasdaqGS:LIVN)	Caisson Interventional, LLC	\$134	67%
12/1/2017	Edwards Lifesciences Corporation (NYSE:EW)	Harpoon Medical, Inc.	\$199	27%

Healthcare (cont.)

- As illustrated below, PC allocation to IPR&D was the only asset to change by more than 5% from the 2016 Study to the 2017 Study within the healthcare industry. Specifically, PC allocation to IPR&D decreased from 35% of PC in the 2016 Study to 27% of PC in the 2017 Study.
- In the 2017 Study, goodwill received the highest allocation of PC among any intangible asset, with 41% of PC being allocated to goodwill on a median basis, which is up from 37% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Industrials

- In the 2017 Study, 54 transactions were observed that allocated PC to intangible assets or goodwill within the industrials industry, up from 48 transactions in the 2016 Study.
- Within the industrials industry, IPR&D was allocated the highest percentage of PC to any identifiable intangible asset, with 39% of PC being allocated to this asset on a median and mean basis. However, it should be noted that there was only a single transaction that allocated PC to IPR&D.
- The second highest percentage of PC allocated to any identifiable intangible asset in the industrials industry was customer-related assets, with 25% and 27% of PC allocated to these assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (Industrials) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	13	24%	\$48	\$281	0%	14%	2%	4%
IPR&D	1	2%	321	321	39%	39%	39%	39%
Trademarks and Trade Names	42	78%	91	445	0%	42%	5%	8%
Customer-Related Assets	48	89%	76	336	0%	78%	25%	27%
Other Identifiable Intangible Assets	24	44%	91	333	0%	92%	2%	11%
Goodwill	51	94%	98	400	0%	75%	34%	34%

- Notable transaction activity in this industry included the following:

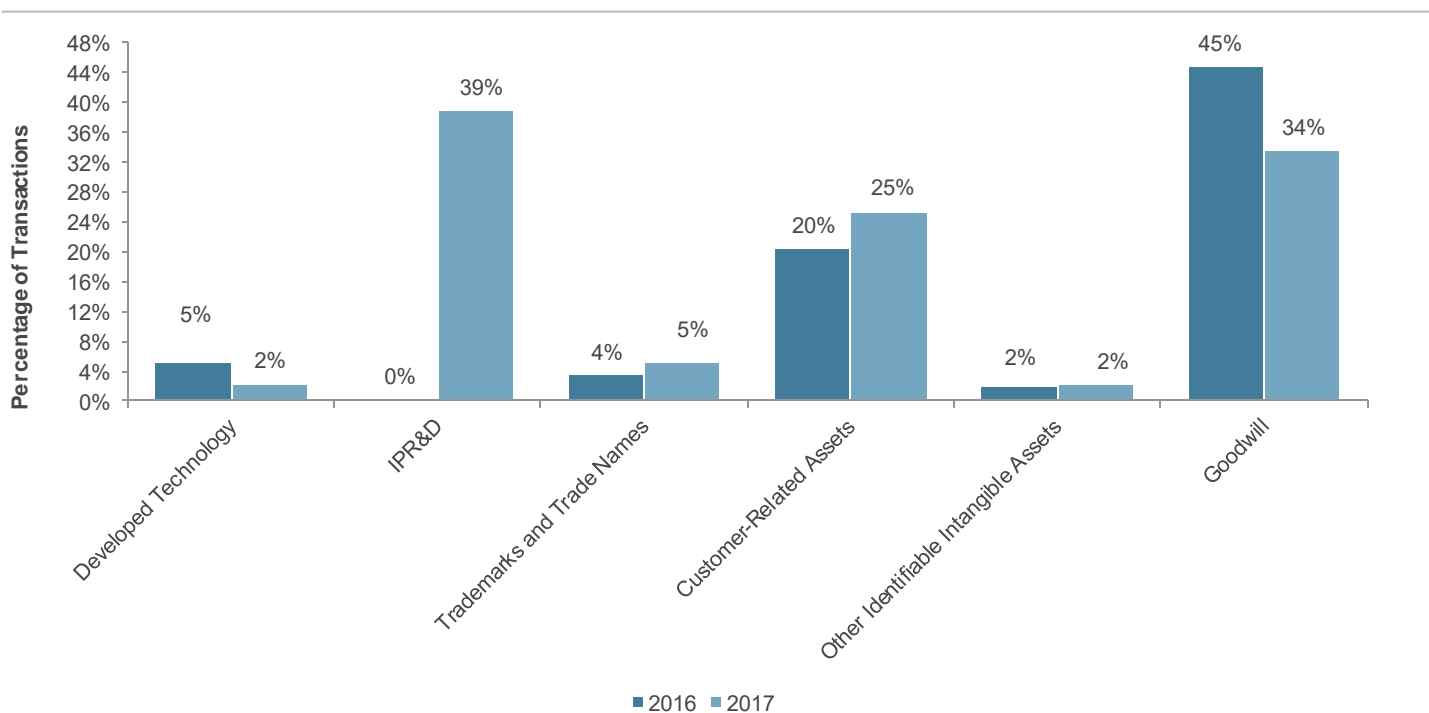
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
4/4/2017	Ag Growth International Inc. (TSX:AFN)	Global Industries, Inc.	\$168	13%
6/2/2017	Federal Signal Corporation (NYSE:FSS)	Truck Bodies & Equipment International, Inc.	\$356	41%
7/5/2017	Kadant Inc. (NYSE:KAI)	NII FPG Company	\$208	35%
9/8/2017	Knight-Swift Transportation Holdings Inc. (NYSE:KNX)	Swift Transportation Company	\$6,423	23%
9/20/2017	Chart Industries, Inc. (NasdaqGS:GTLS)	RCHPH Holdings, Inc.	\$557	38%

Industrials (cont.)

- As illustrated below, PC allocations to IPR&D, customer-related assets, and goodwill all changed by 5% or more from the 2016 Study to the 2017 Study.
- In the 2017 Study, IPR&D received the highest allocation of PC among any intangible asset. As previously mentioned, it should be noted that there was only a single transaction that allocated PC to IPR&D.
- Goodwill received the second highest allocation of PC, with 34% of PC being allocated to this asset on a median basis, down from 45% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Infrastructure Services & Materials

- In the 2017 Study, 18 transactions were observed that allocated PC to intangible assets or goodwill within the infrastructure services & materials industry, down from 20 transactions in the 2016 Study.
- Within the infrastructure services & materials industry, customer-related assets were allocated the highest percentage of PC to any identifiable intangible asset, with 25% and 26% of PC being allocated to this asset on a median and mean basis, respectively.
- The second highest percentage of PC allocated to any identifiable intangible asset in the infrastructure services & materials industry was developed technology, with 8% and 18% of PC allocated to these assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (ISM) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	8	44%	\$99	\$16,360	1%	64%	8%	18%
IPR&D	1	6%	115,901	115,901	1%	1%	1%	1%
Trademarks and Trade Names	10	56%	449	13,515	1%	27%	3%	5%
Customer-Related Assets	14	78%	339	9,793	2%	45%	25%	26%
Other Identifiable Intangible Assets	6	33%	449	19,937	0%	35%	2%	8%
Goodwill	17	94%	274	8,102	0%	71%	37%	35%

- Notable transaction activity in this industry included the following:

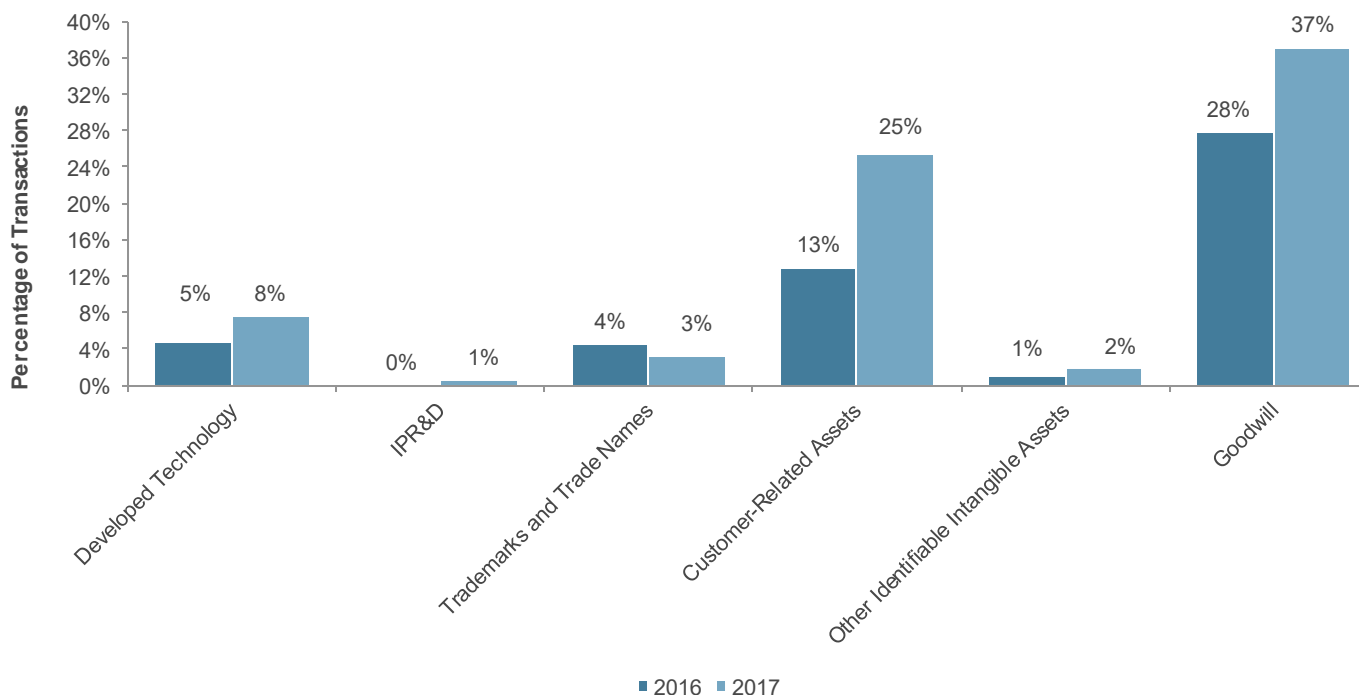
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
6/1/2017	The Sherwin-Williams Company (NYSE:SHW)	The Valspar Corporation	\$14,218	41%
6/6/2017	WestRock Company (NYSE:WRK)	Multi Packaging Solutions International Limited	\$2,392	43%
8/25/2017	DS Smith Plc (LSE:SMDS)	Indevco Management Resources, Inc.	\$1,593	21%
8/31/2017	DowDuPont Inc. (NYSE:DWDP)	E. I. du Pont de Nemours and Company	\$115,901	23%
10/20/2017	H.B. Fuller Company (NYSE:FUL)	Royal Adhesives & Sealants, LLC	\$1,969	39%

Infrastructure Services & Materials (cont.)

- As illustrated below, PC allocation to customer-related assets and goodwill were the only assets to change by more than 5% from the 2016 Study to the 2017 Study within the infrastructure services & materials industry. Specifically, PC allocation to customer-related assets increased from 13% of PC in the 2016 Study to 25% of PC in the 2017 Study. PC allocation to goodwill increased from 28% of PC in the 2016 Study to 37% of PC in the 2017 Study.
- In the 2017 Study, goodwill received the highest allocation of PC among any intangible asset within the infrastructure services & materials industry, with 37% of PC being allocated to goodwill, up from 28% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Technology

- In the 2017 Study, 117 transactions were observed that allocated PC to intangible assets or goodwill within the technology industry, up from 116 transactions in the 2016 Study.
- Within the technology industry, developed technology assets were allocated the highest percentage of PC to any identifiable intangible asset (based on the mean), with 15% and 22% of PC being allocated to this asset on a median and mean basis, respectively.
- The second highest percentage of PC allocated to any identifiable intangible asset in the technology industry was customer-related assets, with 16% and 19% of PC allocated to these assets on a median and mean basis, respectively.

Summary of PC Allocated to Intangible Assets (Technology) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	101	86%	\$85	\$670	1%	100%	15%	22%
IPR&D	13	11%	645	837	0%	29%	3%	6%
Trademarks and Trade Names	69	59%	114	908	0%	20%	1%	3%
Customer-Related Assets	96	82%	93	745	0%	55%	16%	19%
Other Identifiable Intangible Assets	32	27%	75	810	0%	27%	2%	5%
Goodwill	111	95%	85	663	7%	80%	49%	47%

- Notable transaction activity in this industry included the following:

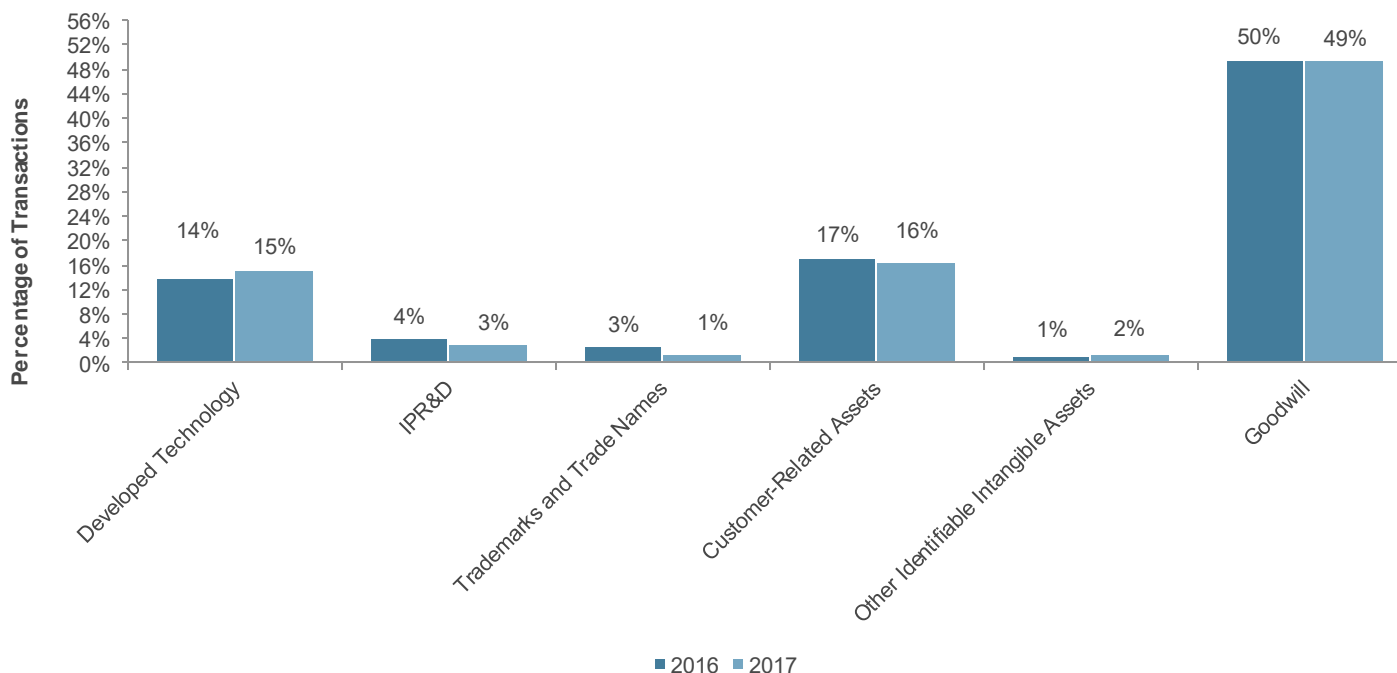
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
4/18/2017	Keysight Technologies, Inc. (NYSE:KEYS)	Ixia	\$2,263	33%
5/26/2017	Veeco Instruments Inc. (NasdaqGS:VECO)	Ultratech, Inc.	\$723	48%
9/29/2017	ANGI Homeservices Inc. (NasdaqGS:ANGI)	Angie's List, Inc.	\$934	34%
11/21/2017	Aptiv PLC (NYSE:APTIV)	nuTonomy Inc.	\$348	29%
12/1/2017	ARRIS International plc (NasdaqGS:ARRS)	Ruckus Wireless, Inc. and ICX Switch Business	\$969	49%

Technology (cont.)

- As illustrated below, there have not been any material changes (+/- 5% or more) in the allocation percentage to any particular intangible asset from the 2016 Study to the 2017 Study.
- In the 2017 Study, goodwill received the highest allocation of PC among any intangible asset within the technology industry, with 49% of PC being allocated to this asset, down from 50% in the 2016 Study.
- Customer-related assets received the second highest allocation of PC among intangible assets, with 16% of PC being allocated to this asset on a median basis, down from 17% in the 2016 Study.

Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Telecom

- In the 2017 Study, six transactions were observed that allocated PC to intangible assets or goodwill within the telecom industry, down from seven transactions in the 2016 Study.
- Within the telecom industry, customer-related assets were allocated the highest percentage of PC to any identifiable intangible asset, with 19% and 23% of PC being allocated to this asset on a median and mean basis, respectively.
- The second highest percentage of PC allocated to any identifiable intangible asset in the telecom industry was developed technology assets, with 13% of PC allocated to these assets on a median and mean basis.

Summary of PC Allocated to Intangible Assets (Telecom) 2017 Study

	Count		PC		% of PC			
	Number	%	Median	Mean	Low	High	Median	Mean
Developed Technology	2	33%	\$141	\$141	4%	22%	13%	13%
Trademarks and Trade Names	2	33%	1,037	1,037	0%	8%	4%	4%
Customer-Related Assets	6	100%	147	5,955	12%	8%	19%	23%
Other Identifiable Intangible Assets	4	67%	913	8,863	0%	13%	1%	4%
Goodwill	6	100%	147	5,955	16%	62%	40%	39%

- Notable transaction activity in this industry included the following:

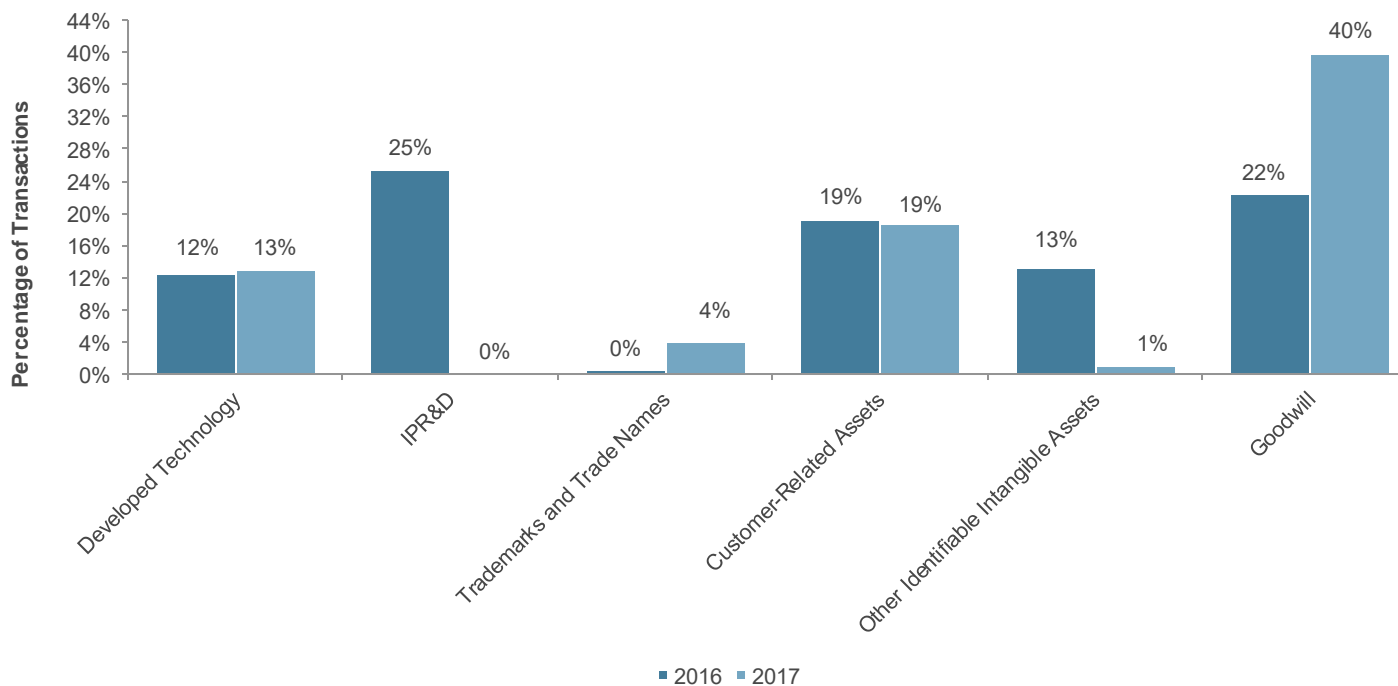
\$ in millions

Date	Acquirer	Target	PC	Total % Allocated to Intangible Assets
7/3/2017	Consolidated Communications Holdings, Inc. (NasdaqGS:CNSL)	Verizon Florida LLC, GTE Southwest Inc. & Verizon CA Inc.	\$1,804	17%
7/28/2017	Windstream Holdings, Inc. (NasdaqGS:WIN)	Broadview Networks Holdings, Inc.	\$271	28%
7/31/2017	Shenandoah Telecommunications Company	Energy Satellite Services, LLC	\$23	57%
9/15/2017	ConvergeOne Holdings, Inc. (NasdaqCM:CVON)	RGTS, Inc.	\$22	21%
11/1/2017	CenturyLink, Inc. (NYSE:CTL)	Level 3 Parent, LLC	\$33,602	28%

Telecom (cont.)

- As illustrated below, there have been material changes (+/- 5% or more) in the allocation percentage of IPR&D, other identifiable intangible assets, and goodwill from the 2016 Study to the 2017 Study. The largest change in PC allocation to intangible assets was observed with IPR&D, which decreased from 25% in the 2016 Study to 0% in the 2017 Study, on a median basis.
- In the 2017 Study, goodwill received the highest allocation of PC among any intangible asset within the telecom industry, with 40% of PC being allocated to this asset, up from 22% in the 2016 Study.

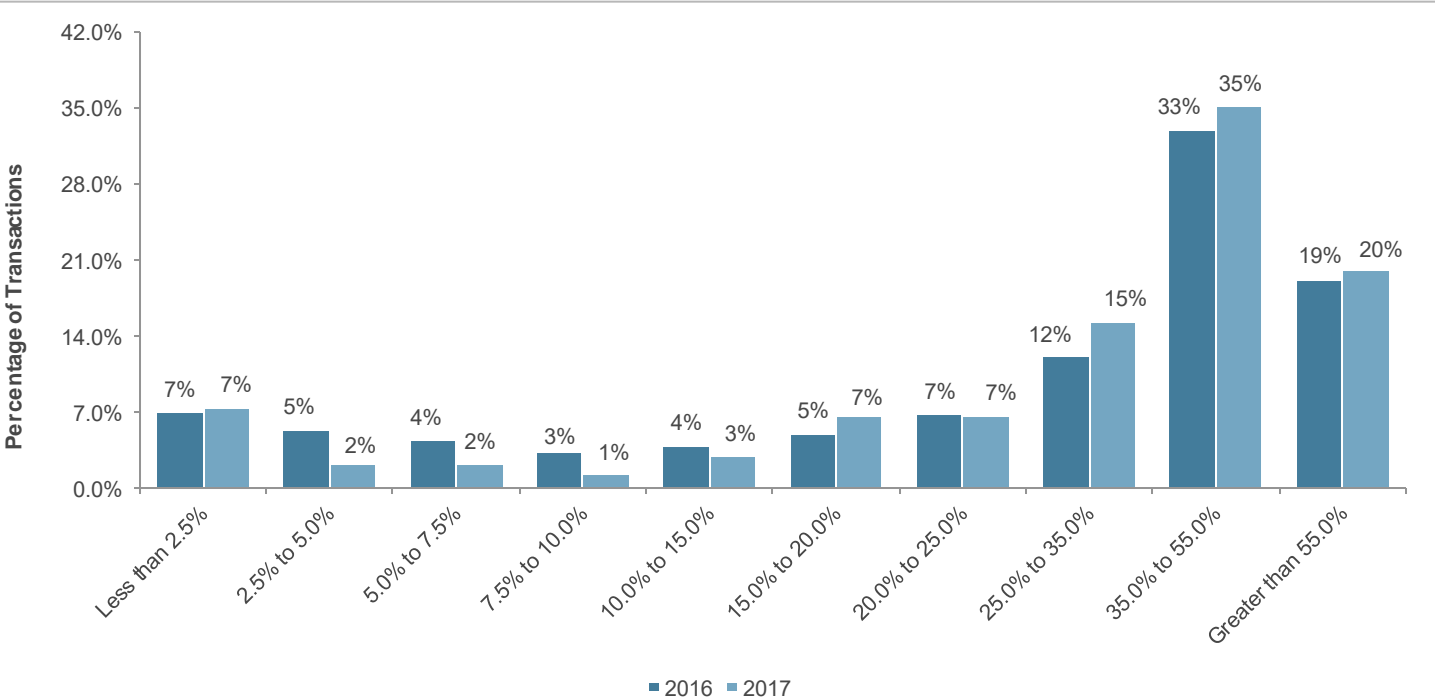
Distribution of PC Allocated to Intangible Assets and Goodwill
2017 Study vs. 2016 Study



Goodwill

- In the 2017 Study, 380 transactions (94%) allocated PC to goodwill. As in previous years, transactions with negative goodwill (i.e., bargain purchases) were excluded from the study. Based on our search criteria, there were nine bargain purchases in 2017, down from 14 in 2016.
- The median and mean allocations of PC to goodwill were 40% and 39%, respectively, in 2017.
- As illustrated below, 285 deals (71%) allocated 25% or more of PC to goodwill.

Distribution of PC Allocated to Goodwill
2017 Study



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